

# THIRTY-SECOND ANNUAL REPORT

OF THE

# Board of Health of the State of New Jersey

1908

AND

## Report of the Bureau of Vital Statistics



PATERSON, N. J.:  
The News Printing Co., State Printers.

1909.

## Board of Health of the State of New Jersey.

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### MEMBERS.

JOHN H. CAFTICK, President . . . . .	Montville.
GEORGE P. OLCOTT, C.E., Vice President . . . . .	East Orange.
BRUCE S. KEATOR, M.D., Secretary . . . . .	Asbury Park.
HARRY M. HERBERT, C.E. . . . .	Bound Brook.
JOHN J. MARNELL . . . . .	Hoboken.
WILLIAM H. CHEW . . . . .	Salem.

The offices of the Board are in the State House, Trenton.

# Table of Contents.

## Thirty-Second Annual Report of the Board of Health of the State of New Jersey, 1908.

	Page.
Secretary's letter of transmittal . . . . .	1
Report of the Board . . . . .	3
Secretary's report . . . . .	10
Laws of 1908 relative to State Department of Health . . . . .	10
Organization of the State Department of Health . . . . .	13
Duties of the State Board of Health . . . . .	15
Standing Committees . . . . .	16
Population . . . . .	17
Births . . . . .	19
Marriages . . . . .	22
Deaths . . . . .	23
Consumption . . . . .	32
Pneumonia . . . . .	36
Deaths among children . . . . .	37
Diphtheria . . . . .	46
Typhoid fever . . . . .	47
Whooping cough . . . . .	54
Scarlet fever . . . . .	55
Measles . . . . .	56
Malarial diseases . . . . .	57
Small-pox . . . . .	59
Cancer . . . . .	59
Suicide . . . . .	62
Rabies . . . . .	65
Notifiable diseases . . . . .	67
Division of Medical and Sanitary Inspection . . . . .	70
Health Officers and Sanitary Inspectors . . . . .	72
State Laboratory diagnosis . . . . .	73
Division of Food and Drugs . . . . .	74
Division of Creameries and Dairies . . . . .	82
Oleomargarine . . . . .	84
Milk . . . . .	84
Pasteurization of milk . . . . .	85

## TABLE OF CONTENTS.

Division of Sewerage and Water Supplies. . . . .	85
Bureau of Vital Statistics. . . . .	87
Cemeteries. . . . .	89
Slaughter houses. . . . .	92
Infectious diseases of animals. . . . .	92
Conference of State and Local Boards of Health. . . . .	93
The mosquito work in the State. . . . .	94
State Sanatoria for advanced cases of tuberculosis. . . . .	95
List of sanitary districts. . . . .	99
List of registrars of vital statistics. . . . .	127
List of coroners. . . . .	135
List of county physicians. . . . .	137
Report of Chief of Division of Medical and Sanitary Inspection. . . . .	139
Report of State Board of Sanitary Examiners. . . . .	165
Report of infectious diseases of animals. . . . .	171
Report of Chief of Division of Creameries and Dairies. . . . .	175
Report of Chief of Division of Food and Drugs. . . . .	203
Report of Director of State Laboratory of Hygiene. . . . .	235
Report of Chief of Division of Sewerage and Water Supplies. . . . .	265
Dedication of Atlantic City's new municipal hospital. . . . .	453
Excerpts from reports of local boards of health. . . . .	455
Legal decisions and opinions. . . . .	471
Report of the Bureau of Vital Statistics. . . . .	477

TRENTON, N. J., Oct. 31, 1908.

*To His Excellency John Franklin Fort, Governor of New Jersey.*

SIR:—I have the honor to transmit herewith the Thirty-second Annual Report of the Board of Health of the State of New Jersey, and the report of the Bureau of Vital Statistics.

Very respectfully,

BRUCE S. KEATOR,

*Secretary.*

(1)



## Report of the Board.

*To His Excellency John Franklin Fort, Governor,  
Trenton, New Jersey.*

SIR:—The State Board of Health in presenting its annual report for the year ending October 31st, calls attention to the fact that the Board as it is now constituted has been in control but little over five months. The detailed reports, however, published herewith account for the work for the full year.

In prefacing this report the present Board desires to particularly emphasize the work that has been accomplished since May last, at which time the Health Department of the State was reorganized. The duties of the present Board comprise not only those of the former Board of Health, but also the duties delegated by law to the former State Sewerage Commission. This consolidation in bringing within one department all work of a similar character in the State, has materially increased the duties of the Health Department. In order to dispose of this increase efficiently this Board deemed it wise at the outset to place the department upon a business basis. To that end it was decided to create a number of divisions, each one in charge of a responsible chief. Five departments were formed and the work that has been accomplished by each is told in detail in this report. Each chief of division has the control and direction of the men assigned to that division and each reports directly to the Board or its executive head. By this arrangement it has been found that much efficient work has been accomplished with little or no friction.

In carrying on this policy, however, the Board has found itself hampered for lack of funds. While additional force has been employed, this force has not been sufficiently large to properly cover the State. The policy of education that is being pursued everywhere with reference to sanitation has

created a strong public sentiment favorable to the work, and additional calls are almost daily being made upon this Board for advice and assistance, and in order to give this where it is proper that it should be given, the Board has found itself embarrassed for lack of needed assistants. The reports of each of the division chiefs appended hereto will show the force of this, and the Board as a whole urgently asks for a larger appropriation from the next Legislature for carrying on its most important work.

The demand for more advisory work is also pressing and the Board feels that by this means only can a greater degree of co-operation exist between the State Board and the various Local Boards. There should be uniformity of action between all health boards, and it is the intention of the Board to bring this about if it can be accomplished. The task is not a small one, however, for there are in the State at the present time 460 Local Boards, and to visit all of these and get them to adopt a uniform course means much work. But the Board is pursuing this policy and hopes in another year to have accomplished much in this direction. The Local Boards are by law required to render a report annually of their work, but during the past year only 335 of these Boards have so reported, and some of the reports have been of a crude and unsatisfactory character. Elsewhere in this report are printed excerpts from the reports of Local Boards that have been received, and these are published in the hope that they will prove an incentive to other Boards to report as fully and clearly in the future.

A great step forward has been taken by the State by placing in the hands of this Board the supervision over epidemics of communicable diseases in State Institutions. The work of inspecting these institutions is now being done under the direction of the proper department, and the results are sure to be highly beneficial.

The work of the State Laboratory during the past year has increased to a marked degree. Physicians and others in all parts of the State are availing themselves of its services more and more each year. New Jersey should be proud of its laboratory for it is well equipped and splendidly manned. The Board believes that it can be demonstrated that the number of bacteriological specimens annually examined in

the New Jersey Laboratory exceeds that of any other State Laboratory in the United States. It was the first institution in the country to undertake this kind of work systematically for physicians. Most of the specimens received, however, have come from physicians in the cities, and it is a matter of regret to the Board that the country practitioners do not make the use of the laboratory that they should, especially in cases of typhoid fever, which in New Jersey, is largely a disease of the rural districts. In connection with the laboratory work the Legislature should make a small additional appropriation to defray the expense of sending by telegraph the results of examinations in cases of diphtheria. These are cases where it might be fatal to rely on the mails.

Another duty with which the present Board has been charged has been the enforcement of the new revision of the pure food law which became operative October 1st, this year. While this law has been in force but a month, it has been demonstrated that it is far from perfect. Although drawn to conform closely to the Federal law, some changes and amendments seem necessary, and this Board joins with the Chief of the Division of Food and Drugs in urging legislation to remedy existing defects in the law.

No regular or systematic inspection of New Jersey dairies was conducted by the State until this Board created the Division of Creameries and Dairies, although work of this character was formerly done by the food inspectors in connection with their other duties, when opportunity offered. Already many hundred dairy farms are reported by the Chief of the Division to have been inspected, the result being marked improvement in hitherto most unsanitary conditions. The work has been by no means as thoroughly done as it should be, the Department suffering in this connection also for lack of inspectors. This can be better understood perhaps when it is explained that there are at least 10,000 dairies in the State supplying milk to New Jersey consumers, and only two men to inspect them.

It was formerly the custom of the State Health Department to require statements but once a month of the work done by the men in the field, these men being in a large measure, required to use their own discretion as to the character

of the work done and the territory covered. Under the system now in vogue in the several departments, these men are required to file daily reports and are, therefore, in close connection with their chiefs, and under their daily control.

In the Bureau of Vital Statistics an increasing amount of work has been done and New Jersey continues in the front rank of registration states. Some changes are needed in the law, however, to increase still more the efficiency of this Department and the Board urges that the Legislature give heed to the suggestions made by the Registrar in his report herewith published.

Perhaps the most important work that the Board has undertaken has been the effort to end stream pollution. It is estimated that the sewage flow in New Jersey is increasing at the rate of 30 per cent. in ten years, and as this sewage is found in large quantities in the waters of this State that are used for drinking purposes, it can be seen how urgent is the need for the abatement of this nuisance. The oyster industry of New Jersey is most important. The action of this Board, therefore, through its Division of Sewerage and Water Supplies in vigorously pursuing the work of relieving the Delaware and its tributaries of this pollution, is of the highest importance to our people. The Chief of the Division of Sewerage and Water Supplies in his report states that "two million dollars, the value of one year's product, would under a conservative estimate, install sewage purification plants on all the systems in the State which are now discharging raw sewage into the Delaware river." Surely then there ought to be no unreasonable delay in beginning the work.

It is gratifying to the Board to be able to report that the coast resort cities and towns are showing a commendable disposition to clean up their beaches; and already many of them are installing purification plants to prevent the accumulation of sewage along their beach fronts—their chief assets.

Through its proper division, the Board has carried on the work of analyzing public water supplies and the value of this is being properly recognized by the public. Private water supplies have likewise been analyzed upon request, while water that is being bottled for commercial purposes has also had the attention of the Board. That the milk supply may be

kept free from contamination the water used on dairy farms and in creameries has in many instances been analyzed, and where found impure other water supplies ordered. This work of safeguarding all water supplies is a tremendous one, for there are thousands of miles of streams in New Jersey to be gone over in search for polluting matter. Private individuals as well as municipalities and corporations have not escaped attention, and the work seems only to have begun.

The Board in conclusion desires to offer the following recommendations and suggestions:

1. It is very important that the Board should undertake the publication of a bulletin at stated intervals which should contain summaries of the work of the Board and of the various divisions, instructions and advice to Local Boards of Health, information to the grocery and drug trade concerning the operation of the food and drug law, popular exposition of certain phases of preventative medicine concerning which the public need to be informed, the results of special investigations carried on by the Board, and such other matter as the Board may see fit to publish. This bulletin should be sent to all physicians in the State, to all Local Boards of Health, all public libraries and newspapers, and to such other persons who may desire to receive it. The expense attached to the publication of such a bulletin would be considerable, but in no other way can the information which would be contained in it be brought to the attention of the public. Such a publication would bring the Board in much closer touch with Local Boards of Health, and would undoubtedly result in greatly increasing the power, influence and usefulness of the State Board.

2. An act should be passed requiring that all milk produced for sale should be cooled to a temperature of 50 F. or below as soon as milked and kept at a temperature until it reaches the consumer. The enforcement of such an act would result in an immediate improvement of our milk supply, and it would also undoubtedly make a considerable reduction in the infant mortality.

3. The Laboratory should be provided with a properly located and equipped room for keeping on hand guinea pigs,

rabbits, etc., for diagnostic purposes. No such room is now available and the bacteriological work is frequently hampered and the result of it rendered uncertain because the laboratory force has no animals with which to conduct experiments.

4. A room should also be provided in which special investigations may be conducted, such as the preparation of anthrax vaccine and Mallein. Such work cannot be conducted in a laboratory where other pathogenic bacteria are being handled without exposing the products to danger of contamination which would produce disastrous results. Anthrax is frequently epidemic in the southern part of the State. During such epidemics it becomes necessary to immunize large numbers of animals in order to check the disease. The State has heretofore purchased the vaccine required from outside manufacturers. If proper facilities were provided it could be manufactured in the laboratory for a small fraction of the sum which it now costs, and it would also be a reliable article. It is impossible to purchase reliable anthrax vaccine from any one as it is not on the market. A room set apart for this purpose could also be used for other investigations which cannot be conducted in the present quarters.

5. The laws relating to the prompt reporting of contagious diseases should be rigidly enforced. They are not so enforced at the present time. It may be a matter of some scientific interest for this Board to obtain histories of epidemics after they are all over, but such information is of little practical value. The Board cannot properly investigate epidemics unless it knows about them in the beginning, and such knowledge can only be obtained if physicians and Local Boards of Health are compelled to report every case of contagious disease at once. The reports received at the present time from many localities are so imperfect and so delayed in transmission that they are almost useless.

6. Adequate legislation should be secured looking toward the proper inspection and control of dairy premises where milk is produced for sale. The Division of Creameries and Dairies is greatly hampered because of lack of proper legal support, and also because of lack of an adequate appropriation to carry on this important work. As the State Board of Health is given supervision over cases of communicable

diseases occurring on dairy premises, the present law requiring the reporting of such cases to local boards of health should be so amended as to require physicians attending such cases to make a direct report to the State Board of Health in order that prompt measures may be adopted to protect milk consumers.

7. The control of tuberculosis in cattle should be vested in the State Board of Health. This is a matter which properly belongs to the Board.

8. The Board should have power to act in a summary way when it becomes necessary to compel Local Boards of Health to perform their duties. The present method is too slow and cumbersome to be of much value.

9. An act should be passed providing that the slaughtering of animals for food and the constructions of buildings where slaughtering is conducted should be supervised and controlled by the State Board of Health. This is a difficult problem, but one which must be met in the near future if this Board is to keep pace with the times.

The Board acknowledges the support that has been given it throughout the State and views with satisfaction the growth of public sentiment favorable to better sanitary conditions.

(Signed).

JOHN H. CAPSTICK,  
BRUCE S. KEATOR,  
GEORGE P. OLCOTT,  
H. M. HERBERT,  
JOHN J. MARNELL,  
WILLIAM H. CHEW.

## Secretary's Report.

*To the Board of Health of the State of New Jersey.*

GENTLEMEN:—In accordance with the provisions of section 3 of chapter 68 of the laws of 1887, and of the amendments thereto, as found in section 3 of chapter 299 of the laws of 1908, it becomes my duty as secretary, acting as executive officer, to superintend the performance of the duties prescribed by law in relation to the State Board of Health, and the classification, index and transmission of vital statistics heretofore required to be made.

### *Laws of 1908 Relative to the State Department of Health.*

Inasmuch as the present Board of Health of the State of New Jersey was newly appointed and reorganized this year, and under the laws of 1908 said Board is charged with the responsibilities and obligations of the former State Board of Health, together with all the duties of the State Sewerage Commission as it formerly existed, it seems expedient to quote the following acts to show how the terms of office of both these boards were terminated; why the present Board came to be appointed, and how the duties and obligations of the State Sewerage Commission were transferred and added to those of the State Board of Health as it is now constituted:

#### *An Act.*

To terminate the terms of office of the members of the Board of Health of the State of New Jersey as the same is now constituted.

*Be it enacted* by the Senate and General Assembly of the State of New Jersey:

1. From and after the passage and approval of this act, the terms of office of the several members of the Board of Health of the State of New Jersey as the same is now constituted under section one of an act of the Legislature entitled "An act to establish in this State boards of health and a bureau of vital statistics, and to define their respective powers and duties," approved March thirty-first, one thousand eight hundred and eighty-seven, shall be and the same are hereby terminated.

2. This act shall take effect immediately.

Approved,  
JOHN FRANKLIN FORT,  
Governor.

April 16, 1908.

(10)

#### *An Act.*

To terminate the terms of office of the State Sewerage Commission as the same is now constituted.

*Be it enacted* by the Senate and General Assembly of the State of New Jersey:

1. From and after the passage and approval of this act, the terms of office of the several members of the State Sewerage Commission, as the same is now constituted, under an act entitled "An Act to prevent the pollution of the waters of this State by the establishment of a State Sewerage Commission, and authorizing the creation of sewerage districts and district sewerage boards, and prescribing, defining and regulating the powers and duties of such commission and such boards," approved March twenty-fourth, one thousand eight hundred and ninety-nine, and the acts amendatory thereof and supplementary thereto, shall be and the same are hereby terminated.

2. This act shall take effect immediately.

Approved,  
JOHN FRANKLIN FORT,  
Governor.

April 16, 1908.

#### *A Supplement.*

To an act entitled "An act to prevent the pollution of the waters of this State by the establishment of a State Sewerage Commission, and authorizing the creation of sewerage districts and district sewerage boards, and prescribing, defining and regulating the powers and duties of such commission and such boards," approved March twenty-fourth, one thousand eight hundred and ninety-nine.

*Be it enacted* by the Senate and General Assembly of the State of New Jersey:

1. From and after the passage and approval of this act all powers and duties heretofore vested in and executed by the State Sewerage Commission, pursuant to the act to which this act is a supplement, and the acts amendatory thereof and supplementary thereto, shall vest in and be executed by the Board of Health of the State of New Jersey.

2. Nothing herein contained shall be held to abate or render invalid any notice or proceeding, or suit at law or in equity, which may have been served, begun or instituted by the State Sewerage Commission, prior to the date hereof, in accordance with the powers and duties heretofore conferred upon it, but the same shall continue in full force and effect, and be further advanced and prosecuted in the name of the Board of Health of the State of New Jersey; nor shall anything herein contained be held to abolish any sewerage district or district sewerage board heretofore created or established pursuant to law; and all appropriations which may have been heretofore made to and for the use of the State Sewerage Commission shall continue and cure to the benefit of the Board of Health of the State of New Jersey for the purpose of carrying into effect the provisions of the act to which this act is a supplement.

3. This act shall take effect immediately.

Approved,  
JOHN FRANKLIN FORT,  
Governor.

April 16, 1908.

#### *An Act.*

To amend an act entitled "An act to establish in this State boards of health and a bureau of vital statistics, and to define their respective powers and duties," approved March thirty-first, one thousand eight hundred and eighty-seven.

*Be it enacted* by the Senate and General Assembly of the State of New Jersey

1. From and after the passage and approval of this act, section one of the act entitled "An act to establish in this State boards of health and a bureau

of vital statistics, and to define their respective powers and duties," approved March thirty-first, one thousand eight hundred and eighty-seven, shall be and the same is hereby amended as follows:

1. There shall be in this State a State Board of Health, to be known as the "Board of Health of the State of New Jersey," which shall be composed of six suitable persons, citizens and residents of this State, to be appointed by the Governor, by and with the advice and consent of the Senate, from time to time as hereinafter directed; one of whom shall be a physician of at least five years' practice in this State, who shall be the secretary of the said board, and shall also be superintendent of vital statistics. The Governor, shall at the time of appointment, indicate one member of said board who shall be the president thereof. Each of the members shall hold office for the term of six years, and their respective terms of office shall be so arranged that the term of office of not more than one member shall expire in any one year. The president and medical secretary of the said board shall, in each instance, upon the occasion of vacancy and reappointment, be designated by the Governor. If the office of any member shall for any cause become vacant before the expiration of the term for which such member was appointed, the same shall be filled by the Governor for the unexpired term only. The compensation of each of such members shall be fifteen hundred dollars per year, payable monthly, except the secretary, whose compensation shall be two thousand five hundred dollars per year, payable monthly.

2. Section three of the said act shall be and the same is hereby amended to read as follows:

3. The president shall call meetings as often as once in three months and also whenever in his judgment it shall become necessary, and whenever requested so to do by two members of the board. The secretary of the board shall superintend the performance of the duties prescribed by law in relation to the State Board of Health, and the classification, index and transcription of vital facts hereinbefore required to be made. The said State Board of Health shall in the month of December in each year make a report to the Governor of their investigations and inquiries for the year, with such communications and suggestions concerning the public health as they may deem proper.

3. All acts and parts of acts inconsistent herewith are hereby repealed, and this act shall take effect immediately.

Approved,  
JOHN FRANKLIN FORT,  
Governor.

April 16, 1908.

## ORGANIZATION OF THE STATE DEPARTMENT OF HEALTH.

On May 8, 1908, Governor Fort appointed the members of the State Board of Health, but their commissions were not received until May 25. On May 26 the members of the State Board met in their offices at the State House, Trenton, for organization, which resulted in establishing the five following working divisions of the State Department of Health:

1. Division of Vital Statistics. 2. Division of Medical and Sanitary Inspection. 3. Division of Food and Drugs. 4. Division of Creameries and Dairies. 5. Division of Sewerage and Water Supplies.

At this or at subsequent meetings of the Board appointments were made in the different divisions, and at the end of the fiscal year, October 31, 1908, the complete personnel of the department was as follows:

Bruce S. Keator, M.D., Secretary and Executive Officer.  
A. Clark Hunt, M.D., Assistant Secretary.  
Charles J. Merrell, Chief Clerk and Stenographer.

### DIVISION OF VITAL STATISTICS.

David S. South, State Registrar and Chief.  
Walter R. Scott, Assistant to the Chief,  
Albert J. Shull, Clerk.  
Mrs. E. C. Closson, Clerk.  
Miss K. M. Vare, Clerk and Tabulator.  
Miss E. S. Merrell, Clerk and Stenographer.

### DIVISION OF MEDICAL AND SANITARY INSPECTION.

A. Clark Hunt, M.D., Chief.  
D. C. Bowen, Sanitary Inspector.

### DIVISION OF FOOD AND DRUGS.

R. B. Fitz-Randolph, Chief of Division and Director of the State Laboratory of Hygiene.  
W. G. Tice, Assistant to the Chief.  
Shippen Wallace, Analyst.

J. V. Mulcahy, Bacteriologist.  
 W. S. Townsend, Inspector.  
 Jerome E. Graves, Assistant Inspector.  
 Louis Tremallo, Assistant Inspector.  
 Joseph Moran, Laboratory Assistant.  
 Frank Yates, Clerk.

#### DIVISION OF CREAMERIES AND DAIRIES.

George W. McGuire, Chief of Division.  
 A. I. Goehrig, Assistant to the Chief.  
 S. S. Vandruff, Inspector.  
 Miss Florence E. Derbyshire, Clerk.

#### DIVISION OF SEWERAGE AND WATER SUPPLIES.

Harry M. Herbert, M.S. C.E., Chief of Division.  
 Arthur G. Fowler, Ph.B., Assistant to the Chief.  
 Mrs. Louise MacMillan, Clerk.  
 Francis E. Daniels, M.A., Chemist and Bacteriologist.  
 Henry W. Denny, Sc. B., Chemist and Water Analyst.  
 Miss Frances P. Kessler, Stenographer.  
 Fred B. Worman, Inspector.  
 E'via Scott, Inspector.  
 Charles B. Robinson, Jr., Inspector.

#### DUTIES OF THE STATE BOARD OF HEALTH.

The work of the State Board of Health as designated in the original act under which it was constituted was chiefly of an advisory character. Enactments from time to time have since added the following duties in line of investigation, inquiry or executive action: "Classification, registration and tabulation of marriages, births and deaths; sanitary supervision over cars, boats and other vehicles in which persons or chattels are transported or carried through the State; investigation of local outbreaks of disease; investigation of nuisances; needs for drainage and neglect of sanitary laws; investigation of the sanitary condition of school houses, tenement houses, manufactories, work shops, public buildings and State institutions, also inquiries concerning conditions affecting the health of persons confined or employed in such buildings; investigations concerning the sources of sickness and mortality and the effect of locality and employment on the public health; prevention of the spread of contagious diseases of animals; prevention of the sale of contaminated milk; receiving and recording reports of communicable diseases; improvement of the local sanitary inspection service; supervision over the administration of maritime quarantine; supervision over the State bacteriological laboratory; the detection of adulterated foods; prevention of the sale of dangerous kerosene oil; prevention of the sale of impure or inert vaccine, antitoxin or other animal products used for remedial or prophylactic purposes; control of the establishment and extension of cemeteries; inspection of dairies; supervision and licensing of creameries; supervision and control of the sale of oleomargarine, and inspection, supervision and control of sewerage and water supplies."

It will thus be seen that the duties and obligations of the State Board of Health are both extremely important and diversified in character. For the Board to do all that is contemplated under the laws has been and is impossible with the very moderate appropriations granted by the legislature with which to employ the necessary sanitary assistants. In order to properly execute the work outlined in the various acts establishing the board and defining its duties in the various lines of sanitary work, the present working force of

the Health Department should be doubled. With the present limited number of Inspectors it is not possible to satisfactorily pursue the work of sanitary investigation and inspection, either in the division of food and drugs, the medical and sanitary division, the creamery and dairy division or the division of sewerage and water supplies. The Health Department could with advantage employ twice or three times the present number of Inspectors, and still not be able to accomplish all the sanitary work of the State as contemplated in the various health laws. At the same time of increasing the inspection service there should be a corresponding increase in the number of chemists, analysts and bacteriologists in the State Laboratory of Hygiene to properly examine the specimens and samples sent in by the physicians or by the Inspectors whose work might otherwise be useless. Transcriptions of births, marriages and deaths, made by local officers, from 1848 to 1878, are on file in the Bureau of Vital Statistics. Since 1878 all the original certificates made by physicians and clergymen have also been filed. This constitutes a remarkable collection of statistical information, but only such mortality tables have been compiled as the limited clerical force of the department would permit. The appropriation for this work is not adequate, and it should be increased. The same is true of the appropriation for the supervision and control of contagious diseases of animals. The present appropriation, two thousand dollars, is not a sufficient amount with which to properly guard the animal industry of the State, against infectious diseases. It is hoped that these facts may be taken into consideration during the coming session of the Legislature, and that ample appropriation may be made with which to properly conduct the department of health of the State in all its branches.

#### STANDING COMMITTEES.

After the reorganization of the State Board of Health in May, 1908, for the purpose of fairly dividing the work and responsibility among the members of the Board, seven standing committees were established, and the following persons were appointed as members of the same:

Vital Statistics—George P. Olcott and William H. Chew.

Cemeteries, Burial and Transportation of the Dead—Harry M. Herbert and John J. Marnell.

Epidemics and Supervision of Lines of Travel—John J. Marnell and William H. Chew.

Drainage, Sewerage and Water Supplies—Harry M. Herbert and William H. Chew.

Public Institutions—George P. Olcott and Harry M. Herbert.

Auditing—John H. Capstick and Bruce S. Keator.

Examiners of Applicants for Appointments—William H. Chew and Harry M. Herbert.

John H. Capstick, President, and Bruce S. Keator, Secretary, members ex-officio of all committees.

POPULATION.—The estimated population of the counties of New Jersey, and also of forty-eight of the larger municipalities, for the year 1907, is stated in the following table. The table also shows the census figures for the past twenty-five years:



TABLE 1.—POPULATION OF THE COUNTIES OF NEW JERSEY AND OF MUNICIPALITIES HAVING 5,000 INHABITANTS OR OVER FOR THE CENSUS YEARS 1880, 1885, 1890, 1895, 1900, 1905, AND ESTIMATED POPULATION FOR 1907.

	1880.	1885.	1890.	1895.	1900.	1905.	1907.
Atlantic County.....	18,704	22,356	28,836	34,750	46,402	59,862	65,246
Atlantic City.....	5,477	7,942	13,055	18,329	27,838	37,593	41,495
Bergen County.....	36,786	39,880	47,226	65,251	78,441	103,033	108,628
Englewood.....						7,922	8,690
Garfield.....			6,004	7,282	9,443	11,098	5,092
Hackensack.....						11,098	11,760
Rutherford.....						5,215	5,541
Burlington County.....	55,403	57,558	58,528	59,117	58,241	62,042	63,562
Bordentown.....	5,334	5,857	5,040	5,176	4,110	4,073	4,058
Burlington.....	7,237	7,690	7,264	7,844	7,392	8,038	8,296
Camden County.....	62,942	76,685	87,687	100,104	107,643	121,555	127,120
Camden City.....	41,659	52,884	58,313	63,467	75,935	83,363	86,334
Gloucester City.....	5,347	5,966	6,564	6,225	6,540	8,055	8,541
Cape May County.....	9,765	10,744	11,298	12,355	15,201	17,390	19,066
Cumberland County.....	37,637	41,832	45,438	49,815	51,193	52,110	52,477
Bridgeton.....	8,722	10,065	11,224	13,292	13,913	13,624	13,508
Millville.....	7,660	8,824	10,002	10,466	10,588	11,884	12,402
Essex County.....	189,929	213,764	256,098	312,000	359,053	409,928	430,378
Bloomfield.....			7,708	8,093	9,668	11,668	12,468
East Orange.....			13,282	17,927	21,506	25,175	26,643
Irvington.....				3,388	5,255	7,180	7,950
Montclair.....			8,656	11,753	13,962	16,370	17,333
Newark.....	136,508	152,988	181,830	215,806	246,070	283,289	298,177
Orange.....	13,207	15,231	18,544	22,792	24,141	26,101	26,855
West Orange.....			4,353	5,854	6,889	7,872	8,265
Gloucester County.....	25,886	27,603	28,649	31,191	31,905	34,477	35,506
Hudson County.....	187,944	240,342	275,126	328,860	386,048	449,879	475,411
Bayonne.....	9,372	13,080	19,033	19,856	32,722	42,263	46,078
Harrison.....	6,898	6,506	8,338	9,872	10,596	12,823	13,714
Hoboken.....	30,699	37,721	43,848	54,083	59,364	65,468	67,910
Jersey City.....	120,722	153,513	163,003	182,713	206,433	232,699	243,205
Keamy.....				10,487	10,896	13,601	14,683
Town of Union.....	5,849	8,398	10,613	13,336	15,187	17,005	17,332
West Hoboken.....			11,665	18,296	23,094	29,082	31,477
Hunterdon County.....	38,570	37,420	35,355	35,334	34,507	33,258	32,758
Lambertville.....						5,016	5,168
Mercer County.....	58,061	66,785	79,978	85,538	95,365	110,516	116,576
Chambersburg.....	5,437	8,542				6,029	6,881
Princeton.....						84,180	88,529
Trenton.....	29,910	34,386	57,458	62,518	73,307	97,308	103,946
Middlesex County.....	52,286	56,180	61,754	70,058	79,762	97,038	103,946
New Brunswick.....	17,166	18,258	19,603	19,910	20,006	23,133	24,384
Perth Amboy.....			9,512	13,030	17,690	25,895	29,173
South Amboy.....			4,330	5,571	6,349	6,258	6,222
Monmouth County.....	55,538	62,324	69,128	75,543	82,057	87,919	90,264
Asbury Park.....						12,183	9,604
Long Branch.....		5,140	7,231	7,333	8,872	12,183	15,493
Red Bank.....			4,145	4,938	5,428	6,263	6,597
Morris County.....	50,861	50,675	54,101	59,530	65,156	67,934	69,045
Dover.....						5,938	6,353
Morristown.....	6,837	8,760	8,156	10,290	11,267	12,146	12,498
Ocean County.....	14,455	15,586	15,974	18,739	19,747	20,880	21,600
Passaic County.....	68,860	83,374	105,046	133,227	155,202	178,858	184,120
Passaic City.....	6,532		13,028	17,894	27,777	37,837	41,861
Paterson.....	51,031	78,347	97,344	105,171	111,529	111,529	114,072
Salem County.....	24,579	25,373	25,151	26,084	25,530	26,278	26,577
Salem City.....	5,056	5,316	5,516	6,337	5,811	6,442	6,696
Somerset County.....	27,162	27,425	28,311	30,447	32,648	36,270	37,599
North Plainfield.....			4,245	5,009	5,616	5,616	5,899
Sussex County.....	23,539	22,401	22,259	22,586	24,134	23,325	23,001
Union County.....	55,571	61,839	72,467	85,404	99,353	117,211	124,354
Elizabeth.....	28,229	32,119	37,764	43,854	52,130	60,561	64,881
Plainfield.....	8,125	8,613	13,629	15,399	18,468	19,468	19,708
Rahway.....	6,455	6,861	7,105	7,945	7,935	8,649	8,935
Summit.....				4,450	5,302	6,845	7,462
Westfield.....						5,265	5,640
Warren County.....	36,589	37,737	36,553	37,283	37,781	40,409	41,452
Phillipsburg.....	7,181	8,058	8,644	9,051	10,052	13,352	14,672

TABLE 2.—SHOWING NUMBER OF WHITE AND COLORED INHABITANTS IN NEW JERSEY, WITH DEATH-RATES PER 1,000 POPULATION, FOR FIVE YEARS, 1901-1907.

YEARS.	Estimated population (total).	Estimated population (colored).	Total death-rate.	Death-rate, white.	Death rate, colored.
1901.....	1,883,669	72,011	16.48	16.65	21.79
1902.....	1,925,781	74,178	15.91	17.33	21.00
1903.....	2,016,797	76,345	15.87	15.44	24.32
1904.....	2,058,909	78,512	17.14	16.91	22.95
1905.....	2,144,143	79,485	15.79	15.57	21.59
1906.....	2,196,238	80,458	16.24	16.02	22.09
1907.....	2,248,331	81,431	16.63	16.42	22.47

BIRTHS—The number of certificates of birth received during the year ending December 31, 1907, was 44,651, an increase of 1,974 over the previous year. Every effort is being made by this Board to have a complete registration of all births which take place in this State, and to successfully complete the work of registration we must have the co-operation of local boards of health. These boards should appoint local registrars of vital statistics who are intelligent and firm, for upon these registrars largely depends the enforcement of the law. The State Department of Labor investigated the ages of some 5,000 children last year, four-fifths of whom were American born, and in less than two-fifths of the American born children were public records available, therefore it is important that every birth be reported as required by law.

Dr. Arthur R. Reynolds alludes to the importance of reporting births in the following words: "There is hardly a relation in life, from the cradle to the grave, in which the evidence furnished by the accurate registration of births may not prove to be of the greatest value; as, for example, in the matter of descent; in relations of guardians and wards; in the disabilities of minors; in the administration of estates; the settlement of insurance and pensions; the requirements of foreign countries concerning residence, marriage and legacies; in marriage in our own country; in voting and in jury and militia service; in the right to admission and practice in the professions and to many public offices; in the enforcement of laws relating to education and to child-labor, as well as to various matters in the criminal code; the irresponsibility of children under ten years of age for crime and misdemeanor; the determination of the age of consent, etc. As the country becomes more densely settled, and the struggle for existence sharper, many of these matters which have hitherto been of minor significance will take on a deeper meaning and acquire greater importance. Hence the urgent necessity for remedy of the defects which prevent a proper registration of births."

TABLE 3.—SHOWING POPULATION, NUMBER OF BIRTHS REPORTED, NUMBER OF MARRIAGES AND NUMBER OF DEATHS IN NEW JERSEY, WITH BIRTH-RATES, MARRIAGE-RATES AND DEATH-RATES FOR THE TWENTY-NINE YEARS ENDING DECEMBER 31, 1907.

YEAR.	Population.*	BIRTHS.		MARRIAGES.		DEATHS.	
		Number of births reported.	Birth-rate per 1,000 population.	Number of marriages.	Persons married per 1,000 population.	Number of deaths.	Death-rate per 1,000 population.
1879	1,020,584	23,116	22.65	7,096	13.91	20,440	20.03
1880	1,130,892	23,680	20.94	7,963	14.08	18,967	16.77
1881	1,160,275	23,484	20.24	8,109	13.98	20,812	17.94
1882	1,189,658	23,108	19.42	8,837	14.86	25,959	21.82
1883	1,209,048	24,430	20.21	9,166	15.16	23,310	19.23
1884	1,248,224	25,263	20.20	8,968	14.37	21,716	17.40
1885	1,278,033	24,077	18.84	8,989	14.07	23,807	18.63
1886	1,310,431	25,497	19.46	12,351	18.85	22,734	17.35
1887	1,342,829	27,340	20.36	15,416	22.96	24,351	18.12
1888	1,375,227	28,074	20.41	16,025	23.31	27,173	19.76
1889	1,407,625	29,099	20.67	15,726	22.34	26,543	18.86
1890	1,441,017	30,103	20.89	15,564	21.60	28,530	19.80
1891	1,478,784	28,882	19.53	15,305	20.70	28,840	19.50
1892	1,511,653	30,627	20.26	16,082	21.28	32,685	21.62
1893	1,538,790	32,285	20.98	17,178	22.33	30,596	19.88
1894	1,578,373	33,662	21.33	16,245	20.58	30,004	19.09
1895	1,672,942	31,742	18.97	15,873	18.98	30,634	18.31
1896	1,718,543	31,207	18.16	18,370	21.38	30,767	17.90
1897	1,764,144	31,595	17.91	18,171	20.80	29,822	16.90
1898	1,810,008	32,515	17.96	13,213	14.59	27,337	15.11
1899	1,855,872	29,419	15.84	13,336	14.37	30,999	16.70
1900	1,883,669	32,270	17.13	14,611	15.51	31,474	16.62
1901	1,925,781	34,812	18.08	16,539	17.18	31,739	16.48
1902	1,967,893	35,116	17.84	18,150	18.45	31,319	15.91
1903	2,016,797	37,242	18.47	19,512	19.35	31,820	15.87
1904	2,058,909	38,751	18.82	18,919	18.38	35,298	17.14
1905	2,144,143	39,689	18.51	20,572	19.19	33,864	15.79
1906	2,196,238	42,677	19.43	21,580	19.65	35,670	16.24
1907	2,248,331	44,651	19.86	23,649	21.04	37,408	16.63

\*Estimated except for census years.

NOTE.—The reports of births are not as complete as are those for marriages and deaths, hence the above table does not represent with accuracy the relation between birth-rates and death-rates.

NOTE.—The large number of marriages reported during the years 1886-1897 was due to the unrestricted authority contained in the laws for the performance of the marriage ceremony in the case of non-residents, and the marked decrease in the number of marriages which occurred in 1898 was directly consequent upon the enactment of the law requiring a license in cases where both parties are non-residents of the State.

**MARRIAGES**—The number of marriage certificates filed with the Bureau of Vital Statistics during the calendar year, 1907, was 23,649, an increase of 2,069 over the previous year.

TABLE 4.—SHOWING NUMBER OF MARRIAGES RECORDED IN NEW JERSEY FOR THE TWENTY-NINE YEARS ENDING DECEMBER 31, 1907.

YEAR.	1879.	1880.	1881.	1882.	1883.	1884.	1885.	1886.	1887.		
Marriages in New Jersey.....	7,096	7,963	8,109	8,837	9,166	8,968	8,989	12,351	15,416		
Persons married per 1,000 population.....	13.91	14.08	13.98	14.86	15.16	15.37	14.07	18.85	22.96		
YEAR.	1888.	1889.	1890.	1891.	1892.	1893.	1894.	1895.	1896.		
Marriages in New Jersey.....	16,025	15,726	15,564	15,305	16,082	17,178	16,245	15,873	18,370		
Persons married per 1,000 population.....	23.31	22.34	21.60	20.70	21.28	22.33	20.59	18.98	21.38		
YEAR.	1897.	1898.	1899.	1900.	1901.	1902.	1903.	1904.	1905.	1906.	1907.
Marriages in New Jersey.....	18,171	13,213	13,336	14,611	16,539	18,150	19,512	18,919	20,572	21,580	23,649
Persons married per 1,000 population.....	20.60	14.50	15.40	15.51	17.23	18.45	19.35	18.38	19.19	19.65	21.04

**DEATHS**—The number of deaths reported during the year ending December 31, 1907, was 37,408. The estimated population is 2,248,331, and the annual death-rate is 16.63 per 1,000 inhabitants. The death-rates shown on the following chart for the past ten years are the lowest in the history of this department:

CHART SHOWING DEATH-RATES IN NEW JERSEY, PER 1,000 INHABITANTS FOR TWENTY-NINE YEARS, 1879-1907.

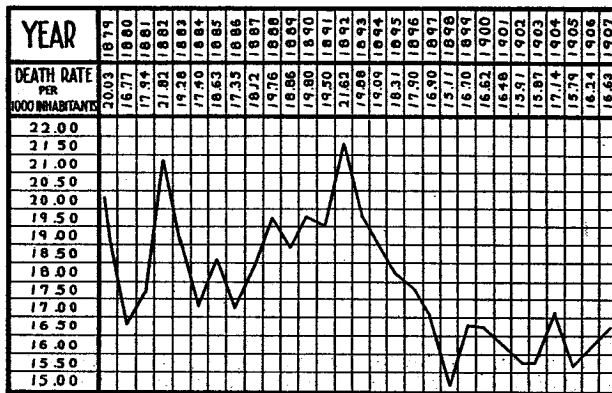


TABLE 5.—DEATHS IN NEW JERSEY, BY AGE PERIODS, FOR THE YEAR ENDING DECEMBER 31, 1907.

Under 1 mo.	AGE PERIODS.																	Total number of deaths.	
	Under 1 year.	1 to 5	5 to 10	10 to 15	15 to 20	20 to 25	25 to 30	30 to 35	35 to 40	40 to 45	45 to 50	50 to 55	55 to 60	60 to 70	70 to 80	80 to 90	Over 90.		Not stated.
2602	5130	3135	878	570	804	1344	1517	1666	1762	1839	1782	1893	1997	4370	3826	2014	244	15	37408

37408

TABLE 6.—SHOWING NUMBER OF DEATHS IN NEW JERSEY FROM CERTAIN CLASSIFIED DISEASES FOR TWENTY-NINE YEARS, 1879-1907.

Table with 11 columns (1879-1887) and rows for various diseases including Acute lung diseases, Consumption, Diarrhoeal diseases, etc.

Table with 11 columns (1888-1896) and rows for various diseases including Acute lung diseases, Consumption, Diarrhoeal diseases, etc.

TABLE 6.—SHOWING NUMBER OF DEATHS IN NEW JERSEY FROM CERTAIN CLASSIFIED DISEASES FOR TWENTY-NINE YEARS, 1879-1907.—(Continued).

Table with 11 columns (1897-1907) and rows for various diseases including Acute lung diseases, Consumption, Diarrhoeal diseases, etc.

TABLE 7.—DEATHS IN NEW JERSEY, PER 10,000 POPULATION, FROM CERTAIN CLASSIFIED CAUSES, FOR TWENTY-NINE YEARS.

Table with 11 columns (1879-1887) and rows for various causes of death including Acute lung diseases, Consumption, Diarrhoeal diseases, etc.



TABLE 8.—SHOWING DEATH-RATE PER 1,000 POPULATION, IN THE CITIES OF NEW JERSEY HAVING OVER 5,000 POPULATION, FOR TWENTY-NINE YEARS, 1879-1907.—(Continued).

NAMES OF CITIES.	1897.	1898.	1899.	1900.	1901.	1902.	1903.	1904.	1905.	1906.	1907.
Asbury Park.....											14.58
Atlantic City*.....	20.45	16.89	19.03	17.85	10.85	16.28	15.33	14.92	16.79	17.93	16.35
Englewood.....			17.57	17.73	15.74	16.45	15.86	13.82	14.90	17.08	16.63
Garfield.....											15.89
Hackensack.....	14.49	11.43	14.94	13.66	17.52	18.34	16.39	13.78	17.48	16.89	18.54
Bordentown.....	14.78	18.17	17.35	19.46	16.55	17.27	18.73	19.71	13.26	17.19	15.52
Burlington.....	18.20	14.28	16.87	24.76	19.73	21.28	22.46	22.32	16.67	17.87	18.63
Camden.....	20.71	17.82	19.35				16.00	16.05	18.01	16.17	18.44
Gloucester.....	25.61	18.31	19.50	19.88	11.27	21.03	17.99	17.32	18.37	18.44	19.55
Bridgeton.....	15.02	13.10	13.74	14.38	13.32	13.89	13.78	16.66	14.09	14.31	17.89
Millville.....	9.67	12.38	13.38	15.78	14.61	16.27	14.13	16.67	13.72	13.67	14.00
Bloomfield.....					14.55	13.50	11.21	14.64	11.40	14.09	11.63
East Orange.....				10.97	9.71	10.94	9.72	12.11	10.72	10.38	11.15
Irvington.....					9.24	14.66	12.86	10.67	12.53	13.35	14.34
Montclair.....	10.63	11.76	13.00	15.11	16.87	14.48	17.42	20.28	18.02	15.49	16.79
Newark.....	19.80	16.65	19.40	19.60	19.14	18.71	18.47	19.61	17.45	19.08	19.11
Orange.....	16.50	19.08	18.19	20.63	17.45	20.26	20.40	21.85	20.46	20.34	19.08
West Orange.....					13.25	10.27	10.52	11.02	13.59	10.66	11.49
Bayonne.....	21.80	25.00	25.59	17.39	16.38	15.32	18.44	16.60	15.76	17.18	16.56
Harrison.....	18.61	23.77	19.18	22.37	21.24	19.33	18.63	16.69	18.87	17.56	19.25
Hoboken.....	21.94	18.06	19.91	23.01	18.67	18.80	17.70	22.33	21.11	21.46	22.91
Jersey City.....	19.60	19.16	19.78	20.34	19.12	18.65	18.82	20.85	18.88	19.36	19.42
Kearny.....						17.45	17.68	23.70	17.20	17.54	14.50
Town of Union.....	14.70	13.58	11.63	14.16	11.25	16.39	16.07	17.76	13.94	16.52	16.41
West Hoboken.....						12.95	11.76	14.48	14.37	12.71	11.79
West New York.....						14.85	11.98	16.14	15.42	13.72	17.07
Lambertville.....											14.71
Princeton.....											9.16
Trenton.....	16.44	15.45	17.71	16.42	16.35	17.19	18.30	18.09	17.63	17.28	18.06
New Brunswick.....	19.33	14.73	16.04	21.29	18.18	20.00	19.43	22.16	19.66	17.76	19.19
Ferth Amboy.....	17.11	14.93	16.16	14.46	16.53	14.82	12.70	14.39	12.20	12.89	13.68
South Amboy.....	17.31	13.14	12.65	13.86	16.14	19.52	15.93	16.06	19.97	21.89	16.86
Red Branch*.....	14.11	18.13	17.51	18.15	24.07	21.90	20.21	22.37	21.51	18.15	18.59
Red Bank.....					16.44	12.58	12.52	15.87	15.97	14.31	13.79
Dover.....	19.12	15.73	14.34	12.46	16.01	15.39	13.87	14.09	15.58	11.19	15.95
Morristown.....	16.16	17.38	19.18	16.38	18.50	16.64	17.95	18.84	20.42	21.10	22.49
Passaic.....	24.29	19.84	23.64	20.99	18.22	17.74	20.03	18.52	18.29	16.39	19.30
Paterson.....	18.71	15.89	19.65	18.70	17.53	16.37	15.29	17.84	16.51	17.66	16.12
Salem.....	16.65	18.30	18.30	20.13	14.11	16.00	17.21	20.31	16.92	16.90	16.25
North Plainfield.....				12.40	12.44	13.17	11.57	17.27		9.59	14.85
Elizabeth.....	17.16	15.50	17.25	17.69	17.17	15.30	16.55	18.72	15.63	17.64	18.70
Plainfield.....	15.91	14.16	15.72	16.01	16.36	15.94	15.84	16.89	15.70	15.93	18.01
Rahway.....	16.06	14.30	16.67	13.50	14.87	17.52	15.50	13.99	13.64	12.51	13.99
Summit.....					14.62	11.81	14.28	13.03	12.27	14.12	10.99
Westfield.....											12.59
Phillipsburg.....	16.75	18.40	13.68	12.13	14.34	15.04	13.44	15.52	10.03	11.49	14.99

\*The death-rate in summer resorts is calculated on the basis of the resident population, whereas the actual population is often several times larger, and on account of this floating population and the large number of invalids included in it, the death-rate is not a criterion of health conditions.

CHART SHOWING RELATIVE MORTALITY IN CERTAIN CITIES OF NEW JERSEY FOR THE YEAR ENDING DECEMBER 31, 1907.

East Orange.....	Population, 26,643. Deaths, 297. Rate per 1,000, 11.15.
Bloomfield.....	Population, 12,468. Deaths, 145. Rate per 1,000, 11.63.
West Hoboken.....	Population, 31,477. Deaths, 371. Rate per 1,000, 11.79.
Perth Amboy.....	Population, 29,173. Deaths, 399. Rate per 1,000, 13.68.
Millville.....	Population, 12,402. Deaths, 174. Rate per 1,000, 14.00.
Kearny.....	Population, 14,683. Deaths, 213. Rate per 1,000, 14.50.
Paterson.....	Population, 114,072. Deaths, 1,839. Rate per 1,000, 16.12.
Town of Union.....	Population, 17,732. Deaths, 291. Rate per 1,000, 16.41.
Bayonne.....	Population, 46,078. Deaths, 763. Rate per 1,000, 16.56.
Montclair.....	Population, 17,333. Deaths, 291. Rate per 1,000, 16.79.
*Atlantic City.....	Population, 41,495. Deaths, 699. Rate per 1,000, 16.85.
Camden.....	Population, 86,334. Deaths, 1,506. Rate per 1,000, 17.44.
Bridgeton.....	Population, 13,508. Deaths, 239. Rate per 1,000, 17.69.
Plainfield.....	Population, 19,708. Deaths, 358. Rate per 1,000, 18.01.
Trenton.....	Population, 88,529. Deaths, 1,599. Rate per 1,000, 18.06.
Hackensack.....	Population, 11,760. Deaths, 218. Rate per 1,000, 18.54.
*Long Branch.....	Population, 15,493. Deaths, 288. Rate per 1,000, 18.59.
Elizabeth.....	Population, 63,861. Deaths, 1,194. Rate per 1,000, 18.70.
Orange.....	Population, 26,885. Deaths, 513. Rate per 1,000, 19.08.
Newark.....	Population, 298,177. Deaths, 5,736. Rate per 1,000, 19.11.
New Brunswick.....	Population, 24,384. Deaths, 468. Rate per 1,000, 19.19.
Jersey City.....	Population, 243,205. Deaths, 4,723. Rate per 1,000, 19.24.
Harrison.....	Population, 13,714. Deaths, 264. Rate per 1,000, 19.25.
Passaic City.....	Population, 41,861. Deaths, 808. Rate per 1,000, 19.30.
Morristown.....	Population, 12,498. Deaths, 281. Rate per 1,000, 22.49.
Hoboken.....	Population, 67,910. Deaths, 1,556. Rate per 1,000, 22.91.

\*The death-rate in summer resorts is calculated on the basis of the resident population, whereas the actual population is often several times larger, and on account of this floating population and the large number of invalids included in it, the death-rate is not a criterion of health conditions.



CONSUMPTION—The number of deaths from pulmonary tuberculosis during the calendar year 1907, was 3,749. Approximately one-tenth of all the deaths in the United States are due to this cause, and in the large cities the proportion ranges from seven to fifteen per cent; however, the National and State Associations for the prevention and relief of tuberculosis, together with the several auxiliary organizations, working in conjunction with the State and Local Boards of Health, will no doubt be the means of lowering the mortality from this disease.

TABLE 12.—DEATHS FROM CONSUMPTION IN NEW JERSEY, BY AGE PERIODS, FOR SEVEN YEARS.

YEARS.	AGE PERIODS.											Total s
	Under 1 year.	1 to 10.	10 to 20.	20 to 30.	30 to 40.	40 to 50.	50 to 60.	60 to 70.	70 to 80.	Over 80.	Not stated.	
1901.....	39	73	241	937	827	510	319	199	87	25	.....	3,257
1902.....	39	62	227	842	759	504	281	199	76	19	7	3,015
1903.....	49	81	285	941	877	534	310	191	95	16	1	3,380
1904.....	67	80	315	983	1,005	575	337	217	78	11	2	3,670
1905.....	40	89	309	972	915	606	335	197	100	23	1	3,587
1906.....	62	93	309	953	942	646	339	199	84	26	1	3,654
1907.....	56	61	256	978	967	682	407	229	90	25	.....	3,751
Totals....	352	539	1,942	6,606	6,292	4,057	2,328	1,431	610	145	12	24,314

TABLE 13.—SHOWING NUMBER OF DEATHS AND DEATHS PER 10,000 POPULATION FROM CONSUMPTION IN NEW JERSEY, AND THE PROPORTION OF DEATHS FROM CONSUMPTION TO TOTAL DEATHS DURING TWENTY-NINE YEARS.

YEARS	Population†	Total deaths in New Jersey	Deaths from consumption	Proportion of deaths from consumption to total deaths	Deaths from consumption per 10,000 population
1879..	1,020,584	20,444	2,788	13.64	27.32
1880..	1,130,892	18,967	2,714	14.30	24.00
1881..	1,160,275	20,810	2,989	14.36	25.76
1882..	1,189,658	25,910	3,475	13.41	29.21
1883..	1,209,048	23,310	3,121	13.39	25.81
1884..	1,248,224	21,716	3,215	14.80	25.76
1885..	1,278,033	23,807	3,320	13.94	25.19
1886..	1,310,431	22,734	3,205	14.10	24.46
1887..	1,342,829	24,331	3,653	15.01	27.20
1888..	1,375,227	27,173	3,358	12.44	24.42
1889..	1,407,625	26,543	3,449	12.99	24.50
1890..	1,441,017	28,530	3,669	12.96	25.46
1891..	1,478,784	28,840	3,456	11.98	23.37
1892..	1,511,653	32,685	3,575	10.94	23.65
1893..	1,538,799	30,596	3,429	11.21	22.28
1894..	1,578,373	30,004	3,433	11.44	21.75
1895..	1,672,942	30,634	3,542	11.56	21.17
1896..	1,718,543	30,767	3,358	10.92	19.54
1897..	1,764,144	29,822	3,237	10.85	18.35
1898..	1,810,008	27,337	3,225	11.79	17.82
1899..	1,855,872	30,999	3,584	11.56	19.31
1900..	1,883,669	31,474	3,514	11.17	18.64
1901..	1,925,781	31,739	3,257	10.26	16.91
1902..	1,967,893	33,655	3,015	8.96	15.32
1903..	2,016,797	31,820	3,380	10.62	16.76
1904..	2,058,909	35,298	3,670	10.40	17.83
1905..	2,144,143	33,864	3,587	10.59	16.73
1906..	2,196,238	35,670	3,654	10.24	16.64
1907..	2,248,331	37,408	3,749	10.02	16.67

\*Estimated except for census years.



TABLE 14.—SHOWING MORTALITY RATES FROM ALL CAUSES AND FROM CONSUMPTION ONLY, IN MUNICIPALITIES HAVING 5,000 INHABITANTS OR OVER, FOR THE YEAR ENDING DECEMBER 31, 1907, PER 10,000 POPULATION.

	Deaths from all causes per 10,000 population.	Deaths from consumption per 10,000 population.
Atlantic County.....	158.9	11.65
Atlantic City.....	168.5	12.05
Bergen County.....	135.3	10.03
Englewood.....	166.5	10.48
Garfield.....	158.9	8.73
Hackensack.....	185.4	11.90
Rutherford.....	93.8	7.22
Burlington County.....	161.1	15.09
Bordentown.....	192.2	19.71
Burlington.....	186.8	7.23
Camden County.....	170.6	17.46
Camden City.....	174.4	15.75
Gloucester City.....	194.4	17.56
Cape May County.....	113.3	12.06
Cumberland County.....	144.6	16.20
Bridgeton.....	176.9	23.69
Millville.....	140.3	14.51
Essex County.....	177.5	20.89
Bloomfield.....	116.3	4.81
East Orange.....	111.5	10.50
Irvington.....	143.4	12.58
Montclair.....	167.9	9.81
Newark.....	192.4	22.88
Orange.....	190.8	25.66
West Orange.....	114.9	15.73
Gloucester County.....	128.4	10.98
Hudson County.....	188.6	20.95
Bayonne.....	165.6	16.33
Harrison.....	192.5	22.60
Hoboken.....	229.1	24.15
Jersey City.....	194.2	23.03
Kearny.....	145.1	10.90
Town of Union.....	164.1	13.53
West Hoboken.....	117.8	13.03
West New York.....	170.7	21.34
Hunterdon County.....	161.8	10.99
Lambertville.....	147.1	11.51
Mercer County.....	161.9	15.96
Princeton.....	91.6	7.27
Trenton.....	180.6	18.30
Middlesex County.....	153.4	12.12
New Brunswick.....	191.9	16.81
Perth Amboy.....	136.8	8.91
South Amboy.....	168.8	17.68
Monmouth County.....	151.8	12.19
Asbury Park.....	145.8	8.33
Long Branch.....	185.9	15.49
Red Bank.....	137.9	16.67
Morris County.....	176.4	15.06
Dover.....	159.5	15.34
Morristown.....	224.8	18.40
Ocean County.....	123.7	11.25
Passaic County.....	159.3	14.43
Passaic City.....	193.0	16.01
Paterson.....	161.2	15.52
Salem County.....	129.1	14.30
Salem City.....	162.8	23.89
Somerset County.....	130.1	12.50
North Plainfield.....	148.5	18.77
Sussex County.....	147.8	10.43
Union County.....	166.0	15.12
Elizabeth.....	187.0	17.07
Plainfield.....	181.7	17.23
Rahway.....	139.9	11.19
Summit.....	109.9	20.10
Westfield.....	125.9	3.55
Warren County.....	154.9	13.27
Phillipsburg.....	149.9	10.91

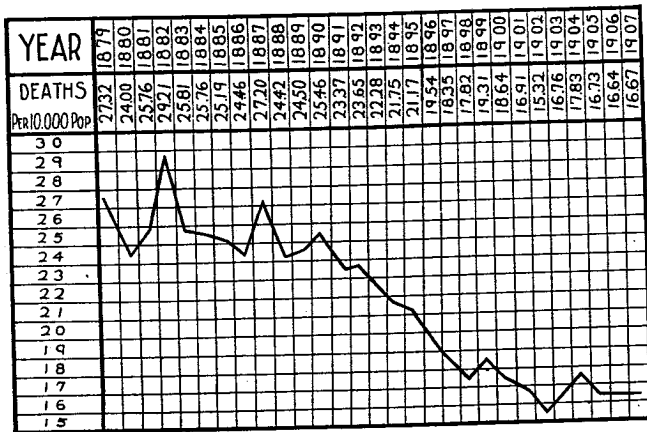
NOTE.—The death-rate in summer resorts is calculated on the basis of the resident population, whereas the actual population is often several times larger, and on account of this floating population and the large number of invalids included in it, the death-rate is not a criterion of health conditions.

TABLE 15.—SHOWING AVERAGE ANNUAL DEATH-RATES FROM ALL CAUSES AND AVERAGE ANNUAL DEATH-RATES FROM CONSUMPTION IN NEW JERSEY FOR TWENTY-NINE YEARS, BY COUNTIES, COMPARED WITH DEATH-RATES FROM ALL CAUSES AND DEATH-RATES FROM CONSUMPTION, FOR THE YEAR ENDING DECEMBER 31, 1907, PER 10,000 POPULATION.

COUNTIES	AVERAGES PER YEAR.			
	Average annual death-rate from all causes per 10,000 population for twenty-nine years.	Average annual death-rate from consumption per 10,000 population for twenty-nine years.	Death-rate per 10,000 population from all causes for year ending Dec. 31, 1907.	Death-rate from consumption per 10,000 population for year ending Dec. 31, 1907.
Atlantic County.....	172.5	17.53	158.9	11.65
Bergen County.....	88.3	14.92	135.3	10.03
Burlington County.....	154.1	18.15	161.1	15.09
Camden County.....	190.0	22.88	170.6	17.46
Cape May County.....	140.9	14.60	113.3	12.06
Cumberland County.....	71.0	20.06	144.6	16.20
Essex County.....	195.7	26.72	177.5	20.89
Gloucester County.....	146.1	17.42	128.4	10.98
Hudson County.....	218.7	26.22	188.6	20.95
Hunterdon County.....	135.5	14.74	161.8	10.99
Mercer County.....	174.8	22.76	161.9	15.96
Middlesex County.....	163.9	17.35	153.4	12.12
Monmouth County.....	152.4	16.98	151.8	12.19
Morris County.....	98.1	20.48	176.4	15.06
Ocean County.....	144.1	20.09	123.7	11.25
Passaic County.....	188.4	22.35	159.3	14.43
Salem County.....	147.0	18.86	129.1	14.30
Somerset County.....	144.5	16.13	130.1	12.50
Sussex County.....	124.0	15.11	147.8	10.43
Union County.....	133.2	15.51	166.0	15.12
Warren County.....	147.5	15.13	154.9	13.27
The State.....	177.1	21.50	166.4	16.67

SECRETARY'S REPORT.

CHART SHOWING DEATHS FROM CONSUMPTION IN NEW JERSEY, PER 10,000 POPULATION, FOR THE TWENTY-NINE YEARS, ENDING DECEMBER 31, 1907.



PNEUMONIA—The mortality from pneumonia shows a gradual increase during the past seven years. This disease is undoubtedly communicable from person to person, and as the infective organism of pneumonia is frequently present in normal saliva, therefore unfavorable weather conditions, or other influences which lower the vitality, lead to the development of the disease.

TABLE 16.—SHOWING DEATHS IN NEW JERSEY FROM PNEUMONIA, WITH AGE AT DEATH, FOR THE YEAR ENDING DECEMBER 31, 1907.

DEATHS FROM PNEUMONIA.	AGE PERIODS.																	Total		
	Under 1 mo.	Under 1 year	1 to 5.	5 to 10.	10 to 15.	15 to 20.	20 to 25.	25 to 30.	30 to 35.	35 to 40.	40 to 45.	45 to 50.	50 to 55.	55 to 60.	60 to 70.	70 to 80.	80 to 90.		Over 90	Not stated
	78	459	442	58	40	55	86	112	156	155	193	177	171	186	412	323	173	28	3	3,307

TABLE 17.—SHOWING DEATHS FROM PNEUMONIA IN CITIES OF OVER 5,000 INHABITANTS, IN NEW JERSEY, BY MONTHS, FOR THE FIVE YEARS ENDING DECEMBER 31, 1907, AND DEATH-RATES PER 10,000 INHABITANTS, FOR EACH OF SAID YEARS.

YEARS.	Estimated population of cities of over 5,000 inhabitants.	MONTHS.												Totals.	Death-rate per 10,000 inhabitants.
		Jan.	Feb.	March	April	May	June	July	August	Sept.	Oct.	Nov.	Dec.		
1903. ....	1,363,464	271	288	261	128	155	67	98	58	75	91	202	278	1,972	14.46
1904. ....	1,370,719	401	350	394	315	241	134	42	51	72	108	187	289	2,584	18.85
1905. ....	1,429,100	309	271	251	190	178	96	75	73	69	121	189	209	2,041	14.28
1906. ....	1,505,142	340	286	341	175	189	86	80	69	89	127	178	285	2,445	14.92
1907. ....	1,546,574	361	290	333	235	214	144	100	64	93	142	162	364	2,202	16.18
Totals. ....	1,682	1,485	1,580	1,043	977	527	395	315	398	589	928	1,425	11,344		

TABLE 18.—SHOWING DEATHS AND DEATH-RATES FROM PNEUMONIA IN NEW JERSEY FOR SEVEN YEARS, 1901-1907.

YEARS.	Deaths from pneumonia.	Deaths from pneumonia per 10,000 inhabitants.
1901. ....	2,539	13.18
1902. ....	2,421	12.30
1903. ....	2,628	13.03
1904. ....	3,486	16.93
1905. ....	2,764	12.89
1906. ....	3,117	14.19
1907. ....	3,307	14.70

DEATHS AMONG CHILDREN.—The continued low death-rate among children under five years of age in New Jersey, shows unmistakably that the careful supervision of the collecting, handling and distribution of milk has been the means of saving the lives of many infants. The State Board of Health recognizing the sanitary significance of this important branch of health work has created a Division of Creameries and Dairy Inspection. The board will continue to establish and maintain high class dairy methods throughout the State.

## SECRETARY'S REPORT.

TABLE 19.—SHOWING NUMBER OF DEATHS IN NEW JERSEY; DEATHS AMONG CHILDREN UNDER FIVE YEARS OF AGE; DEATHS UNDER FIVE YEARS FROM DIARRHOEAL DISEASES, AND DEATHS UNDER FIVE YEARS PER 10,000 INHABITANTS, FOR THE SEVEN YEARS ENDING DECEMBER 31, 1907.

DEATHS.	NEW JERSEY.						
	1901.	1902.	1903.	1904.	1905.	1906.	1907.
Total deaths.....	31,739	31,319	31,820	35,298	35,864	35,670	37,408
Deaths under five years.....	9,549	9,802	9,950	10,913	9,864	11,246	10,867
Deaths under five years from diarrhoea.....	1,787	1,857	1,603	2,354	2,290	2,365	2,453
Percentage of deaths under five years to total deaths.....	30.09	31.30	31.27	30.92	29.13	31.53	29.05
Deaths under five years per 10,000 population.....	49.59	49.81	44.34	53.00	46.00	51.21	48.33

TABLE 20.—SHOWING DEATHS AMONG CHILDREN UNDER FIVE YEARS OF AGE IN NEW JERSEY PER 10,000 POPULATION, FOR TWENTY-NINE YEARS.

YEARS.	Deaths under 1 year per 10,000 population.	Deaths from 1 to 5 years per 10,000 population.	YEARS.	Deaths under 1 year per 10,000 population.	Deaths from 1 to 5 years per 10,000 population.
1879.....	45.58	33.97	1893.....	49.22	24.26
1880.....	40.38	25.12	1894.....	49.75	22.97
1881.....	39.90	25.75	1895.....	45.67	21.79
1882.....	49.88	38.48	1896.....	43.99	24.43
1883.....	44.48	28.22	1897.....	40.16	20.00
1884.....	41.04	22.82	1898.....	35.91	15.83
1885.....	44.69	26.67	1899.....	38.22	17.04
1886.....	41.31	23.83	1900.....	37.05	18.44
1887.....	43.56	25.29	1901.....	36.11	13.48
1888.....	47.51	28.90	1902.....	36.18	13.63
1889.....	48.61	24.95	1903.....	37.08	15.38
1890.....	49.38	25.38	1904.....	36.18	16.82
1891.....	46.90	25.36	1905.....	32.42	13.59
1892.....	52.74	29.08	1906.....	35.39	15.81
.....	.....	.....	1907.....	34.39	13.94

## REPORT OF THE BOARD OF HEALTH.

TABLE 21.—SHOWING DEATHS IN NEW JERSEY FROM DIARRHOEAL DISEASES OF CHILDREN, WITH AGES AT DEATH, COMPARED WITH DEATHS FROM ALL CAUSES AMONG CHILDREN UNDER FIVE YEARS OF AGE, FOR YEAR ENDING DECEMBER 31, 1907.

AGE PERIODS.	Deaths from diarrhoeal diseases.	Deaths from all causes among children under five years of age.
Under one month.....	163	2,602
Over one month and under one year.....	1,853	5,130
One to five.....	437	3,135
Total.....	2,454	10,867

SECRETARY'S REPORT.

REPORT OF THE BOARD OF HEALTH.

TABLE 22.—SHOWING TOTAL DEATHS, DEATHS UNDER FIVE YEARS, PERCENTAGE OF 10,000 INHABITANTS, FOR CERTAIN CITIES OF NEW JERSEY HAVING OVER

Table with columns for Year (1901, 1902, 1903) and rows for various cities (Atlantic City, Bayonne, Bloomfield, etc.). Each row contains four data points: Total deaths, Deaths under five years, Percentage of deaths under five years to total deaths, and Deaths under five years per 10,000 population.

DEATHS UNDER FIVE YEARS TO TOTAL DEATHS, AND DEATHS UNDER FIVE YEARS PER 10,000 POPULATION, FOR THE SEVEN YEARS ENDING DECEMBER 31, 1907.

Table with columns for Year (1904, 1905, 1906, 1907) and rows for various cities (Atlantic City, Bayonne, Bloomfield, etc.). Each row contains four data points: Total deaths, Deaths under five years, Percentage of deaths under five years to total deaths, and Deaths under five years per 10,000 population.

SECRETARY'S REPORT.

TABLE 23.—SHOWING DEATHS IN CERTAIN CITIES OF NEW JERSEY, ALSO DEATHS AMONG CHILDREN UNDER FIVE YEARS OF AGE; DEATHS UNDER FIVE YEARS FROM DIARRHOEA, AND DEATHS UNDER FIVE YEARS PER 10,000 INHABITANTS.

DEATHS.	NEWARK										JERSEY CITY.																
	1901.	1902.	1903.	1904.	1905.	1906.	1907.	1901.	1902.	1903.	1904.	1905.	1906.	1907.	1901.	1902.	1903.	1904.	1905.	1906.	1907.						
Total deaths, five years.....	4,898	4,831	4,901	5,201	4,943	5,738	4,038	4,028	4,130	4,699	4,304	4,907	4,723	4,898	4,831	4,901	5,201	4,943	5,738	4,038	4,028	4,130	4,699	4,304	4,907	4,723	
Deaths under five years from diarrhoea.....	1,513	1,516	1,386	1,320	1,340	1,666	1,426	1,443	1,325	1,492	1,426	1,538	1,456	1,513	1,516	1,386	1,320	1,340	1,666	1,426	1,443	1,325	1,492	1,426	1,538	1,456	
Percentage of total deaths under five years from diarrhoea.....	431	216	199	324	325	330	370	213	270	242	315	315	354	431	216	199	324	325	330	370	213	270	242	315	315	354	371
Deaths under five years per 10,000 population.....	32.27	31.98	28.28	31.87	26.70	33.17	29.04	35.31	35.81	32.08	32.14	32.45	33.38	32.27	31.98	28.28	31.87	26.70	33.17	29.04	35.31	35.81	32.08	32.14	32.45	33.38	30.83
	59.06	58.72	52.22	62.12	46.60	63.20	55.67	67.53	66.78	60.37	64.85	61.28	64.63	59.06	58.72	52.22	62.12	46.60	63.20	55.67	67.53	66.78	60.37	64.85	61.28	64.63	59.87

DEATHS.	PATERSON.										CAMDEN.																	
	1901.	1902.	1903.	1904.	1905.	1906.	1907.	1901.	1902.	1903.	1904.	1905.	1906.	1907.	1901.	1902.	1903.	1904.	1905.	1906.	1907.							
Total deaths, five years.....	1,871	1,773	1,730	1,988	1,841	1,992	1,839	1,377	1,384	1,368	1,281	1,347	1,565	1,871	1,773	1,730	1,988	1,841	1,992	1,839	1,377	1,384	1,368	1,281	1,347	1,565		
Deaths under five years from diarrhoea.....	627	634	505	647	550	681	523	528	448	448	589	412	506	627	634	505	647	550	681	523	528	448	448	589	412	506	435	
Percentage of total deaths under five years to total deaths.....	246	112	91	152	144	130	126	155	58	63	102	83	89	246	112	91	152	144	130	126	155	58	63	102	83	89	81	84
Deaths under five years per 10,000 population.....	36.08	36.00	29.11	30.73	29.88	34.18	28.44	38.13	31.87	34.97	28.70	30.59	36.17	36.08	36.00	29.11	30.73	29.88	34.18	28.44	38.13	31.87	34.97	28.70	30.59	36.17	30.21	
	69.36	59.00	44.60	58.06	49.31	60.37	45.85	66.56	55.60	56.13	62.74	49.42	66.71	69.36	59.00	44.60	58.06	49.31	60.37	45.85	66.56	55.60	56.13	62.74	49.42	66.71	52.70	

DEATHS.	HOBOKEN.										TRENTON.																
	1901.	1902.	1903.	1904.	1905.	1906.	1907.	1901.	1902.	1903.	1904.	1905.	1906.	1907.	1901.	1902.	1903.	1904.	1905.	1906.	1907.						
Total deaths, five years.....	1,128	1,156	1,140	1,420	1,382	1,431	1,556	1,234	1,334	1,405	1,482	1,482	1,599	1,128	1,156	1,140	1,420	1,382	1,431	1,556	1,234	1,334	1,405	1,482	1,482	1,599	
Deaths under five years from diarrhoea.....	361	400	340	456	384	440	481	340	409	359	421	453	418	361	400	340	456	384	440	481	340	409	359	421	453	467	418
Percentage of total deaths under five years to total deaths.....	125	51	55	76	70	81	88	73	92	85	69	69	103	125	51	55	76	70	81	88	73	92	85	69	69	108	103
Deaths under five years per 10,000 population.....	32.22	34.86	30.61	31.14	27.70	30.75	30.91	27.55	30.66	25.55	28.41	30.53	31.28	32.22	34.86	30.61	31.14	27.70	30.75	30.91	27.55	30.66	25.55	28.41	30.53	31.28	26.14
	62.07	65.55	55.14	71.71	58.65	65.98	70.83	45.05	52.69	46.77	51.38	53.22	54.08	62.07	65.55	55.14	71.71	58.65	65.98	70.83	45.05	52.69	46.77	51.38	53.22	54.08	47.22

TABLE 24.—SHOWING DEATHS IN NEW JERSEY UNDER FIVE YEARS OF AGE PER 10,000 POPULATION FOR TWENTY-NINE YEARS, TOGETHER WITH AVERAGES FOR THE NINETEEN YEARS, 1879-1897, AND ALSO AVERAGES FOR THE TEN YEARS 1898-1907.

YEARS.	Deaths under five years per 10,000 population.	YEARS.	Deaths under five years per 10,000 population.
1879.....	75.55	1898.....	51.74
1880.....	65.50	1899.....	55.26
1881.....	65.65	1900.....	55.49
1882.....	88.36	1901.....	49.59
1883.....	72.70	1902.....	49.81
1884.....	63.86	1903.....	52.46
1885.....	71.36	1904.....	53.00
1886.....	65.14	1905.....	46.01
1887.....	68.85	1906.....	51.21
1888.....	76.41	1907.....	48.33
1889.....	73.56		
1890.....	74.74		
1891.....	72.26		
1892.....	81.82		
1893.....	73.48		
1894.....	72.72		
1895.....	67.46		
1896.....	68.42		
1897.....	60.16		
Average death-rate for nineteen years ending 1897.....	71.69	Average death-rate for ten years ending 1907.....	51.29

## SECRETARY'S REPORT.

TABLE 25.—SHOWING PERCENTAGE OF DEATHS UNDER FIVE YEARS TO TOTAL DEATHS, AND DEATHS UNDER FIVE YEARS PER 10,000 INHABITANTS FOR CERTAIN CITIES OF NEW JERSEY HAVING OVER 5,000 POPULATION, FOR THE YEAR ENDING DECEMBER 31, 1907.

NAMES OF CITIES.	Percentage of deaths under 5 years to total deaths.	Deaths under 5 years per 10,000 inhabitants.
Atlantic City	23.61	39.76
Englewood	23.78	39.58
Garfield	59.34	94.29
Hackensack	31.19	57.82
Bordentown	25.40	39.43
Burlington	24.59	45.81
Camden	30.21	52.70
Gloucester	40.12	76.10
Bridgeton	17.99	31.83
Millville	29.89	41.93
Bloomfield	32.41	37.62
East Orange	20.20	22.52
Irvington	21.93	31.45
Montclair	31.96	53.65
Newark	29.04	55.87
Orange	25.73	49.10
West Orange	30.53	35.09
Bayonne	45.22	74.87
Harrison	37.50	72.19
Hoboken	30.91	70.83
Jersey City	30.83	59.87
Kearny	24.41	35.42
Town of Union	32.30	53.01
West Hoboken	34.77	40.98
West New York	46.32	79.07
Lambertville	17.11	25.15
Princeton	25.40	23.25
Trenton	26.14	47.22
New Brunswick	34.83	66.85
Perth Amboy	49.62	67.87
South Amboy	35.24	59.47
Asbury Park	30.71	44.77
Long Branch	24.31	45.18
Red Bank	32.97	45.97
Dover	25.96	41.42
Morristown	29.18	65.61
Passaic	50.62	97.70
Paterson	28.44	45.85
Salem	22.02	35.84
North Plainfield	24.14	35.84
Elizabeth	33.59	62.79
Plainfield	24.02	43.64
Rahway	17.60	24.62
Summit	25.61	28.14
Westfield	19.72	24.82
Phillipsburg	36.36	57.93

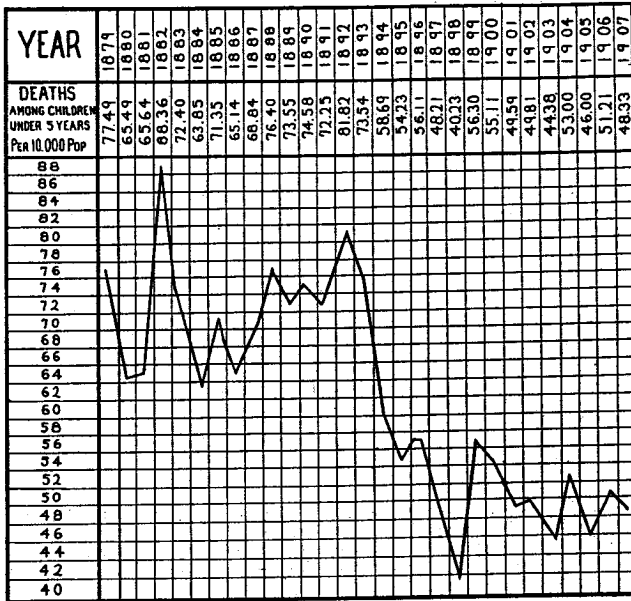
## REPORT OF THE BOARD OF HEALTH.

TABLE 26.—SHOWING NUMBER OF DEATHS IN NEW JERSEY AMONG CHILDREN UNDER FIVE YEARS OF AGE IN MANUFACTURING DISTRICTS, AND ALSO IN COUNTIES OUTSIDE OF THE LARGER TOWNS, WITH COMPARATIVE MORTALITY.

NAMES OF MANUFACTURING TOWNS	Estimated population.	Number of deaths occurring in children under five years of age.	Number of deaths of children under five years of age for each 1,000 of population.	Estimated population of counties outside of larger cities.	Number of deaths occurring in children under five years of age in counties outside of larger cities.	Number of deaths of children under five years of age for each 1,000 of population in counties outside of larger cities.
Bayonne (Hud. Co.)	46,078	345	7.49	32,644	173	5.30
Beverly (Bur. Co.)	2,351	7	2.94	51,208	188	3.67
Boonton (Morris Co.)	3,948	21	5.32	50,028	168	3.36
Bordentown (Bur. Co.)	4,058	16	3.94	51,208	188	3.67
Bound Brook (Som. Co.)	3,696	15	4.06	31,740	104	3.28
Bridgeton (Cumb. Co.)	13,508	43	3.18	26,567	63	2.37
Burlington (Bur. Co.)	8,296	38	4.58	51,208	188	3.67
Camden (Cam. Co.)	86,334	455	5.27	32,245	101	3.13
Carlstadt (Ber. Co.)	3,310	16	4.83	82,551	320	3.88
Elizabeth (U. Co.)	63,861	401	6.28	13,748	54	2.88
Garfield (Ber. Co.)	5,727	54	9.43	82,551	320	3.88
Gloucester Cy (Cam. Co.)	8,541	65	7.61	32,245	101	3.13
Hoboken (Hud. Co.)	67,910	481	7.08	32,644	173	5.30
Jersey City (Hud. Co.)	243,205	1,486	5.99	32,644	173	5.30
Lambertville (Hunt. Co.)	5,168	13	2.52	27,590	70	2.54
Lodi (Ber. Co.)	3,143	23	7.32	82,551	320	3.88
Millburn (Essex Co.)	3,320	11	3.31	32,557	103	3.16
Milltown (Mdx. Co.)	1,470	4	2.72	44,167	218	4.94
Millville (Cumb. Co.)	12,402	62	4.19	26,567	63	2.37
Newark (Essex Co.)	298,177	1,666	5.59	32,557	103	3.16
New Brunswick (Mdx. Co.)	24,354	163	6.68	44,167	218	4.94
Orange (Essex Co.)	26,885	132	4.91	32,557	103	3.16
Passaic City (Pas. Co.)	41,861	409	9.77	28,187	107	3.80
Paterson (Pas. Co.)	114,072	523	4.58	28,187	107	3.80
Perth Amboy (Mdx. Co.)	29,173	198	6.79	44,167	218	4.94
Phillipsburg (W. Co.)	14,672	85	5.79	26,780	86	3.21
Plainfield (U. Co.)	19,708	86	4.36	18,748	54	2.88
Rahway (U. Co.)	8,935	22	2.46	18,748	54	2.88
Raritan (Som. Co.)	4,238	22	5.19	31,740	104	3.28
Riverton Bor. (Bur. Co.)	1,647	5	3.04	51,208	188	3.67
Salem City (Salem Co.)	6,696	24	3.58	44,167	218	4.94
South River (Mdx. Co.)	3,902	37	9.48	44,167	218	4.94
Town of U'n (Hud. Co.)	17,732	94	5.30	32,644	173	5.30
Trenton (Mer. Co.)	88,529	418	4.72	21,166	54	2.55
Vineland (Cumb. Co.)	4,682	14	2.99	26,567	63	2.37
Wharton (Mor. Co.)	2,371	7	2.95	50,028	168	3.36

SECRETARY'S REPORT.

CHART SHOWING DEATHS IN NEW JERSEY AMONG CHILDREN UNDER FIVE YEARS OF AGE, PER 10,000 POPULATION, FOR TWENTY-NINE YEARS.



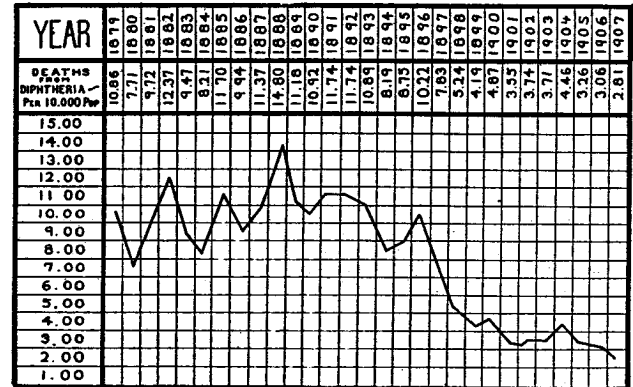
DIPHTHERIA—The death-rate from diphtheria (2.81 per 10,000 population) for the year ending December 31, 1907, is lower than for any period of which this department has record. Reference to the accompanying chart shows that the mortality from diphtheria has greatly decreased during the past decade.

REPORT OF THE BOARD OF HEALTH.

TABLE 27.—SHOWING DEATHS IN NEW JERSEY FROM DIPHTHERIA WITH AGES OF DECEDENTS, FOR YEAR ENDING DECEMBER 31, 1907.

AGE PERIODS.	Deaths from diphtheria.	AGE PERIODS.	Deaths from diphtheria.	AGE PERIODS.	Deaths from diphtheria.
Under 1 month . . . . .	1	25 to 30 . . . . .	7	60 to 70 . . . . .	
Under 1 year . . . . .	49	30 to 35 . . . . .	2	70 to 80 . . . . .	
1 to 5 . . . . .	349	35 to 40 . . . . .	2	80 to 90 . . . . .	
5 to 10 . . . . .	171	40 to 45 . . . . .		Over 90 . . . . .	
10 to 15 . . . . .	36	45 to 50 . . . . .	2	Not stated . . . . .	
15 to 20 . . . . .	11	50 to 55 . . . . .	1	Total . . . . .	632
20 to 25 . . . . .	1	55 to 60 . . . . .			

CHART SHOWING DEATHS FROM DIPHTHERIA, PER 10,000 POPULATION, IN NEW JERSEY, FOR THE TWENTY-NINE YEARS ENDING DECEMBER 31, 1907.



TYPHOID FEVER—The number of deaths from typhoid fever in New Jersey for the calendar year 1907, was 464, or 2.06 per 10,000 inhabitants. The mortality from this disease has varied but little during the past ten years, and it is hoped that the measures now being taken by the State Board of Health to prevent the pollution of the potable waters of this State, will be the means of lowering the death rate from typhoid fever.

## SECRETARY'S REPORT.

TABLE 28.—SHOWING COMPARATIVE DEATH-RATES FROM TYPHOID FEVER, PER 10,000 INHABITANTS, IN THE REGISTRATION AREA OF THE UNITED STATES AND IN NEW JERSEY, FOR THE SIX YEARS ENDING DECEMBER 31, 1906.

Registration area of United States.....	DEATHS FROM TYPHOID FEVER, PER 10,000 INHABITANTS.						
	Annual average 1901-1906.	1901.	1902.	1903.	1904.	1905.	1906.
Registration area of United States.....	3.22	3.24	3.44	3.43	3.19	2.81	3.21
New Jersey.....	1.90	1.93	2.17	1.92	1.87	1.68	1.86

TABLE 29.—SHOWING DEATHS PER 10,000 POPULATION FROM TYPHOID FEVER IN NEW JERSEY FOR TWENTY-NINE YEARS.

YEAR.	Popula- tion.*	Number of deaths from typhoid fever.	Deaths from typhoid fever, per 10,000 in- habitants.	YEAR.	Popula- tion.*	Number of deaths from typhoid fever.	Deaths from typhoid fever, per 10,000 in- habitants.
1879.....	1,020,584	324	3.17	1893..	1,538,799	506	3.28
1880.....	1,130,892	373	3.29	1894..	1,578,373	485	3.07
1881.....	1,180,275	574	4.84	1895..	1,672,942	568	3.39
1882.....	1,189,658	884	7.43	1896..	1,718,543	577	3.35
1883.....	1,209,045	564	4.66	1897..	1,764,141	478	2.70
1884.....	1,248,224	640	5.12	1898..	1,810,008	450	2.48
1885.....	1,278,033	642	5.02	1899..	1,856,872	486	2.62
1886.....	1,310,431	545	4.15	1900..	1,883,669	356	1.87
1887.....	1,342,829	522	3.88	1901..	1,925,781	352	1.83
1888.....	1,375,227	620	4.50	1902..	1,967,893	428	2.17
1889.....	1,407,625	724	5.14	1903..	2,016,797	388	1.92
1890.....	1,441,017	782	5.42	1904..	2,058,909	394	1.87
1891.....	1,478,784	695	4.69	1905..	2,144,143	360	1.68
1892.....	1,511,653	628	3.15	1906..	2,196,238	408	1.86
				1907..	2,248,331	464	2.06

\*Population estimated except for census years.

## REPORT OF THE BOARD OF HEALTH.

TABLE 30.—SHOWING DEATHS FROM TYPHOID FEVER IN NEW JERSEY, PER 10,000 POPULATION, BY COUNTIES, FOR THE SEVEN YEARS ENDING DECEMBER 31, 1907, WITH AVERAGES FOR SEVEN YEARS.

COUNTIES.	YEARS.							Averages for seven years.
	1901.	1902.	1903.	1904.	1905.	1906.	1907.	
Atlantic County.....	2.67	2.74	2.81	1.97	2.01	1.60	2.30	2.30
Bergen County.....	.99	1.08	1.16	1.24	1.10	1.15	1.29	1.14
Burlington County.....	2.58	2.23	3.61	2.89	2.58	3.18	4.41	3.07
Camden County.....	2.11	2.44	1.07	2.46	1.81	2.98	2.99	2.27
Cape May County.....	2.26	.60	.75	.....	1.73	1.65	2.62	1.37
Cumberland County.....	1.94	2.32	.96	2.29	2.88	1.15	2.29	1.98
Essex County.....	1.93	2.12	2.04	1.41	1.39	1.79	2.00	1.81
Gloucester County.....	2.81	2.17	2.16	1.54	1.16	3.14	1.41	2.06
Hudson County.....	1.74	1.86	1.66	1.99	2.66	1.71	1.58	1.89
Hunterdon County.....	1.45	2.03	1.74	1.45	.90	1.80	2.44	1.69
Mercer County.....	1.75	6.04	5.14	3.87	2.35	3.26	6.69	4.16
Middlesex County.....	1.47	1.95	1.05	2.63	1.55	.70	1.92	2.11
Monmouth County.....	1.92	2.36	1.63	1.95	2.62	2.47	1.99	2.13
Morris County.....	1.06	1.21	1.75	1.00	2.21	1.75	1.01	1.43
Ocean County.....	1.00	2.98	.49	2.43	3.35	.95	1.41	1.80
Passaic County.....	2.19	2.50	2.02	.75	1.14	1.33	1.19	1.59
Salem County.....	.....	1.96	1.96	3.53	2.28	3.03	1.51	2.04
Somerset County.....	.60	.59	1.16	.86	2.48	1.35	.27	1.04
Sussex County.....	.41	2.51	.80	1.97	.43	1.71	1.29	1.30
Union County.....	2.64	2.57	2.32	1.99	1.37	1.66	1.37	1.99
Warren County.....	1.85	4.74	1.05	2.35	1.73	1.95	1.43	2.16
The State.....	1.83	2.17	1.92	1.87	1.68	1.86	2.06	1.91

TABLE 31.—SHOWING DEATHS FROM TYPHOID FEVER IN NEW JERSEY, FOR YEAR ENDING DECEMBER 31, 1907, AND SHOWING ALSO THE NUMBER OF DEATHS FROM THIS DISEASE IN URBAN AND RURAL DISTRICTS, TOGETHER WITH POPULATION AND DEATHS PER 10,000 INHABITANTS.

	Aggregate population.	Deaths from typhoid fever.	Deaths from typhoid fever per 10,000 population.
State.....	2,248,331	464	2.06
Cities.....	1,541,051	358	2.32
Rural Districts.....	707,280	106	1.50



TABLE 32.—DEATHS FROM TYPHOID FEVER IN NEW JERSEY, BY AGE PERIODS, FOR SEVEN YEARS.

YEARS.	AGE PERIODS.											Totals.
	Under 1 year.	1 to 10	10 to 20	20 to 30	30 to 40	40 to 50	50 to 60	60 to 70	70 to 80	Over 80.	Not stated.	
1901.....	2	35	57	107	74	36	17	13	9	1	1	352
1902.....	1	25	72	124	92	53	33	18	8	1	1	428
1903.....	3	26	77	108	88	49	19	17	.....	.....	1	388
1904.....	2	24	77	105	83	31	35	16	5	3	.....	384
1905.....	3	33	73	86	65	49	28	16	6	1	.....	360
1906.....	1	34	85	110	67	59	28	11	10	3	.....	408
1907.....	0	22	95	149	93	61	27	11	4	2	.....	464
Totals.....	12	199	536	792	562	338	187	102	42	11	3	2,784

TABLE 33.—SANITARY DISTRICTS IN NEW JERSEY IN WHICH DEATHS FROM TYPHOID FEVER OCCURRED DURING THE YEAR ENDING DECEMBER 31, 1907, WITH POPULATION, NUMBER OF DEATHS, SOURCE OF WATER-SUPPLY AND NATURE OF DRAINAGE.

NAME OF SANITARY DISTRICT.	Population, census 1905.	Number of deaths from typhoid fever.	Water-supply.	Drainage.
Absecon.....	616	1	Domestic.....	No sewers.
Acquanconk township.....	7,187	1	"	"
Allendale borough.....	762	1	Public.....	"
Asbury Park.....	4,526	1	"	Sewers.
Atlantic City.....	37,563	12	"	"
Bayonne.....	42,262	8	"	"
Belleville.....	7,632	1	"	No sewers.
Bergenfield borough.....	1,095	1	"	"
Bethlehem township.....	1,594	1	Domestic.....	"
Beverly City.....	2,538	2	Public.....	Sewers.
Beverly township.....	2,181	2	"	"
Bloomfield.....	11,663	1	"	"
Bogota borough.....	822	1	"	"
Boonton City.....	3,935	2	"	"
Bridgeton.....	13,624	2	"	"
Burlington City.....	8,038	5	"	"
Camden City.....	83,363	23	"	"
Centre township.....	2,451	1	Domestic.....	No sewers.
Chester township (Burlington).....	4,429	1	Public.....	"
Clayton borough.....	1,864	1	"	"
Clinton township (Hunterdon).....	2,026	1	Domestic.....	"
Collingswood borough.....	2,838	2	"	"
Dover City.....	6,353	3	Public.....	Sewers.
East Anwell township.....	1,256	1	Domestic.....	No sewers.
East Newark borough.....	2,828	1	Public.....	"
East Orange.....	25,175	2	"	"
East Windsor township.....	863	1	Domestic.....	No sewers.
Egg Harbor City.....	2,280	1	Public.....	"
Elisabeth.....	60,509	10	"	Sewers.
Englewood.....	7,422	3	"	"
Ewing township.....	1,560	1	Domestic.....	No sewers.
Fairfield township.....	1,825	1	"	"
Florence township.....	1,967	3	"	"
Franklin township (Hunterdon).....	1,101	1	"	"
Gloucester City.....	8,055	4	Public.....	Sewers.
Gloucester township.....	2,300	3	Domestic.....	No sewers.
Guttenberg.....	4,563	4	Public.....	"
Hackensack.....	11,098	2	Sewers.....	"
Haddon Heights borough.....	654	1	Domestic.....	No sewers.

TABLE 33.—SANITARY DISTRICTS IN NEW JERSEY IN WHICH DEATHS FROM TYPHOID FEVER OCCURRED DURING THE YEAR ENDING DECEMBER 31, 1907, WITH POPULATION, NUMBER OF DEATHS, SOURCE OF WATER-SUPPLY AND NATURE OF DRAINAGE.—(Continued).

NAME OF SANITARY DISTRICT.	Population, census 1905.	Number of deaths from typhoid fever.	Water-supply.	Drainage.
Haddonfield borough.....	3,466	1	Public.....	Sewers.
Hamilton township (Mercer).....	5,150	1	Domestic.....	No sewers.
Hammoncton.....	4,334	1	"	"
Harrison.....	12,823	4	Public.....	Sewers.
High Bridge borough.....	1,382	1	Domestic.....	No sewers.
Highland Park borough.....	714	1	Public.....	Sewers.
Hoboken.....	65,468	18	"	"
Hoboken township.....	3,107	1	Domestic.....	No sewers.
Holland township.....	1,528	1	"	"
Holly Beach borough.....	1,327	2	Public.....	"
Jersey City.....	232,699	36	"	"
Kenilworth borough.....	4,265	3	"	Sewers.
Lakewood.....	5,016	1	"	Sewers.
Lambertville.....	5,351	1	Domestic.....	No sewers.
Landis township.....	2,793	1	"	"
Lodi borough.....	12,183	9	Public.....	Sewers.
Long Branch.....	1,336	1	Domestic.....	No sewers.
Lower township.....	1,636	1	Public.....	"
Manasquan borough.....	1,493	1	Domestic.....	"
Mansfield township (Burlington).....	1,365	1	"	"
Matawan township.....	2,030	1	"	"
Medford township.....	1,832	1	Public.....	Sewers.
Merchantville borough.....	2,584	2	Domestic.....	No sewers.
Middle township.....	5,600	1	"	"
Middletown township.....	1,432	1	"	"
Millstone township.....	11,884	6	Public.....	Sewers.
Millville.....	16,370	2	"	"
Montclair.....	12,146	4	"	No sewers.
Morristown.....	9,357	1	Domestic.....	"
Neptune township.....	283,289	73	Public.....	Sewers.
Newark.....	23,133	7	"	"
New Brunswick.....	1,960	1	Domestic.....	No sewers.
New Hanover township.....	4,422	1	"	"
Newton township.....	5,509	8	"	"
Northampton township.....	4,556	1	Public.....	"
Nutley borough.....	1,374	2	Domestic.....	"
Oldmans township.....	26,101	5	Public.....	Sewers.
Orange.....	2,643	2	Domestic.....	No sewers.
Palmyra township.....	3,787	2	Public.....	Sewers.
Passaic City.....	111,529	14	"	"
Paterson.....	2,269	1	"	No sewers.
Paulsboro borough.....	25,893	10	"	Sewers.
Perth Amboy.....	13,352	5	"	"
Phillipsburg.....	18,468	2	"	"
Plainfield.....	3,408	1	Domestic.....	No sewers.
Pohatcong township.....	8,649	2	Public.....	"
Rahway.....	3,954	1	"	No sewers.
Raritan borough.....	3,861	1	Domestic.....	"
Raritan township (Hunterdon).....	1,473	1	"	"
Raritan township (Monmouth).....	3,980	3	"	"
Ridgewood town and township.....	3,301	1	"	"
Riverside township.....	6,443	1	Public.....	Sewers.
Salem City.....	4,932	1	"	"
South Orange borough.....	1,039	2	"	"
Spring Lake borough.....	1,318	2	Domestic.....	No sewers.
Sussex borough.....	4,462	1	"	"
Tabernacle township.....	17,005	2	Public.....	Sewers.
Town of Union.....	84,100	75	"	"
Trenton.....	4,593	2	Domestic.....	No sewers.
Vineland borough.....	2,713	1	"	"
Waterford township.....	2,227	1	"	"
West Deptford township.....	5,265	3	Public.....	Sewers.
Westfield.....	29,082	1	"	"
West Hoboken.....	7,196	1	"	"
West New York.....	10,221	2	Domestic.....	No sewers.
Woodbridge township.....	4,560	2	"	"
Woodbury.....	4,777	1	Public.....	"
Woodcliff borough.....	1,500	1	Domestic.....	"
Woodstown borough.....	.....	.....	"	"

## SECRETARY'S REPORT.

TABLE 34.—DEATHS FROM SCARLET FEVER, DIPHTHERIA AND TYPHOID FEVER IN NEW JERSEY FOR THE TWENTY-NINE YEARS ENDING DECEMBER 31, 1907, COMPARED WITH TOTAL DEATHS.

YEARS.	Popula- tion.	Total deaths.	Death- rate per 1,000 popula- tion.	SCARLET FEVER.		DIPHTHERIA.		TYPHOID FEVER.	
				Number of deaths.	Death- rate per 1,000 popula- tion.	Number of deaths.	Death- rate per 1,000 popula- tion.	Number of deaths.	Death- rate per 1,000 popula- tion.
1879		20,440	18.07	627	.61	1,100	1.09	324	.32
1880	1,130,892	18,967	16.77	573	.51	873	.77	373	.33
1881		20,810	18.39	499	.43	1,128	.97	574	.49
1882		25,910	22.90	1,306	1.01	1,472	1.24	834	.74
1883		13,310	20.60	853	.71	1,146	.95	564	.47
1884		21,716	19.20	547	.44	1,027	.82	640	.51
1885	1,278,033	23,807	18.63	646	.51	1,496	1.17	642	.50
1886		22,734	17.80	222	.17	1,303	.99	545	.42
1887		24,331	19.04	255	.19	1,527	1.14	522	.39
1888		27,173	17.01	574	.42	2,036	1.48	620	.45
1889		26,543	18.99	533	.38	1,574	1.12	724	.51
1890	1,441,017	28,530	19.80	209	.15	1,575	1.09	782	.54
1891		28,840	19.50	238	.19	1,737	1.17	695	.47
1892		32,685	21.62	1,008	.67	1,776	1.17	628	.42
1893		30,596	19.83	445	.29	1,677	1.09	506	.33
1894		30,004	19.09	272	.17	1,294	.82	485	.31
1895	1,672,942	30,634	18.31	264	.16	1,464	.88	568	.34
1896		30,767	17.90	183	.11	1,758	1.02	577	.34
1897		29,822	16.90	203	.12	1,382	.78	478	.27
1898		27,337	15.11	201	.11	950	.52	450	.25
1899		30,999	16.70	187	.10	777	.42	486	.26
1900	1,883,669	31,474	16.62	220	.12	927	.49	356	.19
1901		31,739	16.48	179	.09	683	.36	352	.19
1902		31,319	15.91	217	.11	683	.35	428	.22
1903		31,820	15.78	299	.15	748	.37	388	.19
1904		35,298	17.14	416	.20	918	.45	384	.19
1905	2,144,143	33,864	15.79	164	.07	699	.33	360	.17
1906	2,196,238	35,670	16.24	193	.09	673	.31	408	.19
1907	2,248,331	37,408	16.63	286	.13	632	.29	464	.21

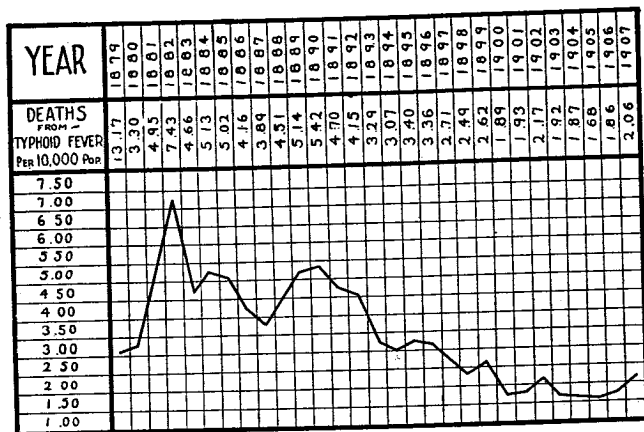
## REPORT OF THE BOARD OF HEALTH.

TABLE 35.—SHOWING DEATHS FROM TYPHOID FEVER AND DEATHS PER 10,000 INHABITANTS FROM TYPHOID FEVER IN THE COUNTIES OF NEW JERSEY FOR YEAR ENDING DECEMBER 31, 1907, ALSO CHART SHOWING DEATHS FROM TYPHOID FEVER PER 10,000 INHABITANTS IN THE COUNTIES OF NEW JERSEY FOR SAME PERIOD.

NAMES OF COUNTIES.	Number of deaths from typhoid fever.	Deaths from typhoid fever per 10,000 inhabitants.	Chart showing deaths from typhoid fever per 10,000 inhabitants.
Atlantic County	15	2.30	=====
Bergen County	14	1.29	=====
Burlington County	28	4.41	=====
Camden County	37	2.99	=====
Cape May County	5	2.62	=====
Cumberland County	12	2.29	=====
Essex County	86	2.00	=====
Gloucester County	5	1.41	=====
Hudson County	75	1.58	=====
Hunterdon County	8	2.44	=====
Mercer County	78	6.69	=====
Middlesex County	20	1.92	=====
Monmouth County	18	1.99	=====
Morris County	7	1.01	=====
Ocean County	3	1.41	=====
Passaic County	22	1.19	=====
Salem County	4	1.51	=====
Somerset County	1	.27	=====
Sussex County	3	1.29	=====
Union County	17	1.37	=====
Warren County	6	1.43	=====

## SECRETARY'S REPORT.

CHART SHOWING DEATHS FROM TYPHOID FEVER IN NEW JERSEY, PER 10,000 POPULATION FOR TWENTY-NINE YEARS.



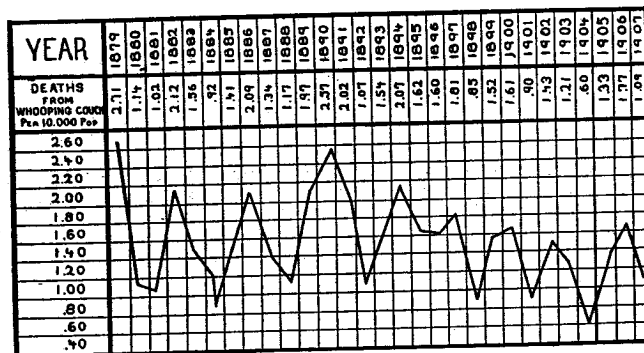
WHOOPING COUGH—The mortality from whooping cough for the year ending December 31, 1907, has continued to be low, the deaths numbering 245 and the death-rate per 10,000 population 1.09. The indifference shown by parents and nurses to this disease makes isolation impossible, and considering the long period of infectiousness quarantine would be difficult to maintain.

## REPORT OF THE BOARD OF HEALTH.

TABLE 36.—SHOWING DEATHS IN NEW JERSEY FROM WHOOPING COUGH, WITH AGES OF DECEDENTS, FOR YEAR ENDING DECEMBER 31, 1907.

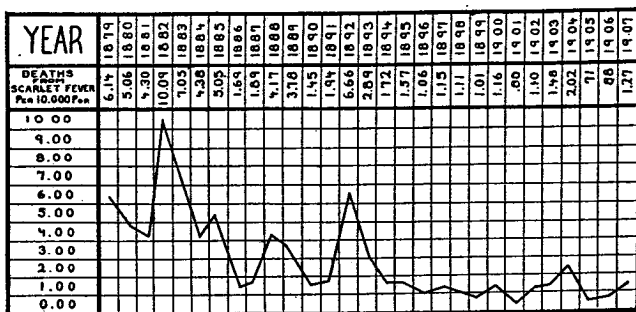
AGE PERIODS.	Deaths from whooping cough.	AGE PERIODS.	Deaths from whooping cough.	AGE PERIODS.	Deaths from whooping cough.
Under 1 month...	11	20 to 25 .....		50 to 55 .....	
Under 1 year.....	118	25 to 30 .....		55 to 60 .....	1
1 to 5 .....	100	30 to 35 .....		60 to 70 .....	
5 to 10 .....	13	35 to 40 .....		70 to 80 .....	
10 to 15 .....	2	40 to 45 .....		80 to 90 .....	
15 to 20 .....		45 to 50 .....		Over 90 .....	
				Total .....	245

CHART SHOWING DEATHS FROM WHOOPING COUGH IN NEW JERSEY, PER 10,000 POPULATION, FOR THE TWENTY-NINE YEARS ENDING DECEMBER 31, 1907.



SCARLET FEVER—Two hundred and eighty-six deaths from scarlet fever were reported during the year ending December 31, 1907, an increase of 93 over the previous year.

CHART SHOWING DEATHS FROM SCARLET FEVER IN NEW JERSEY, PER 10,000 POPULATION, FOR TWENTY-NINE YEARS.

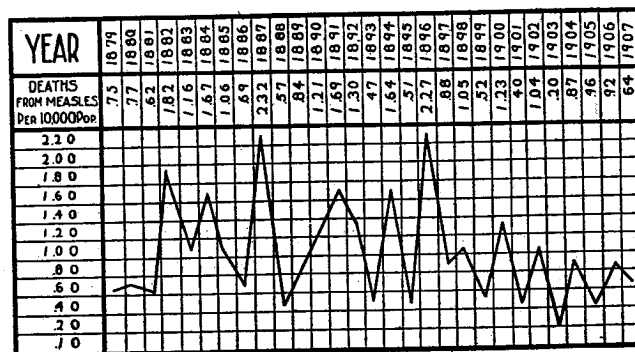


**MEASLES**—During the calendar year 1907, 144 deaths from measles occurred in New Jersey. The records of this State, and experience in all parts of this country and Europe, show that periodical outbreaks of this disease occur with much regularity, and no successful measures have thus far been devised to prevent these epidemics. The high infectiousness of measles for one or two days before the appearance of the eruption, before the parents suspect that the cough and coryza indicate the onset of any serious affection, and before a physician is called to see the patient, permits the spread of the disease, particularly in the beginning of each outbreak, and when notification reaches the local sanitary officer, the opportunity to arrest the progress of the disease by isolation of the patient is passed. If parents would invariably consult a physician whenever a child is suddenly attacked with sneezing attended with more or less cough and red and watery eyes, early diagnosis in measles would be possible, and the prevalence of the disease might be diminished.

TABLE 37.—SHOWING DEATHS IN NEW JERSEY FROM MEASLES, WITH AGE AT DEATH, FOR YEAR ENDING DECEMBER 31, 1907.

AGE PERIODS.	Deaths from measles.	AGE PERIODS.	Deaths from measles.	AGE PERIODS.	Deaths from measles.
Under 1 month...	1	25 to 30...	1	60 to 70...	
Under 1 year...	39	30 to 35...	1	70 to 80...	
1 to 5.....	90	35 to 40...	1	80 to 90...	
5 to 10.....	7	40 to 45...		Over 90.....	
10 to 15.....	1	45 to 50...			
15 to 20.....		50 to 55...			
20 to 25.....	2	55 to 60...		Total...	144

CHART SHOWING DEATHS IN NEW JERSEY FROM MEASLES, PER 10,000 POPULATION FOR TWENTY-NINE YEARS ENDING DECEMBER 31, 1907.



**MALARIAL DISEASES**—The following table and chart show the mortality in New Jersey from malarial affections for twenty-nine years, 1879-1907:

TABLE 38.—SHOWING DEATHS IN NEW JERSEY FROM MALARIAL FEVER FOR TWENTY-NINE YEARS.

YEARS.	Deaths from malarial fever.	YEARS.	Deaths from malarial fever.	YEARS.	Deaths from malarial fever.
1879.....	268	1889.....	203	1899.....	96
1880.....	293	1890.....	195	1900.....	84
1881.....	431	1891.....	180	1901.....	50
1882.....	379	1892.....	198	1902.....	36
1883.....	290	1893.....	148	1903.....	40
1884.....	230	1894.....	162	1904.....	47
1885.....	209	1895.....	144	1905.....	21
1886.....	243	1896.....	119	1906.....	33
1887.....	217	1897.....	132	1907.....	29
1888.....	264	1898.....	82		

CHART SHOWING DEATHS FROM MALARIAL AFFECTIONS, PER 10,000 INHABITANTS, IN NEW JERSEY, FOR TWENTY-NINE YEARS.



SMALL POX—During the year ending December 31, 1907, twenty-six cases of small-pox were reported in New Jersey, and one death occurred from this disease.

TABLE 39.—SHOWING DEATHS IN NEW JERSEY FROM SMALL-POX FOR TWENTY-NINE YEARS.

YEARS.	Deaths from small-pox.	YEARS.	Deaths from small-pox.	YEARS.	Deaths from small-pox.
1879.....		1889.....	3	1899.....	
1880.....	15	1890.....		1900.....	5
1881.....	254	1891.....		1901.....	142
1882.....	367	1892.....	38	1902.....	432
1883.....	54	1893.....	43	1903.....	16
1884.....	7	1894.....	11	1904.....	24
1885.....	2	1895.....	23	1905.....	1
1886.....	4	1896.....	2	1906.....	1
1887.....	5	1897.....		1907.....	1
1888.....	5	1898.....			

CANCER—During the calendar year 1907, 1,466 deaths from cancer were reported and the death-rate per 10,000 population is 6.52, the highest figure from this disease during the past 29 years.

TABLE 40.—SHOWING DEATHS FROM CANCER IN NEW JERSEY FOR TWENTY-NINE YEARS.

YEARS.	1879	1880	1881	1882	1883	1884	1885	1886	1887	1888	1889	1890	1891	1892
Deaths from cancer.....	378	425	451	402	461	484	498	546	574	612	579	640	642	688
Deaths from cancer per 10,000 population.....	3.70	3.75	3.88	3.37	3.81	3.87	3.89	4.15	4.21	4.45	4.11	4.41	4.34	4.55

YEARS.	1893	1894	1895	1896	1897	1898	1899	1900	1901	1902	1903	1904	1905	1906	1907
Deaths from cancer.....	723	731	770	811	857	852	946	921	1042	1,031	1,132	1,125	1,282	1,389	1,466
Deaths from cancer per 10,000 population.....	4.69	4.63	4.60	4.71	4.33	4.70	5.10	4.84	5.43	5.24	5.61	5.46	5.98	6.32	6.52

## SECRETARY'S REPORT.

TABLE 41.—DEATHS FROM CANCER IN NEW JERSEY, BY AGE PERIODS, FOR SEVEN YEARS.

YEARS.	AGE PERIODS.											Totals.
	Under 1 year.	1 to 10	10 to 20	20 to 30	30 to 40	40 to 50	50 to 60	60 to 70	70 to 80	Over 80	Not stated.	
1901.....	1	6	9	19	85	196	280	240	159	47	1	1,043
1902.....	1	7	5	24	92	190	322	216	136	31	7	1,031
1903.....	.....	10	2	22	79	179	293	308	177	57	5	1,132
1904.....	7	5	9	21	81	168	286	302	199	47	.....	1,232
1905.....	6	15	11	22	87	239	294	353	190	64	1	1,389
1906.....	2	12	6	25	104	241	350	350	225	74	.....	1,466
1907.....	1	8	14	23	91	244	377	369	262	77	.....	1,466
Totals.....	18	63	56	156	619	1,457	2,202	2,138	1,348	397	14	8,468

TABLE 42.—DEATHS FROM CANCER IN NEW JERSEY, SHOWING ORGANS AFFECTED AND AGE AT DEATH, FOR THE YEAR ENDING DECEMBER 31, 1907.

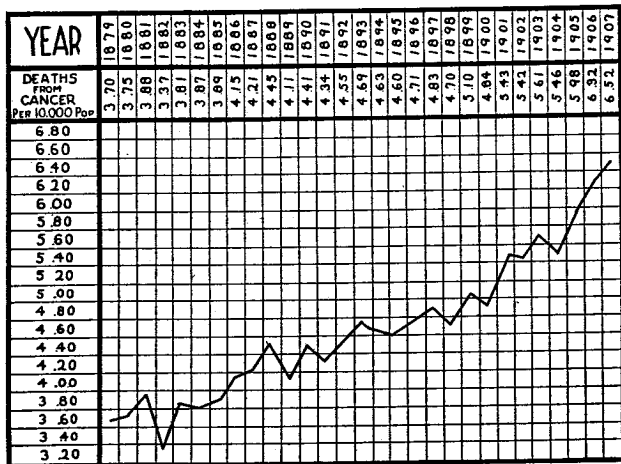
CANCER.	AGE AT DEATH.																	Totals.			
	Under 1 mo.	Under 1 year.	1 to 5	5 to 10	10 to 15	15 to 20	20 to 25	25 to 30	30 to 35	35 to 40	40 to 45	45 to 50	50 to 55	55 to 60	60 to 70	70 to 80	80 to 90.		Over 90.	Age not stated.	
Of the mouth.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	62
Of the stomach and liver.....	1	2	1	2	.....	1	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	866
Of the intestines and rectum.....	.....	.....	.....	.....	.....	.....	3	1	6	4	5	10	12	19	33	35	5	1	.....	.....	134
Of the female genital organs.....	.....	.....	.....	.....	.....	1	1	2	5	14	21	25	33	40	40	31	3	.....	.....	.....	216
Of the breast.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2	10	23	14	22	13	43	20	7	.....	.....	154
Of the skin.....	.....	.....	.....	.....	.....	1	1	.....	.....	.....	.....	.....	.....	.....	8	8	11	14	11	.....	64
Others.....	.....	1	2	3	5	4	2	7	5	10	27	19	14	41	20	9	.....	.....	.....	.....	170
Totals.....	1	3	5	5	9	11	12	35	56	104	140	181	196	369	262	68	9	.....	.....	.....	1,466

## REPORT OF THE BOARD OF HEALTH. 61

TABLE 43.—DEATHS FROM CANCER IN NEW JERSEY FOR THE YEAR ENDING DECEMBER 31, 1907, PER 10,000 POPULATION, BY COUNTIES AND BY CITIES OF OVER 5,000 INHABITANTS.

NAME OF PLACE.	Deaths from cancer.	Deaths per 10,000 population.
Atlantic County.....	13	5.47
Atlantic City.....	30	7.23
Bergen County.....	46	5.57
Englewood.....	6	6.98
Garfield.....	14	3.49
Hackensack.....	33	11.80
Burlington County.....	4	6.44
Bordentown.....	4	9.86
Burlington City.....	6	7.23
Camden County.....	25	7.75
Camden City.....	50	5.79
Gloucester City.....	3	3.51
Cape May County.....	8	4.10
Cape May City.....	20	7.53
Cumberland County.....	13	9.02
Bridgeton.....	8	8.45
Millville.....	22	6.76
Essex County.....	8	6.42
Bloomfield.....	28	10.51
East Orange.....	12	15.08
Irvington.....	14	8.93
Montclair.....	249	8.35
Newark.....	24	8.93
Orange.....	4	4.84
West Orange.....	14	7.04
Gloucester County.....	25	4.23
Hudson County.....	13	2.82
Bayonne.....	8	5.83
Harrison.....	52	7.66
Hoboken.....	159	6.54
Jersey City.....	7	4.77
Kearny.....	4	2.26
Town of Union.....	7	2.22
West Hoboken.....	3	3.77
West New York.....	33	11.96
Hunterdon County.....	1	1.94
Lambertville.....	11	5.20
Mercer County.....	1	1.45
Princeton.....	72	8.14
Trenton.....	21	4.75
Middlesex County.....	5	3.28
New Brunswick.....	15	5.14
Perth Amboy.....	2	3.21
South Amboy.....	32	5.46
Monmouth County.....	2	2.08
Asbury Park.....	10	6.45
Long Branch.....	2	3.03
Red Bank.....	24	4.80
Morris County.....	10	15.34
Dover.....	7	6.60
Morristown.....	15	7.03
Ocean County.....	9	3.19
Passaic County.....	22	5.26
Passaic City.....	66	5.79
Paterson.....	14	7.04
Salem County.....	6	8.96
Salem City.....	24	7.56
Somerset County.....	2	3.41
North Plainfield.....	17	7.39
Sussex County.....	14	7.47
Union County.....	42	6.58
Elizabeth.....	15	7.61
Plainfield.....	2	2.24
Ralway.....	4	5.36
Summit.....	3	5.32
Westfield.....	20	7.47
Warren County.....	6	4.09
Phillipsburg.....	.....	.....
Total in cities of over 5,000 inhabitants.....	1,026	.....
Total for State.....	1,466	.....
Rate per 10,000 population (State).....	.....	6.52

CHART SHOWING DEATHS IN NEW JERSEY FROM CANCER, PER 10,000 POPULATION, FOR TWENTY-NINE YEARS, 1879-1907.



SUICIDE—The number of deaths reported from suicide for the past year was 387, an increase of 49 over the previous year and 65 more than the average for the past seven years which has been 322.

TABLE 44.—SHOWING DEATHS IN NEW JERSEY FROM SUICIDE FOR SEVEN YEARS, 1901-1907.

YEARS.	Deaths from suicide.	YEARS.	Deaths from suicide
1901.....	265	1905.....	354
1902.....	271	1906.....	338
1903.....	314	1907.....	387
1904.....	330		

TABLE 45.—DEATHS IN NEW JERSEY FROM SUICIDE, SHOWING MODE OF DEATH AND AGE AT DEATH, FOR THE YEAR ENDING DECEMBER 31, 1907.

MODE OF DEATH.	AGE AT DEATH.														Totals.		
	1 to 5	5 to 10	10 to 15	15 to 20	20 to 25	25 to 30	30 to 35	35 to 40	40 to 45	45 to 50	50 to 55	55 to 60	60 to 70	70 to 80		80 to 90	Over 90
By poison.....			2	11	18	16	15	19	11	11	8	17	11	3			142
By asphyxia.....				3	1	2	4		4	4	6	7	7	2			40
By strangulation.....				1	2	2	2	4	6	10	7	8	7	3			54
By firearms.....				5	7	12	6	12	17	13	10	12	11	4			111
By cutting instruments.....						2	6	2	1	2	1	1	2	1			18
By drowning.....				1	1	2	1		3	2		3	3				16
By crushing.....									1								2
By precipitation from height.....				1													2
Others.....							2										2
Totals.....		2	22	29	36	36	38	43	42	32	48	42	13	4			387

TABLE 46.—SHOWING NUMBER OF DEATHS BY SUICIDE RECORDED IN NEW JERSEY, BY CITIES, AND BY COUNTIES, EXCLUSIVE OF CITIES, FOR THE YEAR ENDING DECEMBER 31, 1907.

NAME OF PLACE.	COUNTRY OF BIRTH.										Total.	
	United States.	England.	France.	Germany.	Ireland.	Italy.	Scotland.	Hungary.	Sweden.	Other foreign.		Not stated.
Atlantic County.....	7										1	5
Atlantic City.....	1			1	1							18
Bergen County.....	1	1										2
Englewood.....												2
Garfield.....	2									1		3
Hackensack.....	2											10
Burlington County.....	1											2
Bordentown.....	2	1										3
Burlington.....												1
Camden County.....	6			2					1	1	1	11
Camden City.....												1
Gloucester City.....	1											3
Cape May County.....												3
Cumberland County.....												3
Bridgeton.....												3
Millville.....												3
Essex County.....												5
Bloomfield.....	4			1								2
East Orange.....	2											4
Irvington.....	3			1								8
Montclair.....	4	1		19	7	1	2	5	11	2		89
Newark.....	1	1										3
Orange.....	1	1										5
West Orange.....												1
Gloucester County.....												11
Hudson County.....												3
Bayonne.....					1					1	1	20
Harrison.....	6			10								13
Hoboken.....	13	2		15	6	1	1	1	4	3		46
Jersey City.....												7
Kearny.....												6
Town of Union.....	3			3								1
West Hoboken.....				1	4							1
West New York.....				1								4
Hunterdon County.....												1
Lambertville.....												7
Mercer County.....												2
Princeton.....	4	2		1								6
Trenton.....												2
Middlesex County.....	1								1	1		3
New Brunswick.....												3
Perth Amboy.....	2			1					1			5
South Amboy.....				1								1
Monmouth County.....	1											4
Asbury Park.....	1	1		1						1		5
Long Branch.....												1
Red Bank.....												5
Morris County.....	1											1
Dover.....	1								1	1		3
Morristown.....												5
Ocean County.....												5
Passaic County.....	2			1					2	3	1	10
Passaic City.....	7	2		6	2	1			2	2	2	22
Paterson.....												4
Salem County.....												2
Salem City.....												1
Somerset County.....	1											2
North Plainfield.....												3
Sussex County.....												3
Union County.....												9
Elizabeth.....	2	1		5				1				4
Plainfield.....	2			1	1							1
Rahway.....				1								1
Summit.....	1											1
Westfield.....												5
Warren County.....												1
Phillipsburg.....												1
Totals.....	123	13	1	75	17	5	4	9	1	30	13	387

RABIES—During the year ending December 31, 1907, five deaths from rabies occurred in New Jersey.

The prevalence of this disease among dogs in this and in the neighboring States calls for radical legislative action. The following suggestions by E. C. Schroeder, M.D.V., in a circular recently issued by the U. S. Department of Agriculture seem pertinent to this subject:

"If laws covering three points could be made and properly enforced, there is no doubt that rabies would soon have no existence but in the history of the past. The features to be embodied in such laws should be as follows:

1. The proper licensing of dogs and the extermination of those that are not licensed.
2. The proper muzzling of all dogs when they are in public places or on public highways.
3. To hold dog owners responsible for the damage traceable to their dogs.

Every dog should be required to wear a collar inscribed with the license number and the name and address of the owner. The cost of the license, collar and muzzle would be a price by no means great to pay for the privilege of keeping a dog.

No one should oppose the capture and the speedy and painless destruction of homeless and ownerless dogs. These are the members of the canine family that do the most harm. They have wits that are sharpened by the struggle for existence to which they are constantly exposed. The outcast dog, the so-called "yellow cur," roams far and wide; he acts cowardly in the presence of danger, but it is only a surface cowardice based on bitter experience that has taught him to reserve his energies; when he is cornered, or when there is anything to gain, he fights and fights hard. I have no animosity toward this mongrel waif; he merits respect, and if he were not a menace to the public safety, I should regret to see him exterminated.

The ownership of animals imposes obligations, both relative to the animals and to the communities in which they are owned. This statement is accorded the value of a truism when it is applied to an underfed or overworked or otherwise abused horse, or to a dangerous bull that is allowed to frequent a public common or highway unattended. But when we apply







DIVISION OF MEDICAL AND SANITARY INSPECTION.—This division of the health department was established after the appointment and reorganization of the State Board of Health in May, 1908. A. Clark Hunt, M.D., was appointed chief of the division. His detailed report of the work for the fiscal year ending October 31, 1908, will be found of much interest. It is forwarded herewith. The special work assigned to this division is such as was originally, and until the establishment of this division, conducted solely under the immediate and personal supervision of the Secretary of the State Board of Health. The duties of the secretary, as executive officer of the board, have been increased from year to year, as legislative enactments have placed additional powers and responsibilities upon the board, even until the present year, when the additional duties and obligations of the former State Sewerage Commission were, by an act of the legislature, transferred to the health department. It was, therefore, with a desire to relieve the secretary of the immediate details of this medical and sanitary inspection work, and to allow him to give more time and attention to the general supervision and direction of the work of the entire State health department, that this division was created. The work of the division is extensive and somewhat diversified in nature, but it is of an exceedingly important character. It contemplates taking cognizance of sanitary matters in general, affecting the life and health of the citizens of the State, but more especially making inquiries and sanitary investigations as to the causes of various diseases, especially of infectious and contagious diseases; of epidemics and the sources of mortality throughout the State, and also inspections and inquiries into the sanitary condition of public institutions, such as prisons, penitentiaries, jails, almshouses, asylums and other public buildings. At the same time the work of this division extends to local boards of health in assisting them in organization; helping them in establishing proper sanitary codes; giving them advice; making local inspections, etc., etc. In order to properly conduct the diversified duties of this division there should be a larger appropriation made, and more inspectors appointed to assist in the work. There are in the State 460 local boards of health, each of which should, under the law, make annual reports to the State Board of Health. For the year ending October 31, 1908,

only 335 of these boards have made such reports, showing that there are 125 who have entirely failed to comply with the law. Most of the latter are small boroughs or townships where little or no attention is given to sanitary regulations, and where owing to ignorance or indifference communities have little or no protection in sanitary matters. It will be the policy of this board, working through the division of medical and sanitary inspection, to cooperate with these local boards of health, and by advice and a persistent course of educational instruction to bring the standard of these organizations up to the uniform legal requirements.

During the year 24 epidemics or outbreaks of contagious diseases have occurred, while 710 individual cases have been inspected or investigated. Of these cases 253 were typhoid fever; 48 diphtheria; 107 scarlet fever; 14 small-pox and 1 was a case of leprosy. The balance of these cases were disease carriers. Of the 253 typhoid fever cases 2 were in Clark Township; 15 in Franklin Township; 34 in Hammonton; 1 in Lebanon Township; 6 in Harrington Park; 3 in Mansfield Township; 3 in Monmouth Beach; 23 in Mount Holly; 3 in Pennsville; 1 in Raritan; 112 in Roebing; 30 in Salem City; 10 in Somers Point; 1 in Ocean Heights; 1 in Linwood and 8 in Trenton. Of the 48 cases of diphtheria 7 were in Hamilton Township; 2 in Palisades Township and 39 in the New Jersey State Reformatory, at Rahway. Of the 107 scarlet fever cases 17 were in Collingswood; 65 in Lakewood; 17 in Springfield Township and 8 in Upper Pittsgrove Township. The 14 cases of small-pox were in Atlantic City, and the 1 case of leprosy is at Blackwood. A detailed account of medical inspection, tracing the causes, etc., of the foregoing cases is shown in the report of the division of medical and sanitary inspection and will be found of much interest, as will that portion of the report relating to sanitary inspection of the State Encampment, at Sea Girt; of Seaside Park and of the rubbish and garbage nuisance on the Atlantic coast affecting various seaside resorts. It is the intention of the State Board of Health through this division of the health department, during the coming year, to thoroughly inspect and investigate State institutions, calling the attention of the superintendents and managers to any unsanitary conditions that may be found to

exist, and in this way to assist the State in putting all such institutions in perfect sanitary condition.

HEALTH OFFICERS AND SANITARY INSPECTORS.—In accordance with the provisions of chapter 215 of the laws of 1903, the State Board of Health upon its reorganization, May 26, 1908, appointed the following persons as members of the State board of sanitary examiners: George E. McLaughlin, M.D., Jersey City; D. D. Chandler, health officer of Newark; L. R. Thurlow, health officer of Plainfield; Edward Guion, M.D., Atlantic City and A. Clark Hunt, M.D., Metuchen. At the meeting of the members of this board, held at the State House, June 17, 1908, 52 persons were examined as applicants. Of this number 10 applied for license to serve as health officers; 36 for license to serve as sanitary inspectors and 6 for license to serve as plumbing inspectors. Eight of the applicants were licensed to serve as health officers; 8 to serve as sanitary inspectors of the first class; 1 to serve as sanitary inspector of the second class and 4 to serve as plumbing inspectors. Thirty-one of the applicants were refused licenses. At the examination conducted December 4, 1907, 34 applicants were examined. Licenses were granted to 3 applicants to serve as health officers; 4 to serve as sanitary inspectors of the first class; 2 to serve as sanitary inspectors of the second class and 2 to serve as plumbing inspectors. Licenses were refused in the case of 23 of the applicants. A total of 86 applicants were examined for the fiscal year ending October 31, 1908, of whom 32 were licensed and 54 rejected. A detailed statement of the work of this board of sanitary examiners, by A. Clark Hunt, M.D., follows later in this report. This statement shows that since June 1, 1904, the date of the first examination, 282 persons have been examined of whom 148 have received licenses, while 134 have been rejected. Of the total number who have been licensed 54 have received licenses as health officers; 65 as sanitary inspectors of the first class; 4 as sanitary inspectors of the second class; 2 as sanitary inspectors of the third class; 4 as meat inspectors and 19 as plumbing inspectors.

Since the Civil Service Law went into effect on October 10, 1908, the State Board of Sanitary Examiners hereafter may only conduct exclusive examinations of those applicants whose localities have not adopted the provisions of the Civil

Service Law. Where the provisions of that law have been adopted, by a mutual understanding, examinations will be conducted by the Civil Service Commission and the State Board of Sanitary Examiners jointly. Licenses, however, in either case can only be granted by the State Board of Health, and the same uniform high standard in the examinations will be maintained in both cases, so that the effect of this system of licensing, whether the examinations are conducted by the State Board of Sanitary Examiners exclusively or in conjunction with the Civil Service Commission, is to bring the grade of the health officers and sanitary inspectors up to a uniform high standard, and as a result to greatly improve the quality of the local sanitary service throughout the State. Municipalities that have adopted the provisions of the Civil Service Law must hereafter select their health officers or sanitary inspectors only from those who reside in their own municipality and who have passed the Civil Service and Sanitary Examining Board examinations and have received licenses from the State Board of Health.

STATE LABORATORY DIAGNOSIS.—The State Laboratory of Hygiene continues under the supervision of Mr. R. B. Fitz-Randolph, whose detailed statement of the work for the year in this department is given further on in this report.

During the year ending October 31, 1908, there were examined in the bacteriological department of the State Laboratory of Hygiene 12,618 specimens from suspected cases of communicable diseases, an increase of 3,625 over the number examined during the previous year. Of this number 6,090 were examined for diphtheria; 3,637 for tuberculosis; 2,548 for typhoid fever; 173 for malaria and 170 from various other communicable diseases. The following table shows the yearly increase in the number of specimens examined:

TABLE 48.—SHOWING THE NUMBER OF SPECIMENS OF EACH KIND EXAMINED SINCE THE LABORATORY WAS ORGANIZED.

	1896-97	1898	1899	1900	1901	1902	1903	1904	1905	1906	1907	1908
Diphtheria.....	627	600	577	974	1,864	1,487	2,090	2,949	2,896	3,277	3,348	6,090
Tuberculosis.....	233	516	736	809	1,211	1,487	1,833	2,244	2,691	2,948	3,402	3,637
Typhoid fever.....	27	175	339	431	739	884	1,333	1,272	1,268	1,556	1,975	2,548
Malaria.....		4	*	53	113	196	151	98	109	126	149	173
Miscellaneous.....	7	18	*	28	30	55	132	67	84	-126	119	170
Totals.....	914	1,313	1,682	2,380	3,955	4,089	5,559	6,730	7,048	8,033	8,993	12,618

\*The number of these specimens has not been recorded.

DIVISION OF FOOD AND DRUGS.—At the time of the reorganization of the State Board of Health, May 26, 1908, Mr. R. B. Fitz-Randolph, Director of the State Laboratory of Hygiene, was appointed chief of this division, to have charge of all the inspection work relating to food and drugs, as well as directing the work of the laboratory in the examination of specimens sent in by the inspectors for investigation. A detailed account of the work for the year in this branch of the health department, arranged by Mr. Fitz-Randolph, will be found further on in this yearly report. On October 1, 1908, the new act regulating the sale of food and drugs in this State became operative. The provisions of the act, which was approved May 20, 1907, conform closely to those of the Federal Government Act, which is of great advantage, as in operating under the provisions of the one, there is likely to be no conflict with the provisions of the other. During the first eleven months of the fiscal year, *i.e.*, up to October 1, 1908, inspection work and examinations of food and drugs in the laboratory were conducted in accordance with the provisions of the old law, which was approved March 21, 1901. Since the new law became operative the inspections and examinations in the food and drug work have been conducted under the provisions of that law. While the number of specimens of milk and cream actually examined during the year ending October 31, 1908, seem a trifle less than those of the year previous as a matter of fact the number of inspections made is largely in excess of those made during any previous year. This is because a smaller proportion of the samples were forwarded to the laboratory, inspectors by the use of the lactometer, and their greater skill in judging of the quality of the samples inspected, having found it unnecessary to forward specimens in a large number of the inspections made. The number of samples of milk and cream examined in the laboratory during the year ending October 31, 1908, was 2,805 of which 449 were below standard. The total number of articles of food examined during the year was 5,829, showing an increase of 2,223 articles of food examined over those of the previous year. The number found below standard was 775 or only 79 more than those of the previous year. The number of samples of drugs analyzed during the year was 719, which is 148 more than was analyzed during the previous year. The number

found below standard during the year was only 169, while of the 571 specimens of drugs analyzed in 1907, 367 were found below standard, all of which shows conclusively the splendid effect the continued enforcement of the provisions of the food and drugs act is having throughout the State. Fear of detection and prosecution is rapidly bringing the quality of food and drugs up to the normal standard. In all cases where it was believed that there was sufficient evidence to secure conviction suit has been ordered. There have been 307 suits begun during the year. On the following page is a complete table showing all such suits, and what disposition has been made of them. The following penalties for violations of the food and drugs acts have been paid by the State Board of Health into the State treasury during the past eight years: For the year 1901, \$3,000.00; 1902, \$4,900.00; 1903, \$5,500.00; 1904, \$4,308.30; 1905, \$6,462.48; 1906, \$7,462.48; 1907, \$8,553.68; 1908, \$14,477.61.

While these sums do not furnish a criterion by which we can judge of the degree of activity with which the law has been enforced; the object in view being to prevent the sale of adulterated and unwholesome articles of food and drugs, and this purpose having been accomplished in many instances by warning notices without prosecutions—still it will be noticed that the penalties for the fiscal year ending October 31, 1908, are \$5,923.93 more than the penalties for the year 1907, while the penalties for the year 1907 show only an increase of \$1,091.20 over the year 1906. These figures therefore show a marked increase in the work in this division during the fiscal year.

## SECRETARY'S REPORT.

TABLE 49.—SHOWING THE NUMBER OF SUITS INSTITUTED FOR VIOLATION OF THE ACT TO PREVENT THE SALE OF ADULTERATED FOOD AND DRUGS, TOGETHER WITH THE DATE OF ANALYSIS OF SAMPLE AND THE DISPOSITION OF THE CASE, FOR THE YEAR ENDING OCTOBER 31, 1908.

Date of analysis.	Number of sample.	Name of article.	Termination of each case.
Nov. 5, 1907.	C-9394	Milk	Convicted, fine paid.
Nov. 5, 1907.	C-9395	Skimmed milk	Convicted, fine paid.
Nov. 5, 1907.	C-9396	Skimmed milk	Duplicate of C-9395.
Nov. 7, 1907.	A-7797	Milk	Convicted, fine paid.
Nov. 7, 1907.	A-7779	Milk	Paid penalty.
Nov. 7, 1907.	A-7783	Milk	Convicted, fine paid.
Nov. 7, 1907.	A-7788	Milk	Paid penalty.
Nov. 7, 1907.	A-7794	Milk	Convicted, fine paid.
Nov. 7, 1907.	A-7795	Milk	Paid penalty.
Nov. 7, 1907.	A-7796	Milk	Paid penalty.
Nov. 8, 1907.	C-9405	Milk	Convicted, fine paid.
Nov. 14, 1907.	A-7836	Milk	Paid penalty.
Nov. 14, 1907.	A-7848	Milk	Paid penalty.
Nov. 14, 1907.	A-7849	Milk	Paid penalty.
Nov. 14, 1907.	C-9416	Skimmed milk	Convicted, fine paid.
Nov. 18, 1907.	A-7858	Cider vinegar	Convicted, fine paid.
Nov. 18, 1907.	A-7859	Cider vinegar	Convicted, fine paid.
Nov. 20, 1907.	A-7864	Milk	Paid penalty.
Nov. 20, 1907.	A-7868	Milk	Paid penalty.
Nov. 20, 1907.	A-7870	Milk	Paid penalty.
Nov. 20, 1907.	A-7877	Milk	Paid penalty.
Nov. 26, 1907.	C-9512	Milk	Convicted, fine paid.
Nov. 26, 1907.	C-9513	Milk	Duplicate of C-9512.
Nov. 27, 1907.	C-9517	Skimmed milk	Convicted, fine paid.
Nov. 27, 1907.	C-9518	Skimmed milk	Suit discontinued.
Nov. 27, 1907.	C-9519	Skimmed milk	Duplicate of C-9517.
Nov. 30, 1907.	C-9523	Skimmed milk	Convicted, fine paid.
Nov. 30, 1907.	C-9521	Milk	Paid penalty.
Dec. 4, 1907.	B-4651	Milk	Pending.
Dec. 11, 1907.	C-9616	Skimmed milk	Convicted, fine paid.
Dec. 11, 1907.	C-9618	Skimmed milk	Pending.
Dec. 11, 1907.	C-9619	Skimmed milk	Convicted, fine paid.
Dec. 12, 1907.	A-7987	Butter	Convicted.
Dec. 12, 1907.	C-9526	Oleomargarine	Suit discontinued.
Dec. 13, 1907.	C-9622	Skimmed milk	Suit discontinued.
Dec. 17, 1907.	A-8001	Butter	Convicted, fine paid.
Dec. 20, 1907.	A-8009	Milk	Convicted, fine paid.
Dec. 28, 1907.	C-9714	Skimmed milk	Convicted, fine paid.
Jan. 7, 1908.	A-8056	Butter	Convicted, fine paid.
Jan. 8, 1908.	C-9712	Tincture opium	Pending.
Jan. 14, 1908.	C-9745	Milk	Convicted, fine paid.
Jan. 14, 1908.	C-9747	Milk	Convicted, fine paid.
Jan. 14, 1908.	C-9748	Milk	Convicted, fine paid.
Jan. 14, 1908.	C-9751	Milk	Paid penalty.
Jan. 14, 1908.	C-9752	Milk	Pending.
Jan. 14, 1908.	C-9753	Milk	Duplicate of C-9752.
Jan. 16, 1908.	C-9756	Milk	Convicted, fine paid.
Jan. 16, 1908.	A-8015	Tincture iodine	Pending.
Jan. 16, 1908.	A-8063	Tincture iodine	Pending.
Jan. 16, 1908.	A-8073	Tincture iodine	Pending.

## REPORT OF THE BOARD OF HEALTH.

TABLE 49.—SHOWING THE NUMBER OF SUITS INSTITUTED FOR VIOLATION OF THE ACT TO PREVENT THE SALE OF ADULTERATED FOOD AND DRUGS, TOGETHER WITH THE DATE OF ANALYSIS OF SAMPLE AND THE DISPOSITION OF THE CASE, FOR THE YEAR ENDING OCTOBER 31, 1908—(Continued).

Date of analysis.	Number of sample.	Name of article.	Termination of each case.
Jan. 16, 1908.	C-9731	Tincture iodine	Pending.
Jan. 16, 1908.	D-8966	Tincture iodine	Pending.
Jan. 23, 1908.	C-9799	Butter	Convicted.
Jan. 23, 1908.	D-8994	Butter	Convicted, fine paid.
Jan. 23, 1908.	G-843	Butter	Suit discontinued.
Feb. 5, 1908.	C-9882	Lard	Pending.
Feb. 6, 1908.	C-9887	Lard	Pending.
Feb. 6, 1908.	C-9889	Lard	Pending.
Feb. 10, 1908.	C-9913	Lard	Pending.
Feb. 10, 1908.	C-9915	Lard	Pending.
Feb. 13, 1908.	C-9935	Butterine	Suit discontinued.
Feb. 13, 1908.	D-9057	Butter	Convicted, fine paid.
Feb. 13, 1908.	D-9058	Butter	Convicted, fine paid.
Feb. 13, 1908.	D-9062	Butter	Pending.
Feb. 13, 1908.	D-9063	Butter	Convicted, appealed.
Feb. 24, 1908.	G-922	Butter	Convicted, fine paid.
Feb. 27, 1908.	A-8340	Butterine	Suit discontinued.
Mar. 5, 1908.	A-8359	Milk	Convicted, appealed.
Mar. 5, 1908.	A-8375	Milk	Convicted, fine paid.
Mar. 5, 1908.	B-4441	Milk	Convicted, fine paid.
Mar. 5, 1908.	B-4413	Milk	Duplicate of B-4441.
Mar. 5, 1908.	C-9996	Milk	Paid penalty.
Mar. 5, 1908.	C-9997	Milk	Convicted, fine paid.
Mar. 5, 1908.	C-9998	Milk	Duplicate of C-9997.
Mar. 9, 1908.	D-9082	Butter	Suit discontinued.
Mar. 9, 1908.	D-9097	Butter	Convicted, fine paid.
Mar. 12, 1908.	D-9102	Butter	Convicted, fine paid.
Mar. 12, 1908.	D-9106	Butter	Convicted, appealed.
Mar. 12, 1908.	D-9107	Butter	Convicted, appealed.
Mar. 12, 1908.	D-9108	Butter	Pending.
Mar. 12, 1908.	D-9120	Lard	Pending.
Mar. 13, 1908.	D-9126	Lard	Pending.
Mar. 13, 1908.	D-9124	Lard	Pending.
Mar. 21, 1908.	C-57	Skimmed milk	Convicted, fine paid.
Mar. 21, 1908.	D-9145	Milk	Convicted, fine paid.
Mar. 21, 1908.	D-9146	Milk	Convicted, fine paid.
Mar. 21, 1908.	D-9151	Milk	Paid penalty.
Mar. 23, 1908.	D-9142	Butter	Convicted.
Mar. 23, 1908.	C-62	Milk	Convicted, fine paid.
Mar. 24, 1908.	C-64	Milk	Paid penalty.
Mar. 24, 1908.	C-65	Milk	Paid penalty.
Mar. 24, 1908.	C-67	Milk	Convicted, fine paid.
Mar. 24, 1908.	C-68	Milk	Duplicate of C-67.
Mar. 24, 1908.	B-5004	Milk	Paid penalty.
Mar. 24, 1908.	B-5010	Milk	Paid penalty.
Mar. 24, 1908.	B-5013	Milk	Suit discontinued.
Mar. 24, 1908.	B-5014	Milk	Paid penalty.
Mar. 24, 1908.	B-5015	Milk	Paid penalty.
Mar. 24, 1908.	B-5020	Milk	Paid penalty.
Mar. 25, 1908.	C-79	Skimmed milk	Convicted, fine paid.

TABLE 49.—SHOWING THE NUMBER OF SUITS INSTITUTED FOR VIOLATION OF THE ACT TO PREVENT THE SALE OF ADULTERATED FOOD AND DRUGS, TOGETHER WITH THE DATE OF ANALYSIS OF SAMPLE AND THE DISPOSITION OF THE CASE, FOR THE YEAR ENDING OCTOBER 31, 1908—(Continued).

Date of analysis.	Number of sample.	Name of article.	Termination of each case.
Mar. 26, 1908.	C-85	Milk.	Paid penalty.
Mar. 26, 1908.	C-88	Milk.	Convicted, fine paid.
Mar. 26, 1908.	C-91	Milk.	Convicted, fine paid.
Mar. 27, 1908.	A-8505	Milk.	Paid penalty.
Mar. 27, 1908.	A-8508	Milk.	Paid penalty.
Mar. 27, 1908.	A-8512	Milk.	Paid penalty.
Mar. 27, 1908.	A-8522	Milk.	Paid penalty.
Mar. 27, 1908.	A-8525	Milk.	Pending.
Mar. 27, 1908.	D-9164	White pepper.	Convicted, fine paid.
Mar. 31, 1908.	C-115	Milk.	Acquitted, appealed.
Mar. 31, 1908.	C-116	Milk.	Duplicate of C-115.
Mar. 31, 1908.	C-117	Milk.	Duplicate of C-115.
Apr. 3, 1908.	G-985	Lard.	Pending.
Apr. 4, 1908.	A-8540	Milk.	Paid penalty.
Apr. 4, 1908.	A-8542	Milk.	Paid penalty.
Apr. 4, 1908.	A-8543	Milk.	Paid penalty.
Apr. 4, 1908.	A-8553	Milk.	Paid penalty.
Apr. 4, 1908.	A-8564	Milk.	Paid penalty.
Apr. 4, 1908.	A-8565	Milk.	Paid penalty.
Apr. 4, 1908.	A-8566	Milk.	Convicted, fine paid.
Apr. 7, 1908.	A-8572	Milk.	Paid penalty.
Apr. 9, 1908.	C-175	Milk.	Paid penalty.
Apr. 9, 1908.	C-179	Milk.	Paid penalty.
Apr. 9, 1908.	C-180	Milk.	Paid penalty.
Apr. 9, 1908.	C-182	Milk.	Paid penalty.
Apr. 9, 1908.	C-183	Milk.	Paid penalty.
Apr. 9, 1908.	C-185	Milk.	Paid penalty.
Apr. 10, 1908.	B-5271	Milk.	Paid penalty.
Apr. 10, 1908.	G-1009	Butter.	Convicted, fine paid.
Apr. 10, 1908.	G-1007	Butter.	Convicted, fine paid.
Apr. 16, 1908.	G-1014	Butter.	Convicted, fine paid.
Apr. 20, 1908.	C-247	Milk.	Convicted, fine paid.
Apr. 20, 1908.	C-248	Milk.	Duplicate of C-247.
Apr. 20, 1908.	C-249	Milk.	Paid penalty.
Apr. 20, 1908.	C-251	Milk.	Convicted, fine paid.
Apr. 20, 1908.	C-252	Milk.	Acquitted, appealed.
Apr. 21, 1908.	D-9349	Milk.	Convicted, fine paid.
Apr. 21, 1908.	G-1026	Milk.	Paid penalty.
Apr. 21, 1908.	G-1032	Milk.	Pending.
Apr. 24, 1908.	D-9350	Butter.	Convicted, fine paid.
Apr. 24, 1908.	D-9357	Skimmed milk.	Suit discontinued.
Apr. 24, 1908.	D-9358	Milk.	Convicted, fine paid.
Apr. 24, 1908.	D-9359	Milk.	Paid penalty.
Apr. 25, 1908.	C-286	Skimmed milk.	Convicted, fine paid.
Apr. 28, 1908.	D-9166	Butter.	Convicted, fine paid.
Apr. 28, 1908.	D-9168	Butter.	Pending.
Apr. 30, 1908.	G-1035	Milk.	Convicted, fine paid.
May 5, 1908.	D-9360	Coffee.	Convicted, fine paid.
May 5, 1908.	G-987	Coffee.	Convicted, fine paid.
May 7, 1908.	A-8701	Milk.	Paid penalty.

TABLE 49.—SHOWING THE NUMBER OF SUITS INSTITUTED FOR VIOLATION OF THE ACT TO PREVENT THE SALE OF ADULTERATED FOOD AND DRUGS, TOGETHER WITH THE DATE OF ANALYSIS OF SAMPLE AND THE DISPOSITION OF THE CASE, FOR THE YEAR ENDING OCTOBER 31, 1908—(Continued).

Date of analysis.	Number of sample.	Name of article.	Termination of each case.
May 7, 1908.	A-8714	Milk.	Convicted, fine paid.
May 7, 1908.	A-8719	Milk.	Paid penalty.
May 7, 1908.	A-8721	Milk.	Paid penalty.
May 7, 1908.	D-9370	Milk.	Convicted, fine paid.
May 12, 1908.	B-5338	Milk.	Paid penalty.
May 12, 1908.	C-304	Skimmed milk.	Convicted, fine paid.
May 15, 1908.	G-1054	Milk.	Paid penalty.
May 15, 1908.	G-1055	Milk.	Paid penalty.
May 20, 1908.	C-326	Skimmed milk.	Suit discontinued.
May 20, 1908.	C-163	Tincture opium.	Convicted, fine paid.
May 22, 1908.	A-8786	Milk.	Paid penalty.
May 22, 1908.	C-330	Milk.	Convicted, fine paid.
May 22, 1908.	C-332	Milk.	Paid penalty.
May 26, 1908.	No. 1	Cream.	Pending.
May 28, 1908.	C-361	Milk.	Paid penalty.
May 29, 1908.	A-8824	Milk.	Paid penalty.
May 29, 1908.	C-366	Milk.	Paid penalty.
June 3, 1908.	C-403	Milk.	Paid penalty.
June 10, 1908.	A-8916	Milk.	Convicted, fine paid.
June 10, 1908.	A-8921	Milk.	Convicted, fine paid.
June 10, 1908.	A-8919	Milk.	Convicted, fine paid.
June 20, 1908.	C-698	Milk.	Acquitted, appealed.
June 23, 1908.	A-9036	Milk.	Paid penalty.
June 23, 1908.	A-9043	Milk.	Paid penalty.
June 23, 1908.	A-9048	Milk.	Paid penalty.
June 23, 1908.	A-9050	Milk.	Settled.
June 23, 1908.	A-9056	Milk.	Suit discontinued.
June 23, 1908.	A-9055	Milk.	Paid penalty.
June 26, 1908.	C-803	Milk.	Paid penalty.
June 26, 1908.	G-1169	Milk.	Paid penalty.
June 26, 1908.	G-1175	Milk.	Paid penalty.
June 26, 1908.	G-1183	Milk.	Paid penalty.
June 26, 1908.	G-1184	Milk.	Suit discontinued.
June 27, 1908.	G-1185	Milk.	Convicted, fine paid.
June 27, 1908.	G-1189	Milk.	Convicted, fine paid.
June 30, 1908.	G-1221	Milk.	Convicted, fine paid.
June 30, 1908.	G-1220	Milk.	Convicted, fine paid.
June 30, 1908.	G-1215	Milk.	Paid penalty.
June 30, 1908.	G-1218	Milk.	Paid penalty.
July 1, 1908.	G-1234	Milk.	Convicted, fine paid.
July 1, 1908.	G-1248	Milk.	Convicted, fine paid.
July 1, 1908.	G-1249	Milk.	Convicted.
July 1, 1908.	C-880	Milk.	Convicted.
July 1, 1908.	C-881	Milk.	Duplicate of C-880.
July 2, 1908.	G-1267	Milk.	Pending.
July 2, 1908.	G-1266	Milk.	Convicted, fine paid.
July 2, 1908.	C-914	Milk.	Convicted, fine paid.
July 3, 1908.	C-924	Milk.	Paid penalty.
July 7, 1908.	G-1271	Milk.	Convicted, fine paid.
July 7, 1908.	G-1272	Milk.	Convicted, fine paid.

## SECRETARY'S REPORT.

TABLE 49.—SHOWING THE NUMBER OF SUITS INSTITUTED FOR VIOLATION OF THE ACT TO PREVENT THE SALE OF ADULTERATED FOOD AND DRUGS, TOGETHER WITH THE DATE OF ANALYSIS OF SAMPLE AND THE DISPOSITION OF THE CASE, FOR THE YEAR ENDING OCTOBER 31, 1908—(Continued).

Date of analysis.	Number of sample.	Name of article.	Termination of each case.
July 7, 1908	G-1282	Milk	Convicted, fine paid.
July 8, 1908	A-9071	Milk	Paid penalty.
July 8, 1908	G-1285	Milk	Paid penalty.
July 8, 1908	G-1286	Milk	Paid penalty.
July 8, 1908	G-1287	Milk	Convicted, fine paid.
July 8, 1908	G-1288	Milk	Paid penalty.
July 8, 1908	G-1291	Milk	Paid penalty.
July 8, 1908	G-1293	Milk	Convicted, fine paid.
July 8, 1908	G-1292	Milk	Suit discontinued.
July 8, 1908	G-1296	Milk	Convicted.
July 8, 1908	G-1298	Milk	Convicted, fine paid.
July 11, 1908	A-9123	Milk	Convicted, fine paid.
July 11, 1908	A-9150	Milk	Paid penalty.
July 15, 1908	H-619	Milk	Suit discontinued.
July 15, 1908	H-627	Milk	Paid penalty.
July 16, 1908	G-1352	Milk	Paid penalty.
July 16, 1908	G-1358	Milk	Convicted.
July 17, 1908	G-1364	Milk	Paid penalty.
July 17, 1908	H-663	Milk	Convicted, fine paid.
July 17, 1908	H-666	Milk	Convicted, fine paid.
July 21, 1908	G-1413	Milk	Convicted.
July 21, 1908	G-1414	Milk	Convicted, fine paid.
July 21, 1908	H-682	Milk	Convicted, fine paid.
July 22, 1908	A-9255	Milk	Pending.
July 22, 1908	G-1415	Milk	Paid penalty.
July 22, 1908	G-1419	Milk	Convicted, fine paid.
July 23, 1908	H-719	Milk	Paid penalty.
July 23, 1908	H-726	Milk	Paid penalty.
July 24, 1908	H-733	Milk	Paid penalty.
July 24, 1908	H-739	Skimmed milk.	Convicted.
July 25, 1908	G-1448	Milk	Convicted.
July 25, 1908	H-750	Milk	Paid penalty.
July 29, 1908	H-765	Milk	Paid penalty.
July 30, 1908	A-9316	Milk	Paid penalty.
July 31, 1908	A-9333	Milk	Paid penalty.
July 31, 1908	A-9335	Milk	Paid penalty.
July 31, 1908	A-9336	Milk	Paid penalty.
July 31, 1908	A-9343	Milk	Convicted, appealed.
Aug. 11, 1908	H-1016	Skimmed milk.	Pending.
Aug. 12, 1908	G-1577	Milk	Pending.
Aug. 13, 1908	H-1069	Milk	Convicted, fine paid.
Aug. 15, 1908	H-1090	Milk	Convicted, fine paid.
Aug. 15, 1908	G-1620	Milk	Convicted, fine paid.
Aug. 18, 1908	A-9474	Milk	Pending.
Aug. 18, 1908	A-9466	Milk	Paid penalty.
Aug. 18, 1908	A-9455	Milk	Pending.
Aug. 18, 1908	G-1626	Milk	Convicted, fine paid.
Aug. 18, 1908	G-1632	Milk	Paid penalty.
Aug. 20, 1908	A-9481	Milk	Settled.
Aug. 20, 1908	A-9500	Milk	Pending.

## REPORT OF THE BOARD OF HEALTH.

TABLE 49.—SHOWING THE NUMBER OF SUITS INSTITUTED FOR VIOLATION OF THE ACT TO PREVENT THE SALE OF ADULTERATED FOOD AND DRUGS, TOGETHER WITH THE DATE OF ANALYSIS OF SAMPLE AND THE DISPOSITION OF THE CASE, FOR THE YEAR ENDING OCTOBER 31, 1908—(Continued).

Date of analysis.	Number of sample.	Name of article.	Termination of each case.
Aug. 20, 1908	A-9503	Milk	Paid penalty.
Aug. 22, 1908	H-1164	Milk	Paid penalty.
Aug. 27, 1908	G-1675	Milk	Convicted, fine paid.
Aug. 27, 1908	G-1676	Milk	Duplicate of G-1675.
Aug. 27, 1908	A-9517	Milk	Convicted, fine paid.
Aug. 28, 1908	A-9526	Milk	Pending.
Aug. 29, 1908	H-1209	Milk	Paid penalty.
Sept. 2, 1908	G-1711	Cream	Convicted.
Sept. 2, 1908	H-1258	Milk	Paid penalty.
Sept. 2, 1908	H-1232	Ground Cloves.	Convicted.
Sept. 8, 1908	A-9540	Milk	Paid penalty.
Sept. 9, 1908	A-9551	Milk	Convicted, fine paid.
Sept. 9, 1908	A-9554	Milk	Paid penalty.
Sept. 9, 1908	H-1300	Cider vinegar.	Convicted.
Sept. 9, 1908	A-9560	Milk	Pending.
Sept. 15, 1908	A-9561	Milk	Convicted.
Sept. 15, 1908	A-9565	Milk	Settled.
Sept. 15, 1908	A-9566	Milk	Pending.
Sept. 15, 1908	A-9567	Milk	Pending.
Sept. 17, 1908	A-9587	Milk	Pending.
Sept. 17, 1908	A-9594	Milk	Pending.
Sept. 18, 1908	A-9599	Butter	Convicted, fine paid.
Sept. 29, 1908	A-9611	Milk	Settled.
Sept. 29, 1908	A-9610	Milk	Convicted, fine paid.
Sept. 29, 1908	A-9616	Milk	Paid penalty.
Sept. 30, 1908	H-1397	Milk	Paid penalty.
Oct. 1, 1908	A-9631	Milk	Paid penalty.
Oct. 1, 1908	A-9638	Milk	Pending.
Oct. 1, 1908	A-9644	Milk	Paid penalty.
Oct. 1, 1908	A-9647	Milk	Paid penalty.
Oct. 2, 1908	G-1794	Milk	Pending.
Oct. 10, 1908	G-1847	Butter	Pending.
Oct. 10, 1908	G-1848	Butter	Pending.
Oct. 10, 1908	G-1849	Butter	Pending.
Oct. 10, 1908	G-1851	Butter	Pending.
Oct. 10, 1908	G-1854	Butter	Pending.
Oct. 13, 1908	G-1881	Butter	Pending.
Oct. 13, 1908	G-1871	Black pepper	Pending.
Oct. 13, 1908	G-1873	Mustard	Pending.
Oct. 13, 1908	G-1874	White pepper	Pending.
Oct. 13, 1908	G-1875	Cinnamon.	Pending.
Oct. 13, 1908	G-1876	Cayenne pepper	Pending.
Oct. 14, 1908	C-1033	Milk	Pending.
Oct. 14, 1908	C-1061	Milk	Paid penalty.
Oct. 15, 1908	G-1890	Butter	Pending.
Oct. 15, 1908	G-1891	Butter	Pending.
Oct. 15, 1908	G-1892	Butter	Pending.
Oct. 15, 1908	G-1893	Butter	Pending.
Oct. 15, 1908	G-1894	Butter	Pending.
Oct. 16, 1908	G-1900	Butter	Pending.
Oct. 16, 1908	G-1901	Butter	Pending.



TABLE 49—SHOWING THE NUMBER OF SUITS INSTITUTED FOR VIOLATION OF THE ACT TO PREVENT THE SALE OF ADULTERATED FOOD AND DRUGS, TOGETHER WITH THE DATE OF ANALYSIS OF SAMPLE AND THE DISPOSITION OF THE CASE, FOR THE YEAR ENDING OCTOBER 31, 1908—(Continued).

Date of analysis.	Number of sample.	Name of article.	Termination of each case.
Oct. 16, 1908.....	G-1903.....	Butter.....	Pending.
Oct. 24, 1908.....	G-1986.....	Butter.....	Pending.
Oct. 24, 1908.....	G-1988.....	Butter.....	Pending.
Oct. 24, 1908.....	G-1991.....	Butter.....	Pending.
Oct. 31, 1908.....	G-2507.....	Butter.....	Pending.
Oct. 31, 1908.....	G-2509.....	Butter.....	Pending.
Oct. 31, 1908.....	G-2510.....	Butter.....	Pending.

**DIVISION OF CREAMERIES AND DAIRIES.**—This new division of the State health department, which was established at the time of the reorganization of the board, May 26, 1908, is under the direction of George W. McGuire who is chief of the division. A detailed statement of the work done in this division will be found later on in this report. There are in all 138 creameries in the State. All creamery licenses expired on July 5, 1908, and it was determined by the State Board of Health that licenses should be renewed or granted to those whose creameries were found by inspection to be in good sanitary condition, and that licenses should be withheld from all others until they should bring the condition of their places up to a proper sanitary standard. This required rigid inspection of the creameries throughout the State, which, owing to the limited number of inspectors in this division, has not been pursued as rapidly as was desired. All, however, have been inspected and of the 138 creameries 90 having met the requirements of the law, have been licensed, while 48 remain unlicensed. Of the latter all have been notified, and nearly all are rapidly putting their places in good sanitary condition. If on reinspection this is found to have been done they will receive their licenses, otherwise the cases of those who refuse to comply with the law will be placed in the hands of the Attorney-General for prosecution, and they will be prohibited from continuing their creamery business. The penalty for conducting such creameries without license and contrary to the law is \$200.00. Eight new creameries have been licensed during the year, and three creameries have had their licenses revoked because the owners or lessees have failed to meet the

requirements of the law, while seven creameries have been altogether abandoned.

The system of rating creameries by score cards was adopted by the State Board of Health upon its reorganization this year, and has already proved of great value in this division. By this system the chief of the division through the inspectors is able to accurately report to the board the exact sanitary conditions of the creameries of the State. All creameries are required to score seventy-five per cent. or more of a perfect standard, otherwise licenses are refused. A copy of the creamery score card adopted by the board will be found in the report of the chief of this division. It was made to harmonize with the score cards used in New York City. This seemed expedient as much of the milk in New Jersey is delivered in New York, and some milk from New York State is shipped into New Jersey. Wherever it is found that the creameries are below the required standard, and as a result the milk or cream is collected, stored, transported or distributed under unclean or unwholesome conditions, the State Board notifies the local board of these facts, and they in turn exclude the milk and cream from their district until the creameries are put in proper sanitary condition, and such conditions and improvements are approved by the State Board of Health.

**DAIRIES.**—Milk from approximately ten thousand dairies is shipped to the people of the State of New Jersey. For the inspectors of the division of creameries and dairies to make a personal investigation of each of these dairy premises would be a physical impossibility. It is the policy of the State Board of Health, therefore, to cooperate with the local boards of health in trying to do this work. Local boards are urged to adopt ordinances requiring high sanitary conditions of milk delivered to or sold in their locality, and requiring milk dealers to secure licenses or permits to sell or deliver such milk. Local board of health are urged to keep a list of the dealers selling milk in their district, together with lists showing sources from which each dealer secures his supply and the customers to whom he sells the milk. It is the province of the State Board of Health to assist the local boards throughout the State in carrying out this work. Accordingly the State Board is making investigations of dairy premises,

as far as possible, with their inspectors. Wherever reports show that unsanitary conditions exist letters are sent by this board to the dairymen calling their attention to the facts. Copies of these letters are sent to the local boards of health where the dairies are situated or where the milk is sold. If after reinspection it is found that the dairies are still in unsanitary condition, the State Board notifies the local board of the facts, and advises that the sale of the milk be prohibited. This system, with the cooperation of the local boards of health, has been found to work with a marked degree of satisfaction. In the inspection of dairies, as in creamery inspections, the system of using the score card is found to be of great value in establishing a high and uniform sanitary standard for milk. A copy of the score card and record of dairy inspection adopted by the State Board of Health will be found in the report of the chief of the division of creameries and dairies.

**OLEOMARGARINE.**—The chief of the division of creameries and dairies has also acted during the year as chief inspector of the Board of Health, and as such has kept a record of the fines collected by the Attorney-General in all suits brought by the board under the Oleomargarine Act. Fifty-eight such suits have been brought during the year with the collection of fines and costs amounting to \$3,736.84. A general list of such suits with the names of those prosecuted, and the amount of the fines and costs, is given in the report of the work of the division of creameries and dairies which is forwarded herewith.

**MILK.**—The first attempt to improve the quality of milk sold in this State began with the inspection service under the provisions of the law of 1881. This was conducted with a view of preventing the removal of cream and the addition of water. It was not until 1901, that a law was enacted placing the sale of milk under the supervision and control of the State Board of Health. Since that time an active campaign has been conducted against the sale of impure milk through the State Laboratory of Hygiene where analysis of milk have been made, and removal of cream, addition of water and adulteration by use of preservatives has been detected, and as a result the State Board of Health has brought many suits against and collected penalties from the offending parties.

This method of investigation and prosecution, together with the special attention, given through the inspectors to creameries and dairy premises, where collecting, handling and cooling milk, and purity of water, is carefully looked after, has been pursued during the year with unusual vigor, and with a fair degree of satisfactory results. The circular "clean milk" has been distributed freely to both dealers and producers of milk who have been guided by its information and advice into raising the sanitary standard of milk produced and sold by them.

**PASTEURIZATION OF MILK.**—It is now conceded by eminent medical men generally that real pasteurization kills all noxious germs, preserving the nutritious value of milk intact and that the process is without any deleterious effect. It is important, however, to bear in mind what true pasteurization means, and not to be deceived by the process of commercial pasteurization, so much in vogue at the present time, which consists chiefly in heating the milk from forty to sixty seconds, and then suddenly cooling the same which simply increases the preserving qualities of the milk, but destroys no noxious germs nor bacteria, and it is claimed by good authority that this short method of heating actually produces deleterious chemical changes in the milk. Many people are deceived into the belief that they are getting pasteurized milk of safe quality, when, as a matter of fact they are buying not pasteurized milk at all, but milk that has been treated by a process of heating which simply preserves the milk and keeps it from souring, a process that does more harm than good as it enables dealers to preserve bad milk, and to market the same when it is stale and unfit for use. This process which is in use in some localities of New Jersey is pernicious and should be prohibited by law. Real pasteurization on the other hand should be commended. The method advised by eminent medical men is to expose the milk to 160 degrees F. for at least twenty-five minutes, and then to rapidly cool the same to 40 degrees. This process kills all noxious bacteria and preserves the nutritious quality of the milk, a result totally unlike that of commercial pasteurization.

**DIVISION OF SEWERAGE AND WATER SUPPLIES.**—This division was established as a result of the act of the legislature terminating the terms of office of the former State Sewerage

Commission, which was created for the purpose of preventing the pollution of waters of the State, and transferring all the duties and obligations of the said Commission to the State Board of Health. All work, such as was formerly conducted under the supervision of the State Sewerage Commission, together with the inspection of public water supplies formerly performed by the State Board of Health, has been transferred to this division of the health department. Mr. Harry M. Herbert, member of the American Society of Civil Engineers, and member of the State Board of Health, is chief of the division. He has compiled a detailed statement of this branch of the work, a copy of which is included later on in this report and forwarded herewith. During the year ending October 31, 1908, there have been examined and analyzed in this line of work 1,047 samples of water, of which 471 were samples of public supplies; 240 of private supplies; 195 of water on dairy premises; 78 of creamery water supplies; 46 of water supplies of State institutions; 7 of spring waters and 10 of a miscellaneous character. There have also been 71 chemical analysis and 51 bacterial analysis made of sewages and effluents. There have been 36 inspections made of public sewage disposal plants; 2 of private sewage disposal plants; 14 sewerage systems have been inspected and 10 other miscellaneous inspections of pollutions have been made. In the inspection of the pollution of the various waters of the State 632 miles of riparian frontage have been covered; 808 minor pollutions have been reported; 698 notices to cease polluting the waters of the State have been served; 1 preliminary injunction has been granted against an individual polluter and 12 cases have recently been placed in the hands of the Attorney-General for suit. Suits have been commenced by the State Board of Health against five municipalities, viz., Phillipsburg, Wood Lynne, Seabright, Jersey City and West Hoboken, to compel them to cease polluting the waters of the State. Action in the suit against the town of Roebling for polluting the waters of the Delaware river has been suspended pending the installation of a purification plant. Plans and specifications for 37 sewerage systems, extensions and purification plants have been approved by the State Board. Plans and specifications for 8 sewerage systems and extensions were returned for revision and amendments, and one plan is now

being held for consideration, thus making a total of 46 plans and specifications acted upon by the board during the fiscal year. It will be the policy of the State Board of Health to continue this crusade against all who are polluting the waters of the State whether potable or otherwise. All boroughs, towns, municipalities and seaside resorts situated on the Atlantic Ocean, where summer bathing is allowed, are being notified, and in most instances are cheerfully agreeing to cease polluting the waters of the same. If promises and agreements are kept, many purification plants will be installed in these places before the coming summer. The same rigid course of inspection and notification to cease pollution is being pursued throughout the inland portion of the State along the various rivers and streams. The great majority of these offenders are agreeing to cease polluting. Wherever they fail or refuse to do so the cases will be placed in the hands of the Attorney-General for prosecution.

**BUREAU OF VITAL STATISTICS.**—The State Bureau of Vital Statistics of New Jersey is under the direction of Mr. David S. South, State Registrar, who has had twenty years' experience in the work. There is no question about New Jersey being in the front rank of registration states. In the report of the Census Office at Washington, D. C.—The Mortality Statistics for 1906—shows that in 1895 the registration states were limited to New England, New York, New Jersey and Delaware. The same report shows that in 1907, Pennsylvania, Maryland, Michigan, Indiana, South Dakota, Colorado and California were added to the list. Representatives of the United States Census Office in examining the records of this department in 1891 declared at that time that only one state in the Union surpassed New Jersey in the accuracy and uniformity of reports of births, marriages and deaths. Since then, however, other states have become active in this work, and in order to keep New Jersey in the list of leading registration states, a revision of the law in reference to vital statistics is necessary. The State Registrar has repeatedly called attention to this fact, and in a paper read before the New Jersey State Sanitary Association at Lakewood in 1906, he drew attention to the fact that only about 65 per cent. of the births that take place in this State are reported, while 95 per cent. of the marriages and 99 per cent. of the deaths are filed

according to law. The more important features to be incorporated in a revised law would be as follows:

Allow only five days in which to file a report of birth.

Allow only five days in which to file a report of marriage.

Require marriage licenses for all persons contemplating marriage.

No fees to local officers for delinquent certificates.

Larger penalties and prosecution for all persons violating the registration law.

Aside from the hygienic value of the mortality statistics, many applications are daily received at this office for certified copies of records for various uses, such as proof for pension, settlement of estates, enforcement of laws relating to education and child labor, etc., etc. It is, therefore, desirable that all persons required to file certificates of births, marriages and deaths, should comply with the law.

The records in the Bureau of Vital Statistics date back to 1848, and from that time until 1878 transcripts of births, marriages and deaths made by local officers, are on file. Subsequent to 1878 the original certificates made by physicians and clergymen are filed, and although these records contain a veritable mine of statistical information, only such mortality tables as our limited clerical force would permit, have been compiled.

It is hoped that the legislature of New Jersey will see the importance of this branch of health work and appropriate sufficient funds to place New Jersey still higher in the list of registration states.

In referring to the importance of vital statistics and their relation to the public health, the following pertinent statement is found in Park's Hygiene, which is worthy of consideration, in connection with the work of this division:

"An accurate basis of facts, derived from a sufficient amount of experience and tabulated with the proper precision, lies at the very foundation of hygiene, as of all exact sciences, probably no single cause has contributed more to the attention now paid to questions of public health than the careful collection of the statistics of births and deaths and of the causes of death. These collections of figures and facts are usually spoken of as vital or health statistics, because they are so intimately associated with the various problems relating to the health or chances of life which the community enjoys."

**CEMETERIES.**—Under the provisions of chapter 152 of the laws of 1906 applications may be made to the State Board of Health for final decisions in regard to the establishment or enlargement of cemeteries in the State. The law reads as follows:

1. It shall not be lawful to locate any new cemetery or burying-ground, or to enlarge any cemetery or burying ground in this State without the consent and approval of the municipal authorities and Board of Health of the city, township, town or borough in which it is proposed to locate or enlarge said cemetery or burying-ground upon application in writing for that purpose made; and in case of the refusal of the municipal authorities and local board of health to grant the same, then the person or persons making application as aforesaid may, within thirty days after such refusal, apply to the State Board of Health, which shall have power to reverse the decision of the local authorities and grant the application; and in case the local authorities grant the permit to locate or enlarge any cemetery or burying-ground and the same shall be deemed objectionable by the inhabitants of the city, town, township or borough where it is proposed to locate, then ten citizen freeholders thereof may, within thirty days after the granting of such permit, apply to the State Board of Health, which shall have power to reverse the decision of the local authorities and prohibit such location or enlargement; and it is hereby specially provided, that all persons making application as aforesaid for the location or enlargement of any cemetery shall accompany the same with a descriptive map of the premises they propose to occupy, a copy of which shall be also filed in the office of the State Board of Health.

2. All acts and parts of acts inconsistent with this act are hereby repealed, and this act shall take effect immediately.

On March 10, 1908, application was made to the State Board of Health, by the Roman Catholic Diocese of Newark, for reversal of the decision of the common council and board of health of the Borough of North Arlington, Bergen County, in refusing to grant permission to said Diocese for the location of a cemetery in said borough. A committee of two members of the board was appointed to personally visit the proposed cemetery grounds and report to the board. A hearing in this case was given by the State Board of Health on April 13, 1908, and the following resolution was adopted:

"Whereas, in the matter of the application of the Roman Catholic Diocese of Newark for permission to locate a cemetery within the Borough of North Arlington, in the County of Bergen, State of New Jersey, it appearing to the Board of Health of the State of New Jersey that an application in writing was made by the Roman Catholic Diocese of Newark to the Mayor and Common Council of the Borough of North Arlington and to the local Board of Health of said borough, on March 3, 1908, for the consent and approval of those bodies to the location of a cemetery containing one hundred and

twenty-five acres within the boundaries of the said Borough of North Arlington, and that the application was refused on the said third day of March 1908, by the Mayor and Common Council of the borough, and also by the local Board of Health thereof, and the Roman Catholic Diocese of Newark, having within thirty days after such refusal, to wit, on the tenth day of March, 1908, applied to the State Board of Health to reverse the decision of the aforesaid local authorities of the Borough of North Arlington, and to grant the application of the Roman Catholic Diocese of Newark, and the State Board of Health having fixed this day at two o'clock in the afternoon as the time, and the New Jersey Capitol Building as the place for the hearing of said application, and having caused due notice to be given to the petitioner, the Roman Catholic Diocese of Newark, and also to the Mayor and Common Council of the Borough of North Arlington, and to the local Board of Health of said borough, that at this time and place a hearing would be had upon said application, and the interested parties having appeared and argued the matter, and this board having duly considered the application and the arguments and all the facts in connection with the said application, and being of the opinion that the decision of the municipal authorities of the Borough of North Arlington ought to be reversed and the application granted, therefore be it

Resolved, that upon this thirteenth day of April, in the year 1908, that the aforesaid decisions of the Mayor and Common Council of the Borough of North Arlington, and the Local Board of Health of the Borough of North Arlington, be and the same are hereby reversed, and that the application of the Roman Catholic Diocese of Newark be and the same hereby is granted. The attorney for the Borough of North Arlington then secured a writ of certiorari from the New Jersey Supreme Court to review the proceedings in this case. The taking of testimony in said case was later taken up and proceeded until November 5, 1908, when, an agreement having been reached between the Roman Catholic Diocese of Newark and the authorities of the Borough of North Arlington, application was again made to the Common Council and Board of Health of North Arlington, by said Diocese, for permission to locate a cemetery in said borough and consent was then given by the authorities of the borough."

On June 2, 1908, application was made to the State Board of Health, by the Greenwood Cemetery Association, of Millville, for reversal of the decision of the Board of Health of Millville in refusing to grant permission to said Association for the establishment of a cemetery in said city. In this case consent had been given by the Common Council but refused by the Board of Health of the city. On June 13, 1908, a hearing in this case was given by the State Board of Health to interested parties, and the board adopted a resolution similar to the one in the North Arlington case above mentioned reversing the decision of the local Board of Health of Millville and granting permission for the location of the cemetery, the committee appointed by the board to inspect the site of the proposed cemetery having reported in favor of the establishment of the cemetery.

An application was made to the State Board of Health, December 31, 1907, by an attorney representing ten citizen freeholders of the Borough of Fairview, Bergen County, for reversal of the decision of the Common Council and Board of Health of said borough in granting permission to the Fairview Heights Cemetery Company for the establishment of a cemetery in said borough. As the consent of the local authorities in this case was given by resolution and not by ordinance, the attorney for citizens objecting to the location of the cemetery, instituted proceedings before the Supreme Court, and the action of the authorities of the Borough of Fairview was set aside by said Court as being invalid. In accordance with an agreement between the attorney for the Cemetery Company and the attorney representing the petitioners, said agreement being made in the office of this board, the case was not taken up by the State Board of Health until a decision had been rendered by the Supreme Court. After the rendering of the decision of said Court the Cemetery Company again made application to the authorities of Fairview for the establishment of a cemetery, and permission for the location of the same was then granted by ordinance. On August 29, 1908, a second application was received by the State Board of Health, from the attorney representing citizens objecting to the proposed cemetery, for reversal of the decision of the Common Council and Board of Health of Fairview in granting permission for the establishment of a cemetery by the Fairview

Heights Cemetery Company. A hearing in this case was given by the State Board of Health on October 27, 1908, but no decision has yet been reached by the board in the case as the report of the committee appointed to inspect the site of the proposed cemetery has not yet been made.

**SLAUGHTER HOUSES.**—The inspection and investigation of slaughter houses by the State Board of Health as it has been conducted in the past has not been entirely satisfactory because of lack of adequate power of the board to prosecute the offending parties. When slaughter houses have been found to be conducted in an uncleanly or filthy manner, or so as to create a nuisance, it has been the custom of the State Board of Health, under the law, to notify the local Board of Health of that locality of the existing unsanitary conditions, and to request that they proceed to remedy the trouble in such a way as might seem to them expedient, and in accordance with their local health ordinances. This method, while successful in some instances, has on the whole proved unsatisfactory. There should be established in this State several large well-regulated abattoirs, with thoroughly equipped rendering plants, slaughtering rooms, cooling rooms, cutting rooms, store rooms, etc., etc. Establishments conducted in a cleanly and sanitary manner from the time the animals enter them until all the various meat products have been properly treated and are ready for use, and all offal has been disposed of in a modern, sanitary way. Several such establishments located in the larger cities of the State, and operated under municipal control, would give a large supply of clean, wholesome meat to the people of New Jersey, and would render unnecessary any further use of the unsanitary rural slaughter houses. Until such public establishments shall be built and operated it seems expedient that the State Board of Health should have power to supervise, regulate and control the slaughtering of animals under the license or permit system, and that licenses be granted only to those who plan to conduct their business in a thoroughly sanitary manner, without the possibility of creating any nuisance.

**INFECTIOUS DISEASES OF ANIMALS.**—In referring to the history of anthrax in this State, it is interesting to note that no cases occurred in New Jersey during the year of 1907, and that there have been other years when the State has been

free from the disease. During the present year, ending October 31, 1908, however, while there has been no epidemic of the disease, there have been sporadic cases of anthrax in Cumberland, Gloucester, Salem and Sussex Counties, showing that this affection has a tendency to recur, and that an epidemic is possible at any time. It is believed that a persistent method of vaccination with anthrax vaccine, of cattle in infected districts in spring and early summer for a period of years might eradicate the disease entirely. This course has been advised by the board with some degree of success. The expense, which must be borne by the owner, is trivial when compared with the loss which may be sustained if vaccination is not made use of.

While no outbreak of blackleg has been previously reported in this State it is found on investigation that in Sussex County, for a term of ten or fifteen years, this disease has been destroying young cattle among the farmers, but it was mistaken for forage poisoning. It is estimated that possibly 400 head or more of cattle have died of this affection in that locality during this period. In one instance a farmer lost 48 head, leaving only 2 of his herd of cattle living. During this year 20 cases of this disease were discovered among the cattle in Sussex County, and the attention of Whitfield Gray, D. V. S., of Newton, New Jersey, was called to them. He concluded they were cases of blackleg, and he confirmed his diagnosis by sending specimens of the animals to the State Laboratory of Hygiene for examination. With the positive diagnosis established, the method of vaccination was pursued with effective results, and if persisted in for a period of years it is believed the disease will be completely driven out.

During the year ending October 31, 1908, 88 cases of glanders have occurred. Of the total number 57 cases were reported in Essex County. The cases were distributed by counties as follows: Bergen, 5; Essex, 57; Gloucester, 1; Hudson, 11; Hunterdon 1; Mercer 4; Monmouth 1; Morris, 3; Passaic, 1; Somerset, 1 and Union 3. Forty-six cases occurred in Newark.

**CONFERENCE OF STATE AND LOCAL BOARDS OF HEALTH.**—Under the act of 1906 two annual conferences of the State and local Boards of Health have been held. The object of these

meetings is to bring the members of these boards and the local sanitary inspectors together for mutual discussions and instruction on the best methods of local sanitary inspection service in municipalities and townships, and with an idea of securing throughout the State official uniformity in all work pertaining to public health. This year, however, owing to the late date of appointment and organization of the State Board of Health, and the increased duties transferred to it from the former State Sewerage Commission, it seemed expedient to omit this conference, and instead the members of the State and local boards are invited to attend the annual meeting of the New Jersey Sanitary Association, to be held in Lakewood. Another year these annual conferences should be resumed as in no other way can a uniform standard of sanitary administration throughout the State be so greatly elevated and strengthened.

**THE MOSQUITO WORK IN THE STATE.**—Prof. John B. Smith, State Entomologist at the State Agricultural Experiment Station, New Brunswick, who is more familiar with this work than any other man in this State writes to us as follows:

“The position of mosquitoes as a danger to health and as a nuisance generally, has become so definitely fixed by recent investigations, that sanitary authorities now consider the matter of control or even practical extermination as among the more important of their problems. The National Government has through its Marine Hospital Service demonstrated not only that control is feasible; but that it is practical and effective under the distinctly adverse conditions of tropical countries with carriers of a variety of pernicious fevers to deal with.

Several State Boards of Health have conducted investigations and made recommendations and in one State a Mosquito Commission has been appointed.

New Jersey was the first to move in the practical investigation of the matter of State control, and the first to make appropriations for work looking to the elimination of the pest in the swampy areas from which they spread for many miles into the territory round about. The most important step, upon which all the subsequent work in the State is based, was the so-called ‘Duffield Amendment’ to the general Board of Health law, approved March 28, 1904, which enumerated

‘water in which mosquito larvæ breed’ among the nuisances over which the local boards of health have jurisdiction and which they were given power to abate. The importance of this law has not been generally recognized, but as a matter of fact it makes it quite possible to use all the great powers of the health authorities of the State in the elimination of the mosquito pest. In some few municipalities the powers of this law have been effectively used; each year increases the number of those taking the matter practically in hand. So far as local conditions are concerned, every community has its problem in its own control. To this legislation the State has added Chapter 134 of the Laws of 1906, which gives local authorities the right to call upon the State Agricultural Experiment Station for assistance in locating breeding places and, in certain contingencies, provides for State aid.

The law just cited also makes provision for draining the salt marsh areas along the coast line, from which the great mass of migratory forms extend inland for many miles and floods the shore resorts and the cities within thirty miles of the coast line. Under this law over 4,000,000—four million feet of ditching has been already completed, and the salt marsh territory from Jersey City to Barnegat Bay has been drained of its surface water. All this work has been done through the local boards of health; but their cooperation has not been in all cases either prompt or hearty, and while they have abundant power to protect and maintain the work already done by the State, it is decidedly questionable whether the majority of them can be relied upon to do it. There should be authority in the State Board of Health to compel the local boards to act, and in default of prompt action to intervene; otherwise there is danger that the benefits to be derived from the work may be lost by neglect or by willful interference with the drainage system established.”

**STATE SANATORIA FOR ADVANCED CASES OF TUBERCULOSIS.**—During the past eighteen years the mortality from tuberculosis in the State of New Jersey has gradually decreased until the number of deaths from this terrible scourge during the year 1907 per 10,000 population was only 16.67, while in 1882 the death-rate was 29.20 per 10,000 population, and in 1887 it was 27.20 per 10,000 population. This marked and steady diminution of mortality from consumption has been due

largely to radically improved hygienic methods, both of a private and public nature. People generally have become familiar not only with the best methods of treatment for those suffering with the disease, but better still they have learned how to avoid or prevent the spread of the infection. They have found marked beneficial results from an abundance of fresh air, sunlight, pure water, sanitary plumbing, perfect ventilation of living and sleeping rooms, abundance of outdoor life, etc., etc. Notwithstanding the greatly reduced mortality of this scourge in this State the percentage of deaths caused by it is large. No pains or expense should be spared in trying to reduce the mortality to the very lowest point possible, and in making those who are hopelessly afflicted with the disease as comfortable as possible, at the same time, preventing the spread of the infection to others. The tendency of the time is to devote all attention and energy to the treatment of those who are in the incipient stages of this disease, while those who are afflicted with it in the more advanced stages suffer for lack of proper treatment, if indeed they receive any treatment at all. Thus the State of New Jersey has its tuberculosis sanatorium at Glen Gardner where are received only those who are in the incipient stages of the disease, while to those suffering in the advanced stages of the dread malady the State must turn a deaf ear for lack of a place in which to receive or care for them. This is radically wrong. While it is commendable that the State should endeavor to save the lives of the incipient, curable cases—indeed, it should do so at any cost—it is equally incumbent upon the State that she should look after and care for the incurables, those beyond the hope of relief. In fact, by this very method of isolation of the latter class can the infection to others be reduced, possibly more than in any other way. The legislature at the coming session should make ample appropriation for the construction of a large State sanatorium, or perhaps better a number of small sanatoria in some suitable locality, with high altitude and salubrious climate, where those and only those in the advanced stages of tuberculosis in the State could be received and cared for, where they would be given the most efficient, up-to-date, scientific methods of treatment, and where at the same time, they could derive all the benefits of a dry and delightful atmosphere. It is hoped that a bill may be prepared

with this specific object in view and be passed by the legislature during the coming winter. The object is a worthy one, which should commend itself not only to every member of the legislature, but to every thoughtful citizen of the State of New Jersey.

Very respectfully,

BRUCE S. KEATOR,  
*Secretary.*



# LIST OF SANITARY DISTRICTS

With Names and Addresses of Officers and Members.

## CITIES.

**Asbury Park, Monmouth County;** population, 4,526. Members and Officers—Theodore H. Beringer, President; David W. Sexton, George F. Wilbur, M.D., Asher S. Burton, Harry C. Millar, Joseph H. Bryan, M.D., George Turner, B. H. Obert, Health Officer, Secretary and Registrar; Thomas J. Duffield, Harry R. Ingalls and Clarence A. Lamont, Inspectors; Samuel A. Patterson, Attorney.

**Atlantic City, Atlantic County;** population, 37,593. Members and Officers—Elwood S. Johnson, President; John J. Mahoney, C. S. Thompson, William S. Cuthbert, William B. Dill, W. S. Laumaster; Alfred W. Bailey, M.D., Secretary; Alfred T. Glenn, Registrar; Harry C. Beck, Health Inspector; Wm. F. Brode, Plumbing Inspector; Thos. W. Clement, Food Inspector; Benj. H. Sooy, Henry Schneider and Jos. R. Bartlett, Assistant Health Inspectors.

**Bayonne, Hudson County;** population, 42,262. Members and Officers—Pierre P. Garven, President; Garrett L. Post, E. S. Benson, J. Lisk, James Knight, George T. Greenly, Herman Klein; James D. Boyd, Clerk; C. J. Rooney, Registrar; Dr. J. T. Connelly, Health Officer; H. S. Winterhalter and Fred Wilson, Inspectors.

**\*Belvidere, Warren County;** population, 1,869. Members and Officers—F. P. Lefferts, M.D., Secretary.

**Beverly, Burlington County;** population, 2,258. Members and Officers—R. P. Haines, President; Berten Kiple, H. W. Abbott, Geo. A. Smith, B. F. Soby; Chas. J. Parsons, Clerk and Registrar; Geo. T. Tracy, M.D., Inspector.

**Bordertown, Burlington County;** population, 4,073. Members and Officers—Samuel E. Burr, President; Samuel R. Magee, Jos. W. Higgins, David R. Brown, Edwin L. Thompson, Wm. M. Kester, Clerk; Wm. H. Shipps, Registrar; Amos P. Thorn, Inspector.

**Bridgeton, Cumberland County;** population, 13,624. Members and Officers—Oscar E. Kellum, President; Wm. H. Ballenger, Harry Rice; Amos P. Johnson, Clerk; Frank L. Hewitt, Registrar; Dr. Ellsmore Stites, Inspector.

**Burlington, Burlington County;** population, 8,038. Members and Officers—Dr. J. B. Cassidy, President; Franklin Carter, Neil Keeler, Geo. Shinn, William Farner, Thos. Mooney, Clerk; Dr. M. W. Newcomb, Health Officer.

**Camden, Camden County;** population, 32,912. Members and Officers—M. K. Mines, M.D., President; S. G. Bushey, M.D., Wm. I. Kelchmer, M. D., R. H. Gaskill, H. H. Davis, M.D., M. F. Middleton, M.D., E. W. Collins, Eugene B. Roberts, Clerk; Isaac V. Bradley, Registrar; John F. Leavitt, M.D., H. B. Francis, Jos. A. Starr, Wm. H. Iszard, M.D., and G. H. Robinson, Inspectors.

**Cape May, Cape May County;** population, 3,006. Members and Officers—A. L. Leach, M.D., President; Geo. L. Lovett, Robert S. Hand, Wm. R. Shepard; Wm. Porter, Clerk; V. M. D. Marcy, M.D., Inspector.

**Dover, Morris County;** population, 6,353. Members and Officers—D. S. Allen, President; Dr. A. W. Condict, R. F. Woodhull, P. H. Burrell; Dr. H. C. Hunter, Clerk and Registrar; John G. Taylor, Inspector.

**East Orange, Essex County;** population, 25,175. Members and Officers—Roger H. Butterworth, President; Frank B. Lane, M.D., Ralph H. Hunt, M.D.,

\*No report received.

H. L. de Nourie, Harvey Mott; F. W. Lockwood, M.D., Clerk; Lincoln E. Rowley, Registrar; Wm. T. Bowman, Inspector.

**Egg Harbor, Atlantic County;** population, 2,280. Members and Officers—August A. Breder, President; Henry G. Regensburg, Dr. J. U. Elmer, Henry Otto; Wm. Morgenweck, Jr., Clerk and Registrar.

**Elizabeth, Union County;** population, 60,509. Members and Officers—John W. Whelan, President; J. L. Bauer, L. R. Brown, M.D., J. S. Green, M.D., H. R. Livengood, M.D., S. T. Quinn, M.D., Edward W. Connell; John F. Kenah, Clerk and Registrar; L. J. Richards, P. J. Connell and Henry Toole, Inspectors.

**Englewood, Bergen County;** population, 7,922. Members and Officers—Floyd R. DuBois, President; William C. Tucker, Charles E. Weinmann, Alfred Hopkirk; Dr. F. C. Bradner, Secretary; Robert Jamieson, Registrar; Irving Middleton, Inspector.

**Gloucester City, Camden County;** population, 8,055. Members and Officers—Geo. W. Turner, President; Chas. E. Rang, John M. Kandle, J. Alonzo Beek, M.D., John Redfield, Oliver J. Stitser; Carlos B. Allen, Clerk; John J. Mannion, Registrar; D. W. Blake, Jr., Inspector.

**Hackensack, Bergen County;** population, 11,098. Members and Officers—E. K. Conrad, M.D., President; E. B. Walden, Chas. F. Stevens, Peter Hylan-der, John Klauer, John H. DeMott; J. G. Ackerson, Secretary; F. S. Hallett, Health Officer; Robert Ballagh, Inspector.

**Hoboken, Hudson County;** population, 65,468. Members and Officers—Richard H. Stuhmann, President; David Van Wyk, John F. O'Hara, William C. Kackemeester, John J. Rudolph, Joseph Tucker, Clerk and Registrar; W. T. Kudlich, Health Warden; J. Hostmann, Antonio Granelli, James A. Marnell, John Beronio and Thomas Normoyle, Inspectors.

**Jersey City, Hudson County;** population, 232,699. Members and Officers—John J. Broderick, M.D., President; C. E. Putnam, M.D., Henry E. Woelfe, M.D., Frederick E. Finn, M.D., Henry H. Brinkerhoff, M.D., Henry Mack, William Delaney, John Flesey, Wm. J. Murphy, George Hendrickson; James J. Hagan, Health Officer and Secretary; Jos. A. Carlin, Registrar; John Har-nett, Food and Drug Inspector; Hugh Parle, Edward Kelly and David En-twistle, Plumbing Inspectors; Edward Devitt and John Murphy, Sanitary Inspectors; John J. Magner, M.D., Supt. Bureau of Inspections; Edward J. Mulvaney, M.D., Supt. Bureau of Complaints; Joseph Craven, M.D., Supt. Bureau of Contagious Diseases.

**Lambertville, Hunterdon County;** population, 5,016. Members and Officers—Edward W. Closson, M.D., President; Albert D. Anderson, Wm. R. Bowne, Harry K. Kramer, George L. Romine, M.D., James Moonan; James H. Reynolds; Clerk and Registrar; John L. Coryell, Inspector.

**\*Long Branch, Monmouth County;** population, 12,183. Members and Officers—E. B. Blaisdell, Secretary and Registrar.

**Millville, Cumberland County;** population, 11,884. Members and Officers—Silas C. Smith, President; L. H. Hogate, George A. Thorpe, Wm. G. Cham-pion, J. W. Wade, M.D., L. H. Hogate, Clerk and Registrar; Frank Bulloch and John D. Brandriff, Inspectors.

**Montclair, Essex County;** population, 16,370. Members and Officers—Moses N. Baker, President; Richard P. Francis, M.D., Levi W. Halsey, M.D., Herbert M. Lloyd; John N. Holton, Secretary; Chester H. Wells, Health Officer and Registrar; J. G. Foose and J. L. Ebbels, Inspectors.

**Morristown, Morris County;** population, 12,146. Members and Officers—Isaac R. Pierson, President; John R. Burr, Lewis F. Sturgis, Dr. Francis H. Glazebrook, Dr. Clifford Mills, Secretary and Registrar; Robert S. Van Dyke and James Douglas, M.D., Inspectors.

**\*Newark, Essex County;** population, 283,289. Members and Officers—Jas. F. Connelly, Registrar.

**New Brunswick, Middlesex County;** population, 23,133. Members and Officers—F. B. Kilmer, President; Dr. A. L. Smith, Geo. B. Rule, Francis

\*No report received.

C. Van Dyck, Dr. E. S. Cronk; Benj. Gutmann, M.D., Secretary; James Morris-son, Registrar; W. H. Van Deussen and George Frisch, Inspectors.

**Orange, Essex County;** population, 26,101. Members and Officers—Dr. G. H. Richards, President; Dr. D. W. Poor, Ludlow Clark, John T. Davis, James Kane, L. M. Sanders, O. S. Williams; Selskar M. Gunn, Health Officer; Thomas F. Harris, Plumbing Inspector; Richard Savage, Sanitary Inspector.

**\*Passaic City, Passaic County;** population, 37,337. Members and Officers—Wm. B. Davidson, Clerk and Inspector.

**Paterson, Passaic County;** population, 111,529. Members and Officers—John R. Hurley, President; James F. Briody, M.D., John L. Leal, M.D., Wm. McKeon, Franklin Van Winkle; Jas. P. McNair, Clerk; Chas. S. Gall, Registrar; J. Alex. Browne, M.D., Health Inspector; Jas. Fitzpatrick, Wm. S. Green, M.D., W. H. Lowe and John R. Hurley, Inspectors.

**Perth Amboy, Middlesex County;** population, 25,895. Members and Officers—George F. Reynolds, President; Jos. B. Quick, Chas. D. Snedeker, Jacob Kreielsheimer, Victor W. Main, Math. Hansen, Ambrose P. Kennedy; Cort-landt E. Brewster, Clerk; Wilber La Roe, Registrar, John L. Lund, Inspector.

**Phillipsburg, Warren County;** population, 13,325. Members and Officers—Joseph Pfeiffer, President; P. F. Hagerty, Francis Coyne, Daniel Zeigler, Dr. Williston; Frank Knedler, Clerk and Registrar; Howard R. Carey, In-spector.

**Plainfield, Union County;** population, 18,468. Members and Officers—B. V. Hedges, M.D., President; F. W. Dunn, Chas. H. Dunham, Wm. C. Kinney; T. S. Davis, M.D., Secretary; Miss H. O. Mattison, Registrar; L. R. Thurlow, Health Officer; Wm. Addis and John O'Brien, Inspectors.

**Rahway, Union County;** population, 8,649. Members and Officers—Jos. G. Smith, President; W. E. Cladek, M.D., Wm. H. Randolph, W. J. Haliday, Moses Ritter; Chas. H. Lambert, Clerk and Registrar; Fred W. Sell, M.D., Health Officer; Fred J. Mix, Inspector.

**Salem, Salem County;** population, 6,443. Members and Officers—Warren T. Sparks, President; Chas. E. Markley, L. H. Hummel, M.D.; Clinton Bowen, Clerk and Registrar, D. L. Freas, Inspector.

**Summit, Union County;** population, 6,845. Members and Officers—Allan B. Wallace, President; Henry B. Twombly, Franklin D. Feale, James G. Owens, Dr. W. H. Lawrence, Jr.; Dr. J. E. Rowe, Health Officer and Registrar; T. J. Scott, N. M. Bullard and J. J. McGrath, Inspectors.

**Trenton, Mercer County;** population, 84,147. Members and Officers—Chas. P. Britton, M.D., President; Thomas S. Chambers, Francis B. Lee, R. R. Rogers, Sr., M.D., Howard N. Richards, Elmer Barwis, M.D.; Thos. B. Holmes, Clerk; Dr. A. S. Fell, Health Officer; Wm. C. Allen and Edw. L. Titus, Sanitary Inspectors; Geo. W. Feaster, Plumbing Inspector.

**Woodbury, Gloucester County;** population, 4,560. Members and Officers—Wm. T. Cooper, President; S. B. Burkett, H. B. Diverty, W. H. Duffield, A. W. Cattell, W. A. Fisher; Arthur Starr, Clerk; Joshua Dawson and T. D. Clark, Inspectors.

## BOROUGHES.

**\*Allendale, Bergen County;** population, 762. Members and Officers—Wal-lace E. Carver, President.

**Allenhurst, Monmouth County;** population, 247. Members and Officers—James M. Ralston, President. T. C. Cattrell, Ira E. Whyte, George D. Mor-row, A. M. Hyatt; G. B. Cade, Secretary and Registrar; J. G. Havens, Inspec-tor.

**\*Allentown, Monmouth County;** population, 653. Members and Officers—J. S. Robbins, Secretary.

**Alpine, Bergen County;** population, 448. Members and Officers—W. T.

\*No report received.

Opdyke, President; Douglas Green, Closter; L. H. Tavernier, Secretary and Registrar; J. H. Conklin, Inspector.

Andover, Sussex County; population, 427. Members and Officers—J. C. Clark, M.D., President; S. S. Wills; W. E. Willson, Secretary; S. H. Willson, Registrar.

\*Anglesea, Cape May County; population, 400. Members and Officers—Geo. W. Dougherty, Secretary.

Atlantic Highlands, Monmouth County; population, 1,480. Members and Officers—Edward M. Tucker, President; Edward Oakes, E. R. Tumen, E. A. Hartcorn, L. D. Morrison, John R. Snedeker, Inspector; Thomas J. Emery, Clerk and Registrar.

Audubon, Camden County; population, 325. Members and Officers—Frederick Wiechard, President; Wm. Yardley, Dr. E. Sieber; Howard Callingham, Clerk; Ed. Bernetter, Registrar; James Mackintosh, Inspector.

\*Avalon, Cape May County; population, 86. Members and Officers—Chas. B. Kates, Clerk and Registrar.

\*Avon, Monmouth County; population, 328. Members and Officers—H. M. Dolan, Clerk and Registrar.

\*Barnegat City, Ocean County; population, 78. Members and Officers—Alfred W. Brown, Borough Clerk.

\*Bay Head, Ocean County; population, 278. Members and Officers—Julius Foster, Assessor.

Beach Haven, Ocean County; population, 301. Members and Officers—John T. Fox, President; Thos. Cale, Thos. E. Gifford; W. F. Beer, Clerk; Thos. A. Gavin, Registrar and Inspector.

Belmar, Monmouth County; population, 1,089. Members and Officers—Dr. Harry E. Snow, President; Wm. M. Bergen, George G. Titus, Cyrus B. Honce, Frank P. Philbrick, Fred M. Davison, Chas. C. Wood; Chas. O. Hudson, Clerk and Registrar; William A. Robinson, Inspector.

Bergenfield, Bergen County; population, 1,095. Members and Officers—Levi L. Holmes, President; W. B. Van Saun, William B. May, Mervyn Pratt; John J. Huyler, Secretary and Registrar.

Bogota, Bergen County; population, 522. Members and Officers—John McNaughton, President; R. B. Lord, Henry Wehrumaker, Peter Bogart, Jr., A. B. Bogert; John F. Hill, Clerk; H. R. Ross, Registrar; Robt. Ballagh, Inspector, Hackensack.

Bound Brook, Somerset County; population, 3,389. Members and Officers—J. F. Robinson, M.D., President; C. R. P. Fisher, M.D., Geo. Stryker; W. S. Negus, Secretary; Chas. McNabb, Registrar and Inspector.

Bradley Beach, Monmouth County; population, 1,037. Members and Officers—A. W. Allen, President; W. Hallmeyer, G. Jones; C. F. Burney, Clerk and Registrar; George Bostick, Inspector.

Branchville, Sussex County; population, 591. Members and Officers—Morgan D. Hughes, Irving N. Roe, Warren Holton, John H. Quick; Marvin D. Hayward, Secretary.

\*Brigantine, Atlantic County; population, 95. Members and Officers—J. A. Price, Registrar.

\*Butler, Morris County; population, 2,188. Members and Officers—Dr. Samuel K. Owen, Secretary.

\*Caldwell, Essex County; population, 1,670. Members and Officers—Isaac E. Baldwin, Secretary.

\*Cape May Point, Cape May County. Members and Officers—Lafayette Miller, Registrar.

Carlstadt, Bergen County; population, 3,100. Members and Officers—Charles Lonz, E. F. Sickenberger, Otto Landwehr; Herman Foth, Secretary and Registrar; Frederick Taylor, Inspector, Rutherford.

Chatham, Morris County; population, 1,554. Members and Officers—Joseph E. Pollard, M.D., President; Walter V. Sayre, J. Thomas Scott, Henry A. Baker, M.D.; David H. Crawford, Clerk and Registrar; John J. McCormack, Inspector.

Chesilhurst, Camden County; population, 258. Members and Officers—

\*No report received.

James Breary, Mayor; John Graham, Harry Horton, Clarence Glatterer, Louis Salmon, Clarence High, Luther H. Wilson; John G. Bevan, Borough Clerk and Registrar.

Clayton, Gloucester County; population, 1,864. Members and Officers—C. F. Fisler, M.D., President, Registrar and Inspector; A. G. Silver, John W. Dooling, N. D. Brown, D. W. Moore, Jr.

Cliffside Park, Bergen County; population, 2,128. Members and Officers—Chas. S. Brady, President, Grantwood; D. P. Woods, Grantwood; O. R. McElwain, Cliffside; E. Hellstern, Cliffside; Chas. B. Hearn, Clerk, Grantwood; J. H. Raas, Registrar, Grantwood; Dr. Fred C. Robertson, Inspector, Jersey City.

Clinton, Hunterdon County; population, 830. Members and Officers—A. S. Leatherman, President; Wm. Knight; Geo. A. Hall, Clerk and Registrar; Wm. Carpenter, Inspector; James Mulligan, Inspector.

\*Closter, Bergen County; population, 1,272. Members and Officers—Alfred Anderson, Secretary and Registrar.

Collingswood, Camden County; population, 2,588. Members and Officers—Chas. Fletcher, President; B. F. Gardiner, John Smith, Wm. Dewees, Wm. H. Hambrecht, Walter Patterson; H. B. Earnest, Clerk and Registrar; Dr. E. S. Sheldon, C. R. Shinn, and Geo. W. Noakes, Inspectors.

Cresskill, Bergen County; population, 505. Members and Officers—C. A. Lewis, President; Paul O. E. Ruhl, Henry V. Westervelt; John Ferdon, Secretary; George Y. Allaire, Registrar; J. B. W. Lansing, M.D., Inspector, Tenafly.

\*Deal, Monmouth County; population, 164. Members and Officers—Frederick C. Weber, Clerk.

\*Delford, Bergen County; population, 841. Members and Officers—Geo. F. Moore, Secretary, Oradell.

Demarest, Bergen County; population, 480. Members and Officers—Matthew J. Bogert, President; Charles E. Hutchison, Albert Machold, George V. Morton; Edward J. Carr, Clerk and Registrar; Alfred W. Ward, M.D., Inspector, Closter.

Dumont, Bergen County; population, 913. Members and Officers—R. D. Van Buskirk, President; V. B. Demarest, P. E. Moore; E. Stanley Clarke, Clerk and Registrar; Dr. J. E. Pratt, Inspector.

\*Dunellen, Middlesex County; population, 1,517. Members and Officers—W. S. Frederick, Clerk.

\*East Newark, Hudson County; population, 2,828. Members and Officers—East Rutherford, Bergen County; population, 3,165. Members and Officers—George Sanders, President; W. E. Ogdin, Wm. T. Seeger, Frank Hollenbach, Oscar Fortenbach; M. F. Onderdonk, Secretary and Registrar; H. J. Harms, Inspector.

Edgewater, Bergen County; population, 1,392. Members and Officers—Geo. W. Allison, President; H. B. Kerry, John E. Mulligan; John R. Towle, Clerk and Registrar; Dr. S. T. Hubbard, Inspector.

Elmer, Salem County; population, 1,219. Members and Officers—Isaac Reeves, President; Chas. Morris, Dr. I. V. Conover, Joseph Lee; David P. Dare, Clerk.

\*Englewood Cliffs, Bergen County; population, 266. Members and Officers—John G. Ropes, Registrar, Fort Lee.

\*Englishtown, Monmouth County; population, 416. Members and Officers—E. T. Reid, Registrar.

Essex Fells, Essex County; population, 393. Members and Officers—Wm. M. d'Espard, President; W. F. Oakes; J. C. Sprigg, C. E. Leach; F. Byrnes Ivy, Clerk and Registrar; Benj. F. Kent, Inspector.

Etna, Bergen County; population, 681. Members and Officers—Adolph Manl, President; D. Wulf, C. Korby; Gustav Lucie, Clerk; Harry Angell, Registrar.

Fairview, Bergen County; population, 1,693. Members and Officers—Chas.

\*No report received.

Sedore, President; Geo. Freudenrich, John S. Tracy; C. M. Driggs, Clerk; Gustav Hillstrom, Registrar.

\*Fanwood, Union County; population, 445. Members and Officers—Burton P. Hall, Secretary.

Farmingdale, Monmouth County; population, 399. Members and Officers—Dr. Wm. R. Kinnmouth, President; Henry Matz, Levi W. Farry; Frank P. Van Note, Clerk and Registrar.

Fieldsboro, Burlington County; population, 451. Members and Officers—Samuel Church, President; Walter Griffith, William Erickson; William Leath-erbury, Clerk; Geo. W. Carman, Registrar; Robt. Bignall, Inspector.

\*Florham Park, Morris County; population, 803. Members and Officers—W. A. Hehn, Clerk, Chatham.

Folsom, Atlantic County; population, —. Members and Officers—Geo. W. Cowden, President; John C. Eby, Clerk.

Fort Lee, Bergen County; population, 3,433. Members and Officers—Jas. M. Sheehan, President; E. B. Opitz, Peter Cella, Ed. S. Cavanaugh, Gerome Sardi; Robt. H. Morrow, Clerk and Registrar, Coytesville; Max Wyler, M.D., Inspector.

Frenchtown, Hunterdon County; population, 975. Members and Officers—Martin Bellis, President; Wm. S. Dalrymple, Isaac W. Swick, Ernest J. Stryker; Chas. B. Salter, Clerk.

Garfield, Bergen County; population, 5,092. Members and Officers—P. J. Scanlon, President; Miles C. Whitehead, Dr. James Hennessey, Ernest Dah-nert; Louis H. Heinzman, Clerk and Registrar; O. Bonnema, Sanitary Inspec-tor; Martin D. Karl, Plumbing Inspector.

Garwood, Union County; population, 564. Members and Officers—F. Reeder, President; W. Froat, M. Calwell; Julius L. Hildner, Clerk; W. R. Conover, Registrar and Inspector.

\*Glen Ridge, Essex County; population, 2,062. Members and Officers—H. K. Benson, Secretary.

\*Glen Rock, Bergen County; population, 778. Members and Officers—Peter Van Winkle, Secretary and Registrar, Ridgewood.

\*Haddonfield, Camden County; population, 3,466. Members and Officers—Wm. H. Harrison, Clerk and Registrar.

\*Haddon Heights, Camden County; population, 654. Members and Officers—W. M. Pollock, Secretary.

Haledon, Passaic County; population, —. Members and Officers—Ed-mund Whittaker, President; Fred Wenzel, Ernest Schroeder; Edward Pries, Clerk and Registrar; Dr. Albert A. Lydecker, Inspector.

Harrington Park, Bergen County; population, 283. Members and Officers—G. M. Osterberg, President; C. Friend, A. E. Taylor; C. G. Eckerson, Clerk.

Hasbrouck Heights, Bergen County; population, 1,650. Members and Officers—H. B. Vannote, President; J. G. Martin, W. J. Schweickert; W. F. De Voy, Clerk and Registrar; Dr. S. V. Morris, Inspector.

\*Haworth, Bergen County; population, 400. Members and Officers—Henry F. Copeland, Clerk and Registrar.

Hawthorne, Passaic County; population, 2,570. Members and Officers—P. A. Wieland, President; B. Beveredge, F. D. Garrison, C. D. Petry; J. G. Whittaker, Clerk; W. E. Thompson, Registrar; Dr. A. B. Vanderbeck, In-spector, Paterson.

Helmetta, Middlesex County; population, 575. Members and Officers—James Deming, President; Andrew York, Clinton M. Clemons, Jos. D. Lund-sten; Robt. J. Franklin, Clerk; Ed. M. Clemons, Registrar.

High Bridge, Hunterdon County; population, 1,382. Members and Officers—P. H. Murray, President; M. F. Apgar, Samuel Tait; John L. Phillips, Clerk; P. H. Murray, Registrar; Dr. W. C. Alpaugh, Inspector.

\*Highland Park, Middlesex County; population, 714. Members and Officers—Charles Nourse, Clerk.

\*No report received.

\*Highlands, Monmouth County; population, 1,275. Members and Officers—Calvin Parker, Secretary.

Highstown, Mercer County; population, 2,093. Members and Officers—Wm. F. Lott, President, D. H. Cunningham, R. R. Forman, Dr. C. M. Frank-lin, A. V. Dawes, A. V. Pierson, Clerk and Inspector.

\*Holly Beach, Cape May County; population, 1,327. Members and Officers—Forest B. Long, Clerk and Registrar.

Hopatcong, Sussex County; population, 125. Members and Officers—Lewis S. Pilcher, M.D., President, Landing; John Aldred, Landing; Thos. B. Atterbury, Landing; Dwight B. Smith, Landing; Theo. A. K. Gessler, Clerk and Registrar, Landing; Sherborne V. Dameret, Inspector, Landing.

Hopewell, Mercer County; population, 984. Members and Officers—Dr. Robert P. Miller, President; John H. Merz, Wm. H. Hart, Jos. B. Hill; Dr. Robert Zulauf, Clerk and Registrar.

\*Island Heights, Ocean County; population, —. Members and Officers.

\*Jamesburg, Middlesex County; population, —. Members and Officers.

\*Junction, Hunterdon County; population, 974. Members and Officers—Oscar A. Fisher, Secretary.

\*Kenilworth, Union County; population, —. Members and Officers—Charles Kneudson, Clerk.

\*Lavalette, Ocean County; population, 22. Members and Officers—A. G. Fischer, Registrar.

Leonia, Bergen County; population, 1,041. Members and Officers—Henry R. Goesser, President; Fred'k Ellerbrook, Chas. E. Mooney; H. M. Thompson, Clerk and Registrar; Arthur D. Bogert and J. T. Wyckoff, M.D., Inspectors.

\*Linden, Union County; population, 403. Members and Officers—Jos. B. McDonough, Clerk.

\*Linwood, Atlantic County; population, 503. Members and Officers—James Farish, Secretary and Registrar.

Little Ferry, Bergen County; population, 1,772. Members and Officers—Joseph Kavrick, President; Wm. H. Sall, Frank Novak, Louis Brauer, Clerk and Registrar, John A. Dair, Inspector.

Lodi, Bergen County; population, 2,793. Members and Officers—Anthony De Ward, President; E. L. Rumsey, Anthony Cavallo, Eddy Meyers; Jacob Van Hook, Clerk and Registrar; Henry H. Brevoort, Inspector.

Longport, Atlantic County; population, 133. Members and Officers—Thos. D. Sullivan, President; Bolton E. Steelman, Howard Stout; E. Fullerton Cook, Secretary and Registrar.

Madison, Morris County; population, 4,115. Members and Officers—I. N. Van De Water, M.D., President; F. H. Seward, M.D., A. G. Evens, J. J. C. Humbert; E. P. Holden, Clerk; S. Fred Burnet, Registrar and Inspector.

Manasquan, Monmouth County; population, 1,636. Members and Officers—A. H. Miller, President; Alonzo Mount; Robert M. Marks, Clerk and Registrar; R. B. Campbell, Inspector.

\*Matawan, Monmouth County; population, 1,479. Members and Officers—Wm. Rodgers, Clerk and Registrar.

Maywood, Bergen County; population, 687. Members and Officers—Henry Heck, President; Gustav Berroyer, Joseph H. Burr, Charles Staas; G. M. Fetzer, Clerk and Registrar.

Merchantville, Camden County; population, 1,632. Members and Officers—F. W. Klein, President; J. E. Vankirk, A. H. Moses, Dr. J. Lawrence, J. Gun-ison; W. B. Stuart, Clerk and Registrar; Wm. Linderman, Inspector.

Metuchen, Middlesex County; population, 1,907. Members and Officers—A. C. Kelly, President; R. Bruce Crowell, F. A. Orton, C. P. Hull; Herman Gross, M.D., Secretary; A. L. Ellis, M.D., Registrar.

Midland Park, Bergen County; population, 1,617. Members and Officers—Charles R. Mastin, President; C. P. Morgan, Tunis Smith, Wm. Ryan; Chas. B. Williams, Clerk and Registrar; Joseph Payne, M.D., Inspector.

\*No report received.

Millstone, Somerset County; population, 156. Members and Officers—S. O. B. Taylor, M.D., President; W. C. Kitchen, Enoch M. Davis, J. H. Hagaman, John P. Ditmars, W. H. Polhemus, Clerk; Harry Tomlinson, Registrar.

Milltown, Middlesex County; population, 1,210. Members and Officers—Conrad Wagner, President; Adam Wagner, Milton Brindle, Henry Kuhltham, John Dorn, Wm. G. Evans, Clerk; Robt. A. Harkins, Registrar; F. E. Riva, M.D., Inspector, New Brunswick.

\*Monmouth Beach, Monmouth County; population, —. Members and Officers.

\*Montvale, Bergen County; population, 502. Members and Officers—John B. Hering, Registrar.

\*Mount Arlington, Morris County; population, 250. Members and Officers—H. C. Upchurch, M.D., Secretary.

\*Mountainside, Union County; population, 314. Members and Officers—Robert Laing, Registrar.

\*Mount Tabor, Morris County; population, —. Members and Officers—Frank S. Waller, Secretary.

\*National Park, Gloucester County; population, 160. Members and Officers—Adolphus S. Dean, Clerk.

\*Neptune City, Monmouth County; population, 808. Members and Officers—J. H. Leming, Clerk and Registrar, Avon.

\*Netcong, Morris County; population, 1,024. Members and Officers—Chas. W. Eaton, Secretary.

New Providence, Union County, population, 754. Members and Officers—Alfred G. Nason, Sr., President, Murray Hill; Wm. T. Hickson, New Providence; A. E. Jackson, West Summit; Frank Schwarzwaelder, Murray Hill; Wm. Woodruff, Clerk and Registrar, New Providence; Geo. L. Bishop, Inspector, New Providence.

\*North Arlington, Bergen County; population, —. Members and Officers—H. C. Bayliss, Registrar.

North Caldwell, Essex County; population, 483. Members and Officers—Charles B. Gould, President; Ralph C. Bach, Louis Kusmaul, Wm. Little; Sherman Paddock, Clerk; Fred L. Baldwin, Registrar.

Northfield City, Atlantic County; population, 688. Members and Officers—Joseph Lake, President; Wm. Oxley, J. L. McConnell, Walter Heckman, E. C. Duberson, Clerk and Registrar.

North Haledon, Passaic County; population, 697. Members and Officers—Wm. Clowes, President; Wm. Ellis, Charles Ellis, Joseph Graham, Thomas Lord, Edward Watson, John Hay, Samuel Clowes, Clerk and Registrar; Dr. A. A. Lydecker, Inspector.

North Plainfield, Somerset County; population, 5,616. Members and Officers—J. O. Osgood, President; A. E. Kenney, Isaac Schwed; A. H. Dundon, M.D., Clerk and Registrar; John O'Brien, Jr., Inspector.

\*North Spring Lake, Monmouth County; population, —. Members and Officers—F. M. Hunt, Registrar, Spring Lake Beach.

Norwood, Bergen County; population, 432. Members and Officers—Henry Elling, President, Demarest; Wm. Harr, West Norwood; A. Portz, Closter; Josh. Wood, Norwood; P. Luebker, Clerk and Registrar, Norwood; Dr. A. Ward, Inspector, Closter.

\*Nuttley, Essex County; population, 4,556. Members and Officers—F. Clements, Secretary.

\*Oakland, Bergen County; population, 586. Members and Officers—W. B. Romaine, Secretary.

Oaklyn, Camden County; population, 454. Members and Officers—J. F. Johnson, President; Frank Ashdale, Wm. Link, W. Anthony, Emil C. Hessler, Clerk and Registrar.

Ocean City, Cape May County; population, 1,835. Members and Officers—Dr. Chas. B. Rider, President; Dr. C. E. Edwards, Dr. I. N. Griscom, E. W.

\*No report received.

Burleigh, Dr. N. H. Burt, T. Lee Adams, Clerk, Registrar and Health Officer; John W. Smith, Sanitary Inspector.

Ocean Grove, Monmouth County; population, —. Members and Officers—A. E. Ballard, President; J. H. Alday, M.D., H. Wheeler, W. H. Wardell, E. N. Cole; H. B. Alday, M.D., Clerk and Inspector.

Old Tappan, Bergen County; population, 280. Members and Officers—James J. O'Connors, President, Westwood; Joseph F. Plate, Westwood; Jacob Z. Bogert, Westwood; Wm. Blauvelt, Westwood; R. B. Haring, Clerk and Registrar, Westwood.

Orvil, Bergen County; population, 443. Members and Officers—Robert B. Potts, President, Hohokus; Wm. H. Rossell, Hohokus; Wm. H. Leazer, Hohokus; J. C. H. Sherwood, Hohokus; Francis C. Kopp, Secretary and Registrar, Hohokus; Chas. W. Harreys, Inspector, Ridgewood.

Palisades Park, Bergen County; population, 911. Members and Officers—Henry Prigge, President; R. Steenland, Samuel Wells, Clerk and Registrar; William Sehner and Dr. Jos. Van Dyck, Inspector.

Park Ridge, Bergen County; population, 1,189. Members and Officers—Dr. H. C. Neer, President; Dr. J. A. Moeng, J. H. Stark, M. J. Verbeyst, T. G. Forbes, Clerk and Registrar; A. P. Post, Inspector.

Paulsboro, Gloucester County; population, 2,269. Members and Officers—Robert H. Reeves, M.D., President; John H. Brown, Wilmer Leap; Jacob Ballinger, Clerk and Registrar; George C. Laws, M.D., Inspector.

Pemberton, Burlington County; population, 821. Members and Officers—A. J. Morris, President; J. G. Montgomery, J. N. Clevenger, Jos. Jones, J. B. Nutt; J. J. Brander, Clerk.

Pennington, Mercer County; population, 768. Members and Officers—Geo. W. Scarborough, President; Peter A. Caughell, Henry L. Laning, Clerk; Jos. C. Bunn, Registrar; Frank A. Blackwell, Inspector.

\*Pennsgrove, Salem County; population, 2,062. Members and Officers—C. P. Lummis, M.D., Secretary.

Pitman Grove, Gloucester County; population, —. Members and Officers—Dr. C. B. Phillips, President and Registrar; Thomas Goodwin, A. S. Clark, Harry Rulon, Clerk; G. W. Parker, Inspector.

Pleasantville, Atlantic County; population, 2,824. Members and Officers—Henry C. Thomas, President; G. W. Brawn, Seward Scofield, Charles Shewell, John Stephens; T. F. Crawford, Clerk and Registrar; Dr. R. M. Sooy, Inspector.

Point Pleasant, Ocean County; population, 977. Members and Officers—Charles W. Dalrymple, President and Inspector; H. C. Shoemaker, Sr., Dr. E. S. Carrigan, Joseph Elberson, J. L. Conover, Clerk and Registrar.

\*Pompton Lakes, Passaic County; population, 1,013. Members and Officers—Horace L. Wells, Secretary and Registrar.

\*Port Republic City, Atlantic County; population, 451. Members and Officers—Clark A. Johnson, Registrar.

\*Princeton, Mercer County; population, 6,029. Members and Officers—W. B. Howe, Clerk and Registrar.

Prospect Park, Passaic County; population, 1,911. Members and Officers—Alfred McAuley, President; Lambertus Touw, Jacob Boer, John Crawford; Jacob Doeel, Clerk and Registrar; Dr. A. A. Lydecker, Inspector, Haledon.

Raritan, Somerset County; population, 3,944. Members and Officers—Thos. P. Traynor, President; John Fahey, L. M. Lanning, M.D., Joseph Naratto; George H. Brightbill, Clerk and Registrar; Michael Corcoran, Inspector.

Ridgefield, Bergen County; population, 745. Members and Officers—Dr. M. Ayres, President; Wm. K. Davison, John C. Banta, J. C. McGill, Stephen V. R. Martling, Clerk and Registrar.

Riverside, Bergen County; population, 670. Members and Officers—E. N. Crandall, President; North Hackensack; J. A. Williamson, North Hackensack; J. S. Mead, River Edge; W. E. Martin, Clerk, River Edge; Robt. Balgah, Inspector, Hackensack.

\*No report received.

\*Riverton, Burlington County; population, 1,557. Members and Officers—Alex. Marcy, Jr., M.D., Clerk and Inspector.

\*Rockaway, Morris County; population, 1,585. Members and Officers—John H. Miller, Borough Clerk.

Rocky Hill, Somerset County; population, 479. Members and Officers—J. H. W. Tilton, President; H. H. Mount, E. R. Logan, W. N. Stultis; Alfred C. Skirm, Registrar.

Rosevelt, Middlesex County; population, —. Members and Officers—Edw. J. Heil, President, Carteret; A. Grohman, Chrome; Isadore Schwartz, Chrome; J. Frank Born, Clerk, Carteret; C. C. Sheridan, Registrar, Carteret; Dr. F. W. Sell, Health Officer, Rahway.

Roselle, Union County; population, 2,142. Members and Officers—H. C. Pierson, M.D., President; G. W. Strickland, M.D., John I. Howe, A. A. Pope, W. B. Hadley, James W. Hope; J. D. Cooper, Clerk and Registrar; John Kinney, Inspector.

Roselle Park, Union County; population, 2,236. Members and Officers—S. W. Kingsland, President; H. M. Bogert, Patrick Cooley, Chas. Engelhard; Wm. Morris, Clerk and Registrar; Simon Birmingham, Inspector.

Rutherford, Bergen County; population, 5,218. Members and Officers—Dr. Charles Colhoun, President; J. C. Sares, Geo. F. Schermerhorn, F. W. Fleming, C. R. Hunt; F. M. Buckles, Secretary and Registrar; George K. Thomas, Inspector.

Saddle River, Bergen County; population, 474. Members and Officers—George M. Eckert, President; Robert A. Adams, Wm. Blackledge, Wm. Walling, Robert T. Wilson, James L. Ackerman, Clerk and Registrar; Alfred Van Nostrand and Wm. Craig, M.D., Inspectors.

Seabright, Monmouth County; population, 1,166. Members and Officers—Daniel J. Poppinger, President; Charles F. Hampton, Clarence Douglass, James P. Armstrong, Clerk and Registrar; Wm. R. Fowler, Inspector.

Sea Isle City, Cape May County; population, 432. Members and Officers—A. S. Steelman, President; John Ross, Thomas Mitchell, W. Harry Hambleton, Clerk and Registrar; Dr. H. G. Stimus, Inspector.

\*Seaside Park, Ocean County; population, 92. Members and Officers—G. H. Thatcher, Clerk.

\*Secaucus, Hudson County; population, 3,191. Members and Officers—Chas. Maier, Secretary.

Somers Point, Atlantic County; population, 431. Members and Officers—Wm. Thompson, President; Wm. H. Himeback, Lewis Mason, David Robinson; T. G. Middleton, Clerk and Registrar.

South Amboy, Middlesex County; population, 6,258. Member and Officers—E. E. Haines, M.D., President; Samuel Locker, Henry Berlew; F. E. DeGraw, Clerk and Registrar; Charles S. Buckalew, Inspector.

\*South Atlantic City, Atlantic County; population, 115. Members and Officers—B. A. Whittaker, Clerk.

South Bound Brook, Somerset County; population, —. Members and Officers—E. B. Randolph, President; J. K. Tatum, Jacob Byer, E. D. Latourette, Wm. T. Morecraft, James P. Hoffman, Clerk and Registrar.

\*South Cape May, Cape May County; population, 5. Members and Officers—James Ritchie, Mayor.

South River, Middlesex County; population, 3,585. Members and Officers—A. W. Bissett, President; R. V. Reid, Chas. Anderson, Jesse Selover, Clerk; J. C. Bowne, Registrar; R. V. Reid, Inspector.

Spring Lake, Monmouth County; population, 1,039. Members and Officers—S. R. Knight, M.D., President; J. G. Newman; D. H. Hills, Clerk and Registrar; E. Remson, Inspector.

Stanhope, Sussex County; population, 887. Members and Officers—C. E. Herrick, President; J. H. Slaght, Frank Todd, John McMickel, J. J. Shaw, Clerk, Dr. C. K. Davidson, Inspector.

Stockton, Hunterdon County; population, 588. Members and Officers—

\*No report received.

Horace M. Reading, President; Peter A. Sheperd, Hiram B. Neice, Willard W. Johnson, John S. Wilson, Clerk; Philip E. Rockefeller, Registrar and Inspector.

\*Sussex, Sussex County; population, 1,318. Members and Officers—S. F. Quince, Secretary.

Swedesboro, Gloucester County; population, 1,484. Members and Officers—Dr. T. B. Turner, President; Wm. A. Homan, Frederick Weber, W. H. Rieger, Clerk and Registrar; Dr. V. E. De Grofft, Inspector.

\*Tenafly, Bergen County; population, 2,142. Members and Officers—W. R. Cattle, Clerk.

\*Totowa, Passaic County; population, 738. Members and Officers—Wilbur DeMott, Secretary and Registrar, Paterson.

\*Tuckerton, Ocean County; population, 1,332. Members and Officers—J. F. Mathis, Secretary.

Upper Saddle River, Bergen County; population, 324. Members and Officers—Lewis D. Goetschins, President; Peter V. Bush, James D. Carrough, Stephen J. Goetschins, Henry Zabriskie, Secretary and Registrar.

Ventnor City, Atlantic County; population, 116. Members and Officers—Vivian B. Smith, President; C. Claude Scull, Adolph E. Apel, Wm. G. Lore, James G. Scull, Secretary; Edward Guion, M.D., Inspector.

Verona, Essex County; population, —. Members and Officers—W. P. Rich, President; W. J. Whitaker, Wm. A. Schneider, Judson W. Parker, Louis C. Miller, Clerk; Chas. S. Simonson, Registrar; Chester H. Wells, Inspector.

Vineland, Cumberland County; population, 4,593. Members and Officers—J. R. T. Colquhoun, President; J. S. Large, G. W. Lamb, W. F. McKillip, Charles M. Gray, M.D., Clerk and Registrar; John H. Winslow, Inspector.

Wallington, Bergen County; population, 2,475. Members and Officers—John Van Iderstine, President; Edward Taylor, John McCleery, J. Brett, James Brennan, Secretary and Registrar; Dr. D. M. Sullivan, Inspector.

\*Washington, Warren County; population, 3,431. Members and Officers—A. J. Craft, Clerk and Registrar.

Wenonah, Gloucester County; population, 569. Members and Officers—Wm. J. Dawson, President; Dr. Chas. H. Lawrence, Wm. C. Cattell, Dr. Harry A. Stout, Jesse W. English, Clerk and Registrar; Joseph S. Chew, Inspector.

\*West Caldwell, Essex County; population, 490. Members and Officers—John R. Jacobus, Secretary.

\*West Cape May, Cape May County; population, 902. Members and Officers—John D. Craig, Clerk, Eldredge.

Westwood, Bergen County; population, 1,044. Members and Officers—John J. Voorhis, President; R. A. Myers, Charles E. Harring, Dr. B. D. Stone, Nicholas Cleveland, Clerk and Registrar.

Wharton, Morris County; population, 2,285. Members and Officers—Dr. Henry W. Kiee, President; Robert F. Oram, Miller P. Castner, James Williams, Clerk; Daniel J. Ketrick, Inspector.

Wildwood, Cape May County; population, 500. Members and Officers—Henry Coombs, President; John Daggan, H. H. Tomlin, M.D., Otto C. Koeneke, Clerk and Registrar; Harry Hendee, Inspector.

Woodbine, Cape May County; population, 1,850. Members and Officers—Wm. Lipman, President; Barney Breslaw, Samuel Rosenfeld, Charles Kelenson, Ruben Kainer, Fred. Schmidt, Clerk and Registrar; Dr. Behrman, Inspector.

Woodcliff, Bergen County; population, 477. Members and Officers—Wm. English, President; Augustus Cleveland, John H. Wortendyke, David H. Tice, Peter E. Van River, G. J. Wortendyke, Clerk, Allendale, R. F. D. No. 2.

Wood Lynne, Camden County; population, 388. Members and Officers—George F. Annesley, President; Andrew Burnside, Claude N. Davis, Frank G. Muggleworth, Clerk and Registrar; Frank Merideth, Inspector.

Wood Ridge, Bergen County; population, 721. Members and Officers—

\*No report received.

J. H. Schmitt, President; F. C. Ball, J. H. Doerflinger, F. W. Lehmann, Clerk and Registrar; G. Holtz, Inspector.  
**Woodstown, Salem County;** population, 1,500. Members and Officers—Isaac B. Coles, President; Henry V. Foster, Wm. Coleman, Dr. E. P. McGeorge, Richard E. Corson, Wm. B. Foster, Clerk and Registrar; F. P. Vanlier, Inspector.

## TOWNS.

**Absecon, Atlantic County;** population, 616. Members and Officers—T. J. Hamilton, President; Henry Alexander, Samuel Giberson, Samuel Johnson, Registrar and Clerk; E. H. Madden, M.D., Inspector.

**\*Bloomfield, Essex County;** population, 11,668. Members and Officers—Wm. L. Johnson, Secretary.  
**\*Boonton, Morris County;** population, 3,935. Members and Officers—N. A. Meyers, Secretary.

**Freehold, Monmouth County;** population, 3,064. Members and Officers—E. D. Clayton, President; W. A. Barkalow, H. S. Brown, M.D., S. L. Bennett, Alonzo White, Charles V. DuBois, Alonzo Brower, Clerk, Registrar and Inspector.

**Guttenberg, Hudson County;** population, 4,563. Members and Officers—Jacob B. Zimmerman, President; John P. Mager, Charles A. Burnell, Jos. A. Hurley, Wm. Baudendistel, Philip T. Martin, Charles A. Eypper, James J. Moore, Clerk; John A. Bausch, Assistant.

**Hackettstown, Warren County;** population, 2,594. Members and Officers—E. Ayers, President; J. W. Curtis, A. C. Van Syckle, M.D., Thos. Nolan, A. G. Boettiger, Clerk and Registrar; R. G. Clark, Inspector.

**Hammonton, Atlantic County;** population, 4,334. Members and Officers—A. J. Rider, President; John Walther, John A. Hoyle, J. L. O'Donnell, C. R. Scullen, Dr. J. C. Bitler, Clerk and Registrar; Dr. Chas. Cunningham, Inspector.

**Harrison, Hudson County;** population, 12,824. Members and Officers—John T. Malone, President; Dr. Henry Allers, Peter J. Goodman, Nathaniel Comey, Lawrence S. Fagan, Clerk; John T. McClure, Inspector.

**Irvington, Essex County;** population, 7,180. Members and Officers—Jonah Hardgrove, President; Hugo R. Winkler, Julius Bartosch, Fred Engel, Benjamin F. Camp, Edwin Berry, Clerk; Joseph K. Clickenger, Inspector.

**Kearney, Hudson County;** population, 13,601. Members and Officers—Louis Hartung, President; M. D. Clouse, M.D., John R. O'Connor, A. B. Anderson, J. B. Thompson, C. F. Zachan, Clerk; Chas. Schiller, Registrar; Albert E. Geissler, Inspector; Jas. A. Exton, Health Officer.

**Keyport, Monmouth County;** population, 3,385. Members and Officers—Gustave Mauer, President; S. F. Mason, Abram Huyler, Dr. Hartman; Chas. F. Tuthill, Clerk; W. C. Smith, Registrar; James M. Walling, Inspector.

**Red Bank, Monmouth County;** population, 6,263. Members and Officers—C. D. Warner, President; Dr. B. H. Garrison, F. P. Stryker, Charles H. Dennis, James H. Sickles, Secretary; Elwood Minugh, Inspector.

**Somerville, Somerset County;** population, 4,782. Members and Officers—Aaron L. Stillwell, M.D., President; Thos. H. Flynn, M.D., Wm. V. Steele, John B. Osbourn, Wm. R. Sutphen, Clerk and Registrar; George D. Totten, Inspector.

**Town of Union, Hudson County;** population, 17,005. Members and Officers—Chas. F. Ruh, President; Chas. Steeler, R. Riemenschneider, John Weil, Fred Zapp, Emil Maisner, M.D., Richard Specker, Clerk.

**Westville, Union County;** population, 5,265. Members and Officers—Jos. B. Harrison, M.D., President; Sherman Cooper, M.D., Homer H. Butler, Geo. L. Delatour, C. W. Harden, Clerk, Registrar and Inspector.

\*No report received.

**West Hoboken, Hudson County;** population, 29,082. Members and Officers—Albert Kielberg, President and Inspector; Max Hecht, A. O. Wiesenberg, Henry Burstyn, William Ziegler, Clerk.

**West New York, Hudson County;** population, 7,196. Members and Officers—Dr. Jas. J. Benson, President; Rudolf Kunz, Geo. J. Yhlen, Francis A. Crawley, Harry Kuhlke, Clerk.

**West Orange, Essex County;** population, 7,872. Members and Officers—Jos. B. F. Grady, President; David Quinlan, Joseph Fleming, Henry J. Feindt, John B. Lander, Benj. L. Williams, Secretary and Registrar; J. M. Maghee, M.D., and R. W. Kinney, Inspectors.

## VILLAGES.

**Ridgefield Park, Bergen County;** population. —. Members and Officers—John H. Ficken, President; Joseph Fletcher, Wm. G. White, George J. Muller, John J. Robinson, Howard B. Ficken, Clerk; Wm. H. Hunter, Registrar; Chas. A. Knox, M.D., Inspector.

**Ridgewood, Bergen County;** population, 3,980. Members and Officers—John B. Hopper, President; H. S. Willard, M.D., E. T. White, W. H. Moore, John T. Hanks, Secretary; J. B. Hopper, Registrar; H. H. Pettit, M.D., Health Officer; G. H. Soult, Inspector.

**South Orange, Essex County;** population, 4,932. Members and Officers—Mefford Runyon, M.D., President; Richard D. Freeman, M.D., Francis Spier, Jr., J. Budd Smith, Louis V. Blauvelt, Edwin S. Allen, Secretary; A. C. Benedict, M.D., Registrar and Inspector.

## TOWNSHIPS.

**Acquackanonk, Passaic County;** population, 7,187. Members and Officers—Richard Berry, President and Registrar, Clifton; Harry M. Pontin, Clifton; William Lemke, Clifton; Eugene F. Piaget, Richfield; Henry Frederick, Delawanna; E. M. Yereance, Secretary, Clifton; James F. Sutton, Inspector, Clifton.

**Alexandria, Hunterdon County;** population, 1,007. Wm. V. Bloom, President, Little York; Walter Martin, Mt. Pleasant; Joseph Hoff, Everittstown; John C. Wilson, Secretary, Everittstown; F. S. Grimm, M.D., Inspector, Baptistown.

**Allamuchy, Warren County;** population, 571. Members and Officers—Josiah Servis, President, Allamuchy; Eli Deremer, Allamuchy; Benj. A. Hendershot, Secretary, Allamuchy; George A. Jilson, Registrar, Allamuchy; L. C. Osman, M.D., Inspector and Medical Examiner, Hackettstown; Z. R. McMurtrie, Inspector, Allamuchy.

**Alloway, Salem County;** population, 1,562. Members and Officers—J. S. Watson, President, Yorktown; Joseph Garton, Cohansey; Charles Timberman, Alloway; William E. Simkins, Secretary and Registrar, R. F. D., Elmer; Warren L. Ewen, M.D., Inspector, Alloway.

**\*Andover, Sussex County;** population, 478. Members and Officers—Wm. Iliff, Clerk, Lafayette.

**\*Atlantic, Monmouth County;** population, 1,355. Members and Officers—J. H. Johnes, Clerk, Vanderburg.

**\*Bass River, Burlington County;** population, 728. Members and Officers—Jos. B. Lamson, Clerk, New Gretna.

**\*Bedminster, Somerset County;** population, 2,246. Members and Officers—W. D. Vanderbeek, Secretary, Gladstone.

**Belleville, Essex County;** population, 7,632. Members and Officers—Ed-

\*No report received.

ward O'Cyphers, M.D., President, Belleville; J. W. Hirdes, Belleville; Jos. Joutle, Belleville; Joseph Weston, Belleville; Geo. W. Stanior, Belleville; Wm. Bechthold, Belleville; John J. Hannan, Clerk, Belleville; H. W. Underwood, Registrar, Belleville; Geo. W. Williamson, Inspector, Belleville.

**Berkley, Ocean County;** population, 558. Members and Officers—Thomas J. Harvey, President, Bayville; Chas. W. Ward, Bayville; S. R. Johnson, Toms River; M. B. Allen, Clerk, Bayville; Devine Butler, Registrar, Bayville; E. C. Disbro, Inspector, Toms River.

**Bernards, Somerset County;** population, 4,514. Members and Officers—John M. Holmes, President, Basking Ridge; Van Cleve Meeker, Bernardsville; Julius Froehling, Liberty Corner; Frank P. Bowman, Bernardsville; David Buist, Bernardsville; Joseph E. Buck, Clerk, Registrar and Inspector, Bernardsville.

**Bethlehem, Hunterdon County;** population, 1,594. Members and Officers—Jos. H. Painter, President, West Portal; John C. Dalrymple, Valley; H. S. Opydke, Valley; G. C. Lott, Clerk, Junction.

**Beverly, Burlington County;** population, 2,181. Members and Officers—George D. McIvaine, President, Beverly; Frank H. Story, Delanco; Harry K. Cramp, Beverly; H. K. Weiler, M.D., Delanco; Jos. B. Carter, Registrar, Delanco.

**Blairstown, Warren County;** population, 1,537. Members and Officers—Theodore Dawes, President, Blairstown; John E. Jones, Blairstown; Isaiah Lance, Walnut Valley; Jos. A. Dugan, Clerk and Registrar, Vail; Dr. H. O. Carhart, Inspector, Blairstown.

**Boonton, Morris County;** population, 343. Members and Officers—James G. Simms, President, Boonton; Dr. John L. Taylor, Boonton; George W. Blanchard, Boonton; Eben C. Lyon, Boonton; Cornelius Byrnes, Boonton; Harry Gordon, Clerk and Registrar, Boonton; Jacob L. Hutt, Inspector, Boonton.

**Bordentown, Burlington County;** population, 534. Members and Officers—Dr. C. Mendenhall, President, Bordentown; Samuel Johnson, Bordentown; Harrison Chambers, Yardville; William H. Haines, Columbus; Dr. Hugh Le Jambre, Registrar and Inspector, Bordentown.

**Branchburg, Somerset County;** population, 979. Members and Officers—S. D. Opie, President, Neshanic Station; Wm. V. D. Jelliffe, North Branch Station; Tunis Ten Eyck, North Branch Station; Augustus McCullough, Clerk and Registrar, North Branch Station; Henry V. Davis, M.D., Inspector, North Branch Station.

**\*Brick, Ocean County;** population, 2,112. Members and Officers—J. H. Harvey, Secretary and Registrar, Point Pleasant.

**Bridgewater, Somerset County;** population, 962. Members and Officers—John G. Coddington, President, Somerville; Wm. Harris, Somerville; John Slattery, Raritan; Phillip Mundy, Somerville; Elijah Stevens, Somerville; Abram A. Smith, Somerville; Dr. C. F. Halsted, Somerville; B. T. Conkling, Registrar, Somerville.

**Buena Vista, Atlantic County;** population, 2,624. Members and Officers—Alfred Pennock, Sr., President and Registrar, Vineland; Harry Brown, Newtonville; Edmund J. Smith, Richland; Frank Barsughia, Vineland; Douglas Reed, Clerk, Newfield.

**Burlington, Burlington County;** population, 1,012. Members and Officers—Wm. B. Shedaker, President, Burlington; Ellis Parker, Burlington; H. H. Mattson, Burlington; Thos. B. Gandy, Clerk, Registrar and Inspector, Burlington.

**\*Byram, Sussex County;** population, 426. Members and Officers—Chas. McMickle, Clerk, Andover.

**\*Caldwell, Essex County;** population, 644. Members and Officers—Theo. Vincent, Registrar, Caldwell.

**\*Cedar Grove, Essex County;** population, —. Members and Officers—H. B. Whitehorne, M.D., Secretary, Verona.

\*No report received.

**Centre, Camden County;** population, 2,651. Members and Officers—Herbert K. Dobbs, President, Mt. Ephraim; Sewall H. Hodges, Magnolia; Frank M. La Pierre, Magnolia; Dr. Leslie C. Lyon, Magnolia; John H. Jackson, Clerk and Registrar, Magnolia.

**Chatham, Morris County;** population, 629. Members and Officers—Louis M. Noe, President, Madison; Edward Blazier, Green Village; Chas. A. Johnson, Chatham; F. H. Seward, M.D., Madison; J. H. Bebout, Clerk and Registrar, Chatham.

**Chester, Burlington County;** population, 4,849. Members and Officers—Samuel B. Lippincott, President, Moorestown; Geo. Brock, Moorestown; Morris Linton, Moorestown; Samuel C. Roberts, Moorestown; Eugene Hill, Moorestown; Geo. W. Heaton, Clerk and Registrar, Moorestown; Dr. F. G. Stroud, Inspector, Moorestown.

**Chester, Morris County;** population, 1,378. Members and Officers—John B. Kelsey, President, Chester; Wm. Howell, Chester; Elias Wack, Chester; Abraham Tiger, Clerk and Registrar, Chester; Harris Day, M.D., Inspector, Chester.

**Chesterfield, Burlington County;** population, 1,141. Members and Officers—Chas. W. Bunting, President, Crosswicks; Edward Ridgway, Crosswicks; C. E. Wallace, Chesterfield; Wm. Wallace, Clerk, Crosswicks.

**Cinnaminson, Burlington County;** population, 1,064. Members and Officers—Clayton Conrow, President, Cinnaminson; John Schmierer, Cinnaminson; Frederick Bauer, Cinnaminson; Thos. E. Steele, Registrar, Palmyra; Dr. J. D. Janney, Inspector, Cinnaminson.

**Clark, Union County;** population, 387. Members and Officers—Andrew Gibson, President, Rahway; Benjamin King, Rahway; Wm. J. Thompson, Clerk, Rahway, R. F. D. No. 1.

**Clementon, Camden County;** population, 2,257. Members and Officers—Geo. Summerfield, President, Clementon; Jacob C. Lippencott, Kirkwood; F. H. Tomlinson, Lindenwold; Geo. W. Evans, Clerk and Registrar, Lindenwold; Frank B. Cook, Inspector, Laurel Springs.

**Clinton, Hunterdon County;** population, 2,026. Members and Officers—W. E. Berkaw, M.D., President and Inspector, Annandale; John Shurts, Lebanon; John W. Apgar, Lebanon; Austin Cramer, Annandale; B. B. Berkaw, Clerk and Registrar, Annandale.

**Commercial, Cumberland County;** population, 2,476. Members and Officers—C. W. Hand, President, Port Norris; Lewis F. Shropshire, Port Norris; Claude Bateman, Mauricestown; E. B. Bradford, M.D., Port Norris; Walter C. Riggan, Clerk and Registrar, Port Norris.

**Cranbury, Middlesex County;** population, 1,465. Members and Officers—Joseph C. Chamberlin, President, Cranbury; W. I. Stults, Cranbury; Walter Scott, Cranbury; A. M. Davison, Clerk and Registrar, Cranbury.

**Cranford, Union County;** population, 3,600. Members and Officers—Edmund B. Horton, President, Cranford; John W. Heins, Cranford; James C. W. Rankin, Cranford; James L. Vail, M.D., Cranford; Alfred H. Miller, Clerk, Cranford; F. R. Swackhamer, Registrar, Cranford.

**Deerfield, Cumberland County;** population, 3,212. Members and Officers—Elijah R. Parvin, President and Registrar, Deerfield; John Fralinger, Woodruff Station; John Loper, Woodruff Station; James McNab, Deerfield; H. L. Cooper, M.D., Clerk, Deerfield.

**\*Delaware, Camden County;** population, 1,470. Members and Officers—Wm. B. Jennings, M.D., Clerk and Inspector, Haddonfield.

**Delaware, Hunterdon County;** population, 1,926. Members and Officers—Irvin Johnson, President, Raven Rock; George H. Higgins, Sergeantsville; Nelson Lambert, Sergeantsville; David L. Holcombe, Clerk and Registrar, Lambertville; Dr. G. N. Best, Inspector, Rosemont.

**Delran, Burlington County;** population, 1,340. Members and Officers—Chas. Beatty, President, Bridgeboro; A. P. Bright, Bridgeboro; Jos. F. Denner, Riverside; Geo. Friday, Clerk and Registrar, Riverside.

\*No report received.



Dennis, Cape May County; population, 1,777. Members and Officers—Samuel Bishop, President, Eldora; James G. Stiles, Dennisville; Eli Townsend, Clermont; I. S. Townsend, Clerk and Registrar, Clermont; Eugene Way, M.D., Inspector, Dennisville.

Deptford, Gloucester County; population, 2,233. Members and Officers—Thomas Goldy, President, Westville; Benjamin Hains, Westville; Ellison Turner, Sewell; Cirroll C. Headley, Clerk, Registrar and Inspector, Westville.

Dover, Ocean County; population, 2,869. Members and Officers—Thomas B. Irons, President and Registrar, Toms River; W. S. Jackson, Toms River; Thomas J. Grant, Toms River; Anthony A. Dunham, Toms River; John A. Ernst, Clerk, Toms River; Ralph R. Jones, M.D., Inspector, Toms River.

\*Downe, Cumberland County; population, 1,664. Members and Officers—Sheppard Campbell, Clerk, Newport.

Eagleswood, Ocean County; population, 534. Members and Officers—H. G. Shinn, President, West Creek; J. W. Holman, West Creek; Jonathan Cox, West Creek; E. F. Cranmer, Clerk, West Creek; C. H. Conover, M.D., Tucker-ton.

Eastampton, Burlington County; population, 587. Members and Officers—H. E. Lippincott, President, Smithville; S. M. MacFarland, Mt. Holly; S. H. Austin, Mt. Holly; Chas. F. Holzbaur, Clerk and Registrar, Smithville; Dr. G. W. Van Derveer, Inspector, Mt. Holly.

East Amwell, Hunterdon County; population, 1,256. Members and Officers—George Strimple, President, Ringoes; John Holcombe, Lambertville; George Hartpence, Ringoes; Joseph A. Snook, Clerk and Registrar, Hopewell, R. F. D.; Dr. P. C. Young, Inspector, Ringoes.

\*East Brunswick, Middlesex County; population, 2,025. Members and Officers—Henry Warnsdorfer, Secretary and Registrar, New Brunswick, R. F. D. No. 3.

East Greenwich, Gloucester County; population, 1,299. Members and Officers—William Cook, President, Mt. Royal; William Dauson, Mickleton; William Borden, Mickleton; James C. Dauson, Clerk, Mickleton.

East Windsor, Mercer County; population, 863. Members and Officers—Aaron Ely, President, Hightstown; Ed. R. Pickering, Hightstown; Furman Updike, Hightstown; S. L. Mount, Registrar, Etra; Dr. J. M. Franklin, In-spector, Hightstown.

Eatontown, Monmouth County; population, 2,874. Members and Officers—S. S. Stout, President, Eatontown; A. F. Golden, West Long Branch; Whitney Conrow, Oceanport; D. S. Morris, Clerk, Eatontown; Douglass Riddle, Registrar, Oceanport; E. W. Crater, M.D., Inspector, Oceanport.

Egg Harbor, Atlantic County; population, 1,468. Members and Officers—John J. Blackmon, President, Steelmanville; George W. Adams, Idlewood; John H. Smith, Scullville; George S. Winner, Clerk and Registrar, Scullville; Dr. Ernest Zille, Inspector, Scullville.

Elk, Gloucester County; population, 938. Members and Officers—Samuel L. Seran, President and Registrar, Aura; Franklin Homan, Glassboro; Thomas Hann, Ewan; Sheppard Murphy, Monroeville.

\*Elsinboro, Salem County; population, 398. Members and Officers—Wm. D. Griseom, Clerk, Salem.

Evesham, Burlington County; population, 1,356. Members and Officers—H. D. Lippincott, President, Marlton; Wm. Dunphey, Marlton; W. F. Powell, Marlton; Allen Jones, Moorestown; B. K. Brick, M.D., Clerk, Marlton.

Ewing, Mercer County; population, 1,560. Members and Officers—J. L. Knight, President, Trenton Junction; H. M. Fine, Trenton; W. S. Morris, Trenton; Wm. H. Cadwallader, Clerk and Registrar, Trenton, R. F. D. No. 1; Enos B. Allen, M.D., Inspector, Trenton.

Fairfield, Cumberland County; population, 1,625. Members and Officers—Geo. B. Williams, President, Fairton; Edw. Bowe, Fairton; Edwin Trenchard, Fairton; James B. Mulford, Fairton; E. H. Whitticar, Clerk, Fairton; Harry E. Lore, Inspector, Fairton.

\*No report received.

\*Fanwood, Union County; population, 1,341. Members and Officers—Geo. H. Johnston, Clerk and Registrar, Scotch Plains.

\*Florence, Burlington County; population, 1,967. Members and Officers—Robert Cottam, Clerk, Florence.

\*Frankford, Sussex County; population, 998. Members and Officers—Daniel Dalrymple, Registrar, Papakating.

Franklin, Bergen County; population, 1,566. Members and Officers—Daniel Van Houten, President, Wyckoff; William J. Packer, Midland Park; Henry P. Winters, Wyckoff; Daniel Snyder, Clerk and Registrar, Midland Park; Dr. W. F. Keating, Inspector, Wyckoff.

Franklin, Gloucester County; population, 2,197. Members and Officers—A. B. Richman, President, Malaga; Thos. S. Downs, Franklinville; John S. Downs, Newfield; W. T. Jones, Clerk, Franklinville; Harry C. Richman, Registrar, Malaga.

Franklin, Hunterdon County; population, 1,105. Members and Officers—E. H. Deats, President, Pittstown; J. H. Trout, Pittstown; J. H. B. Opydycke, Quakertown; Elwood Nixon, Clerk, Quakertown; Dr. Q. E. Snyder, Inspector, Quakertown.

\*Franklin, Somerset County; population, 3,577. Members and Officers—A. Hummer, Registrar, East Millstone.

\*Franklin, Warren County; population, 1,309. Members and Officers—P. B. Butterwick, Clerk, Asbury.

Fredon, Sussex County; population, 462. Members and Officers—Charles E. Roy, President, Newton; Frank Lanterman, Newton; John Roy, Still-water; Jos. E. Huff, Clerk, Newton, R. F. D. No. 1; Dr. E. B. Beatty, Inspector, Newton.

Freehold, Monmouth County; population, 2,474. Members and Officers—Robert N. Senter, President, Freehold; Millard F. Conover, Freehold; John H. Shepherd, Freehold; Louis S. Packard, Freehold; John H. Drum, Freehold; R. V. Lawrence, Clerk and Registrar, Freehold; Dr. Harry W. Ingling, Inspector, Freehold.

Frelinghuysen, Warren County; population, 728. Members and Officers—T. J. Waterfield, President, Johnsonburg; Charles Lewis, Johnsonburg; Adrian L. Cook, Marksboro; W. H. Ackerson, Assessor, Blairstown.

Galloway, Atlantic County; population, 1,876. Members and Officers—C. Bodine Somers, President, Oceanville; C. M. Leeds, Leeds Point; Harry A. Wickes, Egg Harbor City; J. E. Smith, Assessor, Oceanville.

Glassboro, Gloucester County; population, 2,607. Members and Officers—Dr. Chas. S. Heritage, President, Glassboro; W. H. Yenney, Glassboro; Josiah H. Shute, Glassboro; J. T. Abbott, Registrar, Glassboro; I. C. Souder, In-spector, Glassboro.

Gloucester, Camden County; population, 2,300. Members and Officers—John M. Stetser, President, Blackwood; S. S. Batten, Blackwood; Clarence Blackwood, Sicklerville; Dr. J. Anson Smith, Blackwood; Martin Schubert, Clerk and Registrar, Kirkwood.

Green, Sussex County; population, 500. Members and Officers—S. S. Cole-man, President, Tranquility; A. E. Decker, Andover; D. H. Longcor, Newton; I. L. Labar, Clerk, Tranquility; J. C. Clark, M.D., Inspector, Andover.

Greenwich, Cumberland County; population, 1,122. Members and Officers—George L. Watson, President, Greenwich; John Fithian, Greenwich; Isaac D. Brown, Greenwich; J. W. Butler, Clerk and Registrar, Greenwich.

Greenwich, Gloucester County; population, 754. Members and Officers—Henry Munyan, President, Gibbstown; Edward Bates, Gibbstown; Leopold Feger, Gibbstown; Jacob M. Allen, Clerk and Registrar, Gibbstown; Robert Reeves, Inspector, Paulsboro.

Greenwich, Warren County; population, 854. Members and Officers—Geo. E. Hamlen, President, Stewartsville; P. K. Shipman, Stewartsville; John H. Cyphers, Stewartsville; F. W. Curtis, M.D., Stewartsville; William Sherrer, Clerk, Bloomsbury.

\*No report received.

**Haddon, Camden County;** population, 1,009. Members and Officers—Henry I. Wright, President, Westmont; Alfred M. Matthews, Westmont; Albert J. Cline, Westmont; James St. C. Williams, Clerk and Registrar, Westmont; Edward B. Rogers, Inspector, Collingswood.

**Hamilton, Atlantic County;** population, 2,021. Members and Officers—Harrison A. Wilson, President, Mays Landing; Joseph Bauer, Cologne; C. D. Makepeace, Mays Landing; Harry Jenkins, Mays Landing; Thompson G. Hoover, Clerk, Mays Landing; Henry C. James, M.D., Inspector, Mays Landing.

**Hamilton, Mercer County;** population, 5,150. Members and Officers—E. B. Woodward, M.D., President, Yardville; Josiah T. Allinson, Yardville; Joel A. Cranmer, Trenton; Isaac Robbins, Trenton; Charles A. Comp, Yardville; Wm. T. Robbins, Clerk, Hamilton Square; Josiah T. Allinson, Registrar, Yardville; James N. Reed, Inspector, Homedell.

**Hampton, Sussex County;** population, 623. Members and Officers—A. J. Williams, President, Baleville; J. A. Sigler, Halsey; J. R. Ackerson, Halsey; J. W. Thompson, Clerk and Registrar, Blair.

**Hanover, Morris County;** population, 5,294. Members and Officers—Edwin C. Quinby, President, Registrar and Inspector, Whippany; Edward J. Connelly, Whippany; A. M. Webb, Hanover; Wm. Webb, Boonton; C. W. Dennis, Boonton; Wm. B. Davis, Morris Plains.

**Hardwick, Warren County;** population, 370. Members and Officers—Henry Kice, President, Hardwick; D. R. Newman, Blairstown; M. C. Wildrick, Marksboro; Elmer Savercool, Marcus C. Hill, Secretary and Registrar, Blairstown; Dr. H. O. Carhart, Inspector, Blairstown.

**Hardyston, Sussex County;** population, 3,434. Members and Officers—Reeve Harden, President, Hamburg; Watson Little, Franklin Furnace; Jas. McCue, Stockholm; Smith Simpson, Clerk, Hamburg; J. G. Coleman, M.D., Inspector, Hamburg.

**Harmony, Warren County;** population, 1,086. Members and Officers—H. B. Bossard, M.D., President and Inspector, Phillipsburg; Elmer Cruts, Phillipsburg; George M. Amey, Phillipsburg; J. Manning Rush, Stewartsville; Freeman Schuler, Clerk and Registrar, Phillipsburg, R. F. D. No. 2.

**Harrington, Bergen County;** population, 521. Members and Officers—Leonard B. Sneed, President, Northvale; Jas. F. Argenti, Northvale; Chas. F. Semino, Northvale; Emil Kober, Clerk and Registrar, Northvale.

**Harrison, Gloucester County;** population, 1,624. Members and Officers—S. T. Stratton, President, Mullica Hill; W. Justice, Richwood; I. S. White, Mullica Hill; S. F. Ashcraft, M.D., Mullica Hill; Eli Heritage, Clerk, Richwood.

**Hillsboro, Somerset County;** population, 2,247. Members and Officers—Wm. M. Staats, President, Millstone; John Brokaw, Belle Mead; John V. M. Sutphen, Three Bridges; W. H. Merrell, M.D., Secretary, South Branch; John H. Saums, Assessor and Inspector, Somerville.

**Hillsdale, Bergen County;** population, 945. Members and Officers—Albert Mohmking, President, Hillsdale; George W. Saul, Hillsdale; Frank J. Myers, Hillsdale; John W. Kimmouth, Clerk and Registrar, Hillsdale.

**\*Hohokus, Bergen County;** population, 3,107. Members and Officers—James Devine, Jr., Registrar, Mahwah.

**Holland, Hunterdon County;** population, 1,528. Members and Officers—W. R. Saller, President, Milford; Geo. N. Becker, Milford; Calvin Duckworth, Little York; Dr. A. A. Hell, Inspector, Milford; Alonzo Sinclair, Clerk, Milford.

**\*Holmdel, Monmouth County;** population, 1,221. Members and Officers—V. D. Kenney, Secretary and Registrar, Holmdel.

**Hope, Warren County;** population, 1,025. Members and Officers—George A. Henry, President, Great Meadows; E. J. Winters, Hope; Isaiah B. Hopkins, Great Meadows; Lewis C. Fleming, Clerk and Registrar, Townsbury; Walter Storm, M.D., Inspector, Hope.

\*No report received.

**Hopewell, Cumberland County;** population, 1,840. Members and Officers—D. D. Davis, President, Shiloh; E. G. Ayars, Bridgeton; E. D. Perry, Bridgeton; Walter L. Minch, Clerk and Assessor, Shiloh.

**Hopewell Mercer County;** population, 3,209. Members and Officers—Isaac B. Scudder, President, Titusville; Joseph R. Burroughs, Pennington; David S. Hill, Mt. Rose; Chas. H. Hart, Clerk and Registrar, Titusville; Dr. Wm. M. Radcliffe, Inspector, Pennington.

**Howell, Monmouth County;** population, 2,585. Members and Officers—Benj. M. Cooper, President, Lakewood; R. H. Morris, Adelpia; Chas. E. Perry, Farmingdale; James H. Butcher, Clerk and Registrar, Freehold, R. F. D. No. 2; W. P. Havens, M.D., Inspector, Farmingdale.

**\*Hudson County, Hudson County;** population, 449,879. Members and Officers—C. J. Rooney, Clerk, Jersey City.

**Independence, Warren County;** population, 835. Members and Officers—W. H. McCormick, President, Vienna; A. B. Leigh, Great Meadows; Chas. Rusling, Vienna; F. W. Haggerty, M.D., Clerk, Vienna; W. K. Teel, Registrar, Vienna.

**\*Jackson, Ocean County;** population, 1,534. Members and Officers—Geo. C. Hankins, Clerk, Vanhiseville.

**Jefferson, Morris County;** population, 1,259. Members and Officers—Uher Coll, President, Milton; Harvey R. Davenport, Milton; Daniel Davenport, Milton; Charles Chamberlin, Secretary and Registrar, Wharton; Dr. John Walters, Inspector, Wharton.

**Kingwood, Hunterdon County;** population, 1,188. Members and Officers—Stanford Vanderbilt, President, Baptistown; Ralph Teats, Barbartown; Frank Fisher, Kingwood; Howard Dalrymple, Clerk, Baptistown; Samuel J. Snyder, Registrar, Frenchtown; Frank S. Grim, Inspector, Baptistown.

**Knowlton, Warren County;** population, 1,222. Members and Officers—Peter J. Young, President, Hainesburg; Chas. Harris, Delaware; William Gibson, Delaware; Milton De Witt, Secretary and Registrar, Columbia.

**Lacey, Ocean County;** population, 653. Members and Officers—Dr. G. E. Wallace, President and Inspector, Forked River; Geo. Frazee, Forked River; B. F. Holmes, Forked River; A. H. Grant, Forked River; B. F. Matthews, Clerk and Registrar, Forked River.

**Lafayette, Sussex County;** population, 619. Members and Officers—F. M. Pellet, President, Lafayette; John D. Ackerson, Lafayette; Richard D. Snook, Clerk, Lafayette; Dr. J. C. Strader, Inspector, Lafayette.

**\*Lakewood, Ocean County;** population, 4,265. Members and Officers—H. J. Terwilliger, Secretary and Health Officer, Lakewood.

**Landis, Cumberland County;** population, 3,351. Members and Officers—W. F. Sawyer, M.D., President, Vineland; Alfred Crossman, Vineland; Elmer L. Bolles, Vineland; Jos. W. Holt, Vineland; Geo. Geiger, Vineland; W. I. Frost, Vineland; Henry Taylor, Clerk and Registrar, Vineland; J. H. Winslow, M.D., Inspector, Vineland.

**Lawrence, Cumberland County,** population, 1,730. Members and Officers—E. L. Mulford, President, Cedarville; D. W. Sheppard, Cedarville; Peter Johnson, Fairton; Louis M. Hogbin, Clerk, Cedarville; F. B. Sheppard, Registrar, Cedarville.

**Lawrence, Mercer County;** population, 2,043. Members and Officers—John E. Gorden, President, Port Mercer; Wm. Farr, Trenton; John C. Applegate, Princeton; Edmund Dewitt, M.D., Lawrenceville; Frank Pierson, Secretary, Registrar and Inspector, Lawrenceville.

**Lebanon, Hunterdon County;** population, 1,983. Members and Officers—James F. Smith, President, Chagewater; Wm. A. Alpaugh, High Bridge; Wm. T. Worman, Glen Gardner; Geo. H. Castner, Clerk and Registrar, Califon, R. F. D. No. 1.

**Linden, Union County;** population, 1,096. Members and Officers—John P. Winans, President, Linden; John E. Tucker, Elizabeth; George W. Bauer,

\*No report received.

Elizabeth; Frank B. Stimson, Clerk and Registrar, Linden; Wm. T. Day, Inspector, Roselle.

\*Little Egg Harbor, Ocean County; population, 517. Members and Officers—Norwood Parker, Parkertown.

\*Little Falls, Passaic County; population, 3,079. Members and Officers—W. W. Wilson, Clerk, Little Falls.

\*Livingston, Essex County; population, 1,407. Members and Officers—H. H. Haven, Secretary, Livingston.

Lodi, Bergen County; population, 1,061. Members and Officers—Charles Foose, President, Woodridge; Frank Switz, Little Ferry; John Turick, Hackensack; Julius Pries, Clerk, Woodridge.

Logan, Gloucester County; population, 1,528. Members and Officers—Hugh McGlinicy, Sr., President, Swedesboro; Wm. F. Justice, Swedesboro; John H. Shoemaker, Repaupo; S. B. Platt, Clerk and Registrar, Bridgeport.

\*Long Beach, Ocean County; population, 73. Members and Officers—Charles E. Sherborne, Clerk, Long Beach.

\*Lopatcong, Warren County; population, 695. Members and Officers—E. Frank Cline, Registrar, Shimers.

Lower, Cape May County; population, 1,336. Members and Officers—George Dickinson, President, Erma; J. Durell Hoffman, Fishing Creek; John C. Elliott, Cold Spring; J. P. Mackissie, Clerk and Registrar, Cape May City; Dr. W. A. Lake, Inspector, Erma.

Lower Alloways Creek, Salem County; population, 1,220. Members and Officers—L. H. Carll, President, Hancock's Bridge; Isaac Hawn, Canton; Albert M. Carll, Harmersville; F. B. Harris, M.D., Canton; Edward Hancock, Clerk, Hancock's Bridge.

Lower Penns Neck, Salem County; population, 1,327. Members and Officers—Samuel Lecroy, President, Pennsville; Hance Jaquett, Pennsville; David Dixon, Salem; Wm. H. James, M.D., Pennsville; Ellsworth L. Ireland, Clerk and Registrar, Pennsville.

Lumberton, Burlington County; population, 1,683. Members and Officers—Wm. Jones, President, Lumberton; W. C. Parry, M.D., Hainesport; A. E. Haines, Medford; Jacob Walters, Hainesport; E. C. Davis, Clerk and Registrar, Lumberton.

Madison, Middlesex County; population, 1,582. Members and Officers—Frank P. Lamberson, President, Cliffwood; Ambrose Green, Old Bridge; James Fountain, Old Bridge; Ira C. Crandell, M.D., Old Bridge; D. H. Brown, Clerk and Registrar, Old Bridge; E. D. Barker, Inspector, Matawan.

Manalapan, Monmouth County; population, 1,392. Members and Officers—Edward Hendrickson, President, Englishtown; Joseph C. Sutphen, Tennent; Wm. C. Hartshorne, Freehold; A. T. Applegate, M.D., Englishtown; Garret B. Conover, Clerk, Englishtown; W. D. Herbert, Registrar, Englishtown.

Manchester, Ocean County; population, 785. Members and Officers—Chas. Stults, President, Lakehurst; C. Rhoads, Lakehurst; Peter Christofferson, Whittings; Fred Toney, Lakehurst; Harold Pittis, Clerk and Inspector, Lakehurst; Amos Bozarth, Registrar, Lakehurst.

\*Manchester, Passaic County; population, 2,277. Members and Officers—Emil Kuhn, Clerk, Haledon.

\*Mannington, Salem County; population, 1,652. Members and Officers—Jonathan B. Grier, Clerk and Registrar, Salem.

Mansfield, Burlington County; population, 1,493. Members and Officers—G. Frank Harvey, President, Columbus; John B. Townsend, Columbus; Walter Kirby, Columbus; Jos. H. Armstrong, Clerk and Registrar, Columbus; A. H. Patterson, M.D., Inspector, Georgetown.

\*Mansfield, Warren County; population, 1,234. Members and Officers—Jacob Beaty, Clerk, Port Murray.

Mantua, Gloucester County; population, 1,471. Members and Officers—Benj. Sharp, President, Sewell; Edward Kean, Sewell; John Kincard, Sewell; Wm. S. Hurff, Clerk and Registrar, Sewell; E. Z. Hillegas, Inspector, Mantua.

\*No report received.

\*Marlboro, Monmouth County; population, 1,664. Members and Officers—J. D. Ely, M.D., Clerk and Inspector, Marlboro.

\*Matawan, Monmouth County; population, 1,365. Members and Officers—Daniel Martin, Secretary, Matawan.

Maurice River, Cumberland County; population, 2,133. Members and Officers—Charles Champion, President, Dorchester; Charles Williams, Heislerville; Edwin Elliott, Port Elizabeth; Henry Reeves, Jr., Clerk and Registrar, Leesburg.

\*Medford, Burlington County; population, 2,030. Members and Officers—Wm. Potts, Registrar, Medford.

Mendham, Morris County; population, 1,724. Members and Officers—M. M. Connet, President, Brookside; M. S. Burnett, Chester; A. A. Parks, Brookside; Geo. S. Degroot, M.D., Mendham; Alex. Cochran, Clerk, Brookside; F. H. Garrabrant, Registrar, Brookside.

Middle, Cape May County; population, 2,584. Members and Officers—L. T. Garrison, President, Cape May Court House; V. N. Ericsson, Dias Creek; L. M. Swain, Swainton; J. M. Dix, M.D., Cape May Court House; Joseph Camp, Clerk, Registrar and Inspector, Pierces.

Middletown, Monmouth County; population, 5,600. Members and Officers—John N. Johnson, Jr., President, Belford; Daniel W. Vannote, Belford; Wm. H. Naylor, Navesink; John M. West, Middletown; Frank Osborn, Middletown; Henry D. Smith, Clerk, Middletown; Omar Sickles, Registrar, Navesink; Dr. Daniel S. Hendrickson, Inspector, Middletown.

Midland, Bergen County; population, 1,465. Members and Officers—George E. Van Orden, President, Ridgewood; John W. Winters, Ridgewood; Thomas Gardner, Ridgewood; John D. Bogert, Clerk and Registrar, Ridgewood, R. F. D. No. 1; Frank Freeland, M.D., Inspector, Maywood.

Millburn, Essex County; population, 3,182. Members and Officers—Henry S. Acken, President, Millburn; Wellington Campbell, M.D., Short Hills; Ernest L. Smithers, Millburn; J. M. Drake, Secretary and Registrar, Millburn; F. McGee, Inspector, Millburn.

Millstone, Monmouth County; population, 1,432. Members and Officers—S. P. Dey, President, Perrineville; Abijah B. Chamberlin, Perrineville; Geo. M. Davison, Perrineville; Geo. J. Ely, Clerk and Registrar, Cranbury, R. F. D. No. 4; Dr. W. T. McMellen, Inspector, Perrineville.

\*Monroe, Gloucester County; population, 2,519. Members and Officers—John W. McClure, Clerk, Williamstown.

Monroe, Middlesex County; population, 2,023. Members and Officers—Charles A. Morse, President, Cranbury; John D. Butcher, Cranbury; George McDowell, Cranbury; Robt. R. Vandenberg, Clerk and Registrar, Prospect Plains; John L. Suydam, M.D., Inspector, Jamesburg.

Montague, Sussex County; population, 661. Members and Officers—Timothy Shay, President, Hainesville; Jacob McCarty, Port Jervis, N. Y.; James E. Cole, Port Jervis, N. Y.; George McCarty, Clerk and Registrar, Port Jervis, N. Y., R. F. D. No. 1.

Montgomery, Somerset County; population, 1,504. Members and Officers—H. D. Terhune, President, Belle Mead; Henry Duryea, Skillman; A. B. Mosher, M.D., Belle Mead; Jacob Boice, Clerk, Harlingen; C. B. Alshouse, Registrar, Skillman.

Montville, Morris County; population, 1,650. Members and Officers—John Husk, Jr., President, Towaco; Walter A. Young, Montville; John H. Capstick, Montville; Fred A. Van Duyn, Towaco; John M. Tice, Clerk, Montville.

Morris, Morris County; population, 2,660. Members and Officers—Thomas T. Sands, President and Inspector, Morristown; Watson A. Barton, Morris Plains; Lewis E. Clark, Morristown; Edwin F. Arnold, Morristown; J. Paul Jamieson, Clerk and Registrar, Morristown.

Mount Laurel, Burlington County; population, 1,671. Members and Officers—Budd M. Horner, President, Masonville; J. H. Darnell, Masonville; John

\*No report received.

Dugan, Moorestown; Benj. M. Haines, Clerk and Registrar, Moorestown; Dr. J. B. Wintersteen, Inspector, Moorestown.

**Mount Olive, Morris County;** population, 1,098. Members and Officers—George H. Dorland, President, Flanders; George N. Salmon, Flanders; L. M. Teel, Hacketsstown; S. W. Salmon, Clerk, Mount Olive.

**Mullica, Atlantic County;** population, 794. Members and Officers—Jesse R. Abbott, President and Registrar, Nesco; Alex. J. McKeone, Pleasant Mills; Chas. Saalmann, Egg Harbor City; John Mick, Elwood; John T. Irving, Clerk, Elwood; Dr. J. C. Bitler, Inspector, Hammonton.

**Neptune, Monmouth County;** population, 9,357. Members and Officers—Alfred D. Clark, President, Ocean Grove; John F. Mesler, Ocean Grove; R. E. K. Rotheritz, Asbury Park; R. L. Kuder, Ocean Grove; Leonard Hullitt, Bradley Park; Dr. W. A. Robinson, Ocean Grove; Wm. R. O'Brien, Clerk, Registrar and Inspector, Asbury Park.

**\*New Hanover, Burlington County;** population, 960. Members and Officers—Charles Remine, Registrar, Wrightstown.

**New Providence, Union County;** population, 456. Members and Officers—Henry S. Fullerton, President, Scotch Plains; E. B. Oechsner, Scotch Plains; Joseph Kuntz, Berkley Heights; F. G. Johnson, Clerk and Registrar, New Providence; F. W. Wescott, Inspector, Scotch Plains.

**Newton, Sussex County;** population, 4,422. Members and Officers—Warren H. Smith, M.D., President, Newton; Charles S. Steele, Newton; Charles M. Oukes, Newton; John N. Calvin, Newton; Philetus R. Van Horn, Clerk and Registrar, Newton; Israel L. Hallock, Inspector, Newton.

**Northampton, Burlington County;** population, 5,509. Members and Officers—Franklin Hill, President, Mt. Holly; Joseph Elbertson, Mt. Holly; Samuel Cline, Mt. Holly; Benj. Zelly, Mt. Holly; Thomas Nippins, Mt. Holly; W. T. Stewart, Clerk and Registrar, Mt. Holly; Dr. R. H. Parsons, Inspector, Mt. Holly.

**\*North Bergen, Hudson County;** population, 11,134. Members and Officers—Charles J. Morris, Clerk, Weehawken.

**North Brunswick, Middlesex County;** population, 929. Members and Officers—A. A. Voorhees, President, New Brunswick; Wm. Vincent, New Brunswick; Alfred Yorsten, New Brunswick; Isaac Williamson, Clerk, New Brunswick, R. F. D. No. 5; Dr. J. D. Ten Eyck, Inspector, Franklin Park.

**North Hanover, Burlington County;** population, 747. Members and Officers—C. F. Warner, President, Chesterfield; A. F. Poinsett, Jacobstown; R. Rahilly, Wrightstown; Pearson Taylor, Clerk, Wrightstown.

**North Plainfield, Somerset County;** population, 693. Members and Officers—Theo. Leverson, President, Watchung; Benj. Clark, Scotch Plains; Alex. S. Archible, Scotch Plains; Albert Brokaw, Clerk, Bound Brook; A. P. Voorhies, Registrar, Plainfield; Emil Clementz, Inspector, Watchung.

**Ocean, Monmouth County;** population, 1,574. Members and Officers—Chas. J. Smith, President; John R. Jeffrey, John F. Woolley, Walter A. King, Secretary; H. G. Van Note, Registrar, all of Oakhurst.

**Ocean, Ocean County;** population, 409. Members and Officers—J. W. Letts, Jr., President, Waretown; W. B. Wilkins, Waretown; J. R. Stokes, Waretown; Oscar R. Cranmer, Clerk and Registrar, Brookville.

**Oldmans, Salem County;** population, 1,374. Members and Officers—Albert Saylor, President; Wm. Darlington, Jacob J. Hunt, Edwin E. Somers, Clerk and Registrar, Pedricktown.

**Orvil, Bergen County;** population, 752. Members and Officers—L. M. Terhune, President, Waldwick; H. G. Ackerman, Waldwick; A. C. Quackenbush, Waldwick; Charles Pfitzner, Clerk and Registrar, Waldwick.

**\*Overpeck, Bergen County;** population, 2,850. Members and Officers—Wm. H. Hunter, Registrar, Ridgefield Park.

**Oxford, Warren County;** population, 2,964. Members and Officers—L. B. Hoagland, President, Oxford; Hanlon Gardner, Oxford; H. H. Stires, Belvi-

dere; Isaac Snyder, Belvidere; Michael Mountain, Clerk and Registrar, Oxford.

**Pahaquarry, Warren County;** population, 257. Members and Officers—J. C. Depue, President, Dunnfield; Oliver Courtright, Dunnfield; Charles Lutz, Blairstown; Hiram Zimmerman, Registrar, Mill Brook.

**\*Palisade, Bergen County;** population, 1,042. Members and Officers—Wm. Ely, Registrar, North Hackensack.

**\*Palmyra, Burlington County;** population, 2,643. Members and Officers—F. Blackburn, Clerk, Registrar and Inspector, Palmyra.

**\*Passaic, Morris County;** population, 2,163. Members and Officers—J. A. Havey, Clerk, Stirling.

**Pemberton, Burlington County;** population, 1,706. Members and Officers—Walter E. Woolston, President, Mount Holly; Charles Kinsley, Browns Mills; Victor Bush, Pemberton; Barclay Seeds, Registrar, Pemberton.

**\*Pensauken, Camden County;** population, 3,957. Members and Officers—Harry E. Horner, Clerk and Registrar, Merchantville.

**Pequanock, Morris County;** population, 1,674. Members and Officers—Thomas Dodd, President, Lincoln Park; Andrew J. Slingland, Pequanock; Fred'k Ricker, Butler; Alfred Gilland, Clerk and Registrar, Pompton Plains.

**Pilesgrove, Salem County;** population, 1,726. Members and Officers—Samuel A. Ridgway, President, Woodstown; Clement McAllister, Sharpstown; Edgar C. Moore, Woodstown; Geo. H. Kirby, Clerk, Woodstown, R. F. D. No. 1.

**\*Piscataway, Middlesex County;** population, 2,767. Members and Officers—George W. Coriell, Registrar, New Market.

**Pittsgrove, Salem County;** population, 2,514. Members and Officers—Frank Seabrook, President, Centreton; Joshua R. Kandle, Centreton; John V. Miller, Palatine; Geo. Schalick, Clerk and Registrar, Centreton.

**Plumsted, Ocean County;** population, 1,241. Members and Officers—E. E. Erickson, President, New Egypt; James Larkin, New Egypt; Dayton Hopkins, Hornerstown; Geo. Hartshorn, Clerk and Registrar, New Egypt.

**Pohatcong, Warren County;** population, 3,408. Members and Officers—John M. Crouse, President, Finesville; Isaac Hawk, Springtown; John H. Sherrer, Finesville; Isaac Borts, Alpha; Harry E. Boyer, Clerk and Registrar, Springtown.

**Pompton, Passaic County;** population, 2,981. Members and Officers—Edward R. Brown, President, Haskell; Walter C. White, Butler; James H. Vreeland, Midvale; Lavid Beam, Clerk and Registrar, Midvale; D. N. Shippee, M.D., Inspector, Wanaque.

**\*Princeton, Mercer County;** population, 1,144. Members and Officers—J. H. Hult, Clerk, Princeton, R. F. D. No. 3.

**Quinton, Salem County;** population, 1,135. Members and Officers—Dr. Husted, President, Quinton; A. S. Harris, Quinton; Wm. Radle, Quinton; P. Rianear, Quinton; C. S. Bassett, Clerk and Registrar, Quinton.

**Randolph, Morris County;** population, 2,327. Members and Officers—Wm. A. Kinney, President, Mine Hill; Walter S. Hilles, Dover; John F. Griffin, Mine Hill; Geo. W. Crane, Clerk, Dover; Irving G. Bryant, Registrar, Dover.

**Raritan, Hunterdon County;** population, 3,861. Members and Officers—John Kunsman, President, Flemington; George F. Green, Flemington; Joel D. Hellyer, Flemington; W. S. Buchanan, Clerk and Registrar, Flemington; Dr. J. H. Ewing, Inspector, Flemington.

**Raritan, Middlesex County;** population, 2,612. Members and Officers—John J. Cogswell, President, New Brunswick; Peter Lott, Metuchen; Edward Pfeiffer, Fords; Wm. T. Woerner, Clerk and Registrar, New Brunswick, R. F. D. No. 1.

**\*Raritan, Monmouth County;** population, 1,473. Members and Officers—Rufus O. Walling, Clerk, Keyport.

**Readington, Hunterdon County;** population, 2,423. Members and Officers—Dr. F. L. Johnson, President, Stanton; G. C. Conover, White House Station;

\*No report received.

\*No report received.

Andrew Seals, White House Station; C. C. Huff, Three Bridges; J. W. Opie, Clerk and Registrar, Three Bridges.

\***Ridgefield, Bergen County**; population 745. Members and Officers—Thos. F. Mallon, Registrar, Coytesville.

\***Ridgewood, Bergen County**; population, —. Members and Officers.

**Riverside, Burlington County**; population, 3,301. Members and Officers—Edward Schaubenland, President, Riverside; John Leech, Riverside; Henry Taubel, Riverside; Charles Heiss, Clerk and Registrar, Riverside; Dr. Chauncy B. Lambert, Inspector, Riverside.

\***Rivervale, Bergen County**; population, —. Members and Officers—C. H. De Voe, Registrar, Rivervale.

\***Rockaway, Morris County**; population, 5,153. Members and Officers—Thos. Grant, Registrar, Hibernia.

\***Roxbury, Morris County**; population, 2,323. Members and Officers—Theodore F. King, President; Chas. E. King, John Todd, E. W. Kilpatrick, Clerk, Kenvil.

**Saddle River, Bergen County**; population, 2,048. Members and Officers—Geo. Boyce, President, Fair Lawn; Adam Hopper, Fair Lawn; Tennis W. Vreeland, Arcola; Isaac A. Hopper, Clerk and Registrar, Fair Lawn; Dr. Vanderbeck, Inspector, Paterson.

\***Sandyston, Sussex County**; population, 872. Members and Officers—M. D. Hughes M.D., Clerk, Branchville.

**Sayreville, Middlesex County**; population, 4,779. Members and Officers—August Rohde, President, Sayreville; Wm. Burk, Sayreville; Chas. M. Fisher, Sayreville; J. H. Beekman, M.D., Sayreville; Thos. Creamer, Clerk and Registrar, Sayreville; Henry Boyler, Inspector, Sayreville.

**Shamong, Burlington County**; population, 508. Members and Officers—Wm. H. Brown, President, Indian Mills; John W. Crane, John Miller, Mahlon T. Prickitt, Clerk, Registrar and Inspector, Indian Mills.

**Shrewsbury, Monmouth County**; population, 5,502. Membership and Officers—Albert L. Ivins, President and Registrar, Red Bank; Wm. H. Houston, Red Bank; Forman R. Smith, Fair Haven; Abram T. Bennett, Fair Haven; George D. Cooper, Red Bank; John C. Crawford, Tinton Falls; A. C. Harrison, Clerk, Red Bank; Wm. Churchin, Inspector, Fair Haven.

\***Southampton, Burlington County**; population, 1,860. Members and Officers—Chas. G. Naylor, Registrar, Vincentown.

**South Brunswick, Middlesex County**; population, 2,489. Members and Officers—J. H. Stults, President, Dayton; Arthur Turton, Monmouth Junction; H. W. Jefferes, Plainsboro; Wm. Perkins, Clerk, Kingston.

**South Harrison, Gloucester County**; population, 680. Members and Officers—Clayton G. Kirby, President, Mullica Hill; George F. Wilkinson, Swedesboro; Mathew Allen, Harrisonville; D. C. Lippincott, Clerk, Harrisonville; Samuel Ashcraft, Inspector, Mullica Hill.

**South Orange, Essex County**; population, 1,946. Members and Officers—Wm. H. Kemp, President, Maplewood; H. S. Smith, Maplewood; B. B. Ranson, M.D., Maplewood; Wm. A. Greenaway, Hilton; E. R. Arcularius, Clerk, Hilton; Thomas C. Baker, Registrar, Maplewood; Elvia Scott, Inspector, South Orange.

\***Sparta, Sussex County**; population, 1,613. Members and Officers—J. W. Maseker, Clerk and Registrar, Sparta.

**Springfield, Burlington County**; population, 1,323. Members and Officers—Philip N. Hains, President, Burlington; Edward K. West, Juliestown; Howard Letts, Jobstown; Dr. J. E. Dubell, Columbus; John B. Tilton, Clerk and Registrar, Wrightstown, R. F. D. No. 1.

**Springfield, Union County**; population, 1,123. Members and Officers—Robert H. Morrison, President, Springfield; George Parcell, Fred Kenley, Springfield; Lewis T. Terry, Clerk and Registrar, Springfield; D. W. M. Barnes, Inspector, Springfield.

**Stafford, Ocean County**; population, 994. Members and Officers—Joshua Hilliard, M. D., President, Manahawkin; Charles H. Cranmer, Manahawkin;

George F. Pharo, Manahawkin; George A. Cranmer, Cedar Run; John B. Courtney, Clerk, Manahawkin.

**Stillwater, Sussex County**; population, 815. Members and Officers—Alvin Roy, President, Stillwater; Charles A. Lewis, Stillwater; John R. Kice, Stillwater; Dr. E. W. Landes, Stillwater; O. Van Horn, Clerk and Registrar, Stillwater.

**Stow Creek, Cumberland County**; population, 855. Members and Officers—Asa Bitters, President, Roadstown; Charles Ware, Roadstown; Lewis Willis, Bridgeton; Belford M. Bonham, Clerk and Registrar, Shiloh.

**Tabernacle, Burlington County**; population, 462. Members and Officers—J. C. Haines, President, Vincentown; J. C. Crain, Vincentown; Charles H. Alloway, Vincentown; Geo. H. Wisham, Clerk, Vincentown.

**Teaneck, Bergen County**; population, 1,222. Members and Officers—Wm. Bennett, President, Englewood; Robert Stevenson, Englewood; J. W. Ackerman, Hackensack; Peter I. Ackerman, Clerk, Registrar and Inspector, Hackensack.

**Tewksbury, Hunterdon County**; population, 1,815. Members and Officers—Levi M. Hoffmann, Califon; Fred L. Lindabury, Lebanon; Jacob J. Neff, New Germantown; Hezekiah Philhower, Secretary and Registrar, Califon; Francis A. Appar, M.D., Inspector, New Germantown.

**Union, Bergen County**; population, 2,188. Members and Officers—Charles Garland, President, Lyndhurst; Edmund M. Grimes, Lyndhurst; Charles J. White, Lyndhurst; Thos. E. Buckley, Clerk and Registrar, Lyndhurst; Wm. Anderson, Inspector, Lyndhurst.

**Union, Hunterdon County**; population, 923. Members and Officers—Godfrey Emery, President, Jutland; Geo. Smith, Clinton; Edgar Allen, Pattenburg; Morris Stockton, Clerk, Pattenburg.

\***Union, Ocean County**; population, 913. Members and Officers—E. R. Wills, Clerk, Barnegat City.

**Union, Union County**; population, 2,614. Members and Officers—D. H. Beach, President, Union; D. B. Wade, Union; John H. Doremus, Lyons Farnas; D. Hobart Sayre, Clerk, Union.

**Upper, Cape May County**; population, 1,350. Members and Officers—Harry Young, President, Beesleys Point; Washington Van Gilder, Petersburg; Zachariah Townsend, Tuckahoe; Jesse T. Young, Clerk, Beesleys Point; Wildon Shaw, Registrar, Tuckahoe; Randolph Marshall, M.D., Inspector, Tuckahoe.

**Upper Freehold, Monmouth County**; population, 2,002. Members and Officers—Isaac S. Dawes, President, Nelsonville; Joseph Johnston, Allentown; John W. Havens, Cream Ridge; Franklin C. Price, Clerk, Inlaystown; Wm. Quicksell, Registrar, Hornerstown.

**Upper Penns Neck, Salem County**; population, 793. Members and Officers—Jos. H. Clark, President, Penns Grove; Jos. Lloyd, Penns Grove; James Hutchinson, Penns Grove; J. F. Thompson, Clerk and Registrar, Penns Grove; Dr. J. M. Summerill, Inspector, Penns Grove.

**Upper Pittsgrove, Salem County**; population, 1,722. Members and Officers—R. MacFarland, President, Monroeville; Wm. F. Mayhews, Elmer; Charles Driver, Monroeville; George W. Fitch, M.D., Daretown; R. A. Robinson, Clerk and Registrar, Monroeville.

**Vernon, Sussex County**; population, 1,649. Members and Officers—N. A. Vankirk, President, Glenwood; C. L. Giveans, Glenwood; John I. B. Gunderson, Clerk and Registrar, Glenwood.

**Voorhees, Camden County**; population, 1,009. Members and Officers—E. C. Gardner, President, Kirkwood; Wm. A. Westcott, M.D., Berlin; George Riggins, Gibbsboro; Chas. H. Hammel, Marlton; S. H. Gardiner, Clerk, Ashland.

**Wall, Monmouth County**; population, 3,518. Members and Officers—Geo. C. Wilson, President, Belmar; E. C. White, Belmar; S. B. Pearce, Brielle;

## LIST OF SANITARY DISTRICTS.

Dr. W. W. Trout, Spring Lake; Geo. E. Rogers, Clerk, Registrar and Inspector, Belmar.

**Wallpack, Sussex County;** population, 325. Members and Officers—Nicholas Tillman, President, Wallpack Centre; Samuel S. Cole, Wallpack Centre; Daniel S. Smith, Flatbrookville; J. W. Bunnell, Clerk, Bevans.

**Wantage, Sussex County;** population, 2,080. Members and Officers—J. C. House, President, Sussex; Frank Coe, Sussex; Frank Meddaugh, Sussex; Wm. Wright, Sussex; S. M. Parcell, Clerk and Registrar, Sussex; H. D. Vangesebeck, Inspector, Sussex.

**Warren, Somerset County;** population, 974. Members and Officers—John Gunten, President, Martinsville; Adam Sachs, Plainfield; Frank Alletta, Martinsville; E. E. Sage, Clerk, Plainfield, R. F. D. No. 3.

**\*Washington, Bergen County;** population, 382. Members and Officers—Lucas C. Blauvelt, Clerk, Westwood.

**Washington, Burlington County;** population, 568. Members and Officers—James M. Birdsall, President, Green Bank; Thos. K. Sooy, Green Bank; Julius Gerber, Batsto; John R. Koster, Clerk and Registrar, Green Bank.

**Washington, Gloucester County;** population, 1,336. Members and Officers—B. Frank Allen, President, Sewell; G. R. Hurff, Turnersville; Harry Evans, Sewell; Jos. E. Hurff, M.D., Blackwood; C. D. Nicholson, Clerk and Registrar, Turnersville.

**\*Washington, Mercer County;** population, 1,173. Members and Officers—E. K. Cole, Clerk, Windsor.

**Washington, Morris County;** population, 2,021. Members and Officers—John A. Parker, President, German Valley; Fred Apgar, German Valley; Dr. Ed. Sutton, German Valley; G. H. Sliker, Clerk and Registrar, German Valley; Mahlon Van Nest, Inspector, German Valley.

**Washington, Warren County;** population, 1,089. Members and Officers—Wm. Garrison, President, Washington; Oren Perry, Washington; Daniel N. Wyckoff, Washington; Charles B. Smith, M.D., Washington; Samuel Rinehart, Clerk, Washington.

**Waterford, Camden County;** population, 2,713. Members and Officers—Jesse S. C. Heiss, President, Berlin; Chas. O. Perry, Waterford; Xavier Ottinger, Berlin; Chas. D. Heath, Clerk and Registrar, Berlin; Frank O. Stem, Inspector, Berlin.

**Wayne, Passaic County;** population, 2,017. Members and Officers—Geo. W. Colfax, President, Pompton; Wm. H. Birchenough, Paterson; John Berder, Mountainview; Dr. Warren H. Young, Little Falls; Thos. D. Ryerson, Assessor, Wayne.

**\*Weehawken, Hudson County;** population, 8,027. Members and Officers—Emile W. Graunt, Clerk, Weehawken.

**Westampton, Burlington County;** population, 542. Members and Officers—Clarence W. Loveland, President, Mt. Holly; Firman Dubell, Mt. Holly; Wm. H. Austin, Mt. Holly; Hudson B. Haines, Clerk, Mt. Holly; Dr. Elmer D. Prickett, Inspector, Mt. Holly.

**West Amwell, Hunterdon County;** population, 858. Members and Officers—Chas. A. Slack, President, Lambertville; Chas. E. Holcombe, Lambertville; Wm. J. Cane, Lambertville; Geo. H. Carr, Clerk, Lambertville, R. F. D. No. 2; F. W. Larrison, M.D., Inspector, Lambertville.

**West Deptford, Gloucester County;** population, 2,227. Members and Officers—W. R. Gibbs, President, Thorofare; R. M. Plum, Thorofare; Joseph A. Moore, Woodbury; Dr. James Hunter, Westville; James Carter, Clerk and Registrar, Thorofare.

**West Milford, Passaic County;** population, 2,002. Members and Officers—Samuel E. Cotter, President, Echo Lake; Wm. W. Eckart, Newfoundland; Theo. Stickler, Newfoundland; John M. Weaver, Clerk and Registrar, Newfoundland; Dr. D. E. Drake, Inspector, Newfoundland.

**West Windsor, Mercer County;** population, 1,320. Members and Officers—J. R. Wyckoff, President, Princeton Junction; W. S. Grover, Princeton Junction;

Hiram Mount, Edinburg; Frederick S. Cook, Dutch Neck; Clark W. Hutchison, Registrar, Dutch Neck.

**Weymouth, Atlantic County;** population, 900. Members and Officers—Anderson Campbell, President, Tuckahoe; Thos. Bailey, Tuckahoe; R. P. Sheppard, Tuckahoe; F. R. McKeague, Clerk, Tuckahoe; R. Marshall, M.D., Inspector, Tuckahoe.

**\*Willingboro, Burlington County;** population, 658. Members and Officers—Jerome Wills, Secretary and Registrar, Burlington.

**\*Winslow, Camden County;** population, 2,856. Members and Officers—Michael G. Burdsall, Clerk, Tansboro.

**\*Woodbridge, Middlesex County;** population, 10,221. Members and Officers—Anton Kuhlman, Clerk, Port Murray.

**\*Woodland, Burlington County;** population, 413. Members and Officers—W. J. Buzby, Clerk, Chatsworth.

**\*Woolwich, Gloucester County;** population, 1,138. Members and Officers—W. G. Simmons, M.D., Secretary and Inspector, Swedesboro.

\*No report received.

# List of Registrars of Vital Statistics.

## CITIES.

NAME OF PLACE.	NAME OF REGISTRAR.	ADDRESS.
Asbury Park.....	Budd H. Obert.....	Asbury Park.
Atlantic City.....	Alfred T. Glenn.....	Atlantic City.
Bayonne.....	C. J. Rooney.....	Jersey City.
Bloomfield.....	Wm. L. Johnson.....	Bloomfield.
Bordentown.....	H. W. Kunz.....	Bordentown.
Bridgeton.....	Frank L. Hewitt.....	Bridgeton.
Burlington.....	Thos. S. Mooney.....	Burlington.
Camden.....	L. V. Bradley.....	Camden.
Cape May.....	John W. Thompson.....	Cape May.
Dover.....	J. H. C. Hunter.....	Dover.
East Orange.....	Lincoln E. Rowley.....	East Orange.
Egg Harbor.....	Wm. Morgenweck, Jr.....	Egg Harbor.
Elizabeth.....	John F. Kenah.....	Elizabeth.
Englewood.....	Robert Jamieson.....	Englewood.
Garfield.....	L. H. Heinzman.....	Garfield.
Gloucester City.....	John J. Mannion.....	Gloucester City.
Hackensack.....	Wm. P. Ellery.....	Hackensack.
Hoboken.....	Joseph Tucker.....	Hoboken.
Irvington.....	Mahlon Stockman.....	Irvington.
Jersey City.....	Joseph A. Carlon.....	Jersey City.
Kearney.....	Charles Schiller.....	Kearney.
Lambertville.....	James H. Reynolds.....	Lambertville.
Long Branch.....	E. B. Blaisdell.....	Long Branch.
Millville.....	L. H. Hogate.....	Millville.
Montclair.....	Chester H. Wells.....	Montclair.
Morristown.....	Clifford Mills.....	Morristown.
Newark.....	James F. Connelly.....	Newark.
New Brunswick.....	James A. Morrison.....	New Brunswick.
Orange.....	Willett B. Gano.....	Orange.
Passaic City.....	George F. Grear.....	Passaic.
Paterson.....	Charles S. Gall.....	Paterson.
Perth Amboy.....	Wilbur La Roe.....	Perth Amboy.
Phillipsburg.....	Frank Kneedler.....	Phillipsburg.
Plainfield.....	H. O. Mattinson.....	Plainfield.
Princeton.....	W. B. Howe.....	Princeton.
Rahway.....	Charles H. Lambert.....	Rahway.
Red Bank.....	James H. Sickles.....	Red Bank.
Salem.....	Clinton Bowen.....	Salem.
South Amboy.....	F. E. DeGraw.....	South Amboy.
Summit.....	Dr. J. E. Rowe.....	Summit.
Town of Union.....	C. J. Rooney.....	Jersey City.
Trenton.....	Thomas B. Holmes.....	Trenton.
Westfield.....	C. W. Harden.....	Westfield.
West Hoboken.....	C. J. Rooney.....	Jersey City.
West New York.....	C. J. Rooney.....	Jersey City.
West Orange.....	B. S. Williams.....	West Orange.
Woodbury.....	Arthur Starr.....	Woodbury.

## BOROUGHES.

NAME OF PLACE.	NAME OF REGISTRAR.	ADDRESS.
Allendale.....	J. H. Mattinson.....	Allendale.
Allenhurst.....	G. B. Cade.....	Allenhurst.
Allentown.....	W. E. Forsythe.....	Allentown.
Alpine.....	L. H. Tavernier.....	Alpine.
Andover.....	S. H. Willson.....	Andover.
Anglesea.....	W. E. Young.....	Anglesea.

## BOROUGH—Continued.

NAME OF PLACE.	NAME OF REGISTRAR.	ADDRESS.
Atlantic Highlands.	Thomas J. Emery.	Atlantic Highlands.
Audubon.	Andi Benneter.	Audubon.
Avalon.	Charles B. Kates.	Avalon.
Avon.	H. M. Dolan.	Avon-by-the-Sea.
Barnegat City.	James V. Jones.	Barnegat City.
Bay Head.	Julius Foster.	Bay Head.
Beach Haven.	Thomas A. Gavin.	Beach Haven.
Belmar.	Charles O. Hudnut.	Belmar.
Bergenfield.	John C. Huyler.	Bergenfield.
Beverly.	Chas. J. Parsons.	Beverly.
Bloomsbury.	William D. Little.	Bloomsbury.
Bogota.	Harlan P. Ross.	Bogota.
Bound Brook.	Charles McNabb.	Bound Brook.
Bradley Beach.	C. F. Burney.	Bradley Beach.
Branchville.	M. D. Hayward.	Branchville.
Brigantine.	E. R. Smith.	Brigantine.
Brooklyn.	C. F. Muller.	Lake Hopatcong.
Butler.	Allen Looker, Jr.	Butler.
Caldwell.	J. J. Van Orman.	Caldwell.
Cape May Point.	L. Miller.	Cape May Point.
Carlstadt.	Herman Foth.	Carlstadt.
Chatham.	D. H. Crawford.	Chatham.
Chesterhurst.	John G. Bevan.	Chesterhurst.
Clayton.	C. F. Fisher, M.D.	Clayton.
Cliffside Park.	Jean H. Raas.	Cliffside.
Clinton.	George A. Hall.	Clinton.
Closter.	Alfred Anderson.	Closter.
Collingswood.	H. B. Earnest.	Collingswood.
Cresskill.	George Y. Allaire.	Cresskill.
Deal.	H. D. Harris.	Deal.
Delford.	H. A. Bingham.	Oradell.
Demarest.	Edward J. Carr.	Demarest.
Dumont.	E. S. Clarke.	Dumont.
Dunellen.	Charles A. Coriell.	Dunellen.
East Newark.	C. J. Rooney.	Jersey City.
East Rutherford.	M. F. Onderdonk.	East Rutherford.
Edgewater.	John R. Towle.	Edgewater.
Elmer.	Hiram Van Meter.	Elmer.
Englewood Cliffs.	John G. Ropes.	Coytesville.
Englishtown.	E. T. Reid.	Englishtown.
Essex Fells.	T. Byrne Ivy.	Essex Fells.
Etna.	H. I. Angell.	Etna.
Fairview.	Gustav Halstern.	Fairview.
Farmwood.	Samuel W. McAneny.	Farmwood.
Farmingdale.	Frank P. Van Note.	Farmingdale.
Fieldsboro.	George W. Carman.	Fieldsboro.
Florham Park.	Henry W. Young.	Florham Park.
Folsom.	John C. Eby.	Folsom.
Fort Lee.	Robert H. Morrow.	Coytesville.
Freehold.	Alonzo Brower.	Freehold.
Frenchtown.	W. W. Rogers.	Frenchtown.
Garwood.	W. R. Conover.	Garwood.
Glen Ridge.	Clarence Place.	Glen Ridge.
Glen Rock.	J. B. Christopher.	Ridgewood.
Haddonfield.	Wm. H. Harrison.	Haddonfield.
Haddon Heights.	Wm. H. Key.	Haddon Heights.
Haledon.	Edward Pries.	Haledon.
Harrington Park.	C. E. Ekerson.	Harrington Park.
Hasbrouck Heights.	W. F. De Voe.	Hasbrouck Heights.
Haworth.	Henry F. Copeland.	Haworth.
Hawthorne.	W. E. Thompson.	Hawthorne.
Helmetta.	Edward M. Clemons.	Helmetta.
High Bridge.	P. H. Murray.	High Bridge.
Highlands.	Calvin Parker.	Highlands.
Highland Park.	Charles Nourse.	New Brunswick.
Hightstown.	Frank V. Jemison.	Hightstown.
Holly Beach.	E. Yenney.	Holly Beach.
Hopatcong.	Theo. A. K. Gessler.	Landing.
Hopewell.	Robert Zulaw.	Hopewell.
Island Heights.	John Simpson.	Island Heights.
Jamesburg.	William H. Brooks.	Jamesburg.

## BOROUGH—Continued.

NAME OF PLACE.	NAME OF REGISTRAR.	ADDRESS.
Junction.	Thomas J. Raber.	Junction.
Kenilworth.	Chas. Knudson.	Kenilworth.
Lavalette.	A. G. Fischer.	Lavalette.
Leonia.	H. M. Thompson.	Leonia.
Linden.	Jos. B. McDonagh.	Linden.
Linwood.	James Farish.	Linwood.
Little Ferry.	Louis Brauer.	Little Ferry.
Lodi.	Jacob Van Hook.	Lodi.
Longport.	E. F. Cook.	Longport.
Madison.	S. Fred Burnet.	Madison.
Manasquan.	Robert M. Marks.	Manasquan.
Matawan.	Wm. A. Rodgers.	Matawan.
Maywood.	G. M. Fetzer.	Maywood.
Mendham.	J. D. Lindsley.	Mendham.
Merchantville.	Wm. B. Stewart.	Merchantville.
Metuchen.	Dr. A. L. Ellis.	Metuchen.
Midland Park.	Chas. B. Williams.	Midland Park.
Millstone.	H. Tomlinson.	Millstone.
Milltown.	Robert A. Harkins.	Milltown.
Monmouth Beach.	Jesse W. Potter.	Monmouth Beach.
Montvale.	John B. Hering.	Long Branch.
Mount Arlington.	Cyrus E. Cook.	Montvale.
Mountainside.	Robert Lang.	Mt. Arlington.
Mount Tabor.		Mountainside.
National Park.	Wm. P. Abdill.	National Park.
Netcong.	Geo. T. Keech.	Netcong.
New Providence.	Wm. Woodruff.	New Providence.
North Arlington.	H. C. Baylis.	North Arlington.
North Caldwell.	Fred L. Baldwin.	Caldwell.
Northfield City.	E. C. Duberson.	Bakersville.
North Haledon.	Samuel Clowes.	Haledon.
North Plainfield.	A. A. H. Dundon.	Plainfield.
North Spring Lake.	F. M. Hunt.	Spring Lake Beach.
Northvale.	Emil Kober.	Northvale.
Norwood.	Paul Luebker.	West Norwood.
Nutley.	Henry M. Whitfield.	Nutley.
Oakland.	W. B. Romaine.	Oakland.
Oaklyn.	Emil C. Hessert.	Oaklyn.
Ocean City.	T. Lee Adams.	Ocean City.
Old Tappan.	R. B. Haring.	Tappan, N. Y.
Orvil.	Francis C. Kopp.	Hobokus.
Palisades Park.	S. Wells.	Palisades Park.
Park Ridge.	Thos. G. Forbes.	Park Ridge.
Paulsboro.	Jacob Ballinger.	Paulsboro.
Pemberton.	J. J. Brander.	Pemberton.
Pennsauken.	Joseph J. Sunn.	Pennsauken.
Pennsgrove.	Dr. C. P. Lumms.	Pennsgrove.
Pitman Grove.	Dr. C. B. Phillips.	Pitman Grove.
Pleasantville.	Thomas F. Crawford.	Pleasantville.
Point Pleasant.	J. Lee Conover.	Point Pleasant.
Pompton Lakes.	H. B. Wells.	Pompton Lakes.
Port Republic City.	Clark A. Johnson.	Port Republic.
Prospect Park.	Jacob Doebe.	Paterson.
Ramsey.	Daniel S. Wanamaker.	Ramsey.
Raritan.	Geo. H. Brightbill.	Raritan.
Ridgefield.	S. V. R. Martling.	Ridgefield.
Riverside.	J. H. Weston.	Riverside.
Riverton.	Jacob G. Cottrell.	Riverton.
Rockaway.	Wm. A. Parliaman.	Rockaway.
Rocky Hill.	A. C. Shirm.	Rocky Hill.
Rosevelt.	C. C. Sheridan.	Carteret.
Roselle.	J. F. Ostrander.	Roselle.
Roselle Park.	Wm. Morris.	Roselle Park.
Roseland.	Everett Booth.	Roseland.
Rumson.	V. T. M. Buckler.	Rumson.
Rutherford.	W. T. M. Buckler.	Rutherford.
Saddle River.	James L. Ackerman.	Saddle River.
Seabright.	James P. Armstrong.	Seabright.
Sea Isle City.	W. H. Hambleton.	Sea Isle City.
Seaside Park.	Dr. J. B. Wood.	Seaside Park.



BOROUGH—Continued.

NAME OF PLACE.	NAME OF REGISTRAR.	ADDRESS.
Sacausus.....	C. J. Rooney.....	Jersey City.
Somers Point.....	George Middleton.....	Somers Point.
South Atlantic City.....	Charles Hart.....	South Atlantic City.
South Bound Brook.....	Jas. P. Hoffman.....	South Bound Brook.
South Cape May.....		South Orange.
South Orange.....	A. C. Benedict.....	South River.
South River.....	J. C. Browne.....	Spring Lake Beach.
Spring Lake.....	D. H. Hills.....	Stanhope.
Stanhope.....	C. E. Herrick.....	Stockton.
Stockton.....	F. E. Rockefeller.....	Sussex.
Sussex.....	Chas. E. Willson.....	Swedesboro.
Swedesboro.....	Wm. H. Rieger.....	Tenafly.
Tenafly.....	J. B. W. Lansing, M.D.....	Paterson.
Totowa.....	Wilbur DeMott.....	Tuckerton.
Tuckerton.....	T. Wilmer Speck.....	Allendale.
Upper Saddle River.....	Henry Zabriskie.....	Verona.
Ventnor City.....	Edward Guion, M.D.....	Atlantic City.
Verona.....	C. S. Simonson.....	Verona.
Vineand.....	Dr. C. M. Gray.....	Vineland.
Wallington.....	James Brennan.....	Wallington.
Washington.....	A. J. Craft.....	Washington.
Wenonah.....	Jesse W. English.....	Wenonah.
West Caldwell.....	C. C. Francisco.....	Caldwell.
West Cape May.....	Theo. W. Reeves.....	Eldredge.
West Long Branch.....	A. D. Van Note.....	West Long Branch.
Westwood.....	N. Cleveland.....	Westwood.
Wharton.....	Wm. H. Force.....	Wharton.
Wildwood.....	Otto C. Kremke.....	Wildwood.
Woodbine.....	Fred Schmidt.....	Woodbine.
Woodcliff.....	G. J. Wortendyke.....	Woodcliff.
Wood Lynne.....	F. G. Muggleworth.....	Wood Lynne.
Wood Ridge.....	F. W. Lehmann.....	Wood Ridge.
Woodstown.....	Wm. B. Foster.....	Woodstown.

TOWNS.

NAME OF PLACE.	NAME OF REGISTRAR.	ADDRESS.
Absecon.....	Samuel Johnson.....	Absecon.
Belvidere.....	U. G. Puroell.....	Belvidere.
Boonton.....	Harry Gordon.....	Boonton.
Guttenberg.....	C. J. Rooney.....	Jersey City.
Hackettstown.....	A. G. Boettiger.....	Hackettstown.
Hammoncton.....	Dr. J. C. Bitler.....	Hammoncton.
Somerville.....	W. R. Sutphen.....	Somerville.

VILLAGES.

NAME OF PLACE.	NAME OF REGISTRAR.	ADDRESS.
Ridgefield Park.....	C. A. Knox.....	Ridgefield Park.
Ridgewood.....	J. B. Hopper.....	Ridgewood.

TOWNSHIPS.

NAME OF PLACE.	NAME OF REGISTRAR.	ADDRESS.
Arquackanonk.....	Richard Berry.....	Clifton.
Alexandria.....	John C. Wilson.....	Everettstown.
Allamuchy.....	Geo. A. Jilson.....	Allamuchy.
Alloway.....	Wm. E. Simpkins.....	Elmer.
Andover.....	William Huff.....	La Fayette.
Atlantic.....	Frank E. Heyer.....	Colt Neck.
Bass River.....	Edward E. Cramer.....	New Gretna.
Bedminster.....	W. D. Vanderbeck.....	Gladstone.
Belleville.....	H. W. Underwood.....	Belleville.
Berkley.....	Devine Butler.....	Bayville.
Bernards.....	Jos. E. Buck.....	Bernardsville.
Bethlehem.....	G. C. Lott.....	Junction.
Beverly.....	Jos. B. Carter.....	Delanco.
Blairstown.....	Jos. A. Dugan.....	Vail.
Boonton.....	E. H. Siddle.....	Boonton.
Bordentown.....	Wm. H. Haines.....	Bordentown.
Branchburg.....	A. McCullough.....	North Branch Depot.
Brick.....	J. H. Harvey.....	West Pt. Pleasant.
Bridgewater.....	B. T. Conkling.....	Somerville.
Buena Vista.....	Alfred Pennock, Sr.....	Vineland.
Burlington.....	Thos. B. Gandy.....	Burlington.
Byram.....	John N. Woolston.....	Sparta.
Caldwell.....	Theo. Vincent.....	Caldwell.
Cedar Grove.....	John J. Vreeland.....	Cedar Grove.
Centre.....	John H. Jackson.....	Magnolia.
Chatham.....	J. H. Behout.....	New Providence.
Chester (Bur.).....	George W. Heaton.....	Moorestown.
Chester (Mor.).....	Abram Tiger.....	Chester.
Chesterfield.....	Wm. Wallace.....	Crosswicks.
Cinaminson.....	Thos. E. Stebbins.....	Falmyra.
Clark.....	Wm. J. Thompson.....	Railway.
Clementon.....	George W. Evans.....	Lindenwold.
Clinton.....	Bergen B. Berkaw.....	Annapdale.
Commercial.....	Walter C. Riggin.....	Port Norris.
Cranbury.....	A. M. Davison.....	Cranbury.
Cranford.....	F. W. Swackhamer.....	Cranford.
Deerfield.....	E. R. Parvin.....	Deerfield Street.
Delaware (Cam.).....	William Graf.....	Haddonfield.
Delaware (Hun.).....	David L. Holcombe.....	Lambertville.
Delray.....	George Frady.....	Riverside.
Dennis.....	I. S. Townsend.....	Clermont.
Deptford.....	C. C. Headley.....	Westville.
Dover.....	Thomas B. Irons.....	Tom's River.
Downe.....	S. Campbell.....	Newport.
Eagleswood.....	E. F. Cramer.....	West Creek.
Eastampton.....	Chas. F. Holzbauer.....	Smithville.
East Amwell.....	Jos. A. Snook.....	Rileville.
East Brunswick.....	Henry Warnsdorfer.....	New Brunswick.
East Greenwich.....	J. C. Dawson.....	Mickleton.
East Windsor.....	S. L. Mount.....	Etra.
Eatontown.....	Douglas Riddle.....	Oceanport.
Egg Harbor.....	George S. Winner.....	Scullville.
Elk.....	Samuel L. Seran.....	Aura.
Elmhurst.....	Charles P. Farnkopf.....	Salem.
Evesham.....	Wm. F. Powell.....	Marion.
Ewing.....	Wm. H. Cadwallader.....	Trenton.
Fairfield.....	James B. Mulford.....	Fairton.
Fanwood.....	Geo. H. Johnston.....	Scotch Plains.
Florence.....	Byron Carty.....	Florence.
Frankford.....	Daniel Dalrymple.....	Papaking.
Franklin (Ber.).....	Daniel Snyder.....	Midland Park.
Franklin (Glo.).....	H. C. Richman.....	Malaga.
Franklin (Hun.).....	Elwood Nixon.....	Quakertown.
Franklin (Som.).....	A. Hummer.....	East Millstone.
Franklin (War.).....	P. B. Butterwick.....	Asbury.
Fredon.....	Joseph E. Huff.....	Newton.
Freehold.....	R. V. Lawrence.....	Freehold.
Frelinghuysen.....	W. H. Ackerson.....	Blairstown.
Galloway.....	J. E. Smith.....	Oceanville.
Glassboro.....	J. T. Abbott.....	Glassboro.
Gloucester.....	Martin Schuber.....	Kirkwood.
Green.....	Irving L. Labar.....	Franklinville.

TOWNSHIPS—Continued.

TOWNSHIPS—Continued.

NAME OF PLACE.	NAME OF REGISTRAR.	ADDRESS.
Greenwich (Cum.)	J. W. Butler	Orhelo.
Greenwich (Glo.)	Jacob M. Allen	Gibbstown.
Greenwich (War.)	Wm. Sherrer	Bloomsbury.
Haddon.	James S. Williams	Westmont.
Hamilton (Atl.)	Harry Jenkins	Marys Landing.
Hamilton (Mer.)	J. T. Allison	Yardville.
Hampden.	John W. Thompson	Blair.
Hanover.	Edwin C. Quinby	Whippany.
Hardwick.	Marcus C. Hill	Blairstown.
Hardyston.	Smith Simpson	Hamburg.
Harmony.	Freeman Schuler	Rocksburg.
Harrison.	Emil Kert	Northvale.
Hillsboro.	Eli Heritage	Richwood.
Hillsdale.	J. H. Saums	Someville.
Hohokus.	John W. Kinmouth	Hillsdale.
Holland.	James Devine	Mahwah.
Holmdel.	H. E. Vansyckel	Milford.
Hope.	V. D. Kenney	Holmdel.
Hopewell (Cum.)	L. C. Fleming	Townsbury.
Hopewell (Mer.)	Walter L. Minch	Shoh.
Howell.	Charles H. Hart	Tittsville.
Independence.	James H. Butcher	Vienna.
Jackson.	W. K. Teel	Jackson's Mills.
Jefferson.	W. S. Hendrickson	Woolport.
Kingwood.	Charles Chamberlain	Flemington.
Knowlton.	Samuel J. Snyder	Columbia.
Lacey.	Milton E. Witt	Forked River.
Lafayette.	B. F. Matthews	Lafayette.
Lakewood.	J. C. Strader, M.D.	Lakewood.
Landis.	H. J. Terwilliger	Vineland.
Lawrence (Cum.)	Henry Taylor	Cedarvale.
Lawrence (Mer.)	Furman B. Shepard	Lawrenceville.
Lebanon.	Frank Pierson	Calton.
Linden.	Geo. H. Castner	Linden.
Little Egg Harbor.	Frank B. Stimson	Tuckerton.
Little Falls.	Norwood Parker	Little Falls.
Livingston.	W. W. Wilson	Roseland.
Lodi.	George E. De Camp	Wood Ridge.
Logan.	Julius Pries	Bridgeton.
Long Beach.	A. H. Platt	Beach Haven.
Lopatacong.	A. H. T. Rier	Shimers.
Lower.	E. Frank Kline	Cape May.
L. Always Creek.	J. P. Mackisic	Hancocks's Bridge.
Lower Penn's Neck.	Edward Hancock	Sensenville.
Lumberton.	E. L. Irelan	Lumberton.
Madison.	E. S. Davis	Old Bridge.
Manalapan.	D. H. Brown	Englishtown.
Manchester (Ocean).	W. D. Herbert	Lakehurst.
Manchester (Pas.)	Amos Bozarth	Haledon.
Mannington.	Emil Kubn	Salem.
Mansfield (Bur.)	Clark Pettit	Columbus.
Mansfield (War.)	Jos. H. Armstrong	Oxford.
Mantua.	J. P. Frome	Sewell.
Marlboro.	Wm. S. Hurff	Englishtown.
Matawan.	W. C. McElwaine	Matawan.
Maurice River.	Richard Heuser	Leesburg.
Medford.	Henry Reeves, Jr.	Medford.
Mendham.	Wm. M. Potts	Brookside.
Middle.	F. H. Garrabrant	Pierce.
Middletown.	Joseph Camp	Navesink.
Midland.	Omaz Sicles	Ridgewood.
Milburn.	John D. Bogert	Milburn.
Millstone.	John M. Drake	Crabtree.
Monroe (Glo.)	George J. Ely	Williamstown.
Monroe (Mid.)	John W. McClure	Prospect Plains.
Montague.	R. R. Vandenbergh	Port Jervis, N. Y.
Montgomery.	George McCarty	Belle Mead.
Montville.	C. B. Allhouse	Pine Brook.
Morris.	Fred Van Duyne	Morristown.
Mount Laurel.	Thos. T. Sands	Moorestown.
Mount Olive.	Benj. M. Haines	Mount Olive.
	S. W. Salmon	

NAME OF PLACE.	NAME OF REGISTRAR.	ADDRESS.
Mullica.	J. R. Abbott	Nesco.
Neptune.	Wm. R. O'Brien	Asbury Park.
New Hanover.	Charles Remine	Wrightstown.
New Providence.	P. C. Johnson	New Providence.
Newton.	P. H. Van Horn	Newton.
Northampton.	Walter T. Stewart	Moum Holly.
North Bergen.	C. J. Rooney	Jersey City.
North Brunswick.	I. V. Williamson	New Brunswick.
North Hanover.	Pearson Taylor	Wrightstown.
Ocean (Mon.).	A. P. Voorhies	Plainfield.
Ocean (Ocean).	Harry G. Van Note	Oakhurst.
Oldmans.	Oscar Cramer	Waretown.
Orvil.	Edwin E. Somers	Pedricktown.
Overpeck.	Charles Pitzer	Waldwick.
Oxford.	Wm. H. Hunter	Ridgeland Park.
Pahaquarry.	Michael Mountain	Oxford.
Palisades.	Hiram Zimmerman	Millbrook.
Palmyra.	Walter Thomas	New Milford.
Passaic.	J. A. Harvey	Palmyra.
Pemberton.	Barclay Seeds	Stirling.
Pensauken.	Harry E. Horner	Famborn.
Pequanock.	Alfred Gilland	Merchantville.
Pilesgrove.	Geo. W. Corral	Pompton Plains.
Piscataway.	George Shalik	Woodstown.
Pittsgrove.	George Hartshorne	New Market.
Plumsted.	Harry E. Boyer	Centerville.
Pohatcong.	David Beasler	New Egypt.
Pompton.	Charles P. Gulick	Carpentersville.
Princeton.	Chas. S. Bassett	Midvale.
Quinton.	I. G. Bryant	Kingston.
Randolph.	Wm. S. Buchanan	Quinton.
Raritan (Mon.).	Wm. T. Woerner	Dover.
Raritan (Mid.).	W. C. Smith	Flemington.
Raritan (Hun.).	John W. Opie	New Brunswick.
Readington.	Thos. F. Mallon	Keyport.
Ridgefield.	J. B. Hopper	Three Bridges.
Ridgewood.	Charles Heiss	Coytesville.
Riverside.	C. H. De Voe	Ridgewood.
Rivervale.	Thos. F. Delancy	Riverside.
Rockaway.	E. W. Kilpatrick	Rivervale.
Roxbury.	Isaac A. Hopper	Hillman.
Saddle River.	W. H. Van Sickle	Kenvil.
Sandyston.	Thos. Cresner	Fair Lawn.
Sayreville.	Mahlon Prickett	Bevans.
Shamong.	Albert L. Ivins	Parlin.
Shrewsbury.	Chas. G. Naylor	Indian Mills.
Southampton.	D. C. Lippincott	Red Bank.
South Brunswick.	Thos. C. Baker	Vincetown.
South Harrison.	John W. Maseker	Princeton.
South Orange.	John B. Tilton	Harrisonville.
Sparta.	Lewis T. Terry	Maplewood.
Springfield (Bur.).	John B. Conaway	Sparta.
Springfield (Union).	Obadiah Van Horn	Wrightstown.
Stafford.	B. M. Bonham	Springfield.
Stillwater.	George H. Wisham	Manahawkin.
Stow Creek.	Peter J. Ackerman	Stillwater.
Tabernacle.	Hezekiah Philhower	Roadstown.
Teaneck.	Thos. F. Buckley	Vincetown.
Tewksbury.	Morris Stockton	Teaneck.
Union (Ber.).	C. H. Brandt	Calton.
Union (Hun.).	D. H. Saxe	Lyndhurst.
Union (Ocean).	W. S. Shaw	Pattenburg.
Union (Union).	Wm. Quicksill	Barnegat.
Upper.	J. Ford Thompson	Union.
Upper Freehold.	R. A. Robinson	Tuckahoe.
Upper Penn's Neck.	John Gunderson	Horners-town.
Upper Pittsgrove.	Vernon.	Pennsgrove.
Vernon.	Thos. T. Sands	Monroeville.
Voorhees.	Benj. M. Haines	Glenswood.
Wall.	George E. Rogers	Blairnd.
Wallpack.	J. W. Bunnell	Belmar.
		Bevans.

## TOWNSHIPS—Continued.

NAME OF PLACE.	NAME OF REGISTRAR.	ADDRESS.
Wantage.....	S. M. Parcell.....	Sussex.
Warren.....	Edmund E. Sage.....	Gillette.
Washington (Ber.).....	Paul C. Schultz.....	Westwood.
Washington (Bur.).....	J. R. Koster.....	Green Bank.
Washington (Glo.).....	C. D. Nicholson.....	Turnersville.
Washington (Mer.).....	C. N. Hutchinson.....	Robbinsville.
Washington (Mor.).....	Geo. H. Sliker.....	Pleasant Grove.
Washington (War.).....	Samuel Rinehart.....	Washington.
Waterford.....	Charles D. Heath.....	Berlin.
Wayne.....	Thos. D. Ryerson.....	Wayne.
Weshawken.....	C. J. Rooney.....	Jersey City.
Westampton.....	Hudson B. Haines.....	Mount Holly.
West Anwell.....	George H. Carr.....	Lambertville.
West Deptford.....	James Carter.....	Thorofare.
West Milford.....	John M. Weaver.....	Newfoundland.
West Windsor.....	C. W. Hutchinson.....	Dutch Neck.
Weymouth.....	F. R. McKeague.....	Tuckahoe.
Willingboro.....	W. W. Vansciver.....	Beverly.
Winslow.....	Joseph Graham.....	Cedar Brook.
Woodbridge.....	Peter K. Edgar.....	Woodbridge.
Woodland.....	Andrew Bozarth.....	Chatsworth.
Woolwich.....	H. C. Howey.....	Swedesboro.

## List of Coroners in New Jersey.

Atlantic County—William J. Dubler, Chas. Cunningham, Emanuel Southeimer.  
 Bergen County—Willis W. Curry, Cornelius A. DeMund, William H. Tracy.  
 Burlington County—Barclay Seeds, W. Herman Bisbing, William Grobler.  
 Camden County—William H. Thompson, Wendell P. Wingender, Frank B. Cook, Paul N. Litchfield.  
 Cape May County—Nathan A. Cohen, Wilson A. Lake, Mark Lake.  
 Cumberland County—John S. Halsey, Ralph A. Charlesworth, Henry Maier.  
 Essex County—Richard M. Pearse, John Frank, Edwin Steiner.  
 Gloucester County—James Hunter, Jr., J. Gaunt Edwards, Vernon E. DeGroof.  
 Hudson County—Robert Schlemm, James McLaughlin, Mathew J. Boylan.  
 Hunterdon County—John D. Stockton, Patrick A. Cane, Jacob A. Naught.  
 Mercer County—Edmund R. Nutt, Daniel V. Bower, William M. Disbrow, Frank K. Grove.  
 Middlesex County—Jesse H. Beekman, Fredinand Garretson, John V. Hubbard.  
 Monmouth County—John W. Flock, Robert M. Purdy, John I. Sickles.  
 Morris County—George Hitchens, Francis H. Glazebrook, George L. Johnson.  
 Ocean County—John Hagaman, R. Augustus Crane, Harry C. Shoemaker.  
 Passaic County—Gordon G. Walton, Thos. A. Clay, Arthur A. Legg.  
 Salem County—J. D. Torton, George W. Fitch, Walter D. Wiggins.  
 Somerset County—F. A. Wild, Mahlon C. Smalley, Joseph A. Herbermann.  
 Sussex County—Albert N. Jacob, Jephth C. Clark, Roswell McPeck.  
 Union County—Charles B. Lufburrow, William H. Donaldson, Adolph Degenring.  
 Warren County—Edward W. Sharp, Michael Kenney, Charles N. Shrope.

## List of County Physicians in New Jersey.

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Atlantic County—L. R. Souder, M.D.  
Camden County—W. S. Jones, M.D.  
Cumberland County—E. L. Dismant, M.D.  
Essex County—Daniel Elliott, M.D.  
Hudson County—Charles B. Converse, M.D.  
Mercer County—Frank G. Scammell, M.D.  
Middlesex County—J. L. Suydam, M.D.  
Passaic County—Robert R. Armstrong, M.D.  
Salem County—Henry Jackson, M.D.  
Somerset County—W. H. Long, M.D.  
Union County—F. W. Westcott, M.D.  
Warren County—L. B. Hoagland, M.D.

## Report of the Division of Medical and Sanitary Inspection.

*To the Board of Health of the State of New Jersey:*

GENTLEMEN—I have the honor to submit herewith the following report of the division of Medical and Sanitary Inspection for the year ending October 31, 1908.

The scope of the work which is under the supervision of this Division is clearly defined by the original law of 1887, creating the State Board of Health, and includes the making of sanitary investigations as to the causes of diseases and epidemics; ascertaining the effects of localities and employment on the public health, and also examining the sanitary condition of public, penal, and charitable institutions. In addition to these duties, the division bears a relation to local Boards of Health which requires constant inspection of localities, and giving advice to local authorities as to methods to be adopted for improving local sanitary administration. As the division was created in June of the present year, it was necessary to outline plans for work on new lines, and to so systematize the work of the department that as much as possible might be accomplished.

### LOCAL BOARDS OF HEALTH.

The necessity for adopting some plan for improving local sanitary administration in the various sanitary districts of the State is apparent when we consider existing conditions. There are in the State over 460 local Boards of Health which should be organized under the requirement of the State law. Each Board of Health is required to make an annual report to the State Board of Health, and there are over 125 local Boards of Health that have failed to make these reports this year. In the large cities and boroughs of the State, Boards of Health are well organized, but in smaller boroughs and townships often little effort is made to prevent disease, and such communities are without adequate protection. In some

localities where there are organized Boards of Health, no health ordinances have been adopted, no reporting of cases of communicable diseases is required, and there is no supervision over the disinfection of infected premises, and no investigation of the causes of epidemics. With the knowledge of these conditions it is imperative that an effort should be made to secure the active cooperation of local Boards of Health, and this can only be accomplished by attendance upon their meetings, thus learning the shortcomings and needs of each individual board. During the coming year, as far as possible, the organization of local Boards of Health that have not complied with the legal requirements will be effected, and an attempt made to secure uniformity in dealing with problems affecting the healthfulness of localities.

## COMMUNICABLE DISEASES.

The legislative enactment of 1887, creating the State Board of Health, makes it one of the duties of the Board to inquire into the causes of epidemics. In many localities local Boards of Health never realize their responsibilities and duties until brought face to face with an epidemic which threatens the loss of many useful lives. Much has been added, in recent years, to our knowledge as to the causes of contagious disease and the methods of its transmission, and every case of communicable disease should be carefully investigated, and every effort made to ascertain the source of the infection. No Board of Health can ever be considered efficient until some trained Inspector has been selected, who is thoroughly equipped, by both theoretical and practical knowledge, to make investigations of cases of transmissible disease, and to draw logical conclusions from the data which is obtained. It is the policy of the State Board of Health, through the Division of Medical and Sanitary Inspection, to extend to local Boards of Health assistance in such investigations. A blank containing inquiries which would include the necessary data when all sources of infection are to be investigated, was prepared. The original blank as to typhoid fever is herewith given, as it may be of service to local Boards of Health. Some such form or schedule of inquiries should be adopted in each locality so that all facts as to an individual

case of typhoid shall be collected, and that throughout the State there may be uniformity in record-making. Similar blanks for collecting data as to diphtheria and scarlet fever cases have been prepared.

## RECORD OF HISTORY OF TYPHOID FEVER CASE.

Place.	No.
Name of patient.	Age.
Residence.	
Physician.	Termination of case.
Date reported.	Date of physician's first call.
Date of first symptoms.	Date of taking bed.
Date of relapse.	
Blood test.	Date.
Occupation.	Result.
Place of business.	
Away from home prior to illness?	
If so, where?	
Character of house. (Private house, boarding house, etc.)	
Number of inmates.	
Sanitary condition of premises.	
Source of drinking water.	
Sample taken.	No.
Drank water elsewhere?	Where?
Ice supply.	
Milk supply.	
How received.	
Habitually drank.	
Drank elsewhere.	
Shell fish.	
Baker.	
Other foods suspected.	
Other cases in house.	
Names.	
Other cases among associates.	
Patient have separate room.	
Stools disinfected.	Nurse.
Where disposed of.	How?
Date.	Information given by
	Information given to

During the year 24 investigations of outbreaks of contagious diseases have been made, and a total of 710 individual cases have been investigated. Full reports of these epidemics are on file in the office of the board. Short excerpts have been made from many of the reports, but a few are given in detail, and indicate the methods adopted in making the inquiries, and show the value of the information obtained. The arrangement of reports is alphabetical, to facilitate reference.

## TYPHOID FEVER.

## CLARK TOWNSHIP.

In July, 1908, two cases of typhoid fever were reported on dairy premises located in Clark Township, Union County. The milk from the dairy, amounting to 320 quarts daily, was sold to a retail dealer in Elizabeth. As the patients were the children of the dairyman, and were in no way employed in the collection or distribution of the milk, the milkers were removed to a vacant house located on the premises, and water used for cleansing purposes was obtained from two wells near the tenant house. Every effort was made to separate those collecting the milk from the house in which the patients resided. In the early part of August three men employed in milking were reported as having typhoid fever. It became necessary to quarantine the premises, and milkers from neighboring farms were employed. All utensils were cleaned on other farms, and the wells on the dairy farm were abandoned. A deep driven well was put in by the owner, and upon the recovery of the patients and disinfection of the houses, the quarantine was removed. No cases of typhoid fever occurred in persons served with the milk in Elizabeth. The investigation of the outbreak indicates the constant risk of transmitting typhoid fever by the infection of milk on dairy premises, and also shows the necessity for the prompt reporting of such cases, so that action may be taken by the State Board of Health to guard the consumer.

## FRANKLIN TOWNSHIP, SOMERSET COUNTY.

In the latter part of August several cases of typhoid fever occurred on a farm in Somerset County occupied by the "Pentecostal Union." The society has nearly one hundred members, and the investigation of the outbreak showed that the disease was imported. The sanitary survey of the premises resulted in changes in the disposal of excreta and the sources of water supply.

## FRANKLIN TOWNSHIP, WARREN COUNTY.

Eight cases of typhoid fever occurred among the inmates of a laborers' boarding house. The sanitary survey of the premises showed that the house and its surroundings was unclean. The investigation of the epidemic led to the conclusion that the disease was communicated by contact, as nearly all the cases occurred in persons occupying the same room.

## HAMMONTON.

An outbreak of typhoid fever began in the town of Hammonton about the middle of June, there being four cases reported up to July 15th. Cases then occurred at Elm, Winslow Township. The first case occurred about July 27th, in a bake shop at that place, followed on August 5th, by others, since which time cases have occurred at short intervals in that vicinity. About August 20th, the disease appeared at Rosedale, in Winslow Township.

A history of 34 cases was obtained, and it is doubtful if this number includes all actual cases.

Roughly estimated, it may be said that the cases were spread over an area of three or four miles square, embracing a population of from five to six thousand persons, and, according to the opinion of those consulted, about one-third of this number were Italians. It was quite evident that the infection was not due to an infected milk supply. The public water supply was likewise excluded. The outbreak at no time assumed an explosive nature, not more than three cases being reported on any one day. Most of the cases were quite evenly distributed, from the date of the first one, in June, up to September 28th. The infection, therefore, was slight and intermittent.

The interesting feature of the outbreak is that, of the 34 cases, 28 were Italians and but 6 were Americans, 4 of these occurring in one family; whereas the estimated population among which the cases were distributed is said to be composed of about two-thirds American to one-third Italian. It is, therefore evident that the infection had to do with something common to the Italians.

It was clearly shown by visits to a number of infected premises in Winslow Township that the disinfection of discharges from the sick had been entirely neglected, or performed in a manner wholly inadequate to produce the desired results. Infected matter was either cast upon the ground or placed in open privies, from which it may have been carried by insects, or brought forth on the feet of domestic fowls having access to the filthy contents of such receptacles.

The investigation of the conditions in this locality will be continued, and if there is a recurrence of the disease among Italians, every effort will be made to discover the common source of infection.

## LEBANON TOWNSHIP.

A case of typhoid fever was reported in August, 1908, on premises located in Lebanon. From these premises milk was sold to employees of the Central Railroad. Several cases of typhoid fever among the employees were investigated by the Board of Health of Newark, and the history of the cases showed that the milk supplied to those having the disease was obtained from a dairy located at Lebanon. An investigation was made of the dairy premises by a representative of the State Board of Health, and it was found that a son of the dairyman had recently died of typhoid fever. A prohibition was placed on the sale or distribution of milk produced upon the infected premises. This was continued for several weeks, and was removed when an unpolluted water supply was introduced on the farm. The milkman during the time in which he was prohibited from selling milk produced on his own premises, bought milk from a nearby creamery and distributed it to his customers. As no cases of typhoid fever occurred among the customers using the creamery milk it is conclusive evidence that the infected milk from the dairy caused the original cases.

## MANSFIELD TOWNSHIP, BURLINGTON COUNTY.

In July of the present year three cases of typhoid fever occurred on a farm in Mansfield Township upon which milk was produced and sold to consumers. At the same time two cases were reported on the premises of another dairy in the same township. These cases were investigated, and active measures were taken to protect the consumers of the milk produced on the infected premises. Specific directions were given as to the boiling of well water and cleansing of utensils, and no persons having to do with those infected were allowed to handle the milk or to aid in its distribution. There was no extension of the disease beyond the premises upon which the original cases occurred.

## MOUNT HOLLY.

On June 26, 1908, investigation was made of typhoid fever cases reported during the preceding six months in Mount Holly, Burlington County. It was found necessary to visit the individual premises upon which cases were known to have occurred, and in this way a record of twenty-three cases was secured. Mount Holly is under township government, the boundary lines embracing practically no more territory than is covered by the town itself. The population is about 5,500. The names of seven of the eleven local medical practitioners appeared in connection with the cases, six of whom made reports. The fever appeared in each section of the town, and there was no grouping of cases in any one locality.

The fact that 16 of the 23 persons affected were not out of town during the incubation period preceding the date of attack, shows that the source of infec-

tion for most of the cases was local. In five out of the remaining cases it was not shown that the patients had visited a locality in which typhoid fever was prevalent. The cases occurred among persons having no relations socially, and there was nothing in common among them which suggests any possible infection by personal contact.

In considering milk as a possible source of infection, it was found that seven sources of supply were represented, including one case where a single cow was kept for private use, and two in which milk was procured from persons keeping cows for family use only. In one case no fresh milk was used, and in three cases no information on this point was obtainable. These facts excluded milk as the probable vehicle by which the infection was transmitted. Inquiry into other food supplies was likewise negative.

In eleven cases no ice was used. In two cases ice from various sources was probably used in drinking water. In two other cases ice was procured from one local dealer, and in one case from still another source of supply.

While Mount Holly has no general system of sewers, and open privy vaults abound, fly infection cannot be taken into account because almost all of the cases occurred in cool weather, and before flies were present in any considerable numbers.

In considering water used for drinking purposes, the following facts were shown:

The cases studied were distributed over a considerable period of time, one occurring in January, two in February, seven in March, three in April, six in May and four in June, 1908, thereby indicating a rather slight and intermittent infection.

Cases occurred on twenty-three separate premises, on seventeen of which water from the public supply only is furnished, and there was no evidence that these seventeen affected persons had drunk water from any well in town. In each case on the four premises on which the water supply consisted of a well, the affected persons, while at business or engaged in daily pursuits, had almost daily drunk water furnished by the water company to its consumers in Mount Holly. About 750 buildings in Mount Holly are supplied with water from the public supply, and 1,500 depend exclusively upon private wells. The premises depending upon wells is 100 greater than those furnished with water from the public supply, yet all the cases investigated occurred among users of water from the public supply.

These facts, considered in connection with the results of analysis of samples of the filtered water furnished by the water company to consumers in Mount Holly, pointed more forcibly—but not conclusively—to water as the possible source of infection than to any other cause brought out in this inquiry.

#### PENNSVILLE.

Three cases of typhoid fever occurred in a family residing in Pennsville. The cases were investigated, and the history obtained showed that the first patient contracted the disease while away from home, and the other cases were due to direct contact. During the investigation, the failure of physicians to report cases of communicable diseases in this locality was brought to the notice of the State inspector, and a statement was made by a physician that from ten to fifteen cases of typhoid fever occurred each year in this and surrounding localities, which are not reported to the proper authorities. A communication was addressed to the local Board of Health, calling attention to the requirement of the law in regard to reporting all cases of communicable diseases, and requesting strict compliance with the law in the future.

#### RARITAN.

In July, 1908, a case of typhoid fever on a farm in Raritan, Somerset County, was reported. The case was investigated, and it was found that the patient, a young child, had not been directly exposed to typhoid fever, and had been away from home but once in several months. On this occasion the

child played with another child who a year before had typhoid fever. The children played with toys which had been used by the typhoid patient, which had been packed away in the interval. The possibility of the disease having been contracted from the toys is very remote, but the fact is interesting. The inspection of the premises in Raritan showed that the well was located near a privy vault. The chemical and bacteriological examination of the water from the well indicated pollution, and the well was abandoned and a new source of water supply obtained.

#### ROEBLING.

The site upon which the village of Roebling is being constructed is situated on the Delaware River about eight miles below the city of Trenton, in Florence Township, Burlington County. The village is on high ground, and there is good surface drainage. All of the dwellings are newly constructed, and are neat, substantial, two and one-half story brick buildings, facing on wide, well-graded streets, with yards in front and rear of each dwelling. The streets yards, and grounds are kept clean and free from refuse accumulations, and except for the privy arrangements maintained at the buildings known as "the Shacks," hereafter referred to, there is no vault or cesspool in the village in which human excreta is exposed. At the time this inquiry began there were 217 of the village houses, occupied by as many families, which together with some eighty persons residing in two boarding houses, made a population for the village of about 1,106 persons. A large portion of this population is foreign-born, and includes several nationalities, employees or members of the families of employees of the Roebling & Son's Iron Works, located at that place. The village was first opened to inhabitants in December, 1906. From a study of the tabulated history of the first dozen or so cases of typhoid fever, occurring during the latter part of September and the first half of October, it appeared that the infection might be connected with the milk supply. A careful investigation was therefore made of each dairy premises contributing to the supply, and of the method of transporting and handling the same by the several dealers. A detailed report of the conditions found upon each of the said premises was made, and the following summary of the findings is herewith given:

Upon nine of the twelve above-named dairy premises polluted water was found to be in use for washing milk cans and utensils. On two dairies the water supply was of doubtful quality, and on one only was it above question. The highest score for any one dairy was 63, the lowest 11, and the average 31.8. Considered as a whole, the conditions existing on the dairies contributing to this supply together with the methods of handling the milk, were found to be exceedingly bad, and, with but two or three exceptions, utterly incompatible with the production of clean milk.

The suspicion which attached to the milk supply in the beginning of the outbreak was not, however, borne out by the facts surrounding each new case as the epidemic progressed. Inquiry into the food supplies to which typhoid fever might be traced were likewise negative. By reason of the fact that the cases were occurring among persons of different nationalities, many of them speaking no other than their own language, and among whom there was socially nothing in common, it was apparent that the outbreak was not due to contact. From the history of the cases, gathered as the epidemic continued, the only thing shown to be common to them all was the village water supply, taken from the Delaware River, about 1,500 feet distant from the point at which the village sewer discharged into the river further down stream.

The table which accompanies this report, classifying 112 cases shows the cases in chronological order, giving name, address, date of attack, number of cases on the same premises, source of milk and water supply, and the termination of each case.

The first known case of typhoid fever to occur in the village was in the person of a Hungarian laborer, a boarder in a family residing at 130 Third Avenue, who was taken ill about March 25, 1907, and who went to the St.



Francis Hospital in Trenton. The patient recovered and returned to Roebing. But little of the man's history could be learned, except that he had been in the village about four months, and that he was a frequent visitor to Trenton prior to his illness. The second case occurred some time in April, at 29 Fourth Ave. The patient, a housewife, had been away from the village on short visits prior to her illness, but had not visited in Trenton. The third case was an employe in an office at the village store, who was taken ill on July 6th. This young man lived with his parents in a dwelling on the New Jersey State Hospital grounds, Trenton, in which dwelling there were then three cases of typhoid fever. From the time of his employment, June 4th, to the date of his illness, he came daily from Trenton to his work in Roebing, and took his luncheon at No. 1 Boarding House. During his illness he was cared for in a Trenton hospital, and returned to his duties in Roebing, September 30th. The fourth case was a man who came from Worcester, Mass., to No. 2 Boarding House, June 24th. He was taken ill about one month later and removed to the St. Francis Hospital, Trenton, on August 9th. He returned from the hospital to Roebing, October 7th. The fifth case occurred on Sept. 11th, followed by others September 25th, 26th and Oct. 6th, from which time the disease assumed epidemic form, gradually increasing in severity until the latter part of the same month, when a diminution in the daily number of cases began. The total number of cases recorded was 112, this being 10.1 per cent. of the total population of the village. It was afterwards shown that this number did not furnish a full list of all of the cases occurring during this epidemic, for many who were taken ill left the village, going to hospitals, or to their homes in other towns. A large number of cases were cared for in Trenton hospitals, or in the hospital especially equipped in the village for this purpose by the Roebing Co., in charge of the resident physician, Dr. Paul Traub, with his assistant and a corps of nurses. An unsuccessful effort was made, after the epidemic, to procure a complete list of the names of the persons who were taken ill during the epidemic, who went to their homes or to hospitals in other places to be cared for, and also to learn the total number of deaths resulting therefrom. If the fatality rate is figured from the facts contained in the table above referred to, it is shown that out of the 112 cases there were but four deaths. This would give a fatality rate of 3.66 per cent., which is shown by the evidence later gathered to be incorrect. There were seven deaths occurring among the thirty-three patients admitted to an out-of-town hospital. This included a number of cases, probably fifteen or twenty, of which no record appears in the table above referred to. The large fatality in these hospital cases was undoubtedly due to the bad physical condition of the patients when admitted, and forms no indication of the true fatality rate, when considered with all of the cases in the outbreak. As nearly as can be ascertained from all the facts in hand, there should be about eighteen cases added to the 112, making the total number of cases 130. The total number of known deaths was nine, which gives a fatality rate of 6 per cent.

It should be stated that the patronage of the village was distributed among milk dealers about as follows: A. supplied 90 families, B. and C. supplied 45 families each, and D. supplied 6 families. Cases occurred among each milk dealers' patrons as follows: A...66, B...20, C...10, A. and D...4, A. and B...3, D...1.

There were seven cases in which the source of milk supply was not learned, and one in which no fresh milk was consumed. All used water from the village supply. About Nov. 3rd, notice by officials of the Roebing Company was distributed through the village, advising that all water from the village supply be boiled before using. At about this same date the company began the daily free distribution of distilled water, in unlimited quantities, from house to house. This service was still being continued at the termination of this inquiry. It was also about this date that the company began the work of sinking a test well for obtaining a new water supply, which work was still in progress at the close of the investigation. Following the week ending Nov. 16th, there was a marked falling off in the number of new cases. Cases are known to have occurred among the inmates of 70 dwellings in the village,

including some on every street. The greatest number of cases accredited to any one dwelling occurred among the inmates of "the Shacks" above referred to, which consists of several temporary bunk houses, together with two general mess rooms, the whole being located 600 feet distant from any other village dwelling. The closet accommodation at "the Shacks" consist of a building over a trench in the ground, located in close proximity to the mess rooms and bunk houses, in which a large mass of human excreta was exposed. At the time this inquiry began, there were about 123 persons housed in these buildings. Six cases were known to have come from "the Shacks," and probably others, for there were at least seven known hospital cases in which the dwelling place of the patients were not learned. There were twenty dwellings in which more than one case occurred. Four cases only were known to have occurred among persons residing in Boarding Houses No. 1 and 2. Two of these cases were among the four which preceded the epidemic proper, and which doubtless became infected outside the village. The other two occurred November 8th and 15th, respectively. The patients resided in Trenton, and worked at Roebing, where they ate their midday meal at Boarding House No. 2. There were over 80 persons residing in these two houses during the period of the epidemic, using the public water supply, and being served with milk by the same dealers. Diligent inquiry failed to discover other cases occurring among the inmates of these boarding houses, or to offer any explanation why they should have enjoyed such seeming immunity from the disease.

Much assistance was furnished by the officials of the Roebing Company during the inquiry. The investigation of this extensive outbreak of typhoid fever, in a community in which every effort had been made to secure sanitary conditions, resulted in the definite conclusion that the disease had its origin in, and was spread by, the water taken from the Delaware River, which was grossly polluted by the sewerage of the city of Trenton at a point only a few miles above the village of Roebing.

#### SALEM CITY.

The outbreak of typhoid fever which began in the city of Salem, Salem County during the early spring, continued during the summer and early fall, and terminated in the latter part of October. Thirty cases connected with this outbreak were studied. Twenty-seven occurred in the city of Salem, and three among United States troops, stationed at Fort Mott, who were believed to have contracted the disease in Salem.

The first case, occurring in the early part of March, was followed by one in April and two in June. Two of these first four cases evidently had their infection outside of the city of Salem, while in all probability the infection in the first and third cases occurred in Salem. Up to the time of the beginning of the investigation, August 13th, the outbreak had been mild in type, showing a slight and intermittent infection, and by reason of this and other conditions connected with the cases reported up to that date, it was evident that, in order to definitely fix the source of infection, a study of each individual case would be necessary. The cases occurred in the following order:

During the month of March .....	1 case.
" " " " April .....	1 case imported.
" " " " June .....	3 cases 1 "
Week ending July 11th .....	1 case.
" " " " 18th .....	1 "
" " " " 25th .....	7 cases.
" " " " Aug. 1st .....	2 "
" " " " 8th .....	3 "
" " " " 15th .....	4 "
" " " " Sept. 5th .....	3 "
" " " " 12th .....	1 case.
" " " " 19th .....	1 "
" " " " 26th .....	2 cases.
Total .....	30 cases.

Excluding the three cases occurring among the troops stationed at Fort Mott, there were 26 dwellings from which 27 cases were reported and in which 130 persons resided. There was but one dwelling in which a second case occurred.

In considering water as a possible source of infection it was shown that water for drinking purposes was procured from shallow wells on 24 of the 27 premises. Water from the city supply was used for drinking purposes on but three premises, and the case occurring on one of these was evidently imported. The public supply was therefore excluded. No reliable information was available to show the number of dwellings in the city depending exclusively upon dooryard wells as a source of water supply. From observation made while visiting the infected premises, it would appear that there are but few dwellings in Salem not supplied with a private well, and on many premises provided with water from the public supply wells are depended upon to furnish "cool" water for drinking purposes during the summer season. The soil underlying the site of the city consists of from one to two feet of mud and roots, underlying which is coarse yellow sand and gravel to a depth of about 19 feet, which is water-bearing. Below this is a bed of marl which is impervious to water.

The surface of the ground at Salem, according to the State Geologist's records, is from 10 to 30 feet above tide water level. Measurements of wells in different sections of the city show a depth varying from 10 to 15 feet. The water of these wells was found to be from 6 to 10 feet beneath the ground surface. These measurements were made following a long drought, and, combined with the statements that wells are never known to go dry in this section, tend to show that there is but slight fluctuation in the ground water level. Samples of the well waters collected for chemical and bacteriological examination in the State Laboratory of Hygiene were found without exception to be polluted.

By reason of the permeable character of the soil in which these shallow wells are sunk, and the fact that many premises in the town have no connection with the sewers, and that on almost every premises there is a privy vault leading into the water-bearing stratum which supplies these wells, it can readily be seen how every well in the city is likely to have become polluted. Notwithstanding this fact, there is nothing in the history which indicates typhoid infection in any single well or group of wells in any particular section of the city. Certainly no considerable number of the infected persons drank water from any one well. The cases were not confined to any one section of the city, and, with but one exception, not more than one case occurred in any one dwelling. If the source had been well water, the infection must have been both slight and intermittent, as well as widely diffused, to have caused, during a period of several months, but 30 cases in a population of over 6,000 persons, spread over a territory of more than one mile square.

There was nothing in common, in the social relations of the persons affected to suggest that the infection was spread by personal contact.

Considering flies as the means of transporting the typhoid fever germs in this outbreak, the conditions were favorable, and some of the cases may have been attributable to this cause. The first three cases, one of which was evidently imported, occurred before fly time, the fourth, also imported, occurred just about the season that the fly becomes active. On the premises upon which the first case occurred the discharges from the patient, without previous disinfection, had been placed in an overflowing privy vault or cast upon the surface of the ground in an unclean yard during the entire six weeks of illness. The same dangerous practice took place on the premises on which the third case occurred. On the premises on which the fourth case came from out of town, on July 4th, a like condition prevailed. It will, therefore, be seen that at this season of the year, as flies were becoming numerous and active, there were three known foci of infection at which conditions were particularly favorable to fly infection. About the middle of July the infection appears to have been most active. On premises upon which some of the later cases occurred it was also shown that the discharges from the sick had not always been thoroughly disinfected and safely disposed of.

In considering milk as the vehicle for infection the following facts appear. In the first four cases, two, as already stated, were imported. One of the remaining two, the first to occur, procured milk from a local dealer who will be designated as A. Excluding the second and the two imported cases, we have the following history concerning milk:

Cases in families procuring milk from Dealer A	16
Persons affected who drank milk supplied elsewhere by Dealer A	5
Cases in which no milk from Dealer A was used	4
Secondary cases, probably due to contact	1
	—
Add first four cases	26
	—
Total	30

The above arrangement of the cases places 21 of the 30 among those who used milk supplied by Dealer A. If you add to this number the one from among the first four cases who used milk from Dealer A you have 22 in this group. If you go further and include the case occurring in the family which daily procured their water supply from the well on the premises of Dealer A there are 23 persons who are very closely associated with this milk supply. Exclude the two imported cases and there remain but four, among the total number of 28 cases believed to have had their infection in Salem, that were in no way associated with the milk depot premises of Dealer A. One of these four was in all probability a contact case, in one the family kept their own cow, in one no milk was used, and in one the milk was procured from a party keeping a cow for private use. Among the 23 affected persons who used milk supplied by Dealer A, 22 were shown by inquiry to have drunk the milk without first heating.

At the time of this outbreak there is said to have been 13 milk dealers supplying milk to the six thousand or more inhabitants of Salem. A considerable number of families also procured milk from a local creamery. Dealer A was then distributing 250 quarts of milk daily, to about 275 families. At the time suspicion fell on this particular dealer's supply, about the first of August, his patronage began to fall off, so that by August 13th, less than 200 quarts of milk was sold daily by him. This amount further decreased to less than 100 quarts before Dealer A disposed of his business, on September 13th, to a party who continues the same from other premises. Notwithstanding the gradual falling off of the amount of milk daily distributed by this dealer, new cases of typhoid fever which kept occurring proved to be in persons who were users of milk supplied by him. The search which was conducted for a typhoid history among the persons residing on the milk depot premises, and also upon the two dairy premises from which the dealer procured his main supply, gave negative results. The water supply in use for washing cans and utensils on the milk depot premises was from a well which was found to be grossly polluted. There were no provisions for sterilizing cans and utensils. The business was conducted in unclean surroundings and without proper equipment. Polluted waters were in use for washing cans and utensils on both of the dairy premises from which Dealer A procured his main supply, but no evidence of typhoid infection was found on any of the premises investigated. Until July 1st, Dealer A frequently procured from a local creamery varying amounts of milk to supplement his regular supply, and twice between July 1st and August 13th, he procured small amounts from the same creamery. The source of the particular milk procured from the creamery could not, for obvious reasons, be traced. Notwithstanding the strong presumptive evidence shown by this inquiry against the milk supplied by Dealer A, positive proof of specific infection is lacking. However, avenues of possible infection of this milk supply may have existed which were difficult or impossible of detection, with the rather poor opportunity afforded for the study of the outbreak.

There are some features in the history which are rather opposed to the idea of milk infection:

1. The outbreak was entirely free from the explosive character which so often occurs in the case of infected milk supplies.

2. There appears to be nothing in the manner of distributing the milk to consumers which was particularly liable to convey the infection from one premises to another. The dealer used very few bottles, and, so far as learned, no cases occurred on premises where bottled milk was served.

3. But two persons under ten years of age were affected, and these cases did not occur until September 1st. If caused by an infected milk supply the number of cases among children would presumably be large.

4. Of the 30 cases 24 were among males. This percentage of difference is unusually high, assuming the infection to be in some article of food consumed in the home.

After all, it seems more than coincidence that so large a number of the cases should have occurred among users of milk from one source, and this supply forming such a very small percentage of the total amount consumed by the inhabitants of the city of Salem. In the absence of more facts, the evidence strongly points to milk sold by Dealer A as the vehicle through which the infection was transmitted, and fully justified the action recommended by the Medical and Sanitary Inspection Department of the State Board of Health on August 17th, against the suspected milk supply.

#### SOMERS POINT.

Inquiry into the typhoid fever outbreak in Somers Point shows the following facts:

Somers Point is located on Great Egg Harbor bay. The main section of the town, and that in which the typhoid fever occurred, lies near the bay shore, on ground gradually rising to an elevation of about 30 feet at a distance of about 275 yards from the bay, and again sloping toward lower land lying back of the town. The soil underlying the site of the town is said to be sand and gravel extending down to thin layers of clay 25 or 30 feet beneath the surface on the highest ground.

Between the latter part of July and the latter part of August 10 cases of typhoid fever occurred in eight of the group of about 100 dwellings located at this point. In addition to the 10 cases investigated, there were at least two among summer visitors, who left for their city homes upon the first symptoms of the disease. Cases occurred in houses located on the ridge and on both sides of the slope from the elevated ground upon which the town is situated. The facts surrounding the cases tend to show that the infection was due to local causes, and apparently not to personal contact.

The milk supply was under suspicion when the inquiry began, because of the fact that one dealer had supplied milk to all premises upon which cases had occurred. This fact lost its significance, however, when it later developed that but one dealer distributed milk in Somers Point, and no typhoid fever history was found on his small dairy premises nor on the two others from which he daily procured small amounts. This dealer also supplied milk to consumers in Ocean Heights and along the shore road, among whom no cases occurred.

Wells were in use for drinking purposes on six of the eight infected premises, while two were supplied from the Pleasantville public water supply. It is more than probable that the patients on these two premises also drank water from the wells in town, but surely not all, nor any great proportion, of the persons affected drank water from the same well. Wells in the town draw water from beneath thin layers of clay underlying the surface and subsoil, and varying in depth from 15 to 32 feet, according to the elevations of the ground in which they were sunk. Samples of water were taken from the three wells, two dug and one driven. The dug well, 32 feet deep, located on the highest ground in town, was found to be polluted. The bored well, located near by, and having about the same depth, showed a less degree of pollution. The third,

a dug well, without unclean surroundings, and located on much lower ground but evidently drawing water from the same stratum, was also polluted.

The first case to occur—but the last one to be reported—was heard of on September 7th, after the investigation began. The patient, a male, 18 years of age, was a baker by trade, and lived with his employer on the bake shop premises, centrally located in the group of dwellings in which the cases later occurred. The history of this first case showed that, while the youth had not felt well for some time, it was during the first week in August that his employer's wife noted his loss of appetite, languor and inability to perform his duties in the usual way. She insisted on his consulting a physician, which he did, calling on a physician in Atlantic City weekly for three consecutive weeks. It was later learned from this physician that the patient's temperature was not taken, and his case was not then recognized as typhoid fever. The lad kept at his work in the bake shop until September 6th, when he went to bed, and a physician was called, who stated that the patient was suffering from typhoid fever, probably in the fifth week of the disease. On September 10th, his temperature dropped to normal. A blood test confirmed the diagnosis of typhoid fever. For several weeks, while ill, this youth worked a portion of each day and night in the bake shop. This was located in the rear of the lot, poorly screened from flies, and in unclean surroundings. Dejections were placed in an open privy vault located in the door yard near the bake shop door. The facilities for cleansing the hands in the bake shop were unsatisfactory.

Other cases followed that of the baker, in eight houses located from 50 to 200 yards distant from the bake shop. Whether or not the case which occurred on the bake shop premises was a source of infection for any or all of those which followed near by, was not susceptible of proof. That foods prepared in the bake shop were supplied to all of the houses in which cases occurred, and that no cases occurred among the patrons of two out of town bakers who conducted delivery routes in Somers Point, was shown by the inquiry to be true. One case which occurred in Ocean Heights, and one occurring in Linwood borough, located about 2 and 1 and ½ miles respectively, from Somers Point, were investigated, and it was shown that in these two families supplies were also procured from the delivery wagon sent out from the bakery above referred to.

#### TRENTON.

In October, 1908, Dr. Fell reported 8 cases of typhoid fever in which the history showed that the milk used by the patients previous to their illness was obtained from one milk dealer. A thorough investigation of the sources of milk supply and of the sanitary condition of the dairy premises, was made, but no facts were brought to light which indicated that the infection was due to the milk supply.

#### DIPHThERIA.

##### HAMILTON TOWNSHIP, MERCER COUNTY.

Seven well-defined cases of diphtheria were reported in this township, the first case being discovered on March 30, 1908. In addition to the cases of clinical diphtheria, there were a number of persons exposed to the disease in whom slight sore throats developed, but as no specimens were sent to the laboratory no definite diagnosis was made. These cases can undoubtedly be classified as carriers of diphtheria. The investigation made by the State Board of Health led to the adoption, by the local authorities, of a better system of reporting cases of communicable diseases, and in future the proper isolation of patients and disinfection of infected premises will be insisted upon.

## PALISADES TOWNSHIP.

Cases of diphtheria among children in attendance upon the school in Palisades Township were investigated in October, 1908. In 1905 four cases occurred, and in 1906, shortly after the opening of the school, twelve or fifteen cases were reported. The majority were children connected with the kindergarten. With the opening of the school for the present year two cases were reported. An inspection of the school building failed to reveal any errors in structural or sanitary arrangements to which the source of the disease could be attributed. The Board of Education were directed to disinfect and thoroughly cleanse all school rooms and books; to have daily medical inspection and send specimens for examination to the State Laboratory of Hygiene; to permit no child that had contracted the disease to return to the school until two negative results were reported of specimens sent for bacteriological examination; and to discontinue the use of common drinking cups.

## RAHWAY REFORMATORY.

On December 22, 1907, a case of diphtheria was detected in this institution, and the patient was injected with antitoxin and isolated in a small hospital located away from the main buildings. A second case was reported January 15th, 1908, and from this date until February 12th, cases were reported almost daily, the only exceptions being the 17th, 18th, and 20th of January. Specimens from the throats of 250 inmates of the institution were sent to the State Laboratory of Hygiene for examination, and a large number of persons who gave no clinical evidence of the disease were proved to be carriers of the infective organism. These carrier cases were given antitoxin and quarantined with the true clinical cases. All inmates of the institution were given immunizing doses of antitoxin. The total number of clinical cases was 39, carriers 273. The total number under quarantine during the epidemic was 312, and of this number 246 were isolated once, 56 twice, 7 three times, and 3 four times. One case was isolated 67 days. The epidemic terminated April 10th, 1908. The largest number isolated in one day was 32, and on February 11th, there were 18 cases discharged from the hospital. It is interesting to note the distribution of the cases in the institution. Of the persons affected, 85 slept under the dome, which is in the centre of the building, 53 were located in the east corridor, 42 in the west corridor, 68 in the east side tiers, and 64 in the west side tiers.

The cause of the spreading of the disease, and the difficulty experienced in limiting the number of cases, is readily understood when the conditions existing at the institution are known. The building was designed to accommodate 250 inmates, but when the epidemic occurred there were 538 prisoners crowded into the building, 270 sleeping under the dome and in the corridors. There the cots were only twelve inches apart. This arrangement permitted discharges from the mucous surfaces of those infected to be carried directly to the breathing passages of persons occupying adjoining beds. When the cases were reported there were no hospital accommodations, and the large drill hall was used for the purpose. It was due entirely to the active measures adopted that the disease was so readily placed under control. The value of the Laboratory of Hygiene was clearly demonstrated, as specimens from the throats of all inmates were examined constantly, and as a result all carriers of the disease were isolated. The total number of bacteriological examinations made of specimens from the throats and noses of inmates was 3,000. The immunizing of all inmates prevented a number of cases. Those connected with the institution cooperated with the State authorities in the adoption of preventive measures. The need of more ample accommodation for the housing of inmates and the necessity for a thoroughly equipped hospital, were demonstrated. An addition to the institution is nearly completed, and the Board of Managers have under consideration the erection of a separate hospital building.

## SCARLET FEVER.

## COLLINGSWOOD.

An outbreak of scarlet fever occurred in this borough in July and August, 1908. The first case was reported on July 22nd, and from that date until August 20, there were seventeen cases under observation. The investigation of these resulted in the inference that the disease was transmitted by the milk supply. With one exception, those affected were users of milk supplied by one dealer. The cases were spread over the entire borough. There was no evidence of personal contact. Eight milk dealers distributed milk in the borough. On the routes of seven no cases appeared. The eighth served 110 families. This man purchased milk from two dairies, on the premises of which no history of scarlet fever was obtained. The inquiry was finally directed to the transmission of the disease by bottles, and it was found that a young woman residing in the home of one of the milk dealers' patrons had been taken ill July 4th. A physician was consulted, but no diagnosis was made. From the facts gathered, this woman evidently had a mild attack of scarlet fever which detained her from her work for about a week. The case was not reported to the local authorities, and no restrictions were placed upon the patient. Empty milk bottles were taken from the home of this person, and with no adequate cleansing were refilled and distributed to other houses. On July 22nd, the first case was reported to the local Board of Health. The dealer continued to take empty milk bottles from infected premises, and, without proper sterilization, to refill and distribute them, and fresh cases occurred in the homes of his customers.

On August 8th, the dealer was requested to boil all bottles and utensils and to sterilize bottles each day, and his premises were cleansed and disinfected. As the outbreak at once terminated when this was done, the theory that the disease was transmitted by milk bottles was confirmed.

## LAKEWOOD.

On July 14th, a request was received from the local Board of Health of the township of Lakewood to assist in an investigation of an outbreak of scarlet fever in Lakewood. The work proved difficult on account of the length of time the disease had been prevalent, and the large number of cases to be investigated, many of which had not been reported to the local Board of Health, there being some in which no physician had been called. Under these conditions the facts obtained were less reliable. However, 65 cases, covering a period of over eight months, were investigated, classified and consecutively arranged.

Cases occurred in 36 households, and the infection was mainly confined to a section of the town located on the east side of the tracks of the Central Railroad, a locality whose population consists of permanent residents, wage-earners and persons of moderate means.

Reports were filed with the Clerk of the local Board of Health in the regular way, by attending physicians, in 32 of the 65 cases investigated. These reports show that seven physicians reported one case each, and that 25 cases were reported by one physician. Six physicians attended 18 cases in which no reports were made, and there were 15 cases in which no physician was in attendance. The outbreak was mild in character, in many cases so mild that parents were not prompted to summon a physician, and in some cases in which physicians were called the patients proved to be but slightly ill. There were some very severe cases, however, particularly among those occurring in the latter part of the epidemic.

The diagnosis in each reported case was taken from records in possession of the Clerk of the local Board of Health. In unreported cases, when the patient was a child, the statements of parents was taken; in adult cases information

was procured from the patients themselves, or from the heads of households in which the cases occurred. The column of diagnosis shows that 32 cases were reported as scarlet fever by attending physicians; 6 in which parents stated that physicians said the cases were scarlet fever, but made no reports; 11 in which parents state that the infection was called measles by the attending physician; 1 in which the diagnosis was thought to be diphtheritic sore throat; 3 in which the parents thought the case scarlet fever but called no physician; and 12 in which parents were in doubt about the nature of the disease.

The ages of the patients were:

1 to 5 years . . . . .	21	cases.
6 to 10 years . . . . .	31	"
11 to 15 years . . . . .	5	"
16 to 20 years . . . . .	2	"
21 to 25 years . . . . .	1	case.
26 to 30 years . . . . .	2	cases.
Over 30 years . . . . .	3	"
Total . . . . .	65	"

The data relating to school attendance is incomplete. It was purposed to procure from the school register the dates upon which each child last attended school prior to illness, and also the dates upon which they returned thereto. This could not be done, owing to the absence from town of the custodian of the school records. The data as to school attendance, gained from parents and from pupils themselves, show that before the closing of the schools in June children in the following grades were affected:

#### EAST LAKEWOOD SCHOOL.

Kindergarten Department . . . . .	4
First Grade . . . . .	5
Second Grade . . . . .	11
Third Grade . . . . .	1
Fourth Grade . . . . .	3
Fifth Grade . . . . .	1
Third Grade High . . . . .	2
Center School . . . . .	2
Total . . . . .	29

The following are statements and facts taken from the records of the individual cases:

CASE 1.—This child came with her mother from New York in the late fall. The child was taken ill, and the attending physician, so the mother said, pronounced the case measles, taking, however, a specimen from the throat for bacteriological examination. The Laboratory records show that the blank accompanying this specimen gives scarlet fever as the physician's diagnosis.

CASE 2.—This occurred December 1st, in the same family as Case 1; and was attended by another physician, who pronounced it German measles. The mother stated that this child, together with another later attacked, had already had measles.

CASE 3.—This occurred in another family December 6th, and was reported as scarlet fever, as were also Cases 4 and 5, occurring in still other families on December 11th and 12th.

Case 6 was the third to occur in the same household in which Case 1 occurred.

CASE 9 was of a young woman who came from New York City, and was taken ill a week after her arrival. This case was not reported. The patient

stated that the attending physician called the infection German measles. She also stated that she was quite ill for five or six weeks, and that desquamation was very pronounced, following subsidence of the fever; that children were kept from the house during her illness; and that disinfection was performed by a nurse from the St. James Hospital, Lakewood.

CASE 10.—This was attended by the same physician as Case 9. The mother states that the doctor at first said the child had scarlet fever. This case was followed within a few days by two others in the same family.

CASE 24.—Attended by the same physician as Cases 9 and 10. The parents of both state that the physician said the case was scarlet fever.

CASE 57.—Date of attack June 29th, reported by the attending physician as scarlet fever on July 15th, following the beginning of this inquiry.

It appears from the foregoing:

1. That many, if not all, of the so-called measles cases were, in fact, scarlet fever.

2. If the cases were scarlet fever, and the attending physician so believed, then there was a direct violation of the Act approved March 22nd, 1895, in failing to report the same. If the cases were in reality measles, then the provisions of the ordinance of the local Board of Health were violated by attending physicians in failing to report them, reports of measles having been made obligatory by ordinance.

3. Prior to the beginning of this inquiry, there appears to have been no action on the part of the local Board of Health of Lakewood Township to institute an investigation, in order to learn the true nature of the disease with which, as appears to have been generally known, some were affected, where no physician was in attendance.

4. No action was taken by the Board of Health to secure reports from attending physicians in the so-called measles cases.

5. It appears that no official action was taken by the local Board of Health to restrict the spread of scarlet fever, in reported cases of said disease, until after this investigation began when, on July 17th, a meeting was held and arrangements made to establish isolation for infected persons and disinfection of infected premises.

6. At the time this inquiry was conducted, there was no qualified and regularly appointed health officer or sanitary inspector in the employ of the local Board of Health.

The facts clearly show that this outbreak had its beginning in a single case which occurred in the early part of November. The lack of proper isolation and disinfection in this case resulted in the gradual spread of the disease, by contact, to other persons, thus establishing new centres of infection. As these increased in number, the outbreak grew in volume, exciting public notice, and resulting in the investigation, and subsequent action by the local Board of Health. There can be no doubt but that this epidemic would have been averted if the same effectual methods of isolation and disinfection had been employed in the first place as were afterwards instituted by the local Board of Health.

#### SPRINGFIELD TOWNSHIP.

On June 10th, 1908, an outbreak of scarlet fever in Springfield, which resulted in 17 reported cases, and one death, was investigated. The outbreak began in the latter part of April and continued until the middle of June. The first case, mistaken for measles and not isolated nor disinfected, was that of a school girl. The disease was communicated to her mother and three other persons, one of whom was an employee on a dairy farm serving milk to consumers in Springfield and Milburn Townships. While the dairy employee was but slightly ill, he consulted a physician on May 19th, but no suspicion that he might be affected by scarlet fever was around until the wife of his employer developed a typical case on June 6th, and became so ill that her life was despaired of. Barring a few days while ill enough to remain in bed, the dairyman continued his work, assisting with the milking, washing utensils, filling

bottles, and other work in the milk-room. He also delivered milk on one of the routes. Between June 3rd and 6th, eight cases of scarlet fever occurred in as many homes served with milk from this dairy, all among children who drank the milk. They were in dwellings widely separated, and there was no evidence, save in one case, of any known exposure to the infection other than through the milk supplied by this dairy. In that case there was exposure by contact, May 22nd, with the school girl first infected. On June 9th, an order was served prohibiting the sale or transportation of milk from this dairy. Two cases occurring after this date were apparently contact cases.

It appears probable, from facts obtained, that while the dairy employee above mentioned might have infected the milk supply each day that he worked while ill, he infected only a portion of one day's supply, which resulted in the eight cases occurring between June 3rd and 6th.

The dairy itself is above the average in equipment for handling its output, but observations made show how readily infection might be transmitted to the milk by an infected person, as did the employee here referred to.

#### UPPER PITTSBORO TOWNSHIP, SALEM COUNTY.

On September 16th, a nine year old girl came home from the Walnut Grove schoolhouse, Upper Pittsboro Township, Salem County, with her elder brother, ill with what her mother thought to be measles. Within a week all five of the children in this family had developed the disease, and on September 23rd, a physician of Elmer was called. He diagnosed the disease as scarlet fever, and promptly reported the cases to the proper officials of Upper Pittsboro Township. On October 5th, the two children first mentioned returned to the Walnut Grove school, but were refused admittance because they had no permit from the local health authority. On October 8th, they again returned, and were admitted. The mother stated that the house had not been visited by anyone representing the township Board of Health, nor were any restrictive measures placed upon members of this family until October 13th, when a card was placed upon the dwelling and quarantine established by the local Board of Health.

On October 10th, three other cases of scarlet fever occurred among the pupils of the Walnut Grove school present when the two first infected had returned. These three cases occurred on dairy premises as follows:

1. J. E., P. O. address Elmer, dairy located near Walnut Grove school. Produces about 50 quarts of milk daily, which is shipped to Joseph Lapetina, 7th and Catherine Streets, Philadelphia, Pa.

2. E. R., P. O. address Elmer, dairy located near Walnut Grove school. Produces about 150 quarts of milk daily, which is shipped to the Hotel Traymore, Atlantic City, N. J.

3. W. J., P. O. address Elmer, dairy located near Walnut Grove school. Produces about 80 quarts of milk daily, which is shipped to Wm. Kelly, 1204 Prince Street, Philadelphia, Pa.

Restrictive measures were at once placed upon the three dairies above mentioned, and arrangements were made for close supervision over them during the prevalence of the disease on their premises.

One of the patients of the first family infected was a youth of 17 years, who was employed on the dairy farm of N. V. He was taken ill September 23rd, and returned to work October 1st. On October 7th, his employer noticed that his work seemed to hurt his hands. On examination it was found that the epidermis was peeling in large flakes. The youth was taken to a physician who said he was desquamating, following an attack of scarlet fever, and should be sent home. This youth was the only man employed on the farm, who took no part whatever in the dairy work, and to this fact alone a narrow escape from infecting a public milk supply is probably due.

It is clearly shown by information gathered during the inquiry that the infection which resulted in three cases of scarlet fever on the three dairies above referred to took place in the Walnut Grove school; also that this infection was

the direct result of the return to school, October 8th, of two children from the house first infected; and that their attendance then was made possible by the failure of the health officials of Upper Pittsboro Township to isolate patients and disinfect the premises first infected.

#### LEPROSY.

Following is a report of an investigation of a suspected case of leprosy. On September 28, 1908, a colored boy named Charles Clark was admitted to the Camden County Almshouse at Blackwood, New Jersey. Upon admission it was found that he had ulceration of the toes, and other symptoms which indicated that he might be suffering from a contagious disease. He was not, therefore, placed in the almshouse, but in a separate building in the rear of the hospital. The room in which he was received was thoroughly disinfected. Dr. Hurff, the physician in attendance at the almshouse, after examining the boy and learning his history, decided that the disease with which he was afflicted was leprosy.

The history of the case is as follows: Some five years ago the father of the boy came to this country from New Barbadoes, and now resides at 122 Clay Street, Camden. Two years ago the patient, Charles Clark, came from New Barbadoes with his cousin Belfield Smith and his brother Abram Clark. They landed in New York City, then went to Camden to reside with Prince William Clark. Up to the time that the boy showed symptoms of the disease he was engaged in blacking boots at the corner of Locust and Kaighn Avenues, Camden. Seven months ago the first symptoms of the disease appeared on his hands, and he went to the Douglass Hospital, corner of 15th and Lombard Streets, Philadelphia. After being in the hospital five weeks he was discharged, but being unable to work, application was made for his admission to the Camden County Almshouse. Upon inquiry it was found that Clark had seen cases of this disease in the island, and upon being questioned he stated that if he were in the islands the disease would be called leprosy.

At the present time the patient is located in a small, one-story building between 75 and 100 feet from, and in the rear of, a county hospital. A separate privy is provided for his use, and all food is carried to him in papers, which he immediately destroys. Washing of clothing is done by the patient, in fact he cares for himself in every way, and dresses the ulcers on his toes. The dressings are carried to the door by the steward of the hospital, and after use are burned. Although there seemed little doubt as to the nature of the disease, Dr. Hurff was advised to seek corroboration of his diagnosis, and the name of Dr. MacDonald, surgeon at Fort Mott, who has made considerable investigation into the nature of this disease, was suggested. Dr. MacDonald examined the patient, and stated that it was one of the most typical cases of leprosy that he had seen in the United States. The authorities of the county are in correspondence with various State and Government Boards to determine what final disposition shall be made of the case.

#### SMALL-POX.

Following is a report of an investigation of an outbreak of small-pox which occurred in Atlantic City, N. J. Early in February, 1908, a colored man employed as a waiter at one of the hotels contracted the disease. He had recently been visited by a friend from the South, but although a careful investigation was made, it was impossible to trace the origin of the disease. This case was not discovered until the patient was well. The last of March a colored man employed in the same hotel, and working in the same room with the first case, was found suffering from small-pox. This case also was

not found until the patient had almost completely recovered. Nearly all the cases in the city which followed were traceable to exposure to this one. The third case occurred in the same house in which the second case resided. This patient went to Philadelphia, April 20, and was sent to the isolation hospital in that city. The fourth case was traceable to exposure to the second, and when discovered the patient was removed to a small-pox hospital. The fifth case was an employee at the same hotel, and had been exposed to one of the prior cases. He was sent to the hospital April 25th. As soon as these cases were reported, a house-to-house canvass was made of that portion of the city in which the patients lived, and other cases were discovered. On April 25th, a driver of a bus developed small-pox and was immediately taken to a hospital. On April 26th, another case was discovered and sent to the hospital. On April 27th, two more cases were found, one of them being a hotel employee. On May 2nd, another case was found and taken to the hospital. On May 9th, it was learned that the wife of one of the patients had had small-pox and had entirely regained her health before it was discovered. None of the patients resided in any of the hotels, but were employees. All of the cases occurred in a portion of the city covering four or five blocks. The total number of cases was 14. The local Board of Health started a house-to-house inspection for the purpose of discovering cases, and employed 12 physicians to vaccinate all exposed to the disease. 2,500 vaccinations were performed. The hotel proprietors and the owners of the rolling chair concessions required all employees to be vaccinated, and in this way 2,500 additional persons were vaccinated, making a total of 5,000. The last person was discharged from the hospital about June 3rd, 1908. All infected articles were removed from the rooms in which the persons were affected with the disease, and were destroyed, and the premises were thoroughly disinfected with formaldehyde gas.

The investigation showed that the intelligent and active measures taken by the local Board of Health were effective.

## Sanitary Inspection.

Local Boards of Health are called upon at times to deal with nuisances in which the advice of the State Board of Health is needed, and frequent requests for assistance are received. These requests are given prompt attention. The supplement to the act of 1887, approved May 24, 1894, gives to the State Board of Health the power to abate nuisances existing within the jurisdiction of a local Board of Health, and the law provides that a notice to abate a nuisance may be sent to the secretary of a local Board of Health, and if no action for the abatement of the nuisance is taken by the local Board, the State Board may file a bill in the Court of Chancery to secure an injunction to prohibit the continuance. The law also provides that where a nuisance exists in one sanitary district, and affects an adjacent sanitary district, similar action may be taken by the State Board of Health. This law has been applied in but few instances, but under its provisions many local nuisances which are unabated might be effectually remedied.

The following reports of inspections are selected from many others. The reports of the inspection of the State Encampment at Sea Girt, and the nuisance caused by garbage and rubbish being deposited on the Atlantic coast near seaside resorts, are of public interest. The report of the sanitary inspection of the Borough of Cliffside Park is not intended as a criticism of the locality, as the section is one of recent development, and the enterprising citizens of the borough appealed to the State Board of Health for the purpose of bringing the knowledge of the unsanitary conditions to the inhabitants. The local Board of Health has been reorganized, a Sanitary Inspector appointed, and an effort made to secure the introduction of a system of public sewers. The borough is located in one of the desirable residential sections of the State, and nearly all of the objectionable conditions which are noted in the report will be removed with the introduction of the sewer system. At the Sea Girt encamp-

ment plans have been formulated for correcting the present unsanitary conditions. The inspection of the nuisance caused by the dumping of rubbish on to the Atlantic coast resulted in lessening the nuisance as indicated in the report which follows hereafter.

#### SEA GIRT ENCAMPMENT.

Following is a report of an inspection of the New Jersey encampment, made July 31, 1908. The method of dealing with sewage on the encampment ground consists of a sewer system which has its outlet into Newberry Lake, which is south of the camp ground. In addition to this, there are, in the rear of several houses on the camp ground, four cesspools, which have been regularly cleaned during the season. It is planned to introduce a new and improved system of sewage disposal during the coming year, and this matter is under the care of the Division of Sewerage and Water Supplies. The main sewer passes at the end of each company street, and receives the washings from the camp kitchens, sinks, ice boxes, and from the hydrants. At the time of inspection the sewer was stopped at the east end of the ground, and inspection openings had been made. These openings were filled with sewage. A number of water closets are connected with the sewer. These have floors of wood, and the fixtures are automatically flushed. There are no screens in the windows. Camp kitchens are provided at the end of each company street. These kitchens consist of a cemented floor sloping to the centre, where a gully trap is placed, and in the rear of the cemented portion is a cemented ice box. These ice boxes are also connected with the sewer, and it was stated that no traps are placed under the ice boxes, but that they are connected directly with the sewer. The food prepared in these kitchens is distributed to the various tents, and each soldier returns the plates which have contained food after his meal is completed. It is said that at times the soldiers throw scraps of meat and other articles outside of the tents, but at the time of inspection there was no evidence of this. The kitchen in the rear of the officers' mess hall was inspected, and it chanced that the midday meal was in course of preparation. The kitchen was filled with flies, the sinks were in a filthy condition, the meat block was saturated with grease, and there was evident lack of attention to the details of personal cleanliness by those who were preparing and serving the food. The water from one of the ice boxes for the keeping of meat and milk discharged on the ground beneath the building. There were no screens either in the kitchen or in the officers' dining room. Garbage cans are provided for each of the camp kitchens, and those in the rear of the one where officers' meals are prepared were filled to overflowing, and covered with flies. It was stated that the garbage was removed once or twice a day.

As a result of the inspection the following suggestions were made:

1. A complete system of sewers should be introduced.
2. Cement floors should be placed in the water closets, and the windows and doors of the buildings should be screened.
3. The ice boxes and sinks on the kitchen platforms should be trapped.
4. There should be a more frequent collection of garbage and provision for more covered cans.
5. More careful attention should be paid to cleanliness in the kitchen attached to the officers' dining room, and the windows and doors of both kitchen and dining room should be screened.
6. The sanitary condition of the camp, throughout the time of encampment, should be under the supervision of a competent sanitary officer.

#### NUISANCE CAUSED BY DEPOSIT OF GARBAGE ON ATLANTIC COAST.

Following is a report of an investigation of a nuisance of which complaint was made by Nathan Bijur, in a communication addressed to Hon. J. Franklin Fort, and referred by His Excellency to the State Board of Health. Complaint was made that garbage and rubbish have recently been deposited in large quantities along the New Jersey coast. For the purpose of ascertaining the character of these refuse materials, one of the representatives of the State Board of Health visited a number of places, from West End to Highland Beach, and the following facts were ascertained.

At the Taekanasse and the Holland House bathing grounds, located at West End, the beach was strewn with large quantities of rubbish, among which were broken furniture, bottles, corks, straw, paint cans and kegs, brushes, feather dusters, old barrels, fruit baskets and crates, old building material such as lathe and other wood, and many other articles usually found in the rubbish from large communities. In fact, the material was apparently composed of that portion of municipal rubbish, separated from garbage, which had withstood the disintegrating effect of sea water for a considerable length of time. There were also observed several carcasses of small animals, in an advanced state of decomposition, which had been in the water some time, and a quantity of dead fish and fish offal which were in a comparatively fresh condition, indicating that they had come from a point much nearer by than the rubbish and dead animals.

Information was obtained at the Taekanasse bathing grounds that fishermen bring fish from the pounds, located off the shore at this point, and at times clean them before landing, and throw the offal and worthless dead fish back into the sea, which probably accounts for the presence of such materials along the shore. At West End information was obtained showing that rubbish and materials of a similar nature had been washed upon the shore since June 27, 1908, and at other times when northeast winds prevailed. Inquiry was also made as to the methods of disposal of garbage and refuse materials in Jersey City, Hoboken and Bayonne, and in none of these places are any such materials taken to sea, but are utilized for filling in sunken lots.

In an interview with the representative of the Street Cleaning Department of the City of New York, information was obtained showing that all garbage collected is taken to Barren Island, and that none of it is deposited at sea. Every day three scow loads of street sweepings and ashes are towed to sea and emptied beyond Scotland Light. The materials on the scows is similar to that which was found cast upon the New Jersey coast. In addition to the public docks in New York City, there are seven private docks from which scows, containing earth and other materials, are towed to sea and emptied. The representative of the Street Cleaning Department stated that after the week ending July 4, 1908, the dumping of street sweepings and ashes at sea would be permanently discontinued.

As a result of the investigation we are led to believe, therefore, that the bulk of the deposit upon the New Jersey shore had resulted from the dumping at sea of street cleanings and ashes by the authorities of New York City, and that, as this method of disposal has been discontinued, there should be no further recurrence of the nuisance. Should complaints again be received, it will be necessary to investigate the character of the material which is being deposited at sea from the private docks in New York City.

#### CLIFFSIDE PARK.

A typical example of the dangerous unsanitary conditions that result from the neglect of local health bodies to fearlessly and efficiently perform their duties is seen at Cliffside Park, near the Palisades, in Bergen County. Inspections made there revealed foul and menacing conditions. The investigations made by the State Sanitary Inspector showed a natural depression in the ground partly filled with broken rock, into which offensive liquids escaped from a main sewer, filling the crevices between the rocks. These liquids were, at the time of the inspection, teeming with mosquito larvae.



It was also shown that waste liquids from a number of dwellings are discharged into the ditches which parallel the trolley track, where many offensive pools form breeding places for mosquitoes. Waste liquids from a number of houses flow down the street gutters and thence into the roadway ditch. The overflow from cesspools contributed to the flow. Sewage from flats and other dwellings was discharged upon the ground, forming sluggish streams and stagnant and offensive pools in other parts of the borough. Overflowing cesspools discharge into the street gutters, down which it flows for four blocks, increasing in volume from many other houses along the avenue, thence across private property, finally discharging into an open sewer. Garbage and rubbish from the borough is deposited by the contractor upon an old farm. This dump covers a considerable area and by reason of the lowness of the ground the decomposed and offensive refuse is partly submerged with liquids, apparently house drainage, which forms an ideal place for the propagation of mosquitos and swarms of flies, as well as reeking, offensive odors and gases. No attempt is made to cover this offensive mass. During rain storms the dump is evidently submerged to the extent that sewage from dwellings occupied by two thousand persons is discharged upon the surface of the ground into leaching and overflowing cesspools from which the natural surface drainage reaches Gorge Road. In the streets in that portion of the town rivulets of sewage wind their way through rubbish and garbage lying in the street gutters, and small children were seen playing in the pools of sewage standing in the gutters on Walker street. In many back yards of this vicinity of the borough rubbish and garbage is thrown in heaps, cesspools are overflowing, stable manure accumulates in large quantities, and open privy vaults are in general use throughout the unsewered section of the borough. The report closes with this encouraging statement: "At a recent meeting of the local Board of Health a regularly qualified health officer was appointed for the Borough of Cliffside Park, and arrangements are now being completed for establishing a health office with the appointee in charge."

## State Institutions.

By the provision of Chapter 292 of the laws of 1908, the State Board of Health is given supervision over epidemics of communicable diseases in State institutions. The provisions of the law are somewhat vague, and the exact powers and duties of the Board are not clearly defined. If the spread of communicable diseases is to be prevented, it is essential that the early cases should be reported, so that the number of foci of infection may be lessened. To secure this end, the following circular letter was addressed to the Superintendent of each State institution:

BOARD OF HEALTH OF THE STATE OF NEW JERSEY,  
TRENTON, Sept. 4, 1908.

GENTLEMEN—We desire to direct your attention to Chapter 292 of the laws of 1908, which reads as follows:

1. It shall be the duty of the Board of Health of the State of New Jersey, whenever an epidemic shall occur in any institution maintained in whole or in part by the State, to immediately initiate and prosecute vigorously all measures to check and control such epidemics, regardless of, and without reference to any local board or boards of health, and to that end such State Board of Health is hereby endowed with full power and authority in the premises.

2. All acts and parts of acts inconsistent herewith are hereby repealed.

3. This act shall take effect immediately.

In the passage of this act it was the evident intention of the legislature to give to the State Board of Health the power to cooperate with the managers of State Institutions in efforts to prevent the spread of communicable diseases. If the number of such cases is to be limited, it is essential, at as early a date as possible, to determine the origin of the disease and to take immediate action for the improvement of sanitary conditions, and the elimination of the various avenues of infection.

We therefore request that the State Board of Health be notified at once when a case of any of the following diseases occurs in your institution:

Chicken-pox	Typhoid fever
Small-pox	Tuberculosis
Measles	Diphtheria
	Scarlet fever.

Upon the receipt of such a notification a representative of this Board will immediately be detailed to make an investigation, and we will advise with you as to the preventive measures which should be adopted.

Very respectfully,  
BRUCE S. KEATOR,  
Secretary.

Replies to the communication were received from a majority of the Superintendents of institutions, expressing a willingness to report all cases of communicable diseases, and up to the present time cases of tuberculosis have been reported as existing in three institutions. When these reports were received a representative of this department visited the institutions, and learned the methods which were adopted to prevent the spread of the disease. The knowledge of the sanitary condition of institutions, if healthful conditions are to be secured and epidemics avoided, is so essential that preparations were made to inspect every penal and charitable institution in the State, and a schedule of inquiry has been prepared which is intended to cover every detail, and form the outline for an exhaustive report. These inspections are now being made, and should be completed for presentation in the next annual report of the Board, but immediate improvements in institutions where there are defective sanitary conditions will be made, as the plan has been adopted of sending to the institution upon which a report is made a statement of the necessary changes and a request that defects be remedied.

The review of the work of the year only indicates the possibility of future usefulness in this department, and is an incentive to increased application in endeavoring to secure better local administration of health matters, and by careful investigation of epidemics to lessen the loss of life due to failure to ascertain the origin and causes of outbreaks of communicable diseases. The careful work of Mr. D. C. Bowen, the Assistant Inspector of the Department, in investigating epidemics is worthy of commendation, and the Department is indebted to your honorable Board for hearty cooperation in every effort to make the work of the division efficient.

Very respectfully submitted,

A. CLARK HUNT,

*Chief of Division.*

## Report of the State Board of Sanitary Examiners.

*To the Board of Health of the State of New Jersey:*

GENTLEMEN—Examination of applicants for licenses to serve as Health Officers and Sanitary Inspectors in the sanitary districts of the State are conducted in accordance with the provisions of Chapter 215 of the laws of 1903. The Board of Examiners, which is appointed by the State Board of Health, was organized March 16, 1904, and the first examination was held June 1, 1904. With the reorganization of the State Board of Health, which occurred May 26, 1908, the following persons were appointed to conduct the examinations: L. R. Thurlow, Health Officer, Plainfield; D. D. Chandler, Health Officer, Newark; George E. McLaughlin, M. D., Jersey City; Edward Guion, M.D., Atlantic City and A. Clark Hunt, M.D., Metuchen. At a meeting held May 29, 1908, George E. McLaughlin, M.D., was elected President of the Board, and A. Clark Hunt, M.D., Secretary and Treasurer. The enactment by the Legislature of 1908 of a civil service law changes somewhat the provisions of the act requiring the Board appointed by the State Board of Health to conduct the examinations. The question of the relation of the two laws, which seem to conflict, has been presented to the Civil Service Commission, and the decision rendered is that persons applying for license as Health Officers and Sanitary Inspectors from localities that have adopted Civil Service requirements will be examined by the Civil Service Commission and that in all other localities in the State licenses shall be obtained from the Board of Examiners appointed by the State Board of Health.

As the examinations are regularly held on the first Wednesday in June and December of each year, and the time for preparation of papers was insufficient, the June examination was postponed until June 17, 1908.

The following shows the number of applicants applying for licenses, the number of licenses issued and the number of applicants rejected:

Number examined, 283; licenses issued, 148; number rejected, 135.

The effect of the operation of the law requiring qualified men to occupy positions as employees of local Boards of Health has been of great value in increasing the effectiveness of local sanitary administration, but the advantages would be greatly increased were there some school for training the applicants for practical work. In Wisconsin and California already departments have been created for this purpose, and at Cornell University, New York, a course of instruction in sanitary science is offered to students. These universities are under State supervision and the problem is more readily solved than in New Jersey. The low salaries which are paid to those engaged in executing public health laws gives little encouragement to young men to take up this useful branch of work, and until the public is educated to the realization of the importance of well educated and well trained men for positions of such responsibility, it will be difficult to make any permanent improvement in existing conditions. There is some evidence however of increasing interest in this subject in many States, and within a short time the creating of a school for the instruction of Health Officers in New Jersey may be realized.

# List of Licensed Health Officers and Sanitary Inspectors.

Following is a list of the persons who have successfully passed the examinations provided for in the act approved April 8th, 1903:

## HEALTH OFFICERS.

†Budd H. Obert. . . . .	Asbury Park, N. J.
†Hiram Williams, M.D. . . . .	Passaic, N. J.
†Alex. Marcy, Jr., M.D. . . . .	Riverton, N. J.
†Wm. S. Green, M.D. . . . .	Paterson, N. J.
Walter Taylor, M.D. . . . .	Jersey City, N. J.
Maria M. Vinton, M.D. . . . .	East Orange, N. J.
Edward Guion, M.D. . . . .	Atlantic City, N. J.
†Fred W. Sell, M.D. . . . .	Rahway, N. J.
Howard L. Baumgartner. . . . .	Asbury Park, N. J.
Lewis L. Sharp, M.D. . . . .	Palmyra, N. J.
†Ferdinand N. Sauer, M.D. . . . .	Jersey City, N. J.
†George T. Tracy, M.D. . . . .	Beverly, N. J.
†Chester H. Wells. . . . .	Montclair, N. J.
†Duncan W. Blake, Jr., M.D. . . . .	Gloucester City, N. J.
Samuel D. Mayhew, M.D. . . . .	Bridgeton, N. J.
John O'Brien, Jr. . . . .	Montclair, N. J.
†James A. Exton, M.D. . . . .	Arlington, N. J.
Frank H. Streightoff. . . . .	Montclair, N. J.
†G. W. Fithian, M.D. . . . .	Perth Amboy, N. J.
†Henry MacDonald. . . . .	Newark, N. J.
†Leon R. Thurlow. . . . .	Plainfield, N. J.
†Edward B. Rogers, M.D. . . . .	Collingswood, N. J.
†J. I. Hoverder, M.D. . . . .	Atco, N. J.
W. U. Kurtz, M.D. . . . .	Asbury Park, N. J.
John K. Adams, M.D. . . . .	Orange, N. J.
William W. Brooke, M.D. . . . .	Bayonne, N. J.
†Thomas J. Duffield. . . . .	Asbury Park, N. J.
Henry D. Abbott, M.D. . . . .	Bayonne, N. J.
†Eugene H. Sullivan. . . . .	Orange, N. J.
†J. Alex. Browne, M.D. . . . .	Paterson, N. J.
Perkins Boynton. . . . .	Little Falls, N. J.
†Ellsmore Stites, M.D. . . . .	Bridgeton, N. J.
†Marcus W. Newcomb, M.D. . . . .	Burlington, N. J.
Charles P. Eaton. . . . .	Jersey City, N. J.
†V. M. D. Marcy, M.D. . . . .	Cape May, N. J.
†Milton L. Somers, M.D. . . . .	Atlantic City, N. J.
†Harry H. Petit, M.D. . . . .	Ridgewood, N. J.
†John T. Connelly. . . . .	Bayonne, N. J.
Charles J. Larkey. . . . .	Bayonne, N. J.
†T. Lee Adams. . . . .	Ocean City, N. J.
†R. H. Parsons, M.D. . . . .	Mount Holly, N. J.

†In the service of the local board of health

Jay E. Kilpatrick	Montclair, N. J.
William Schluer	Orange, N. J.
William G. Schaffler, M.D.	Lakewood, N. J.
†William H. Shipp, M.D.	Bordentown, N. J.
Morris W. Clouse, M.D.	Kearny, N. J.
†Joseph J. Craven, M.D.	Jersey City, N. J.
†Selskar M. Gunn	Orange, N. J.
Joseph Payne, M.D.	Midland Park, N. J.
†Jay G. Foose	Montclair, N. J.
John J. Broderick, M.D.	Jersey City, N. J.
Henry H. Brinkerhoff, M.D.	Jersey City, N. J.
†George W. Lawrence, M.D.	Lakewood, N. J.
†James J. Hagan	Jersey City, N. J.

## PLUMBING INSPECTORS.

†Henry B. Francis	Camden, N. J.
Joseph Sonnenberg	Irvington, N. J.
Conrad Deuchler	Newark, N. J.
Charles M. Whelan	Trenton, N. J.
†William F. Brode	Atlantic City, N. J.
†Thomas D. Clark	Woodbury, N. J.
Edward J. Kelly	Jersey City, N. J.
Thomas F. Harris	Orange, N. J.
†G. H. Soutt	Ridgewood, N. J.
Henry A. W. Smith	Ocean City, N. J.
Hugh F. Parle	Jersey City, N. J.
R. LeRoy Skillman	Newark, N. J.
Andrew McGookin, Jr.	Newark, N. J.
Frederick W. Nichols	Newark, N. J.
Luke J. Devine	Elizabeth, N. J.
James Barnard	Trenton, N. J.
Frank H. Fitzgeorge	Trenton, N. J.
George F. Shafer	Hackensack, N. J.
Charles F. West	Gloucester City, N. J.

## SANITARY INSPECTORS OF FIRST CLASS.

†Fred W. Hering	Jersey City, N. J.
†George W. Gilmore	Newark, N. J.
†Fred C. Robertson, M.D.	Jersey City, N. J.
†John T. McClure	Harrison, N. J.
†John G. Taylor	Dover, N. J.
Charles E. Bellows	Bridgeton, N. J.
†Albert E. Geissler	Kearny, N. J.
Thomas Ainge	Lansing, Mich.
Charles S. Voorhis	Palmira, N. J.
†Lewis E. Boutillier	Newark, N. J.
†Joseph C. Salle	Bloomfield, N. J.
†Casper Benz	Newark, N. J.
†Robert W. Meeker	Plainfield, N. J.
John K. Bennett, M.D.	Gloucester City, N. J.
William H. Addis	Plainfield, N. J.
William W. Heberton, M.D.	South Orange, N. J.
Eric Ordell	Newark, N. J.
John Greaves	Jersey City, N. J.
†John E. Rowe, D. V. S.	Summit, N. J.
George N. Smith	Newark, N. J.
†Frank Dencklan	Plainfield, N. J.

†In the service of the local board of health.

J. H. C. Hunter	Dover, N. J.
Chauncey V. Bunnell	Jersey City, N. J.
†Charles F. Conrad	Newark, N. J.
Percy W. Sipp	Newark, N. J.
†H. S. Winterhalter	Bayonne, N. J.
Jay E. Kilpatrick	Montclair, N. J.
W. J. E. Seder	Newark, N. J.
†Alonzo Brower	Freehold, N. J.
†Frederick E. Wilson	Bayonne, N. J.
David R. Thompson	Delaware City, Del.
†Jay G. Foose	Montclair, N. J.
†William H. Lowe, D. V. S.	Paterson, N. J.
Charles W. Harveys, M.D.	Ridgewood, N. J.
Joseph C. Bitler, M.D.	Hammonton, N. J.
†Lynford E. Tuttle, M.D. V.	Bernardsville, N. J.
James L. Ollif	Plainfield, N. J.
J. J. Reason, M.D.	Carteret, N. J.
†Alfred C. Benedict, M.D.	South Orange, N. J.
†John H. Winslow, M.D.	Vineland, N. J.
†Harry R. Ingalls	Asbury Park, N. J.
Edward F. Flynn	Newark, N. J.
†Elvia Scott	South Orange, N. J.
Harris Day, M.D.	Chester, N. J.
A. I. Goehrig	Trenton, N. J.
Harry E. Moffett	Newark, N. J.
Irwin C. Dakin	Newark, N. J.
William Gluck, Jr.	Newark, N. J.
Fred S. Ball, M.D.	Lakewood, N. J.
Felix McGee	Millburn, N. J.
Charles E. Divine	Newark, N. J.
†Charles McNabb	Bound Brook, N. J.
James J. Waters	Newark, N. J.
John L. Lund, M.D.	Peth Amboy, N. J.
Edward Mulvaney, M.D.	Jersey City, N. J.
John J. Magner, M.D.	Jersey City, N. J.
Edward J. Devitt	Jersey City, N. J.
†J. L. Ebbels	Montclair, N. J.
H. G. Eakin	Union Hill, N. J.
Joseph R. Bartlett	Atlantic City, N. J.
Frank V. Wilkinson	Newark, N. J.

## SANITARY INSPECTORS OF SECOND CLASS.

†Charles Cunningham, M.D.	Hammonton, N. J.
†Franklin P. Vanier	Woodstown, N. J.
†Joseph J. Chickenger	Irvington, N. J.
†J. C. Shinn, M.D.	Jamesburg, N. J.

## SANITARY INSPECTORS OF THIRD CLASS.

David Jamieson	Gloucester City, N. J.
†Robert A. Hirner	Woodbridge, N. J.

†In the service of the local board of health.

## MEAT INSPECTORS.

†G. F. Harker, D.V.S.	Trenton, N. J.
†Richard W. Hewitt, D.V.S.	Camden, N. J.
Willet H. Cooper, D.V.S.	Trenton, N. J.
†Albert T. Sellers, D.V.S.	Camden, N. J.

†In the service of the local board of health.  
‡Deceased.

Respectfully submitted,

A. CLARK HUNT.

## Report on Infectious Diseases of Animals.

*To the Board of Health of the State of New Jersey:*

GENTLEMEN—Prior to the meeting of the last Legislature an estimate of the amount of money required to prevent the recurrence of anthrax in several counties in the southern portion of the State was made by the State Board of Health and presented to the committee on appropriations. No increase in the usual appropriation of two thousand dollars for the supervision of contagious diseases of animals was allowed by the Legislature, and the Board was unable to carry out the plans which had been formulated. As the disease has appeared in but four counties in the State, viz., Cumberland, Salem, Gloucester and Sussex, there is reason to believe that if free vaccination, with anthrax vaccine, of animals grazing on infected meadows could be offered to the owners, and the offer accepted by them, in a few years the spores of the disease would disappear. Owners of cattle in the region where the disease has appeared have been notified that the only method that can be adopted by them to avoid losses of animals in the future is to vaccinate all animals in the spring of the year before placing them upon infected pasture land. The expense incurred must, at the present time, be borne by the owners of live stock, but we trust that a liberal policy will be adopted in the near future and that the State will share this burden.

### BLACK LEG.

No outbreak of this disease has heretofore been reported in New Jersey. The germs of the disease are similar to those of anthrax in that they reside for long periods of time in the soil, and in growing plants and grasses. When in a dry state they may live for several years. The disease is not regarded as contagious, but where animals are exposed to the same sources of infection they contract it, and by infected pastures the disease is continued from year to year. Only animals between the ages of three months and four years are usually attacked. Fortunately the spread of the disease may be limited by preventive inoculation, and it will be necessary to repeat the inoculations each spring until the infection ceases. The cases which were reported to this Board occurred in Vernon Township, Sussex County, and the history of the outbreak is as follows:

About March 20 of the present year, Whitfield Gray, D.V.S., of Newton, was called to investigate the death of young cattle upon a farm near Vernon. Specimens from an animal that had died were forwarded to the State Laboratory of Hygiene, at Trenton, and the bacteriological examination verified the diagnosis of black leg which Dr. Gray had made. The history of deaths of cattle in this section shows that for over fifteen years farmers have lost each year a number of young stock, but had always assigned forage poisoning from eating laurel as the cause of death, and no veterinarian was summoned. In one year on one farm 48 out of 50 animals died, and on another farm the losses each year were so great that the farmers gave up trying to raise young stock. On March 20 Dr. Gray was called to the farm of Joseph Burroughs, near Vernon. The farm contains 2,200 acres of grazing land on and along the mountain. The owner had lost 13 head of cattle from January to March. On the farm of William Forgeson, four miles from the Burroughs farm, seven

animals had died. The history of the outbreak shows that the disease has existed for a long time, and that no precautions have been taken to prevent its spread or the loss of animals. No attention has been given to the proper disposal of the carcasses of dead animals, and these have been left to decompose upon the surface of the ground and infect the pasture land. The country being mountainous and sparsely settled cattle are not looked after except at infrequent intervals and when an animal died the carcass was not found until decomposition was far advanced. Dr. Gray estimates the loss of owners in the last ten years at between 300 and 400 head. When the diagnosis of black leg was confirmed at the Laboratory Dr. Gray was authorized to offer free protective vaccination to animals that had been exposed or were feeding on infected pastures. Joseph Burroughs of Vernon availed himself of this offer, and 12 cattle were vaccinated. None of the vaccinated animals have died. On the premises of Arthur Rutherford, Vernon, 11 vaccinations were performed, and 35 on the farm of Henry B. DeKay. Dr. Gray was employed by the Board, and authorized to perform free inoculation of animals on infected premises and also to instruct owners as to the methods to be employed in the burial of infected carcasses of animals dying of black leg, so that the pasture fields should not become permanently infected. By following this plan each spring for several years the disease will be eradicated.

#### MANGE.

In many portions of the State the disease has been epidemic, but no accurate statement can be made of the total number of cases as no report is made of them by owners of affected animals, and in many instances no veterinarian is employed. In Morris, Somerset and Middlesex Counties, the cases reported were placed under the supervision of qualified veterinarians, and the animals quickly responded to treatment. In Morris County a number of quarantine notices were served upon owners of horses affected with mange, but little was accomplished in lessening the number of cases, and the disease was transmitted from one animal to another so that the quarantines extended over several months. The method which was finally adopted by this board which gave the best results consisted in directing a veterinarian to visit the owner of animals affected with mange and give definite instructions as to the isolation of such animals, the thorough disinfection of stalls, harness, pails, etc., and also to outline a method of treatment of the animals which would result in the rapid disappearance of the disease.

#### CEREBRO-SPINAL MENINGITIS.

In a communication received from a livery stable keeper in Toms River information was obtained showing that a number of horses in that vicinity had died of some form of epidemic or endemic disease. On September 21, 1908, an investigation was made of the conditions at Toms River, and it was found that in 1906 a number of owners of live stock suffered loss of horses from a disease, the character of which was not clearly determined. At that time four veterinarians from various sections of the State had been called to attend cases. It is estimated that 130 animals have been lost, as a result of this disease, along the shore from Egg Harbor to Point Pleasant. A communication was addressed to each one of the veterinarians who had been in attendance, with a request that they should state the character of the disease. Only one of them stated clearly that the disease was cerebro spinal meningitis. The statement was made by one of the veterinarians that the disease was in all probability carried by flies, but this is only a theory and as yet has not been substantiated. Dr. Rogers, of Woodbury, was requested to make an investigation of conditions existing at Tuckerton, and to report his conclusions. In a communication received on September 30, Dr. Rogers stated that the disease differed somewhat from forage poisoning, and that in all probability it is carried by insects from one animal to another. Specimens of the spinal cord and blood of an animal which had died of the disease were forwarded by Dr. Rogers to the State Laboratory of Hygiene, at Trenton, but the condition of the specimens on their arrival at the Laboratory was

such as to preclude any examination. Other specimens were taken by Mr. Fitz-Randolph, Director of the State Laboratory of Hygiene, but their examination gave no definite information. The history of the outbreak and the character of the symptoms manifested were presented to Dr. Leonard Pearson, of the Philadelphia Veterinary College, and he expressed the opinion that the disease was cerebro spinal meningitis, and suggested that further bacteriological investigations be made by Drs. Fitz-Randolph and Reicher for the purpose of endeavoring to ascertain the method of its transmission.

#### GLANDERS.

In 1906 in Passaic and Essex Counties construction work on railroads and other improvements necessitated the employment of a large number of horses which were brought from New York City, Newark, Jersey City and many sections in New Jersey. These animals were in many instances debilitated by hard work, and cases of glanders were reported in increasing numbers. The conditions seemed to call for some special action, and the State Board of Health adopted resolutions suggesting to the local Boards of Health, in the sections where the disease appeared, the wisdom of discontinuing the use of public drinking fountains. This suggestion was followed, and at the close of the year the disease was under control. Since 1906 the number of cases occurring has been the average which is to be expected each year, and requests were received from local Boards of Health that the restriction placed upon the use of public drinking fountains be removed. Correspondence with the health boards in reference to this matter indicated a diversity of opinion, but the majority were insistent on continuing the restrictions and the State Board of Health decided to make no change in the existing regulations.

Respectfully submitted,

A. CLARK HUNT.

# Report of the Division of Creameries and Dairies.

By GEORGE W. McGUIRE, Chief.

*To the Board of Health of the State of New Jersey:*

GENTLEMEN—I have the honor to submit herewith a report of the transactions of the Division of Creameries and Dairies for the year ending October 31, 1908:

## CREAMERIES.

At the end of the fiscal year, October 31, 1908, there were in operation in this State one hundred and thirty-eight establishments which under the law are classed as creameries. Ninety of these have been licensed by the State Board of Health and forty-eight are not yet licensed. The latter require reinspections in order to learn whether the improvements requested by the Board have been made before a license will be issued.

The term creamery is defined by the act as follows:

“Any establishment where milk is received or stored for sale or distribution by wholesale or for the manufacture of the same into butter, cheese, condensed milk or other food for human beings.”

The establishments for the handling and distribution of milk in this State are of various types, and include, beside the butter and condensed milk factories, other combination plants where ice cream, cheese and casein are manufactured from part of the product received, often in the same rooms where the milk is prepared for market. It would be better if these establishments were placed in different classes and licensed under names that would indicate more clearly the character of the business carried on. More satisfactory ratings could then be given them on the official score card.

The score card system of judging creameries was adopted by the Board and used for the first time in July of the present year, and it has proved to be a valuable agent for recording the actual sanitary conditions on creamery premises. Since a large proportion of the milk handled in creameries in the

upper end of the State finds a market in New York City, while that from some of the New York State creameries is shipped to cities in this State, it was deemed advisable by the State Board to adopt the official score card used by the Board of Health of the City of New York. With but few exceptions it meets every condition required, and constitutes a uniform standard of inspection, showing the sanitary conditions surrounding the milk, which are so mutually important to both States. The time during which these score cards have been in use has been too short to enable us to score every creamery, and thirty-five of them are yet to be done; consequently we cannot at this time give the percentages of the different conditions existing on such premises this year.

In scoring creameries it has thus far been our policy to refuse a license to any establishment falling below 75 per cent. of the perfect standard. A copy of the score awarded to each creamery is sent to its owner, and a record of it is kept in this office. This makes a perfect system, and informs the owner of all the defects discovered by the inspector on his premises, thereby enabling him to correct them before another inspection takes place.

The following is a copy of the official score card above referred to:

**BOARD OF HEALTH OF THE STATE OF NEW JERSEY.**  
*DIVISION OF CREAMERIES AND DAIRIES.*

License No. ....	Score Allowed. ....	A. M. ....	P. M. ....
No. ....	Inspection No. ....	Date. ....	Time. ....
Location. ....	County. ....	Address. ....	Address. ....
Owner. ....	Manager. ....	Number of employees. ....	Number of patrons. ....
Quantity of milk received daily. ....	Qts. ....	Average butter fat test for dairies at present } ....	free from infectious disease. ....
Milk train leaves daily at. ....	A. M. ....	On. ....	Railroad. ....
Method of Pasteurizing. ....	Machine used. ....	Branch. ....	Branch. ....
Cream is made by hand-skimming, separating. ....	made on the premises. ....	made on the premises. ....	made on the premises. ....
Butter, Cheese, Condensed Milk, Casein, Ice Cream or Milk Sugar are. ....	posted. ....	Source of ice supply. ....	Source of ice supply. ....
Board of Health Rules are. ....	posted. ....	Source of ice supply. ....	Source of ice supply. ....
Name. ....	Address. ....	Cans MILK. ....	Cream CREAM. ....
Name. ....	Address. ....	Cases MILK. ....	Cases CREAM. ....
Name. ....	Address. ....	Cans MILK. ....	Cases CREAM. ....
Name. ....	Address. ....	Cases MILK. ....	Cases CREAM. ....
Name. ....	Address. ....	Cans MILK. ....	Cases CREAM. ....
Name. ....	Address. ....	Cases MILK. ....	Cases CREAM. ....

**Shipments to Customers.**

Name. ....	Address. ....	Cans MILK. ....	Cases CREAM. ....
Name. ....	Address. ....	Cases MILK. ....	Cases CREAM. ....
Name. ....	Address. ....	Cans MILK. ....	Cases CREAM. ....
Name. ....	Address. ....	Cases MILK. ....	Cases CREAM. ....
Name. ....	Address. ....	Cans MILK. ....	Cases CREAM. ....
Name. ....	Address. ....	Cases MILK. ....	Cases CREAM. ....



	PERFECT SCORE	ALLOWED
1 PREMISES surrounding creamery are . . . . . clean . . . . .	2	.....
2 RECEIVING ROOM is . . . . . partitioned off from main milk room . . . . .	2	.....
3 Weigh vats and storage tanks are . . . . . covered when in use . . . . .	4	.....
4 MILK-HANDLING ROOM is . . . . . used exclusively for handling milk . . . . .	1	.....
5 Is . . . . . separate from where cans are washed . . . . .	1	.....
6 Is . . . . . separate from where engine or boiler is located . . . . .	1	.....
7 Is . . . . . well lighted by . . . . . windows . . . . .	2	.....
8 All odors and steam are . . . . . carried to the outside air . . . . .	3	.....
9 WALLS AND CEILING are . . . . . sheathed and dust tight . . . . .	2	.....
10 Are . . . . . painted with some light-colored paint . . . . .	1	.....
11 All ledges are . . . . . clean and free from dust and dirt . . . . .	2	.....
12 FLOORS are . . . . . free from dirt, rubbish or pools of drainage . . . . .	2	.....
13 Are . . . . . made of concrete stone or some non-absorbent material . . . . .	5	.....
14 Are . . . . . water-tight . . . . .	2	.....
15 Are . . . . . so graded that all drainage is discharged at one or more . . . . .	2	.....
16 Strainers in floor are . . . . . at least 6 inches in diameter . . . . .	1	.....
17 SPACE BENEATH CREAMERY is . . . . . dry . . . . .	3	.....
18 Is . . . . . free from waste or rubbish . . . . .	1	.....
19 DRAINS are . . . . . of earthenware or iron . . . . .	2	.....
20 Are . . . . . water-tight . . . . .	2	.....
21 Are . . . . . continuous from the floor level to point of disposal . . . . .	2	.....
22 Are . . . . . protected against freezing . . . . .	1	.....
23 DRAINAGE is . . . . . satisfactorily disposed of . . . . .	5	.....
24 MILK PUMPS AND PIPES for milk can . . . . . be readily taken apart . . . . .	1	.....
25 Are . . . . . thoroughly cleaned daily . . . . .	2	.....
26 All steam and water pipes are . . . . . painted and clean . . . . .	1	.....
27 MILK VATS are . . . . . in good repair . . . . .	1	.....
28 All tin joints are . . . . . soldered flush . . . . .	1	.....
29 Are . . . . . thoroughly cleaned daily . . . . .	2	.....
30 MILK CANS are . . . . . washed with hot water and washing solution . . . . .	2	.....
31 Are . . . . . rinsed out with clean water . . . . .	1	.....
32 Are . . . . . exposed to live steam for at least two minutes . . . . .	2	.....
33 ALL MILK is . . . . . protected from dust, dirt and flies while in pools . . . . .	2	.....
34 Is . . . . . protected while in mixing vats or over aerators . . . . .	2	.....
35 Is . . . . . received at a temperature not above 60° F . . . . .	3	.....
36 Is . . . . . kept below 50° while held or handled on premises . . . . .	2	.....
37 COOLING TANKS are . . . . . water-tight . . . . .	1	.....
38 Are . . . . . made of some non-absorbent material . . . . .	1	.....
39 Are . . . . . supplied daily with clean water or filled with clean ice . . . . .	1	.....
40 WATER SUPPLY is . . . . . ample for all the needs of the creamery . . . . .	5	.....
41 Water supply is . . . . . apparently free from all contamination and is . . . . .	10	.....
42 STORAGE TANK for water is . . . . . cleaned regularly . . . . .	1	.....
43 Is . . . . . covered or protected from dirt . . . . .	1	.....
44 ATTENDANTS are . . . . . cleanly in their habits . . . . .	2	.....
45 Garments worn by such employes are . . . . . clean . . . . .	2	.....
46 PRIVY, water closet, earth closet, tight vault is . . . . . satisfactorily located . . . . .	2	.....
47 Is . . . . . in a cleanly condition . . . . .	1	.....
48 SPITTING OR SMOKING in any part of the building is . . . . . allowed . . . . .	1	.....
49 Domestic animals are . . . . . allowed in creamery . . . . .	1	.....
Remarks . . . . .	100	.....

Inspector.

Section 4 of the Creamery Act has proved a potent factor in compelling improvements in sanitary conditions on creamery premises, without resorting to the delays incident to legal procedure. The section reads as follows:

4. It shall be the duty of the State Board of Health to notify, in writing, the local Board of Health of every sanitary district in which milk or cream is sold, and which milk or cream is found to be collected, stored, transported or distributed under unclean or unwholesome conditions.

It has been necessary in several instances to notify local Boards that the methods used in certain creameries in handling milk intended for sale in their municipalities were found to be grossly unsanitary and attended with risk to the consumer. Immediately upon receipt of such notice by the local Boards, milk shipped from these creameries was intercepted upon its arrival at its destination, and its use as food prohibited until the unsanitary conditions were remedied and the creameries approved by the State Board of Health. The local Boards of the cities of Plainfield, Perth Amboy and New Brunswick have been especially active in preventing the sale of milk after receiving notices of this kind.

Since the scoring system has been in operation, other Boards of Health besides those above mentioned have been revising their health codes by adding supplements requiring dealers to name the sources of their supply before a permit to sell milk within their municipal limits would be granted.

In this way the source of every dealer's supply becomes known to the local Board, and if a notice should be received from the State Board condemning the product of a certain creamery, the supply can be immediately stopped.

The following table shows the number of creameries to which this Board has sent notices to improve defective conditions:

TABLE A.

Number of creameries which have been notified to provide proper covers for milk receptacles . . . . .	37
Number of creameries notified to protect milk while in mixing vats or over aerators . . . . .	2
Number of creameries notified to remove cause of offensive odor . . . . .	7
Number of creameries notified to improve method of bottling milk . . . . .	2
Number of creameries which have been notified to make repairs in drainage system . . . . .	14
Number of new cesspools built . . . . .	2
Number of creameries which have been notified to repair interior surfaces, making them dust-proof . . . . .	18
Number of creameries notified to repair floors . . . . .	13
Number of creameries notified to clean space beneath creamery . . . . .	2
Number of creameries notified of polluted water supplies . . . . .	7
Number of creameries notified of suspicious water supplies . . . . .	2

Eight new creameries have been established, and seven abandoned during the year. The abandoned creameries were located in Spring Mills, Ludlow, Pennington, German Valley, Robbinsville, Bridgeton and Hartford. Those at Spring Mills, Ludlow, Pennington and German Valley were closed because the quantity of milk received by the operators was insufficient to warrant the running of the plants. This milk is now being taken to other creameries in the same localities.

The creamery at Bridgeton has been operated for several years by various milk dealers, and has always been refused a license by this Board on account of the unsanitary conditions found to exist there. It was finally abandoned by the last owner because the Board refused to license it.

The owner of the creamery at Robbinsville, after having been notified a number of times to equip the establishment according to sanitary requirements, finally complied with the law and was granted a license, but it was subsequently revoked because he neglected to take the sanitary precautions required of him. He then set up an establishment for the handling of milk in the village of Allentown, Monmouth County, New Jersey, some one and one-half miles from the Robbinsville creamery. Two inspections of the Allentown creamery showed the place to be conducted in a very unsanitary manner, and the Board authorized a suit for the recovery of the penalty of two hundred dollars for operating the plant in violation of the law. On the trial day the case was adjourned, and the defendant asked for a hearing before the Board, which was granted. He appeared with counsel, who stated that Mr. Hulse, the owner, had been under the impression that the license issued to him for his Robbinsville creamery entitled him also to conduct the business at his new place in Allentown. When informed that such was not the case, he stated that he had had no intention of violating the law in this respect, and that since his premises at Allentown were operated contrary to the provisions of the Act, he would take immediate steps to construct a building which would in every way conform to the law's requirements. After considering the statement made by counsel for this defendant, the Board withdrew the suit on the promise of the owner, as stated above. A communication recently received from

him, states that his building is in course of construction and will soon be ready for inspection by an officer of this Department.

The abandoned creamery at Hartford was formerly operated as a butter creamery. Many criticisms have been made of this place during the past three years, but because of improved methods it was finally licensed. During the month of August of the present year one of the operators was stricken with typhoid fever, and other cases followed in the village and the surrounding country. While this outbreak could not be traced directly to the product handled in the creamery, the sanitary conditions revealed by several inspections of the plant were of such a character that the owner found it impossible to comply with the requirements of the Board. The license was therefore revoked and the creamery abandoned.

In the City of Camden there are five creameries which come within the classification for licenses as defined by the Act. Three of these have been licensed. The other two were refused licenses by the Board, because they did not comply with the legal requirements. The Board of Health of the City of Camden was notified of the defects in these places, and communications received from them stated that they were taking steps to compel a compliance with the city ordinance regarding the sale of milk. Time has not permitted a reinspection of these premises at the date of this report.

During the spring and early summer a serious condition existed on the premises of the creamery at Roy's Crossing, Sussex County, New Jersey, the facts of which were at the time reported to this Board. Patrons of the Susquehanna Railroad complained of the stench emanating from these grounds, and an inspection showed that waste fluids, consisting of decomposing milk and other offensive matter, were discharged into an open ditch alongside of the creamery, and that for a distance of over a hundred yards this decaying material was exposed to the atmosphere and caused a positive nuisance. Other very serious unsanitary conditions existed in the creamery rooms. It required several visits to this place, besides written communications, before the creamery was placed in a sanitary condition. The Board finally found it necessary to limit the time for making the improvements, but they were finally completed and a license

granted. Nearly five thousand quarts a day are handled and manipulated in this creamery, and it requires frequent visits by an inspector to an establishment of this kind to insure the purity of the milk handled therein.

The following table will show the conditions at creameries relating to the temperature of milk before and after shipment, the number in which the milk is pasteurized before shipment, and other important features:

TABLE B.

Number of creameries at which milk is received at or below 60 degrees F.	40
Number of creameries who keep milk at or below a temperature of 50 degrees F. before shipment.	40
Number of creameries who pasteurize milk before shipment.	99
Number of creameries who use milk pumps.	37
Number of creameries in which offensive factory odor was present.	28
Number of creameries scored having ample water supply.	28
Number of creameries scored having insufficient water supply.	95
Number of creameries scored having a pure water supply.	8
Number of creameries in which infectious disease was reported.	51
	1

TABLE C.—LIST OF CREAMERIES IN NEW JERSEY, SHOWING THE LOCATION BY COUNTIES, NAME OF OPERATOR AND DISPOSAL OF PRODUCT.

LOCATION.	NAME OF OPERATOR.	DISPOSAL OF PRODUCT.
<b>Burlington Co.</b>		
Columbus	E. R. Supple's Sons	Shipped to Philadelphia, Beach Haven and Bay Head.
Pemberton	Montgomery & Smith	Shipped to Asbury Park, Barnegat, Camden, Burlington, Merchantville.
<b>Camden Co.</b>		
Camden	Clements & Moore	Sold in Camden.
"	Wm. E. Cramer	" " "
"	James P. Daly	" " "
"	Harry R. Read Co.	Shipped to Ocean City, Island Heights and Barnegat City.
"	Howard W. Walford	Sold in Camden.
<b>Cumberland Co.</b>		
Bridgeton	Artic Ice & Milk Co.	Shipped to Millville, Vineland, Atlantic City, Philadelphia and Wildwood. Part of product manufactured into ice cream.
"	Bridgeton Condensed Milk Co.	Manufactured into condensed milk and shipped to Philadelphia.
<b>Essex Co.</b>		
Caldwell	Harry F. Backes	Wholesaled and retailed in Newark and Orange.
Newark	Seiler Bros.	Wholesaled and retailed in Newark.
<b>Hudson Co.</b>		
Jersey City	Howell Condensed Milk Co.	Shipped to Jersey City and New York. Part of product manufactured into condensed milk.
<b>Hunterdon Co.</b>		
Amndale	Marchant Brothers	Shipped to Plainfield.
Baptistown	George H. Scott	Shipped to Philadelphia.
Barbertown	Wm. Strauss	Carted to Idell and manufactured into butter.
Barley Sheaf	Anwell Valley Dairy Co.	Shipped to Philadelphia.
Bloomsbury	C. W. Van Natta	Shipped to Jersey City, Newark, Elizabeth and Roselle Park.
Califon	C. C. Demarest & Co.	Shipped to Bayonne and Westfield.
Cherryville	C. R. Peterman	Manufactured into butter.
Clinton	James Wyckoff	Shipped to Jersey City, Newark, Bridgryn, Elizabeth, Perth Amboy, New Market.
Clover Hill	A. C. Durling	Shipped to Newark.
Everettstown	G. H. Scott	Shipped to Philadelphia.
Flemington	Seiler Bros.	Shipped to Perth Amboy, Newark and Roselle Park.
Frenchtown	Robert Harberson	Shipped to Philadelphia.
Hampton Junction	Marchant Brothers	Shipped to Plainfield, Elizabeth, Bayonne, Greenville and Cranford.
Hoffmans	Isaac H. Hoffman	Shipped to Califon and Newark.
Idell	Wm. Strauss	Manufactured into butter and shipped to Philadelphia and Lambertville.
Jutland	Geo. N. Robinson	Shipped to Elizabeth and Perth Amboy.
Lebanon	Geo. Clark & Son	Shipped to Bayonne.
Little York	S. V. Eckel & Son	Manufactured into butter and shipped to Trenton, Phillipsburg, Philadelphia, Bloomsbury, Milford and Little York.
Locktown	Locktown Dairymen's Association	Manufactured into butter and shipped to Trenton.
Milford	Henry Hauptfuehrer	Shipped to Philadelphia.
Mount Pleasant	Geo. H. Scott	Shipped to Frenchtown and Philadelphia.
New Germantown	A. C. Durling	Shipped to White House.
Oak Grove	C. R. Peterman	Carted to Cherryville and manufactured into butter.
Oak Summit	Harry Sassaman	Manufactured into butter.
Pattenburg	Geo. N. Robinson	Shipped to Newark, Jersey City and Perth Amboy.
Pittstown	Empire State Dairy Co.	Shipped to Brooklyn.

TABLE C.—LIST OF CREAMERIES IN NEW JERSEY, SHOWING THE LOCATION BY COUNTIES, NAME OF OPERATOR AND DISPOSAL OF PRODUCT—(Continued.)

LOCATION.	NAME OF OPERATOR.	DISPOSAL OF PRODUCT.
<b>Hunterdon Co.</b>		
Readington.	Farmers' Exchange Co.	Manufactured into butter and carted to South Branch.
Reaville.	Farmers' Exchange Co.	Manufactured into butter and shipped to Trenton and Philadelphia.
Ringoes.	Harberson Dairies' Co.	Shipped to Philadelphia.
	Wm. Strauss.	Manufactured into butter and shipped to Philadelphia and Ringoes.
Rosemont.	Wm. Strauss.	Carted to Sergeantsville and manufactured into butter.
Sergeantsville.	Wm. Strauss.	Manufactured into butter and shipped to Trenton and Philadelphia.
Sunnyside.	James Wyckoff.	Shipped to Elizabeth, Newark and Jersey City.
Three Bridges.	Amwell Valley Dairy Co.	Shipped to Newark, Elizabeth and Perth Amboy.
Wertsville.	Hernig & Northrup.	Milk carted to Hopewell.
West Portal.	C. W. Van Natta.	Shipped to Jersey City.
White House.	A. C. Durling.	Shipped to Newark and New York.
<b>Mercer Co.</b>		
Harbourton.	Samuel A. Burns.	Manufactured into butter and shipped to Trenton and Frankfort, Pa.
Hopewell.	Hernig & Northrup.	Shipped to Philadelphia and Trenton.
<b>Middlesex Co.</b>		
Crabury.	Cook and Jones.	Shipped to Spring Lake and Princeton.
Highland Park.	W. W. Ten Eyck.	Sold in New Brunswick.
New Brunswick.	New Brunswick Hygienic Milk Co.	Sold in New Brunswick.
	De Hart Voorhees.	Sold in New Brunswick.
Three Mile Run.		
<b>Monmouth Co.</b>		
Allentown.	Allentown Dairy Association.	Shipped to Asbury Park, Spring Lake and Mansquan.
	B. Frank Hulse.	Sold in Trenton.
Colt's Neck.	Colt's Neck Creamery Co.	Carted to Asbury Park.
<b>Morris Co.</b>		
Chester.	Seiler Bros.	Shipped to Newark and Orange.
Flanders.	Willwood Farms Dairy Co.	Shipped to New York.
	Wm. McLaughlin.	Shipped to Newark and Dover.
German Valley.	T. Welch.	Shipped to Newark and Jersey City.
Middle Valley.	Geo. Clark & Son.	Shipped to Bayonne.
Morristown.	Luther Kountz.	Manufactured for private use and surplus sold to local trade.
Naughtlight.	Du Bois Bros.	Shipped to Jersey City.
Towaco.	Max Wenzel.	Shipped to Hoboken.
Troy Hills.	H. F. Shivers.	Shipped to Caldwell.
<b>Salem Co.</b>		
Alloway.	F. A. Backeler.	Shipped to Millville, Cape May, Wildwood, Sea Isle City and Philadelphia. Part of product manufactured into butter and ice cream.
		Shipped to Ocean City.
		Shipped to Atlantic City, Glassboro, Ocean City, Camden and Pleasantville.
	Isaac B. Reeve.	Milk shipped to Philadelphia and Atlantic City.
		Milk carted to Salem.
Harmersville.	J. Q. Davis.	Shipped to Atlantic City.
Monroeville.	Monroeville Ice Cream Co.	Shipped to Atlantic City.
Salem.	Abbott's Alderney Dairies.	Manufactured into condensed milk and shipped to Philadelphia.
	Bridgeton Condensed Milk Co.	Shipped to Atlantic City and other seashore points and Philadelphia.
	J. Q. Davis.	Shipped to Atlantic City and other seashore points and Philadelphia.
Sharptown.	Wm. Richman.	Shipped to Camden, Atlantic City and Holly Beach.
Woodstown.	James McIntire.	Shipped to Philadelphia.
	C. French Moore.	Shipped to Philadelphia, Ocean City, Atlantic City and Camden.
<b>Somerset Co.</b>		
Belle Mead.	Farmers' Exchange Co.	Shipped to Philadelphia, Trenton and Farmingdale.

TABLE C.—LIST OF CREAMERIES IN NEW JERSEY, SHOWING THE LOCATION BY COUNTIES, NAME OF OPERATOR AND DISPOSAL OF PRODUCTS.—(Continued.)

LOCATION.	NAME OF OPERATOR.	DISPOSAL OF PRODUCT.
<b>Somerset Co.</b>		
Bernardsville.	Heenan Childs.	Shipped to New York and Basking Ridge.
Flagtown.	Samuel Levi.	Shipped to New York City.
Luther Childs.	Luther Childs.	Shipped to New York City.
Lamington.	Seiler Bros.	Shipped to Newark.
Liberty Corner.	Luther Childs.	Shipped to New York City.
Lyons.	Farmers' Exchange Co.	Carted to Reaville and manufactured into butter.
Montgomery.		
	E. D. Dennis.	Shipped to Newark.
Neshanic.	Wm. Rausch.	Shipped to Brooklyn.
	Geo. W. Field.	Shipped to Bayonne.
North Branch.	James Woods.	Shipped to New York City.
Pluckemin.	A. C. Durling.	Shipped to White House.
Pottersville.	Wm. Arkenburg.	Made into butter and cream and shipped to Plainfield, Somerville, Elizabeth and Trenton.
Raritan.		Shipped to Philadelphia.
		Shipped to Trenton and Philadelphia.
<b>Skillman.</b>	J. B. Longshore.	
<b>South Branch.</b>	Farmers' Exchange Co.	
<b>Sussex Co.</b>		
Andover.	Fulboom Dairy Co.	Shipped to New York City and Paterson.
		Shipped to New York City.
Augusta.	T. O. Smith's Sons.	Shipped to Pelletown, N. Y.
Baleville.	Alex. Campbell Milk Co.	Shipped to Newark.
Beemerville.	Seiler Bros.	Shipped to New York City.
Bevans.	Borden's Condensed Milk Co.	Shipped to Unionville, N. Y.
Branchville.	S. C. Hayne.	Shipped to Jersey City and Brooklyn.
Clove.	Brown & Bailey.	Shipped to Brooklyn.
Glenwood.	Diamond Dairy Co.	New York City.
Hamburg.	Borden's Condensed Milk Co.	Newark.
Hunsville.	Newark Milk & Cream Co.	Shipped to Brooklyn and Rutherford, N. J.
Lafayette.	H. S. Chardavoynne.	
McAfee.		
Monroe.	Wm. M. Evans.	Shipped to Brooklyn.
	Newark Milk and Cream Co.	Shipped to Newark.
Mulford.	Sanford Dairy Co.	Shipped to New York City.
Newton.	Dairy Products Company.	New York City.
Papakating.	Borden's Condensed Milk Co.	Shipped to New York City.
Prace's Crossing.	Orange Co. Milk Association.	Shipped to New York City.
Quarryville.	Horton-Lewis Cream Co.	Shipped to Jersey City and Paterson.
Roy's Crossing.	Fulboom Dairy Co.	Shipped to New York City.
Sparta.	George Ihnken.	Shipped to New York City.
Stillwater.	M. Jermert Dairy Co.	Shipped to Brooklyn.
Stockholm.	George Ihnken.	Shipped to Jersey City and Hackensack.
Sussex.	Beakes' Dairy Co.	Shipped to New York City.
		Condensed milk and casein manufactured.
	Horton-Lewis Cream Co.	Shipped to Jersey City.
		Shipped to Brooklyn.
	Dennis Reardon.	Shipped to New York City.
Swartwood.	George Lodes.	Shipped to Brooklyn and Jersey City.
Tranquility.	Lehigh & Hudson R. R.	Shipped to Brooklyn and Jersey City.
Vernon.	Raid Ice Cream Co.	New York City.
Warbasse.	Henry Tepperwin.	Shipped to Brooklyn.
Woodruff's Gap.	H. S. Chardavoynne.	
<b>Warren Co.</b>		
Allamuchy.	Halprin Dairies.	Shipped to Newark.
Blairtown.	Empire State Dairy Co.	Shipped to Brooklyn.
Bridgewater.	H. A. Rausch.	Shipped to Brooklyn.
Broadway.	Broadway Creamery Co.	Shipped to Orange and Wharton.
Changewater.	Taylor Plate Milk Co.	Shipped to Brooklyn.
Delaware.	F. W. Jensen.	Shipped to Staten Island, Jersey City and Hoboken.
		Shipped to New York City.
Great Meadows.	Sanford Dairy Co.	Shipped to Brooklyn.
Hackettstown.	Alex. Campbell Milk Co.	Shipped to Brooklyn.
Hainesburg.	Ira C. Hunter.	Shipped to New York City.
Long Bridge.	Mutual Milk & Cream Co.	Shipped to New York City.
Marksboro.	Mutual Milk & Cream Co.	Shipped to New York City.
Roxburg.	Elmer Worthington.	Carted to Stone Church.
Vails.	Fulboom Dairy Co.	Shipped to Paterson and Jersey City.

The following shows the number of samples of water collected, those reported to be "polluted," those "suspicious," those "probably safe" and those "good."

Polluted, 15; suspicious, 12; probably safe, 27; good, 24; total, 78.

Notice was sent to the owner of each creamery whose water supply was found to be suspicious or polluted with a request that immediate steps be taken to improve conditions, and no doubt at the next inspection, the necessary improvements will be found to have been made.

The following code of rules were adopted by the Board at a meeting held June 30th, 1908, for the government of creameries. These rules are printed on stout muslin and a copy is posted in every creamery in the State.

#### BOARD OF HEALTH OF THE STATE OF NEW JERSEY.

##### ACT OF THE LEGISLATURE GOVERNING CREAMERIES.

No person or persons, firm or corporation, buying or receiving milk or cream for the purpose of selling the same as such, or for manufacturing the same into butter, cheese, condensed milk, or other food for human beings, shall place, keep or store the same in any vat, tank, can, bottle, vessel, utensil or other receptacle which is unclean, and every building or structure in which milk or cream is received, and which milk or cream is intended for sale, shall be provided with an abundant supply of pure and wholesome water, and shall be provided with adequate facilities for the cleansing of all receptacles and utensils employed in handling milk or cream. The interior surfaces of the walls and ceilings of all such buildings and structures shall be smooth and be kept free from dust. The floors of all rooms in such buildings in which milk is received or kept or handled shall be impervious to water, and the surfaces shall be so graded that waste fluids will flow into a water-tight drain, and be finally disposed of in a manner which will not create a nuisance. No portion of any creamery building shall be used as a dwelling, nor as a laundry or kitchen.

##### RULES GOVERNING THE OPERATION OF CREAMERIES.

1. The site of the creamery building must be dry, and the surroundings free from all refuse accumulations. Creamery buildings must not be located near any stable, chicken yard, hog pen or slaughter house, and no open privy vault or other receptacle for filth allowed near said buildings. If cesspools are necessary, they must be screened to prevent the entrance and exit of flies. Waste fluids from creamery premises must be conducted through sub-surface drains and finally disposed of in a manner which will not create a nuisance.

2. If the creamery is provided with a cellar, this apartment must be well lighted and ventilated and kept scrupulously clean and dry.

3. The floors of all rooms in which milk is handled must be covered with asphalt or other material impervious to water, and the surfaces graded to permit quick escape of waste fluids into a properly constructed drain.

4. No room in any creamery which is used for receiving, handling or bottling milk shall be used for any other purpose.

5. All creamery rooms in which milk is stored, handled or exposed must be screened to prevent the entrance of insects.

6. All vats must be provided with removable covers of a pattern approved by the State Board of Health, and all vats must be kept covered at all times when milk is contained in them.

7. The milk should, when practicable, be elevated when it is received and before it is transferred from the dairymen's cans to receptacles provided by

the creamery, to a sufficient height to permit it to flow by gravity through open channels to the separator, cooling apparatus, cans, bottles, etc. If pumps and closed pipes are used in conveying milk, they must be so constructed that every portion of their interior surfaces will be accessible for cleaning. All pipes used for this purpose must have an internal diameter of at least two inches, and must be made up of short lengths. All pipes, separators, coolers and other machinery used for handling milk must be daily taken apart and all surfaces which come in contact with milk must be thoroughly cleaned and sterilized.

8. Every creamery should be equipped with a steam sterilizing chamber large enough to receive all cans, bottles and utensils used in handling milk, and all such containers and utensils, after thorough washing, should be exposed to live steam at a temperature of 240 degrees F. for not less than thirty minutes before use.

9. No measuring rod or other instrument should be put into milk unless such rod or instrument has been sterilized before use.

10. The water used in creameries must be pure, wholesome and abundant in quantity.

11. Every portion of the creamery building and premises must be kept clean and free from dust, cobwebs and accumulations.

12. Creamery employes must be cleanly in their habits; their outside garments should be white and clean, and warm water, soap and clean towels must be provided to permit convenient washing of their hands.

13. The temperature of milk for sale or shipment must not be above 50 degrees F.

14. All milk, at the time it is received at the creamery, should be at or below a temperature of 60 degrees F.

15. Cats, dogs, fowls or other domestic animals must not be kept or allowed in or about creamery buildings.

16. Each creamery owner or manager must send to the Chief of the Division of Creameries and Dairies, when requested so to do, a statement giving the name and address of every person supplying milk to said creamery, the quantity of milk sent by each person, the amount of milk shipped or delivered from the creamery, the names and addresses of the persons to whom such milk is shipped or delivered, the quantity of milk so shipped or delivered and such other matter relating to the management and operation of such creamery as may be requested by said Chief of the Division of Creameries and Dairies.

17. Each creamery owner or manager must report immediately by telegraph to the Chief of the Division of Creameries and Dairies any case or suspected case of typhoid fever, scarlet fever, diphtheria or tuberculosis, occurring among the employes of the creamery or their families, or among the patrons supplying milk to the creamery or their families. The Manager of the creamery must at all times make diligent effort by inquiry or otherwise, to ascertain whether or not any case or suspected case of any of the above mentioned diseases exist among any of the aforesaid persons. Failure to obey this rule will result in the immediate revocation of the license issued to the creamery, the owner or manager of which disobeys it.

18. No person suffering from typhoid fever, scarlet fever, diphtheria or tuberculosis shall be employed in or permitted to enter any creamery in this State.

#### DAIRIES.

While no regular and systematic inspection of dairies was conducted by State authorities until the present State Board of Health created the Division of Creameries and Dairies, yet for a number of years past, work of this character has been done by the Food Inspectors in connection with their

other duties, under the direction of the Board. Many hundred dairy farms in all sections of the State have been visited for inspection and scoring, which has resulted in a vast improvement in their sanitary condition.

It is estimated that there are in the neighborhood of ten thousand dairies which supply milk to the population of New Jersey, and with the number of inspectors employed by the State it is impossible to make regular inspections or even to visit each of them once a year. Consequently it will be the chief policy of this Department to cooperate with local Boards of Health whose ordinances require certain sanitary standards for milk, and who earnestly desire the assistance of this Board in their efforts to improve the condition of their milk supplies.

A feature of the work planned for the present year is the inspection of dairies within the corporate limits of our large cities. The existence of many of these places in the thickly populated districts of cities is an evil that has long been felt, and that it has wrought much harm is well known to health officials. Lists of these dairies are in our possession, and in several localities work has been begun which promises to result in the abolishment of those which, on account of unsuitable location and incapable management, render the milk produced in them dangerous to the public health. Up to this date, the Boards of Health in Jersey City, Newark, Hoboken, Elizabeth and Camden have submitted lists of the owners of all dairies located within their limits, for the purpose of having them inspected as a preliminary step toward their betterment.

The number of dairies existing within the limits of the above named cities is as follows:

Jersey City.....	46
Newark.....	72
Hoboken.....	6
Elizabeth.....	22
Camden.....	10

The above lists were received too late to begin the work of inspection in all these cities, and thus far it has been completed only in the dairies located in Hoboken and Elizabeth.

The following letter, addressed to the Board of Health of the city of Hoboken, was sent after the inspections had taken place:

TRENTON, N. J., September 24, 1908.

*Board of Health of the City of Hoboken,  
Hoboken, N. J.*

GENTLEMEN—I have the honor to enclose you herewith copies of the dairy scores made of the six dairy premises located in the city of Hoboken. No dairy having a rating below 60 per cent. of the perfect mark as indicated on the official score card should be permitted to sell milk. In the performance of my duty, I have reported to the State Board of Health the condition of these premises as they were found during several inspections made by officers of this Department, and I presume they will communicate with you further on the subject.

On the same date the following report was made to the State Board of Health relative to the investigation of the above mentioned dairy premises:

TRENTON, N. J., Sept. 24, 1908.

GENTLEMEN—Pursuant to a letter received from a citizen of Hoboken, dated August 19th, complaining of the unsanitary condition of a dairy premises located on Madison street, Hoboken, I visited the above named premises on August 27th.

A communication was also received from the Health Officer of Hoboken, dated September 5th, complaining of the unsanitary condition of a second dairy premises located on the same street. As a result of the first inspection I wrote to the Hoboken Board of Health under date of August 29th, in which I stated that the milk of the dairy first complained of was produced and handled under conditions which render it unfit for human consumption. Subsequently, five other dairy premises located within the city limits of Hoboken were also inspected. The total awards allowed these dairymen on the score card are as follows:

41½ %; 26¼ %; 37 %; 37¾ %; 36 %; 35¼ %.

Copies of the score cards, showing the results of inspections, have been forwarded to the Board of Health of Hoboken.

These dairy premises are located on city lots 25 x 100 feet in area, and include the dwelling and the stable.

In two or three stables, the floors are of concrete, and since the cows are not provided with bedding material, they are compelled to lie in their own excrement, and consequently the bodies of many of those we saw were plastered with manure. Some of the cows were turned on the commons for pasture and were not seen. The entire handling of the milk is generally done in the stables, in the same room where the cows are housed. The washing of cans and utensils, straining and bottling of milk, in some cases the storing of milk, take place in the stable room, amid the foul atmosphere which is always present.

In one case the straining of the milk is done through pocket handkerchiefs, which is on a line with all the methods in use at this place.

I would respectfully recommend that the Board of Health of the city of Hoboken be requested to revoke the permits which have been issued to the above dairies, for the reason that wholesome milk is not and cannot be produced on these premises.

Respectfully yours,

GEORGE W. MCGUIRE,

Chief of the Division of Creameries and Dairies.

The Board took immediate action in the matter, and by a resolution notified the Board of Health of the City of Hoboken that as the dairies had been found in such unsanitary condition, and were located on such small areas in a thickly populated portion of the city, the production and sale of milk on these premises should be prohibited. At a special meeting of the Hoboken Board of Health the permits which had been issued to all the dairies referred to were revoked, and the owners notified to discontinue the production of milk therein. Letters were received from these dairymen regarding the action of this Board and the Hoboken Board, requesting that further instructions be given them for the purpose of enabling them to place their dairies in a sanitary condition. In each instance replies were sent in substance, as follows:

Your letter is received, and in reply I have to say that the matter of licensing a dairy within the city limits of Hoboken is entirely within the province of the local Board of Health of that city. I do not believe, however, that it is possible to produce sanitary milk on the premises on which your dairy is located, nor in any similar place within the limits of a city.

I question whether the State Board of Health can approve of any dairy located in as congested a portion of the City as yours is, because it is impossible to provide and maintain the proper facilities for handling milk in a sanitary manner.

Yours very respectfully,

GEO. W. McGUIRE,

Chief of the Division of Creameries and Dairies.

In the city of Elizabeth, twenty-two dairies were inspected and the following is the score of each, based upon the official score card of the State Board of Health:

64¼%; 60½%; 57½%; 56¼%; 55%; 52¼%; 52¼%; 51%; 50%; 48¼%; 45%; 42½%; 44¼%; 40¾%; 40¼%; 34¾%; 34½%; 33%; 32¾%; 27¾%; 17¾%.

One dairy could not be scored on account of a recent fire and improvements in the stable, then in course of reconstruction.

The following extract from the report made by this Division to the State Board of Health shows the conditions under which these establishments are maintained:

These "dairies" are generally situated on city lots, usually 25 x 100 feet in area; some, however, occupy two city lots of 50 x 100 feet in area.

During the summer season the cows are permitted to roam on the adjacent commons, and in the winter time, most of them are housed during the whole season, having no exercise grounds whatever.

The facilities for the proper handling of the milk, and for washing cans and utensils, and for keeping the cows in a fit condition, are entirely inadequate on these congested premises, and it is my opinion that unless frequent and systematic inspection is pursued by the officers of the local board, the milk from these premises will be attended with much risk to the consumers.

Eight samples of water were taken from these premises and analyzed in the Laboratory of Hygiene, and the result shows that at least 90 per cent. of the samples collected were grossly polluted, and steps should be taken for their immediate closure.

Copies of the score of each of these dairies were forwarded to the Secretary of the State Board of Health, who in turn sent them to the Health Officer of Elizabeth with a letter expressing the views of this Board on the existence of these unsanitary premises.

In December of last year a request was made by the New Brunswick Board of Health asking the assistance of this Board in the inspection of every dairy supplying milk to that city. The object in view was to fix a standard, based upon the official score card of the State Board of Health, for all dairies supplying that municipality with milk. In compliance with their request, the work was undertaken and has been continued at intervals during the year. The local Board generously defrayed the expenses of this inspection, and Mr. F. B. Kilmer, President of the Board, Dr. Benjamin F. Gutmann, Secretary, and their local Inspector, accompanied the officer of this Board. During the months of December and January eighty-two dairies were inspected and scored. Copies of these score cards, containing the rating of each dairy, were sent by the State Board to the local Board, and also one to each dairyman whose premises had been visited. The effect of this work in that vicinity was to create an excitement among the dairymen, and more or less hostile feeling was engendered when the results became known. The sentiment changed, however, after several meetings of the dairymen had been held and the object sought had been freely explained and discussed, and it is to be doubted now whether the dairymen in that locality would be willing to have the system of dairy inspection changed.

The inspection referred to was used as a basis for the enactment of an ordinance which is now in effect, and which embodies all the features which tend to promote a hygienic milk supply for that city. This ordinance provides that all milk held in storage or in milk wagons shall be not less than

50 degrees F., and compels milkmen to secure a permit for the sale of milk within the city limits. It also requires that all dairy premises shall attain a rating or not less than 60 per cent. of the perfect score as indicated on the official score card of the State Board of Health.

The following table is given as showing classification of dairies supplying milk to the city of New Brunswick on a basis of total score at the time this report was written:

Number of dairies having a total score of	90 or over	1
" " " " " " " "	80 " " " " " "	2
" " " " " " " "	70 " " " " " "	8
" " " " " " " "	60 " " " " " "	26
" " " " " " " "	50 " " " " " "	35
" " " " " " " "	40 " " " " " "	9
" " " " " " " "	30 " " " " " "	1
Total		82

Subsequent requests to reinspect a number of these New Brunswick dairies came from that Board in August, and the officer sent from this Board was accompanied on these second visits by the same gentlemen who made the first inspections. The premises visited at this time were those where improvements had been made or were in contemplation, or where special information was desired. They included forty-five dairies.

At the time of this inspection the State Board of Health had adopted the new score card, which to some extent differed from the previous one in the method of scoring. For instance in the former score card, where animals appeared to be in good flesh and otherwise in good physical condition, but where no tuberculin test had been applied, eight points were allowed. In the new score card, these eight points are disallowed unless a veterinary certificate is furnished, showing that the cows have been tuberculin tested; or that a physical examination of the herd has been made by a reputable veterinarian.

Work similar to the above was done in the borough of Roselle, Union County, and the following table shows the results recorded in this inspection:

SHOWING CLASSIFICATION OF DAIRIES ON A BASIS OF TOTAL SCORE.

Number of dairies having a total score of	70 or over	1
" " " " " " " "	65 " " " " " "	3
" " " " " " " "	60 " " " " " "	2
" " " " " " " "	40 " " " " " "	1
Total		7

The following is a record of the inspection of dairies supplying milk to the borough of Metuchen, Middlesex Co., N. J., made at the request of the Metuchen Board of Health:

RECORD OF INSPECTION OF DAIRIES SUPPLYING MILK TO THE BOROUGH OF METUCHEN, MIDDLESEX CO., N. J.

I. SHOWING NUMBER AND CONDITION OF COWS.

Number of cows in herds	63	
" " herds inspected	5	
" " " tested		0
" " " clean		1
" " " in fair condition		4
" " " dirty		0
Total		5

II. SHOWING CONDITION OF COW STABLES.

CONDITION.		CUBIC AIR SPACE.	
Clean	1	500 cu. ft. or over	3
Fair	2	400-500 cu. ft.	0
Dirty	2	Under 400 cu. ft.	2
Total	5	Total	5

LIGHT.		VENTILATION.	
Ample	1	Adequate	1
Fair	1	Fair	0
Insufficient	2	Insufficient	1
Dark	1	Poor	3
Total	5	Total	5

III. SHOWING CHARACTER OF WATER SUPPLY USED FOR CLEANING UTENSILS.

Dug wells near house	3
Artesian wells	1
Driven wells	1
Total	5

IV. SHOWING METHODS IN COOLING MILK.

Cans placed in tubs of well water	1
Mechanical cooler and cans immersed in ice water	1
Mechanical cooler only	2
Cans immersed in wood vat filled with well water	1
Total	5



V. SHOWING METHODS OF STORING MILK ON DAIRY PREMISES.

Cellar.....	1
Wood vat in open air.....	1
In milk house.....	1
In wagon shed.....	1
Open air.....	1
<hr/>	
Total.....	5

VI. SHOWING CLEANLINESS OF MILKING.

Score.	Dairies.
80 per cent.	1
70 "	1
50 "	3
	<hr/>
Total	5

VII. SHOWING CARE EXERCISED IN THE HANDLING OF MILK ON DAIRY PREMISES.

Score.	Dairies.
70 per cent.	1
65 "	1
55 "	3
	<hr/>
Total	5

VIII. SHOWING CLASSIFICATION OF DAIRIES ON A BASIS OF TOTAL SCORE.

Number of dairies having a total score of 80 or over.....	1
" " " " " " " 60 " " .....	2
" " " " " " " 55 " " .....	1
" " " " " " " 50 " " .....	1
	<hr/>
Total.....	5

Pursuant to a request made by Henry W. Green, President of the Board of Trustees of the Lawrenceville School, which is located between Princeton and Trenton, an inspection of the six dairies supplying that school with milk was made in April of the present year. The result of this inspection can be seen by the following total scores of each dairy:

No. 1	First inspection....	61 $\frac{1}{2}$ %	Fourth inspection....	75 %
No. 2	" "	61 $\frac{1}{2}$ "	" "	65 "
No. 3	" "	54 "	" "	65 $\frac{1}{4}$ "
No. 4	" "	47 $\frac{1}{2}$ "	" "	51 $\frac{3}{4}$ "
No. 5	" "	53 $\frac{3}{4}$ "	" "	59 $\frac{3}{4}$ "
No. 6	" "	54 "	" "	55 $\frac{1}{4}$ "

During these four inspections, ranging from April sixteenth to September seventeenth, marked improvements were noted After each inspection a report was made to the Board of Trustees of the School, giving a detailed account of the sanitary conditions of the premises, and considerable correspond-

ence passed between this office and the President of the Board.

The last three inspections took place after the close of the school year, which gave the owners of the inspected dairies ample opportunity to prepare their premises for the production of clean, wholesome milk before the opening of the school in the autumn, and as will be noted by the figures given above, more improvements had been made on all the premises by that time.

The following letter from the President of the Board of Trustees of the Lawrenceville School, dated September 15, 1908, shows the determination of that Board to insist upon all proper measures to insure a strict compliance with the requirements of the State Board of Health regarding the sanitary conditions under which milk supplied to the School is produced:

I beg to enclose a copy of a letter which I sent to the several persons supplying milk to the school. The replies to these letters indicate a very evident desire to meet your requirements, but imply some uncertainty as to just what these requirements are in each individual case. If this uncertainty is justified could you not take measures to see that no ground is left for any further delays in meeting your requirements as a result of this excuse? You note that the school has insisted upon your requirements being met, and we mean to stand by this decision.

Yours very truly,

HENRY W. GREEN.

The circular letter referred to, which was sent by the President of the Board of Trustees to each dairyman supplying the School with milk, is as follows:

DEAR SIR:—In order that the school should inform itself definitely as to the quality and character of milk furnished to those under its care, and in order to safe-guard against any disease or infection arising from impure milk, or conditions likely to affect the purity of the supply, the school requested the State Board of Health to make such examination of the conditions of the herds, the housing of the herds and the matters affecting the supply, as, in their judgment, was deemed wise, with the result that certain reports have been presented to the school showing conditions declared by the State Board to be both unsanitary and unsafe. In conformity with the request of the State Board, certain minor improvements have been effected during the summer; but for the School's protection it is absolutely necessary, and we mean to insist, that the requirements of the State Board shall be met sufficiently to enable them to report to us an improvement in conditions which will warrant their passing on each individual source of supply as up to their standard of requirements. A reasonable time will be allowed for you to comply with these requirements, but unless you do so it will be impossible for the school to permit those in charge of its several houses to continue to

take milk from sources which the State Board cannot approve. The school earnestly desires that you take immediate measures to meet the requirements prescribed.

Yours very truly,  
HENRY W. GREEN.

It is the intention of this Department to make a reinspection of all these dairies in the near future and to repeat them at intervals during the school year.

SCORE CARD.

The use of the score card for establishing proper standards for the production and handling of milk at the dairy is the most valuable agent yet devised for that purpose. Its value in judging the hygienic quality of milk according to the methods used in its handling and the conditions existing at the dairy cannot be over-estimated. Its advantages are in giving each dairy its mathematical rating and in pointing out defects and showing where improvements may be made, often at little or no expense. As the dairyman is furnished with a copy of his score, he can readily see where the defects of his management lie, and is thus enabled to correct them. The following is a copy of the score card which has been adopted by the Board of Health of this State, and is now used in the inspection of each dairy:

No. .... Score Allowed ..... %

BOARD OF HEALTH OF THE STATE OF NEW JERSEY.

Dairy Inspection Division of Creameries and Dairies

- 1 Inspection No. .... Time ..... A. M. P. M. Date ..... 190
- 2 Tenant ..... P. O. Address .....
- 3 Township ..... County .....
- 4 Owner ..... Party Interviewed .....
- 5 Milk retailed at ..... By whom .....
- 6 Address ..... Since .....
- 7 If shipped, to whom ..... Address .....
- 8 Distance of farm from creamery ..... Occupied farm since .....
- 9 No. of Cows ..... Breed ..... No. Milking .....
- Quarts milk produced .....
- 10 All persons in the households of those engaged in producing or handling milk are free from all infectious disease .....
- 11 Date and nature of last case on farm .....
- 12 A sample of the water supply on this farm numbered ..... taken for analysis .....
- 190 ..... and found to be .....
- 13 Size of cow barn, length ..... feet. Width ..... feet. Height of ceiling .....

STABLE

	PERFECT	ALLOW
14 COW STABLE is ..... located on elevated ground with no stagnant water, hog-pen, or privy within 100 feet. ....	1	.....
15 FLOORS are ..... constructed of concrete or some non-absorbent material .....	1	.....
16 Floors are ..... properly graded and water-tight. ....	2	.....
17 DROPS are ..... constructed of concrete, stone or some non-absorbent material. ....	2	.....
18 Drops are ..... water-tight. ....	2	.....
19 FEEDING TROUGHS, platforms or cribs are ..... well lighted and clean .....	1	.....
20 CEILING is constructed of ..... and is ..... tight and dust-proof. ....	2	.....
21 Ceiling is ..... free from hanging straw, dirt or cobwebs. ....	1	.....
22 NUMBER OF WINDOWS ..... total square feet ..... which is ..... sufficient. ....	2	.....
23 Window panes are ..... washed and kept clean. ....	1	.....
24 VENTILATION consists of ..... which is sufficient 3, fair 1, insufficient 0 .....	3	.....
25 AIR SPACE is ..... cubic feet per cow which is ..... sufficient (600 and over—3) (500 to 600—2) (400 to 500—1) (under 400—0) .....	3	.....
26 INTERIOR of stable painted or whitewashed on ..... which is satisfactory 2, fair 1, never 0 .....	2	.....
27 WALLS AND LEDGES are ..... free from dirt, dust, manure or cobwebs .....	2	.....
28 FLOORS AND PREMISES are ..... free from dirt, rubbish or decayed animal or vegetable matter. ....	1	.....
29 COW BEDS are ..... clean. ....	1	.....
30 LIVE STOCK, other than cows, are ..... excluded from rooms in which milch cows are kept. ....	2	.....
31 There is ..... direct opening from barn into silo or grain pit. ....	1	.....
32 BEDDING used is ..... clean, dry and absorbent. ....	1	.....
33 SEPARATE BUILDING is ..... provided for cows when sick. ....	1	.....
34 Separate quarters are ..... provided for cows when calving. ....	1	.....
35 MANURE is ..... removed daily to at least 200 feet from the barn ( ..... ft.) .....	2	.....
36 Manure pile is ..... so located that the cows cannot get at it. ....	1	.....
37 LIQUID MATTER is ..... absorbed and removed daily and ..... allowed to overflow and saturate ground under or around cow barn. ....	2	.....
38 RUNNING WATER supply for washing stables is ..... located within building. ....	1	.....
39 DAIRY RULES of the Department of Health are ..... posted. ....	1	.....

COW YARD

40 COW YARD is ..... properly graded and drained. ....	1	.....
41 Cow yard is ..... clean, dry and free from manure. ....	2	.....

## COWS

	PERFECT	ALLOW
42 COWS have been examined by Veterinarian.	3	
Date 190 Report was.	1	
43 Cows have been tested by tuberculin, and all tuberculous cows removed.	5	
44 Cows are all in good flesh and condition at time of inspection.	2	
45 Cows are all free from clinging manure and dirt. (No dirty.)	4	
46 LONG HAIRS are kept short on belly, flanks, udder and tail.	1	
47 UDDER AND TEATS of cows are thoroughly cleansed before milking.	2	
48 ALL FEED is free from dirt and mould.	1	
49 DISTILLERY waste or any substance in a state of fermentation or putrefaction is fed.	1	
50 WATER SUPPLY for cows is unpolluted and plentiful.	2	

## MILKERS AND MILKING

51 ATTENDANTS are in good physical condition.	1	
52 Special Milking Suits are used.	1	
53 Clothing of milkers is clean.	1	
54 Hands of milkers are washed clean before milking.	1	
55 MILKING is done with dry hands.	2	
56 FORE MILK or first few streams from each teat is discarded.	1	
57 Milk is strained at clean in clean atmosphere.	1	
58 Milk strainer is clean.	1	
59 MILK is cooled to below 50° F. within two hours after milking and kept below 50° F. until delivered to the creamery.	2	
60 Milk from cows within 15 days before or 5 days after parturition is discarded.	1	

## UTENSILS

61 MILK PAILS have all seams soldered flush.	1	
62 Milk pails are of the small mouth design, top opening not exceeding 8 inches in diameter. Diameter.	2	
63 Milk pails are rinsed with cold water immediately after using and washed clean with hot water and washing solution.	2	
64 Drying racks are provided to expose milk pails to the sun.	1	

## MILK HOUSE

65 MILK HOUSE is located on elevated ground with no hog-pen manure pile or privy within 100 feet.	1	
66 Milk house has direct communication with building.	1	
67 Milk house has sufficient light and ventilation.	1	
68 Floor is properly graded and water-tight.	1	
69 Milk house is free from dirt, rubbish and all material not used in the handling and storage of milk.	1	
70 Milk house has running or still supply of pure clean water.	1	
71 Ice is used for cooling milk and is cut from.	1	

## WATER

72 WATER SUPPLY for utensils is from a located feet deep and apparently is pure, wholesome and uncontaminated.	5	
73 It is protected against flood or surface drainage.	2	
74 There is privy or cesspool within 250 feet ( feet) of source of water supply.	2	
75 There is stable, barn-yard, or pile of manure or other source of contamination within 200 feet ( feet) of source of water supply.	1	
	100	

Inspector.

## INSPECTIONS OF DAIRY PREMISES.

The following list shows by counties the number of inspections which have been made on dairy premises, the number of quarts of milk produced and the disposal of the product:

TABLE D.

LOCATION.	NUMBER OF INSPECTIONS.	QUARTS OF MILK PRODUCED.	DISPOSAL OF PRODUCT.
<b>Bergen Co.</b>			
Englewood	3	335	Englewood.
Leonia	1	150	Leonia and Englewood.
Midland Twp.	1	200	Hackensack.
<b>Burlington Co.</b>			
Bordentown Twp.	4	160	Dobbins, White Hill, Bordentown, Roebling and Trenton.
Chester Twp.	3	1,075	Moorestown and Riverton.
Chesterfield Twp.	8	690	Bordentown and Long Branch.
Florence Twp.	2	200	Florence and Roebling.
Mansfield Twp.	5	430	Philadelphia, Florence and Roeb-ling.
<b>Camden Co.</b>			
Moorestown	5	250	Camden and Philadelphia.
Springfield Twp.	2	280	Camden and Mt. Holly.
Willingsboro Twp.	3	280	Beverly.
Audubon	3	160	Audubon.
Center Twp.	2	200	Mt. Ephraim.
Gloucester Twp.	3	430	Atlantic City and Mt. Ephraim.
Haddon Heights.	2	240	Haddon Heights.
Haddon Twp.	1	110	Camden.
<b>Cumberland Co.</b>			
Leola	6	1,365	Vineland.
<b>Essex Co.</b>			
Irvington	1	320	Newark.
<b>Gloucester Co.</b>			
Elk Twp.	2	820	Gloucester and Pitman.
West Deptford Twp.	12	955	Woodbury.
<b>Hudson Co.</b>			
Hoboken	7	570	Hoboken.
<b>Hunterdon Co.</b>			
Clinton Twp.	1	30	Lebanon.
<b>Merer Co.</b>			
Ewing Twp.	5	525	Trenton.
Hamilton Twp.	1	70	Allentown.
Hopewell	1	80	Hopewell.
Hopewell Twp.	4	480	Trenton.
Lawrence Twp.	26	430	Trenton and Lawrenceville.
Princeton Twp.	2	160	Princeton.
West Windsor Twp.	1	60	Princeton.
<b>Middlesex Co.</b>			
East Brunswick Twp.	4	130	New Brunswick.
Highland Park	1	80	New Brunswick.
New Brunswick	2	435	New Brunswick.
North Brunswick Twp.	23	1,080	New Brunswick.
Piscataway Twp.	22	2,190	New Brunswick.
Raritan Twp.	9	730	New Brunswick and Metuchen.
South Amboy	1	120	New Brunswick.
South Brunswick Twp.	1	35	Kingston and Princeton.
Woodbridge Twp.	1	125	Rahway.
<b>Monmouth Co.</b>			
Hovell	2	150	Belmar 70 qts., Long Branch 80 qts.
<b>Morris Co.</b>			
Montville Twp.	7	190	Towaco, 130 qts.; Jersey City, 30 qts.; Hoboken, 30 qts.
<b>Fassale Co.</b>			
Aquackonock Twp.	1	400	Paterson.
Little Falls	2	45	Paterson.
<b>Somerset Co.</b>			
Bernardsville	1	220	New York City.
Bound Brook	2	120	Bound Brook.
Franklin Twp.	43	2,190	New Brunswick.
Hillsboro Twp.	23	1,065	New Brunswick.
Montgomery Twp.	2	1,810	Skillman, 810 qts.; Philadelphia and Trenton, 1,500 qts.
<b>Sussex Co.</b>			
Hampton Twp.	1	420	Newark.
Wantage Twp.	4	780	New York City.
<b>Union Co.</b>			
Elizabeth City	22	1,110	Elizabeth.
Linden Twp.	1	180	Roselle.
Union Twp.	8	1,055	Newark, Elizabeth and Roselle.
<b>Bucks Co., Pa.</b>			
(Lower Makefield Twp.)	1	150	Trenton.

## INSPECTIONS OF WELLS ON DAIRY PREMISES.

Inspections of water collected from wells used on dairy premises in eighteen of the twenty-one counties show, out of the 195 samples examined, that 115 were "polluted," 15 were "suspicious," 48 were "probably safe" and 17 were "good."

The percentage of samples reported to be "polluted" can readily be accounted for, as they were taken only because of the unfavorable conditions surrounding the wells. The terms "polluted," "suspicious," "probably safe" and "good" can be defined as follows:

"Polluted" is absolutely unfit for potable use.

"Suspicious" is a water which shows some trace of pollution, usually bacterially, although the complete analysis does not warrant the condemnation of the supply.

"Probably safe" is used where there is no proof of bacterial pollution, but where there is evidence of surface drainage entering the well. This can be corrected by care of the well.

"Good" means that the water shows no trace of pollution, either bacterially or chemically.

Notice was sent to the owner of each dairy on whose premises a contaminated water supply was located, requesting immediate improvements to be made in compliance with the law relating to the purity of water supplies on dairy premises.

## CODE OF RULES.

The following code of rules were adopted by the Board and ordered to be printed on stout muslin sheets. A copy of these rules are posted by the Inspector on every dairy premises:

## BOARD OF HEALTH OF THE STATE OF NEW JERSEY.

*Advice to Dairymen Concerning the Production of*

## CLEAN MILK.

*Care of the Cows.*—The health of the cows should be carefully guarded, and should be curried and brushed daily to prevent hair, dust and dried excreta from falling into the milk. The udders and teats should be made clean before milking.

*Cow Stables.*—Cow stables should be well lighted and well ventilated. The ceilings and side-walls should be smooth and dust-tight, and be free from ledges and projections upon which dust may lodge. The air space allowed for each animal should not be less than six hundred cubic feet. The floor should be water-tight, and the floor of the stalls should be graded to permit fluids to flow away from the animals. Mudholes in the barnyard and pastures should be filled.

Excreta should be removed from the stable building at least as often as once in each day, and it should not be deposited near the building nor in the enclosed yard in which the cows are allowed to take exercise, sun and air. The interior of the stable should be kept clean and free from all accumulations.

Facilities should be provided to enable the milkers to wash their hands and put on clean outer garments.

*The Water Supply.*—The water supplies for dairies should be pure, abundant and easily accessible. No water which is obtained from surface wells located in the immediate vicinity of dwellings, outbuildings, or other known sources of pollution, should be used on dairy premises, and every such well should be filled with clean earth and its use should be abandoned. No well which has become contaminated because of the pollution of the soil of the

locality can be made safe by cleaning. A well once contaminated by receiving its supply of water through soil which has been defiled by a leaky drain, a cesspool or a privy vault, or by waste liquids cast upon the ground surface, cannot be made safe by any process of cleaning, and the use of water from such a well may at any time be followed by an outbreak of typhoid fever, diarrhoea, or one of the other water-borne diseases. If surface wells (those which are dug or driven) are used, they should be located at least three hundred feet from any known or apparent source of soil pollution, and if possible, they should be located on elevated ground.

*Cooling the Milk.*—Immediately after the milk is drawn from the cow, it should be transferred to the containers in which it is to be sent to market, and be cooled to 50 degrees F. or below. The cooling process should be conducted in a manner which will not expose the milk to contamination. If the milk is cooled by passing it over pipes or surfaces containing ice water, this operation should only be performed in a tightly closed apartment which is kept scrupulously clean, and which is used for no other purpose. The floor of such rooms should be kept wet when the milk is being cooled, and no persons except the necessary employes should be permitted to enter it.

*Protection of the Milk.*—The outer garments of the persons who do the milking should be clean, preferably white; the milker's hands should be clean; the milk should be received in a clean pail through a cloth strainer, over a small opening in the cover of the pail; care should be taken to avoid stirring up dust before milking; the containers into which the milk is placed for storage or transportation should be tightly covered to prevent the admission of dust; the pail, strainers and all utensils and containers should be sterilized before use by being immersed in boiling water for at least thirty minutes, or by exposure to a temperature of not less than 240 degrees F. for not less than thirty minutes in a suitable steam sterilizer; the milk should be transferred at once after milking to the bottles or cans in which it is to be sent to market and the cooling process should be rapid.

*Infectious Diseases on Dairy Premises.*—The occurrence of a case of typhoid fever, scarlet fever or diphtheria on a dairy premises should be at once reported to the local Board of Health, and the patient and all infected persons should be removed from any possible contact with the milk.

## OLEOMARGARINE.

The act of 1901 (P. L. 1901, page 186) abolished the office of Dairy Commissioner and created the office of Chief Inspector, which carried with it the enforcement of the Oleomargarine Act. From that time until 1906, attorneys for defendants in oleomargarine cases attacked the wording of the act regarding the form of complaint used in prosecutions, on the ground that the language used was ambiguous, in that it did not definitely state how the action was to be brought. The section referred to (Section 21) is as follows:

The office of State Dairy Commissioner is hereby abolished, and all duties imposed upon the State Dairy Commissioner by an act of the Legislature not repealed by this act shall hereafter be performed by the Chief Inspector appointed under the authority of this act, and under the direction of the State Board of Health.

Procedure under this section required the Chief Inspector to be present in person at every trial in order to testify that the action was brought under the direction of the State Board of Health. The supplement to the act, approved April 20th, 1906, reads as follows:

The Chief Inspector of the Board of Health of the State of New Jersey, shall hereafter perform and exercise all the duties and powers imposed, prescribed or conferred on the State Dairy Commissioner by the provisions of the act to which this act is a further supplement, and process in any action

for the recovery of a penalty for violation of any of the provisions of said act to which this act is a further supplement, or any act supplementary thereto or amendatory thereof, shall be issued at the suit of and in the name of said Chief Inspector as plaintiff.

This supplement requires the Chief Inspector to perform all the duties prescribed by the provisions of the Oleomargarine Act, but since the appropriation for the enforcement of this and other acts relating to the adulteration of food and drugs was made in a lump sum, the assignment of Inspectors to carry out the requirements of the Oleomargarine Act was made by the Secretary of the Board, and all details regarding the action of the Inspectors have been directed by him.

The only work which is performed by the Chief Inspector under the act, therefore, is to keep the records of fines collected by the Attorney-General and transmit them to the State Treasurer.

The following list shows the amount of money collected in fines and costs during the past year, together with the names and addresses of the persons from whom they were collected:

MONTH.	DEP. ENDANT.	ADDRESS.	FINE.	COSTS.
November, 1907	Braun & Fitts.....	Camden.....	\$00.00	\$12.38
December, 1907	Braun & Fitts.....	Camden.....	100.00	3.60
"	Wm. H. Hooy.....	Somerville.....	100.00	1.25
"	Dennis Kennedy & Chas. H. Allen, trading as Central Supply Co.....	Atlantic City.....	100.00	17.60
"	Charles H. Allen.....	Camden.....	100.00	3.60
"	Wm. Hohnstrater.....	Elizabeth.....	100.00	.....
"	Ennis Magnusen.....	Union.....	.....	5.60
"	Joseph Trouber.....	Hoboken.....	.....	3.00
"	Charles Krampfert.....	Union Hill.....	.....	3.35
"	John Worscheck.....	Hoboken.....	.....	7.20
"	Charles Holdings.....	Hoboken.....	.....	8.70
"	William H. Cortis.....	Union Hill.....	.....	8.80
January, 1908	John J. Donahue.....	Elizabeth.....	.....	14.10
February, 1908	Nynder Vandryke.....	Paterson.....	100.00	6.50
"	Caeser Haefeli.....	Paterson.....	100.00	11.57
"	Peter Demil.....	Paterson.....	100.00	17.37
"	Jacob Rosenberg.....	Passaic.....	100.00	11.57
March, 1908	Moses Scheuer, David Scheuer and Murray Applebaum, trading as Scheuer & Bro.....	Orange.....	100.00	5.04
"	John D. Bronson.....	Elizabeth.....	100.00	.....
"	Albert Scheuer and Frederick Scheuer, trading as Scheuer & Sons.....	Newark.....	100.00	.....
April, 1908	Moses Scheuer, David Scheuer, Murray Applebaum, trading as Scheuer & Bro.....	Orange.....	100.00	.....
"	Gustav Modersohn.....	Newark.....	100.00	17.84
"	Frank Hemming.....	Newark.....	100.00	5.42
"	Edward J. Thompson.....	Newark.....	100.00	6.65
"	Peter W. Vanness.....	Newark.....	100.00	6.65
"	Charles E. Ecker.....	Newark.....	100.00	5.42
"	Dennis W. Toye.....	Newark.....	100.00	6.65
"	George N. Cohn.....	Newark.....	100.00	6.65
"	Harry E. Demarest.....	Bloomfield.....	100.00	8.42
May, 1908	William A. Potts.....	Elizabeth.....	100.00	.....
"	Charles Gaedcke.....	Elizabeth.....	100.00	6.36
"	Andrew Petruskie.....	Passaic.....	.....	7.26
"	Joseph Obal.....	Passaic.....	.....	7.10
"	Clinton Fralick.....	Jersey City.....	100.00	11.43
June, 1908	Joseph Freedman.....	Elizabeth.....	100.00	.....
"	Simon Scheuer, Albert Scheuer and Frederick Scheuer, trading as S. Scheuer & Sons.....	Westfield.....	100.00	4.40
"	Elias M. Gutman.....	Elizabeth.....	10.00	.....
"	William W. Wilson.....	Plainfield.....	10.00	6.00
"	Charles W. Tallman.....	Plainfield.....	100.00	6.00
July, 1908	Andrew Petrusky.....	Passaic.....	100.00	.....
"	Max Goldberger.....	Perth Amboy.....	100.00	2.10
"	Elias M. Gutman.....	Elizabeth.....	20.00	.....
"	Robert Besse.....	Jersey City.....	100.00	11.55
"	Elias Gutmann.....	Elizabeth.....	10.00	.....
August, 1908	Frank Brand & Co.....	Newark.....	100.00	9.60
Sept.-Oct., 1908	Louis Singer.....	Newark.....	100.00	3.60
	Total Fines.....		\$3,440.00	
	Total Costs.....			\$206.84
	Grand Total.....			\$3,736.84

## Report on the Division of Food and Drugs.

R. B. FITZ-RANDOLPH, CHIEF.

*To the Board of Health of the State of New Jersey :*

GENTLEMEN—I have the honor to submit the following report on the Division of Food and Drugs for the year ending October 31, 1908.

The Division of Food and Drugs was created by the Board in May, 1908. The work carried on by this division has been substantially the same as was previously conducted by the former Board under authority contained in an act entitled "An Act to secure the purity of foods, beverages, confectionery, condiments, drugs and medicines, and to prevent deception in the distribution and sales thereof," approved March 21, 1901. Under the former arrangement the Director of the State Laboratory of Hygiene conducted the examination of samples of food and drugs sent to the Laboratory by Assistant Inspectors appointed under authority contained in the act above referred to. These Inspectors were under the direct supervision of the Secretary of the Board. At the present time the management of the entire food and drug work is entrusted to the Chief of the Division, acting under the direction of the State Board of Health. This arrangement is preferable in several respects to the one previously in force. A more satisfactory cooperation between the Laboratory and the Inspectors is now possible, the responsibility for the proper performance of the work is centered in one person, and the Secretary of the Board is relieved of much detail in the control of Inspectors.

During the year, important changes have been introduced in the method of controlling Inspectors. The regulation of inspection work, especially when Inspectors operate in distant parts of the State and seldom report at headquarters

in person, is very difficult if the highest degree of efficiency is to be obtained. This problem has not yet been solved in a satisfactory manner in this State, but we believe that the service has materially improved in the past year. The duties of an Inspector of food and drugs are such that a successful man must possess an unusual amount of tact and discretion, incorruptible honesty, and a devotion to duty which will lead him to do faithful and efficient work when left largely to his own resources. This Division is fortunate in having Inspectors who display these qualifications, and to their faithful and intelligent work our success is largely due. During the year a system of Inspector's reports has been devised which enables the Chief of the Division to obtain prompt information regarding the movements of the Inspectors and the kind and amount of work they are doing. Under the former system, Inspectors submitted a report of their operations at the end of each month. At present the Inspectors report daily by mail on forms provided for that purpose, stating in detail the kind of work done, the number and kind of samples collected, the places visited, and such other information as may be necessary for the Chief of the Division to have. The places to which the Inspector intends to go on the two days following the date of the report are also included. These reports are made out and mailed on the evening of every working day and reach the office the next morning. This system enables Inspectors to be located at any time and permits their movements to be closely followed. Reports relating to the progress and termination of prosecutions are made on another form which is sent in whenever such information is obtained. Once a month a detailed expense account is submitted by the Inspectors.

Because of the change in the system of keeping records relating to Inspectors and on account of the imperfect and fragmentary information contained in those reports made under the old system, it is impossible to give an accurate and detailed account of the movements of the Inspectors for the past year. At the end of the present year it will be possible to show exactly the work which has been done in the field.

In order that the state may be efficiently patrolled and violators of the law detected and punished, a larger force of

Inspectors should be provided. At the present time only three are attached to this Division. One of these is located in Camden, one in Elizabeth and one in Morristown. It is impossible for these men to properly cover the territories assigned to them. A man located in Camden can cover Camden, Atlantic, Gloucester, Cumberland, Salem and Cape May Counties fairly well, as much of this territory is thinly populated, and all parts of it are readily reached by rail. In the northern part of the State the situation is entirely different. In order that even a beginning toward systematic inspection may be made, it will be necessary to assign an Inspector to Hudson and Bergen Counties; one to Union an Essex; another to Sussex, Passaic and a part of Warren; another to Ocean, Monmouth and parts of Middlesex and Somerset and still another to Mercer, Burlington, Hunterdon and parts of Middlesex and Somerset. From the above statement it appears that six is about the minimum number of men necessary with which to make a beginning toward the proper policing of the State.

It is not claimed that sufficient inspection could be made with this force. This is not the case. But every locality in the State could be visited at least once a year and much more time could be spent in the sections which most need it. With the present location of Inspectors certain parts of the State are necessarily neglected. No man is now available for work in Sussex and Warren Counties without great loss of time and heavy expenditures. Until recently an Inspector was stationed in Sussex County and the lack of supervision over this section has not yet been keenly felt, but that territory is the great milk producing section of the State, and, unless our inspections are kept up there, the quality of the milk sold will surely suffer. Mercer, Hunterdon, Middlesex and portions of Burlington Counties have been neglected during the last four years because no Inspector was located at Trenton. The territory along the Delaware River from Trenton to Phillipsburg is so situated that none of our Inspectors can visit it conveniently, and the thickly settled region in the vicinity of New York has been slighted because there were not men enough available to properly cover the ground.

An increase in the inspection force necessarily implies an increase in the Laboratory staff. At the present time there

are two chemists attached to this Division besides the Chief, whose other duties leave him little time for analytical work. This number is too small. At least one chemist should be provided for each Inspector and more would be desirable. One Inspector can easily collect in one day a sufficient number of samples to keep a chemist busy for a week or more. The necessary work which must be performed on each sample is steadily increasing in amount. The grosser forms of adulteration which are easily detected are being abandoned and replaced by skillfully devised sophistications, designed, in many instances, expressly to deceive and mislead the chemist. The State Laboratory of Hygiene is now fairly well equipped to perform almost any variety of work needed in the examination of food and drugs, but the Laboratory staff is entirely too small to permit the complete and exhaustive examination of samples which we would like to make.

On October 1st, 1908, the new Food and Drugs Act, passed in 1907, went into effect, superseding a previous act of 1901. Up to that time this Division had been operating under the former act. This report, covers, therefore, eleven months under the old act and one under the new. Although the new law has been in force such a short time, several defects in it have made themselves unpleasantly felt. Through an error on the part of the printer the words "(as determined by the test)" in the first subdivision of section three were included, although it was intended that this phrase should be omitted as its presence may seriously hamper the enforcement of the act with respect to drugs described in the Pharmacopoea and National Formulary. It seems entirely improper to confine the chemist for the ten years which must elapse before a revision of the Pharmacopoea becomes effective, to the methods of analysis laid down in that work, especially as many of them have proved unreliable, and in some instances better and more accurate ones have already been devised. Such a restriction would operate as a prohibition on progress in official drug analysis, and there is no branch of analytical chemistry in such an unsatisfactory condition as that relating to drug analysis.

In section three, subdivision four, the word "injuriously" should be omitted because it is persistently misinterpreted by the courts, which seem to be firmly convinced that the

quality or strength of a food can only be injuriously affected by an adulteration which renders the substance injurious to health.

Specific provision should be made in the act for the punishment of persons who, in response to a demand for an article of a certain quality, deliver to the purchaser an inferior article or a substitute, without informing him that this has been done. When the substance so delivered bears a label, the act as it reads at present protects the purchaser fairly well if he reads the label, but when goods are sold in bulk and no labels are used, a considerable opportunity for fraud exists.

In order that no confusion may exist in the minds of manufacturers, and for the purpose of simplifying the trial of cases, it would be advisable to specifically prohibit the use of certain preservatives in food stuffs. It is recommended that boric acid, salicylic acid, formic acid, hydrofluoric acid, sulphurous acid and nitrous acid and their derivatives be prohibited in foods.

Section five, which was amended in 1908, for the purpose of permitting certain manufacturers in this State to continue to use their unsanitary and improper methods of manufacture is so drawn as to be grossly defective as is more fully pointed out later in this report. The second proviso in this section should be eliminated.

In section fourteen the words "in this State" imperil the validity of the section without serving any useful purpose. They should be stricken out.

In order to avoid confusion the words "Imitation," "Blend," and "Compound" should be defined in the act and the limitations attending their use specified. Certain requirements now contained in the Rules and Regulations adopted by the Secretaries of the Treasury, Commerce and Labor and Agriculture for the enforcement of the Federal Food and Drugs Act should be enacted in this State for the purpose of rendering the requirements with respect to the labelling of goods more definite.

The sale of renovated butter should be so regulated by law that the deception now practised on the public by retail dealers throughout the State could be stopped. This matter will be more fully discussed later.

Legislation is needed to enable the State Board of Health

to exercise such supervision over the manufacture of foods as will insure to the consumer clean and wholesome articles. Such regulations are especially needed in factories where canned and condimental foods are prepared. The conditions existing at the present time in some of these factories are little short of revolting.

An effective slaughter house inspection bill should be passed in order that the citizens of the State may be protected against diseased and unwholesome meat. The sanitary arrangements and methods of operation in some of our abattoirs, especially the smaller ones, would not be tolerated by the public if the true state of affairs was generally known.

As a measure of economy, legislation providing that the certificate of a chemist of this Division, properly certified under oath, shall be prima facie evidence of the facts contained in it, is greatly desired. The constant attendance at trials by the chemists attached to this Division results in large expenditures of money and vexatious interruptions in the laboratory work. The writer believes that an amendment covering this point could be so drawn that everyone involved would be fairly treated. There are certain times when the presence of a chemist in court is indispensable, but in the great majority of cases his testimony is not disputed and his certificate would be just as satisfactory and convincing as his testimony. In order to secure his attendance at times when the defendant desires to cross-examine him it could be provided that he must be produced in all cases concerning which due notice is given to the Board that the defendant desires his presence. In this way all rights of the defendant would be protected and the chemist would be saved many unnecessary trips to court.

In the interest of the people, trial by jury should be eliminated from the Food and Drugs Act. The writer is aware that trial by jury is regarded by the average American as one of the fundamental bulwarks of his liberty, and the attempt to deny that privilege to anyone is always met by determined opposition. He is also aware by reason of long experience, that trial by jury in cases of this sort results, at times, in such gross perversions of justice as to render the enforcement of the law extremely difficult if not impossible. Our method of selecting jurors, especially in the lower courts,

is such that twelve men of average intelligence are not to be had on a single jury. The subject matter of the evidence presented in these cases, especially the expert testimony, is such that the average juror is entirely unfamiliar with it, and incapable of correctly estimating its value, and he is therefore not qualified to arrive at a proper conclusion. The same objection applies to the court as well, but by no means to the same extent as the judges in our courts are highly educated and intelligent men (with one or two lamentable exceptions) and usually get a sufficient grasp of the matter at issue to decide the case properly according to the evidence. Neither are they, as a rule, swayed by personal considerations. This is not the case with the jury. In the rural districts a defendant is indeed unpopular if he has not one or two friends on the jury who are willing to violate their oaths in order to protect a personal friend from the consequences of his acts, even though, in the abstract, they are in favor of the enforcement of the law. The jury is always the refuge of the lawyer who has a weak and defective case and who hopes by beclouding the issue and appealing to the sentiment and the prejudices of the jurors, to defeat the ends of justice for the benefit of his client.

In order that the work done by this division and the other departments of the Board may be properly presented to the public, it is very desirable that the Board should issue bulletins in printed form at regular intervals, which would contain summaries of the work done by all the divisions. That portion of the bulletin devoted to the Division of Food and Drugs should include the results of the examination of all samples of food and drugs which have been found to vary from the legal requirements. Publicity, rightly used, is the most powerful weapon we have for the correction of evil practices. The writer is convinced that the periodical publication of the names of offenders against the Food law would secure much greater improvement in existing conditions than is now obtained by prosecuting offenders and relying on someone else to notify the public. This method of exposing violations of the law has worked wonders in other states. It has long passed the experimental stage and is well established as one of the most satisfactory ways to secure improvement in the condition of the food and drug supply. Almost every State



in which food and drug inspection is carried on publishes some sort of a bulletin, and one is badly needed in New Jersey.

The Food and Drugs Act provides in section 30 that local Boards of Health may enforce the provisions of the act within their corporate limits in exactly the same manner that the State Board enforces it throughout the State. This is a very wise and important provision as it places in the hands of local authorities power to assist the State Board in its difficult task by keeping watch over their own localities in a manner impossible for the State Board to adopt. Certain provisions of the act lend themselves readily to enforcement by local Boards and several such bodies are now doing more or less efficient work in this direction. The enforcement of that portion of the act relating to the sale and distribution of milk should certainly be undertaken by local authorities. The milk supply needs such constant supervision that this Division, by reason of its inadequate force, is entirely unable to cover the State. The methods of milk analysis are simple, and do not require elaborate laboratory equipment nor especially skilled analysts. The local Board of Health has also a weapon which the State Board does not possess, which it can use with deadly effect against the milkman who sells adulterated milk. The local Board can revoke the license of such an individual and effectually prevent him from doing business within its jurisdiction. Such a method of enforcing the law produces far quicker and more certain results than does the infliction of penalties.

Section 45 of the Food and Drugs Act provides for the inspection and condemnation of unwholesome and decomposed food and should certainly receive attention by local Boards of Health. Adequate enforcement of this section by this division is at present impossible. On the other hand, local Boards can profitably utilize a portion of the time of one or more of their employees in carrying out its provisions. The work is of great importance in the protection of the public health and the section is so drawn that it can be readily enforced by local Boards who are willing to devote a moderate amount of time to it.

The foregoing statements are not intended to convey the idea that local Boards should limit themselves to the enforcement of the sections above referred to, but their attention

is especially directed to these sections because the enforcement of these sections by such bodies is entirely practicable and will not involve heavy expenditures. This division stands ready at any time, insofar as our resources will permit, to cooperate with any local Board of Health in the enforcement of any portion of the act, and we are not only willing, but anxious to secure cooperation in every part of the State. The time is rapidly approaching when the supervision which the public will demand over articles of food and drugs will be so great that no one body can successfully perform it. A division of labor is inevitable. It seems equally inevitable, in order that satisfactory progress may be made, that the local Boards will enforce those portions of the act which lend themselves readily to local supervision, leaving the more unusual problems and those involving extensive and difficult analytical work, and the necessarily accompanying elaborate equipment, to the greater resources of the State Board of Health.

That portion of the work of the State Laboratory of Hygiene relating to the examination of food and drugs consists in the analysis of samples, collected and sent to the Laboratory by authorized Inspectors attached to the Division of Food and Drugs, and, in certain cases, by local Boards of Health. The Laboratory is unable to examine miscellaneous samples sent by persons not connected with the State or local Boards of Health. Under certain conditions the analysis of samples sent by purchasers of food and drugs is undertaken if we have reason to believe that the performance of such analysis will enable us to detect violations of the law. No reports of such analysis will be furnished to persons sending such samples, but, should the analysis disclose a violation of the law, steps will be taken to secure the punishment of the offender. The work of the Division of Food and Drugs is sharply defined by law and the performance of miscellaneous analyses for the purpose of satisfying curiosity is no part of its duties and will not be undertaken.

For the last two years the food and drug work has been increasing at a rapid rate. During the year ending Oct. 31, 1908, there were examined 6,581 samples of food and drugs, an increase over the number examined during the preceding year of 53 per cent.

The following table shows the kinds of samples examined and the number of samples of each kind during the years 1906, 1907, and 1908:

ARTICLES EXAMINED.	1906.			1907.			1908.		
	Above Standard.	Below Standard.	Total.	Above Standard.	Below Standard.	Total.	Above Standard.	Below Standard.	Total.
Milk and cream.....	1,556	585	2,441	2,317	521	2,838	2,356	449	2,805
Foods other than milk.....	731	295	1,026	592	175	767	2,898	328	3,024
Drugs.....	138	267	405	204	367	571	550	169	719
Kerosene Oil.....				63	6	69	31	2	33
Total.....	2,725	1,147	3,872	3,176	1,069	4,245	5,635	946	6,581

This table shows clearly the value of the enforcement of the Food and Drug Law. In spite of the increasing number of samples examined the number not complying with the law is constantly diminishing.

**MILK.** During the year 2,805 samples of milk and cream were examined of which 449 were found to vary from the legal standard. These may be divided into the following classes:

1. Milk containing less than 12.00 per cent. of total solids. .... 316.
2. Milk containing added water. .... 86
3. Skimmed milk containing added water. .... 7
4. Skimmed milk sold in containers not properly marked. .... 18
5. Milk containing formaldehyde. .... 20

The following table shows the number of these samples concerning which the evidence appeared to be sufficient to base prosecutions upon and which were, therefore, submitted to the State Board of Health with the recommendation that the persons selling them or offering them for sale be used for the penalty provided by law:

1. Milk containing less than 12.00 per cent. of total solids. .... 112
2. Milk containing added water. .... 81
3. Skimmed Milk containing added water. .... 6
4. Skimmed milk sold in containers not properly marked. .... 18
5. Milk containing formaldehyde. .... 19

An inspection of these figures will show that a great deal of milk is still sold in this State which does not comply with the legal requirements although for more than twenty years the inspection of milk has been carried on with constantly increasing vigor. It is true that conditions at the present time are better than they used to be, but such improvement can only be main-

tained by unremitting vigilance. Milk is the most important food that is sold, and can readily be adulterated without such adulteration being detected by the consumer. A large part of it is used for the feeding of infants and invalids, and it is of the greatest importance that it should be pure, wholesome and contain the proper amount of nutriment when it reaches the consumer. With the cleanliness of milk this report has nothing to do. That subject will be discussed in the report of the Chief of the Division of Creameries and Dairies. It seems desirable, however, to direct attention to a point which, in the struggle for cleanliness, has been somewhat neglected of late years, and that is the desirability of having the consumer receive a proper return in food value for the price he pays for his milk. Claims are periodically made by the persons, to whom the degradation of our milk supply would work advantage, that the standard of 12.00 per cent. milk solids now in force in this State is too high, because cows will occasionally be found which will give milk that does not come up to that requirement, and, they argue, any standard which makes the pure product of any cow unsaleable, is unfair and improper. A brief consideration of this argument will show that it is without merit. There is no doubt that there are cows occasionally which will give milk containing less than 12.00 per cent. total solids. There is also no doubt that such cows are so few in number that, when their number is compared to the total number of milk producing cows, it becomes small almost to the vanishing point. It is exceedingly uncommon for the mixed milk from a herd of four or more cows to contain below 12.00 per cent. total solids. It should also be remembered that cows giving milk of the character referred to are not normal cows. These animals belong almost exclusively to one breed, the Holstein, which are bred to give large quantities of milk. The results of very numerous analysis of Holstein milk show that average milk from this breed contains about 12.40 per cent. total solids. This racial trait of giving large quantities of milk has been carefully developed by breeders, who had quantity only in view, until many of the highly bred animals of this class have become mere machines for the production of what may be called naturally watered milk. It is not inconceivable that continual breeding for quantity only would in time produce so abnormal a breed that they would give milk containing but 10.00 per cent. total solids. There seems to be no good reason why, by persistent effort, a cow's function might not become deformed just as a bulldog's head or a dachshund's legs are deformed by long continued breeding with that in view. Cows of the quantity type are profitable to the dairyman in this section because milk intended for consumption as such is usually bought by measure or weight, and the price does not depend upon the amount of nutritive constituents for which the consumer buys it; and it takes less feed and fewer cows to produce a given amount of milk of this quality than it does to produce an equal amount of rich milk. The consumer, however, buys milk for use as food. He can obtain water from much safer sources and far more economically from the water company than from the milkman; and he is entitled, inasmuch as custom compels him to buy his milk by measure and not by real food value, to expect that the bulk which he pays for will provide him with the amount of nourishment which average cow's milk contains. But the lowering of the milk standard in this State would mean far more than the admission of the milk of a few exceptionally poor cows to the market from which it is now legally excluded. If the lowering of the standard would only operate to legalize the sale of such milk, it could safely be lowered at the present time without impairing the quality of market milk in the slightest degree because there are not cows enough of this type in the State to have any appreciable effect on the quality of market milk, and it is perfectly safe to say that none of the milk from these cows is excluded at the present time. It might be if they were all gathered together in one herd, but, as a matter of fact, they are scattered throughout all sections of the State, and when milk from them goes to market it is mixed with the richer milk of other cows so that the united product contains solids enough to be legally sold. The argument, therefore, that the standard should

be lowered in order to take care of such cows is of no value, because they are taken care of adequately under the present standard.

This argument is not put forward in good faith by those seeking to reduce the standard, because they are perfectly familiar with all these facts, but it is used by them because their real desire is of such a character that they dare not make public mention of it. The true purpose of lowering the standard is to enable the producer, wholesaler or retailer to *fraudulently tamper with his milk without danger of detection*. If milk were a substance of perfectly definite composition no standard would be necessary; it would be its own standard. But this is by no means the case. Different cows give milk of varying composition, the same cow gives milk of different composition at different times; there are occasional animals, the milk from which varies widely in composition from the accepted limits of normal milk; and this is the reason that a standard is needed. If a standard was not available, the skillful producer could, by judicious watering or skimming, alter the composition of his milk to his own profit and to the detriment of the consumer, and still keep the composition within the limits of variability of natural milk if these occasional cows are to be considered, and it would be impossible to protect the consumer against his cupidity, because it would be impossible to prove that adulteration had been practised.

The above statements with regard to the desirability of a standard are applicable to any locality where milk is produced for consumption as such. There is still another reason why lowering the standard in this State would be disastrous not only to the consumer but to the producer as well. Nearly half of the milk produced in this State goes to the City of New York, a place where a 12.00 per cent. standard is also in force and where the quality of the milk supply is jealously guarded. The agitation for a lower standard comes from just those localities from which milk is shipped to New York. Therefore, even if milk of a lower standard could legally be sold in this State, much of it would be excluded from its only available market. A considerable amount of milk goes to Philadelphia where a similar standard obtains. Finally, the Federal Government has established a standard of 12.00 per cent., and milk below that standard is not permitted to enter into interstate commerce. It will, therefore, be readily seen that a lowering of the present standard would not benefit the very persons who are demanding it, would discredit New Jersey milk in the markets of other states and would work grave injury to the milk consumer in this State. The honest producer would be injured by unfair competition and the dishonest one would degrade his milk and himself because encouraged to do so by the laxity of the law.

It is very desirable that the milk which the consumer receives from day to day should be of uniform composition. This is most important when the milk is to be used for infant or invalid feeding. Cows' milk, when used for infant feeding, is usually modified by the addition of water, cream or other substances which are added for the purpose of making the resulting mixture more nearly like human milk in its composition. The presence of an excess of casein is particularly detrimental to many infants, and almost as many are unfavorably affected by an excess of fat. In order that an infant may be properly nourished and make satisfactory progress on cows' milk it is necessary to feed it up to the limit of assimilation, and, when that limit is exceeded for any particular constituent, digestive disturbances usually begin immediately. While the most satisfactory way to obtain properly modified milk is to have it specially prepared on prescription by a concern that makes a business of preparing and sending out such mixtures ready for feeding, yet such a product is necessarily expensive and, in many places, not to be had at all. The mother is, therefore, in most instances, under the necessity of preparing the product herself. She has no facilities for analyzing milk and must assume that the milk she receives every day is of uniform composition and use this assumed composition as the basis of her mixture. If the composition was in fact uniform, even if it differed somewhat from her assumption, a few trials would secure a proper mixture, but anyone who has studied the methods of

milk production and handling in this State will realize that uniformity of composition is not ordinarily attained in market milk. The particular quart or two of milk which she daily receives from her dealer, even if he produces it himself, almost always shows considerable variations. Constancy of composition can only be obtained when the milk of the entire herd is mixed before being marketed and this is rarely done by the producer. He milks his cows, pours the milk from one after another into a can until it is full, then begins on the next can, and so on until the milking is finished. If he has a small herd and one person does all the milking, following the same order with respect to cows every day, each can may have approximately the same composition. If the herd is large and there are a number of milkers it is very unlikely that a given can will contain milk from the same cattle two days in succession. If the retailer buys his milk from a creamery or from several producers the chance of a given customer getting uniform milk is even smaller. Even the best and most careful producers are not above criticism in this respect. Some years ago the writer made repeated examinations of a large number of samples of certified milk. The following results of analysis of pairs of samples from each of several sources, taken on different days, while they are extreme differences, greater than are usually met with, will serve to show that these differences are sometimes great enough to produce serious digestive disturbances when used in the preparation of modified milk, if a mixture of uniform composition is needed:

	Specific gravity.	Total solids.	Fat.	Solids not fat.
1.	{ 1.0329	14.60 %	5.20 %	9.40 %
	{ 1.0303	12.20 %	3.70 %	8.50 %
2.	{ 1.0320	15.22 %	5.90 %	9.32 %
	{ 1.0329	13.94 %	4.30 %	9.14 %
3.	{ 1.0317	12.25 %	3.50 %	8.75 %
	{ 1.0328	13.97 %	4.77 %	9.20 %

It will readily be seen that if any of these milks were to be modified, and were assumed to have the composition of the first members of any of these pairs of samples, and really have the composition of the other member of the pair, the finished mixture would be quite different from that desired.

The remedy for such variations is obvious and easily adopted. All the milk from the dairy should be mixed together daily, and the dairy should contain a sufficient number of cows to furnish a uniform supply from day to day when this has been done.

The addition of water to milk is a form of adulteration as old as the milk business, but it is slowly but surely being checked by vigorous prosecution of offenders. When milk inspections were first begun in this State the addition of water was a common practise. The enforcement of a 12.00 per cent. standard for total solids checked this practise to a large extent. Since reliable methods have been discovered for the detection of added water in milk the dishonest producer has found it increasingly difficult to tamper with his product. Water, if pure, when added to milk merely reduces its nutritive value and imposes no hardship upon the producer except the fraud of which he is the victim. When, however, the water comes from the farmer's highly polluted barnyard or kitchen well, as is often the case, this form of adulteration may become the most dangerous to which any of our food products are subjected. Numerous examinations of water from wells on dairy premises throughout the State show that a large proportion of them are so polluted that they would probably become infected if a case of typhoid fever occurred on the premises. There is abundant evidence that the adulteration of milk with water of this character has been the cause of numerous outbreaks of typhoid fever entailing many deaths and much suffering and loss to the communities affected. In view of these facts, the adulteration of milk with water will not be tolerated under any circumstances, and every person who is detected in the sale of such milk is promptly prosecuted for the recovery of the penalty prescribed by law.

As is shown in the table given above, we have been able to allege added water in 93 samples of whole and skimmed milk during the year. In the detection of added water much reliance is placed on the figure obtained by examining the whey, obtained by curdling the milk under definite conditions, by means of the immersion refractometer. This method, first described in this country by Leach,\* has been in use in this laboratory for several years. Numerous samples of milk of undoubted purity have been examined and in no instance has a refractometer reading below 39° been obtained on pure milk. The refractometer serves equally well to detect added water in skimmed milk, the amount of fat present in the milk having no effect on the reading. During the year a number of samples of skimmed milk, sold as such, have been examined and seven samples were obtained which contained sufficient added water to enable it to be detected by means of the refractometer.

The following table gives the results of analysis of a sample of skimmed milk which had been systematically watered in the laboratory.

Added water.	Fat.	Total solids.	Specific gravity.	Refractometer.
0 %	0.2 %	9.71 %	1.0339 %	42.00 %
5 %	.....	9.23 %	1.0328 %	40.80 %
10 %	.....	8.74 %	1.0310 %	39.70 %
15 %	.....	8.27 %	1.0290 %	38.05 %
20 %	.....	7.80 %	1.0275 %	36.70 %
30 %	.....	6.95 %	1.0241 %	34.20 %
40 %	.....	5.92 %	1.0209 %	31.30 %
50 %	.....	4.91 %	1.0170 %	28.40 %

Until the new food law went into effect on October 1, 1908, there had been no standard for fat in milk in this State and difficulty had been experienced in protecting the consumer against the skimming of milk when this was skillfully done. Now that a fat standard is in force, although in the judgment of the writer it is somewhat low, more progress will be made in checking this dishonest custom of certain dealers who partially skim their product before marketing it. Skimmed milk is a wholesome and nutritious food and the law permits it to be sold if contained in cans or vessels marked in a particular manner with the words "Skimmed Milk." During the past year attention was directed to the enforcement of this provision and 18 persons were prosecuted for the sale of skimmed milk in vessels not properly marked.

Previous to this time attempts had been made to persuade dealers, especially in the southern part of the State, to comply with this provision, but without marked success. A number of these dealers insisted that bottles with the words "Skimmed Milk" blown in them were not to be had, but after a number of prosecutions had been started against persons who had violated the law in this respect, there seemed to be no difficulty in obtaining a sufficient number of such bottles to meet their requirements.

It is gratifying to note that the use of preservatives in milk in this State has diminished greatly in the last few years. This diminution is due partly to the vigorous campaign carried on against them by this Board, and partly to the practise of pasteurization which delays the souring of milk for a time. Boric acid and borax seem to have entirely disappeared and formaldehyde appears to be the only preservative now in use. During the year 20 samples were found which contained preservatives and all but two of these were obtained in one city. It was discovered early in the summer that a number of milk dealers in Elizabeth were using formaldehyde. Numerous samples were taken and those persons who were selling milk containing formaldehyde were promptly detected; prosecuted and convicted. Before the summer was over no preserved milk could be found in that city, and it is believed that the practise has been broken up there.

\*Leach. Rept. Mass. State B. of H., 1903.

The use of preservatives is always resorted to for the purpose of concealing inferiority. Clean, properly handled milk needs no preservative to keep it sweet until it reaches the consumer. The addition of these substances to milk is a confession on the part of the user that he is too ignorant, too lazy or too penurious to take proper care of his milk. Their use is prohibited by law and all violations are promptly prosecuted.

Pasteurization of milk is being extensively practised throughout the State, and the amount of milk so treated is rapidly increasing. This report is hardly the proper place to discuss the merits and disadvantages of this method of renovating milk, but there can be no doubt that the consumer should be able to ascertain whether he is getting pasteurized milk or not. It is, therefore, suggested that the Legislature be requested to enact a law requiring that all vessels containing pasteurized milk be plainly labeled to that effect. Clean raw milk costs more to produce and market than dirty pasteurized milk; the consumer is utterly unable to differentiate between them. He should therefore, be provided with a means of ascertaining what he is really getting and the simplest method of accomplishing this is by a proper system of labeling. Such a system has already been put into effect in a number of places with good results.

In order that milk may reach the consumer in such a condition that it is wholesome and fit for use as food, it is necessary that it be immediately cooled and kept cold until consumed. Producers, wholesalers and retailers throughout the State neglect this very necessary precaution, and it is therefore urged that the legislation be obtained which will require all milk produced for sale as such to be kept continuously at or below a temperature of 50° F., until it is delivered to the consumer. The enactment and enforcement of such a law would result in the saving of many lives each year.

TABLE B.—SHOWING THE KIND AND NUMBER OF SPECIMENS EXAMINED OTHER THAN MILK AND CREAM.

Articles Examined.	Number above standard.	Number below standard.	Total number of specimens.
Arrowroot.....	26	1	27
Baking Powder.....	5	0	5
Bread.....	1	0	1
Butter and Oleomargarine.....	192	69	261
Candy.....	2	0	2
Catsup, tomato.....	7	11	18
Cheese.....	8	0	8
Chocolate.....	35	2	37
Cider, apple.....	23	4	27
Cocoa.....	105	2	107
Coffee, ground.....	37	11	48
Corn, canned.....	13	2	15
Corn Meal.....	4	0	4
Extract of Lemon.....	48	24	72
“ “ Orange.....	1	0	1
“ “ Raspberry.....	3	1	4
“ “ Vanilla.....	93	10	103
Flour, buckwheat, prepared.....	6	1	7
Flour, mixed, prepared.....	2	0	2
Flour, wheat.....	26	0	26
Gelatine.....	1	0	1
Honey, extracted.....	113	6	119
Jams, various kinds.....	16	1	17
Jellies, various kinds.....	19	2	21
Lard, various kinds.....	167	22	189

TABLE B.—SHOWING THE KIND AND NUMBER OF SPECIMENS EXAMINED OTHER THAN MILK AND CREAM.—(Continued).

Articles Examined.	Number above standard.	Number below standard.	Total number of specimens.
Milk, condensed.....	3	0	3
Molasses.....	195	13	208
Olive Oil.....	65	3	68
Peaches, canned.....	1	0	1
Peas, canned.....	13	0	13
Rice.....	6	0	6
Sausage.....	0	1	1
Scrapple.....	1	0	1
Spices.....			
Allspice, ground.....	68	0	68
Cinnamon, ".....	23	1	24
Cloves, ".....	67	8	75
Ginger, ".....	117	0	117
Mace, ".....	62	2	64
Mustard, ".....	136	9	145
Nutmeg, ".....	15	0	15
Paprika, ".....	1	0	1
Pepper, black, ".....	249	13	262
Pepper, white, ".....	86	3	89
Pepper, cayenne, ".....	63	4	67
Starch, corn.....	62	1	63
Starch, wheat.....	1	0	1
Sugar, brown.....	2	0	2
Sugar, granulated.....	4	0	4
Sugar, powdered.....	5	2	7
Sugar, maple.....	7	1	8
Syrup, maple.....	2	1	3
Syrup, sugar.....	13	3	16
Tapioca.....	1	0	1
Tea.....	2	1	3
Tomatoes, canned.....	5	0	5
Vinegar.....	0	2	2
Vinegar, cider.....	405	79	484
Vinegar, malt.....	2	2	4
Vinegar, syrup.....	21	1	22
Vinegar, distilled.....	39	4	43
Vinegar, white wine.....	0	3	3
Wine, sherry.....	1	0	1
Totals.....	2,696	326	3,022

The above table is a summary of the examinations of foods other than milk and cream which have been made in the laboratory during the year. The table is followed by brief comments on a number of the foods therein mentioned.

**BUTTER.** Two hundred and sixty-one samples of butter and oleomargarine were examined during the year of which 69 were found to have been sold or had in possession with intent to sell in violation of law. With one or two exceptions all these illegal samples consisted of oleomargarine sold for butter, and therefore, in violation of Chapter 84 of the laws of 1886, which permits the sale of oleomargarine provided that it is not colored in imitation of natural butter and provided also that when a sale is made to a retail purchaser such purchaser must receive a verbal notice that the substance is not natural butter and also " \* \* \* a card or notice printed on which shall be the name of the substance sold and the name and address of the seller or vendor, and nothing else shall be printed thereon unless it be the weight of the parcel; and said notice or card shall be at least six inches long and at least four inches wide and the printing thereon shall be at least of the size known as two line English, and said notice or card shall be printed in black and in the English language upon white paper plainly and legibly, and shall be either on the outside of the outer wrapper in which the substance is delivered to the purchaser or upon a separate card or paper attached thereto; in either case the notice shall be so placed that no part thereof shall be concealed from view."

The figures above given will show that the illegal sale of oleomargarine is practised to a considerable extent in this State at the present time. When butter is expensive, the temptation to substitute oleomargarine costing not much more than half the price, is frequently too great for the dishonest retailer to resist. There can be no objection to the sale of oleomargarine as such: it is a wholesome and nutritious food when properly made, but its sale for butter to the prejudice of the consumers pocketbook will not be tolerated. There is a widespread belief among retailers throughout those sections of the State in which this article is sold that if a package containing oleomargarine has anywhere upon it the words "Oleomargarine" or "Butterine," no matter how faint and illegible or how thoroughly concealed from view they may be the requirements of the law have been met, and no further verbal notice is needed. This misconception apparently emanates from wholesalers and manufacturers who, so we are informed, instruct their retailers to that effect. The law is perfectly explicit on this point and will be rigidly enforced.

In past years considerable difficulty was experienced in stopping the sale of colored oleomargarine, but during the last year no colored goods have been found on the market. The sale of oleomargarine colored in imitation of natural butter is prohibited by law. No doubt there is still some of it sold in the State, but the vendors have succeeded in eluding the inspectors of this division. A class of offenders very difficult to deal with are the persons who peddle oleomargarine from wagons. These individuals usually represent themselves to be farmers selling the produce of their own farms, or agents of farmers or creameries. They are difficult to locate for the purpose of obtaining samples and are still more difficult to find after a sample has been taken, and it becomes necessary to serve the papers summoning them to appear in court.

These persons frequently sell other dairy products, and eggs which are also usually of an inferior grade. This method of selling goods is necessarily an expensive one and consumers should realize that they are very likely to be deceived in the quality of the articles which they purchase from such irresponsible individuals, especially when such articles are offered at prices lower than those prevailing among established and reputable dealers.

**TOMATO CATSUP.** The tomato catsup on the market may be divided into two classes: that which contains benzoate of soda and that which is free from preservatives. At the present time there does not seem to be any catsup on the market in this State in which preservatives other than benzoate of soda are used. The new food law which went into effect October 1, 1908, requires that catsup containing benzoate of soda must have the presence of the preservative and the date of manufacture declared on the label, if the goods were made during the years 1907 or 1908, within

this State. An attempt made to enforce this portion of the food law quickly disclosed the fact that the section in question (Section 5) had been so carelessly drawn as to be defective in all probability, and, whether defective or not, its enforcement would work hardship on the manufacturers in the State, who, under the terms of the section, are required to place the date of manufacture on the label. This would place these goods at a disadvantage, compared to goods manufactured in other States, which need not be so dated.

Manufacturers are much opposed to dating canned and condimental foods put up in sealed packages, in a manner intelligible to the public. They claim that goods of this sort, if properly packed, remain indefinitely without deterioration, but that the public in purchasing would discriminate in favor of new goods to the detriment of the manufacturer, wholesaler and retailer. In the writer's opinion there is not much force in this argument. If, as the manufacturers claim, goods of this kind do not deteriorate, the public will soon find out that this is the case. If, on the other hand, the people really do demand fresh goods, and are willing to pay the slightly higher price which the loss of old goods would necessitate, there can be no doubt that packages should be so marked that the purchaser can be assured that he gets what he demands. A similar argument was used in opposing the declaration of preservatives on the label. It was asserted that preservatives were, not only harmless but really beneficial, but that the purchaser, through prejudice, would discriminate against preserved goods to the detriment, if not the destruction, of the trade. Because of the efforts of pure food officials throughout the country, manufacturers, who still use preservatives were forced to declare their presence on the label. This practice is now almost universal, yet people buy these goods as freely as before, and the trade has suffered but little.

It is to be regretted that so many manufacturers still make use of preservatives in goods of this kind. It has been proven beyond possibility of doubt that such goods can be successfully packed, stored, transported, sold and eaten when they contain no artificial preservatives, and there is, therefore, no excuse for the use of these substances. It is true that catsup made of inferior or decomposing materials, or made in an uncleanly manner, or of two thin a body, because of the presence of an undue amount of water, is difficult to pack without great loss, unless preservatives are used. It is also true that the manufacture of non-preserved catsup is somewhat more costly, because a larger and more expensive equipment is required, but the increased cost of manufacture is small. Catsup is a food eaten in small quantities, and the increased cost of a really pure article would hardly be felt by the consumer. On the other hand, numerous manufacturers are relying on the presence of benzoate of soda to prevent decomposition in catsups of so thin a body, due to excessive watering or insufficient concentration, that it would be utterly impossible to keep it without the use of antiseptics. The sale of articles of this kind constitute a fraud inasmuch as the purchaser, while buying a nominally cheap article, is really paying a large price for water, which would not be present in the higher grade of goods.

**CHOCOLATE.** Thirty-seven samples were examined of which two were classed as below standard. One of these samples contained an excess of cocoa shells, the other contained a large amount of corn starch.

**CIDER.** Twenty-seven samples were examined of which four were found on analysis not to consist of the pure juice of apples. Salicylic acid was present in three of these and in one, which contained little or no apple juice, saccharine was found. One sample was especially interesting, having been made by diluting boiled cider with water.

The use of preservatives in sweet cider is practised by almost every manufacturer in the State. The methods of manufacture of cider at present in use in this locality are crude in the extreme as are also the methods of distribution, and the resulting product is usually far from palatable.

There can be no doubt that properly made and properly matured cider, such as is made in France and other European countries, if it could be had in our markets, would command a ready sale. Manufacturers claim that sweet cider as sold in this State cannot be kept in the condition demanded by the consumer without the use of a preservative, and this is doubtless true when the methods of manufacture, storage and distribution are considered. There is no doubt, however, that unfermented apple juice can be made, kept a reasonable length of time and sold without any more difficulty than attaches to the sale of unfermented grape juice, which is now successfully distributed in a pure condition without the use of any preservative.

**SPICES.** During the past year a much larger number of ground spices were examined than ever before. This was done in order to ascertain whether the improvement noticed in previous years extended to all kinds and all brands of spices.

Very few adulterated samples have been found, and many of these have proven, on investigation, to have been goods which had been in stock for a long time. The result of our investigation of these articles shows beyond doubt that a very great improvement has taken place in the quality of commercial ground spices, and that at this time, almost all of them are true to name and properly labeled.

**ALLSPICE.** No adulterated samples of ground allspice were found during the year. Sixty-eight samples were examined.

**CINNAMON.** Twenty-four samples were examined, one of which was adulterated with ground cocoa nut shells.

**CLOVES.** Seventy-five samples were examined and eight classed as adulterated. Four of these contained an excess of clove stems, one was adulterated with a large amount of cocoa nut shells and three contained foreign starch, probably buckwheat.

**GINGER.** One hundred and seventeen samples were examined and none found to be adulterated.

**MACE.** Sixty-four samples were examined and two found to be adulterated; one with a foreign cereal starch, the other with exhausted ginger.

**MUSTARD.** One hundred and forty-five samples were examined, nine of which were found to be adulterated. Three of these were classed as adulterated, because they contained an excess of mustard hulls, two were colored with turmeric, and four contained large amounts of cereal starches and were colored with turmeric.

**NUTMEG.** Fifteen samples were examined and none found to be adulterated.

**PAPRIKA.** One sample was examined which was found to be of good quality.

**BLACK PEPPER.** Two hundred and sixty-two samples were examined, thirteen of which were found to be adulterated. Seven of these contained an excess of pepper shells, one an excess of shells and sand, one contained olive stones and cereal starches, and four were adulterated with cereal starches. One sample received was misbranded, the box containing it being labeled "Pepper" whereas it contained paprika. It is held that the word "Pepper" without qualification refers to black pepper.

**WHITE PEPPER.** Eighty-nine samples were examined and three classed as adulterated. One of these contained olive stones and cereal starches and the other two contained cereal starches.

**CAYENNE PEPPER.** Sixty-seven samples were examined and four classed as adulterated. One of these was wormy and mouldy, another contained a considerable amount of a foreign plant tissue, which could not be positively identified. The other two consisted principally of cereal starches colored with an aniline dye.

**COCOA.** One hundred and seven samples were examined and two found to be adulterated because of the presence of foreign starch.

**COFFEE.** Forty-eight samples of ground roasted coffee in packages were examined of which eleven were found to be adulterated. Five of these contained chicory and six chicory and broken peas. In addition to these adulterations, most of the package coffees were misbranded, the labels bearing misleading statements regarding the quality of the coffees contained in them. The marketing of ground roasted coffee in packages is a practise that has nothing to commend it. No matter how good the coffee may have originally been, the length of time which must necessarily elapse between the grinding and the sale causes a loss of flavor and aroma which cannot be avoided.

**CANNED CORN.** Fifteen samples were examined and two classed as adulterated, because of the presence of saccharine. Saccharine is in no sense a food and is added to corn for the purpose of concealing inferiority, and to make it appear of greater value than it really is. There is also grave doubt as to the harmlessness of saccharine, even when taken in small doses.

The results of our investigation of the net weight of packages of canned corn show clearly the need of legislation requiring that the net weight of canned goods be placed on the package. A large number of weightings of cans of corn, taken from State institutions and bought under contract as two pound cans, showed that the average gross weight was 1 lb. 8 oz., and the average net weight 1 lb. 5 oz. per can, a deficiency in weight of 35%.

**EXTRACT OF LEMON.** Seventy-two samples were examined and twenty-four found which varied from the legal requirements. Ten of these samples were deficient in lemon oil, four of them were artificially colored, and ten of them were both colored and deficient in lemon oil. In addition to these defects most of these extracts were misbranded, the words "Concentrated," "Double Extract," "Triple Extract," and similar misleading expressions have been made use of. Some of them also had deceptive formulas purporting to state the composition of the contents of the package, but written in a manner calculated to mislead the purchaser.

**EXTRACT OF VANILLA.** One hundred and three samples of vanilla extract were examined and ten found to be adulterated. The usual adulterants, coumarin, artificial vanillin and artificial color were found. Many of these samples were misbranded in the manner described under lemon extract. Inasmuch as a number of these samples, which would be classed as misbranded under the new food law were examined before that Act went into effect, were classed with the samples passed as above standard, the proportion of adulterated samples found, when judged by the new law, is too small.

**HONEY.** One hundred and nineteen samples of honey were examined and six of these were found to be adulterated with invert sugar. The old time adulterants of honey, cane sugar and glucose, have almost disappeared from the market, but invert sugar is being used by the unscrupulous manufacturers, who believe that its presence cannot be detected by the chemist. There is little difficulty, however, in detecting this substance when added in sufficient quantity to make such addition profitable.

**JAMS, JELLIES AND PRESERVES.** Thirty-eight samples of these substances were examined and three classed as adulterated, because the contents of the package did not correspond to the statements made on the label. There has been marked improvement during the last few years in the labeling of articles of this kind. Apple jelly flavored with artificial imitations of fruit flavors and colored with aniline dyes, no longer masquerades as pure fruit jelly, and apple pulp with a few fruit skins and a seed or two is no longer labeled as pure fruit jam. Articles made in this way are still sold, but in almost all cases they are properly labeled. The use of preservatives in goods of this kind is not so frequent as in former years and, when used, they are almost invariably declared on the label. Benzoate of soda seems to have completely displaced the other preservatives formerly used.

**LARD.** One hundred and eighty-nine samples were examined and twenty-two were found to be adulterated with cottonseed oil and beef stearin. The deception practised in the sale of this article is almost entirely on the part of the retailer. Compound lard comes to him in packages properly marked, but in response to a demand for "Lard" he frequently sells the purchaser compound lard without informing him of its true nature, and without placing any label on the package. This form of deception is widespread throughout the State, and is clearly in violation of law.

**MAPLE SUGAR AND SYRUP.** Eleven samples were examined and two of these were found to be below the legal requirements, because they contained foreign sugars. The labeling of maple products has been revolutionized, within the last five years, and at the present time almost all imitations are labeled in such a manner that the observing purchaser will have no difficulty in determining their true character.

**MOLASSES.** Two hundred and eight samples of molasses were collected and examined and thirteen of these were found to have been adulterated with glucose. As with lard, the deception in the sale of molasses is practised chiefly by the retailer who receives his goods properly marked by the manufacturer, but who serves his customer with a mixture of molasses and glucose when asked for molasses.

**POWDERED SUGAR.** Seven samples were examined and two of these were found to contain added starch.

**SAUSAGE.** The single sample of sausage examined was condemned because it was in a state of putrefaction when sold.

**CIDER VINEGAR.** Four hundred and eighty-four samples of cider vinegar were examined of which 79 were found to vary from the legal standard. The analytical data on six of these samples enabled us to state positively that they were adulterated. It is probable that a number of others were also adulterated, but the figures obtained on analysis did not differ sufficiently from the accepted constants for cider vinegar to make it certain that

they had been tampered with. Most of the samples were undoubtedly cider vinegar or mixtures of cider vinegar and water, low in acid, or solids or both. Vinegar manufacturers almost always water their vinegar in order to bring the acid strength down to the legal minimum. The use of artificial color which is prohibited by law in this State is becoming infrequent, and the substitutes for cider vinegar consisting of distilled vinegar colored with caramel have almost disappeared from the market.

**MALT VINEGAR.** Four samples were examined and of these two were found not to be malt vinegar. Both consisted of distilled vinegar colored with caramel.

**SYRUP VINEGAR.** Out of twenty-two samples examined one was classed as adulterated, because it was low in acid.

**DISTILLED OR WHITE VINEGAR.** Forty-three samples were examined of which four were deficient in acid strength.

**WHITE WINE VINEGAR.** No samples of true white wine vinegar were received. The three samples purchased as such were distilled vinegar.

The following table shows the number and kind of drugs examined during the year, and is followed by short comments on the more important of them:

TABLE C.—SHOWING THE KIND AND NUMBER OF DRUGS EXAMINED DURING THE YEAR.

Articles Examined.	Number above standard.	Number below standard.	Total number of specimens.
Aether.....	22	2	24
Alcohol.....	48	20	68
Aqua Hamamelidis.....	141	2	143
Aqua Hydrogenii Dioxid. ....	37	5	42
Calx Chlorinata.....	7	18	25
Linimentum Camphoræ.....	1	1	2
Liquor Calcis.....	21	21	42
Oleum Lini.....	2	0	2
Oleum Olive.....	45	1	46
Potassi Bitartras.....	103	0	103
Quinine Sulphas.....	1	0	1
Sodii Bicarbonas.....	1	0	1
Sodii Boras.....	74	2	76
Spiritus Camphoræ.....	20	38	58
Terebinthina.....	1	0	1
Tinctura Hydrastis.....	0	3	3
Tinctura Iodi.....	18	37	55
Tinctura Nucis Vomice.....	1	3	4
Tinctura Opii.....	3	16	19
Tinctura Zingiberis.....	1	0	1
Miscellaneous.....	3	0	3
<b>Totals.....</b>	<b>550</b>	<b>169</b>	<b>719</b>

**AETHER.** Twenty-four samples were examined, two of which were found to differ from the requirements of the Pharmacopœa, because they contained excessive amounts of alcohol and water.

**ALCOHOL.** Sixty-eight samples were examined of which twenty were classed as below standard because the alcoholic strength was below that specified in the Pharmacopœa. In almost all these samples the deficiency in strength was slight, amounting to less than two per cent. by volume. Two samples were decidedly low, one containing 84.60% and the other 85.90% by volume. These samples had evidently been diluted with water.

**AQUA HAMAMELIDIS.** One hundred and forty-three samples were examined and two found to differ from the legal standard. One of these contained formaldehyde, the other was deficient in alcoholic strength.

**AQUA HYDROGENII DIOXIDI.** Forty-two samples were examined and five were found to be deficient in hydrogen dioxide. The inspectors were instructed to collect this drug in unbroken packages as supplied by the manufacturer, and in all but a few cases this was done. In all, except one sample, the deviation from the standard was slight, showing that this drug, as found on the market to-day may be classed as a stable preparation when kept in original packages. One sample which was sold by a druggist in his own bottle contained but 0.765% of hydrogen dioxide instead of three per cent. This sample had evidently been taken from a package the contents of which had deteriorated.

**CALX CHLORINATA.** Twenty-five samples were examined of which eighteen were deficient in available chlorine. The standard fixed by the Pharmacopœa, 30% available chlorine, is somewhat high for a commercial preparation which deteriorates when stored, but there is no excuse for the sale of this article when it contains practically no available chlorine. Seven of the eighteen samples classed as below standard contained less than ten per cent. of available chlorine. The poorest sample contained but 2.8%. Such preparations as these are of little value, and their sale constitutes a real danger. Most of the chlorinated lime sold by druggists is used for disinfecting purposes, and a worthless preparation, by reason of its failure to perform the function expected of it, may be the means of permitting the distribution of infectious material.

Some of the preparations received were marked "For technical use." It is held that no such marking is adequate to exempt the pharmacist from liability for the sale of an inferior article. A person purchasing goods recognized by the Pharmacopœa from a pharmacist is entitled to receive goods conforming with the requirements of that work unless the actual strength is stated on the label.

**LINIMENTUM CAMPHORÆ.** Two samples were examined of which one was found to be deficient in camphor, and also to contain a mineral oil. Great improvement has been noticed in the quality of camphor liniment sold during the last two years. When the examination of this drug was first begun three years ago, over half the samples collected did not comply with the requirements of the Pharmacopœa. During the past two years a large number of warning notices have been sent to druggists regarding the sale of inferior camphor liniment, and at the present time very few samples are found to differ from the legal requirements.

**LIQUOR CALCIS.** Forty-two samples were examined, and twenty-one found to be below the legal requirements. The poorest sample was deficient in calcium hydroxide to the extent of 97%. There is no excuse for a preparation of this sort. Lime water, made according to the requirements of the Pharmacopœa and properly stored, will not deteriorate more than ten per cent. in six months, and the figure fixed by the Pharmacopœa is sufficiently low to allow for such deterioration. Improper storage and the manufacture of this preparation from inferior materials or from prepared tablets is responsible for most of the defective preparations.



**OLEUM OLIVÆ.** Forty-six samples of olive oil were examined of which one was found to have been adulterated with cottonseed oil. Two years ago about twenty-five per cent. of the samples of olive oil collected from druggists were found to be adulterated. The improvement in the quality of drugs, due to the enforcement of the food and drug law is well illustrated by the improvement in this article.

**POTASSI BITARTRAS.** One hundred and three samples were examined all of which were found to comply with the law. The adulteration of this substance, at least of that quality which is sold by druggists, seems to have been discontinued.

**SODÆ.** Seventy-six samples of borax were examined and two of these were found to contain bicarbonate of soda.

**SPIRITUS CAMPHORÆ.** Fifty-eight samples were examined of which thirty-eight varied from the requirements of the Pharmacopœa. This preparation should contain ten grams of camphor per 100 cubic centimeters of the finished product. The deficiency in camphor in those tinctures found to be below the legal strength can only be attributed to carelessness of manufacture. Many druggists assert that this drug loses camphor by volatilization on keeping, and attempt to account for the deficiency in their preparations in this way. Such a loss of camphor does not occur. Experiments made by Barnard\* and also in this laboratory show that spirits of camphor contained in tightly closed bottles remains constant in composition indefinitely, and when kept in open containers which permit evaporation to take place, the concentration of the camphor increases.

One of Barnard's experiments showed that a U. S. P. tincture, after being kept in an unstoppered bottle for twenty-six weeks had concentrated to such an extent that the remaining solution was 269.17% of the strength required by the Pharmacopœa.

**TINCTURA HYDRASTIS.** All of the three samples examined contained less hydrastine than is required by the Pharmacopœa. The figures obtained were 0.24, 0.28 and 0.35 grams per 100 ccm.

**TINCTURA IODI.** Fifty-five samples were examined and thirty-seven classed as below standard. Six of these samples contained no potassium iodide, showing that the pharmacists who prepared them were still using the Pharmacopœa of 1890, although the new one has been in force over three years. As a whole the quality of tincture of iodine has materially improved since the report of last year was made. This may be attributed largely to the activity of this Board in prosecuting druggists who sold tinctures not in accordance with the law. The preparation of this drug is simple, it is made from chemicals which can readily be obtained in a state of purity, and, when prepared according to the directions laid down in the Pharmacopœa it does not deteriorate with age.

Certain samples taken during the year seem to have been carelessly stored, and on that account have become concentrated to a considerable extent. This appears to be the only way to account for the figures obtained on analysis.

The composition of the following two samples will serve to illustrate the point in question:

	A7738	D8918
Iodine.....	10.97 gm. per 100 ccm.	12.26 gm. per 100 ccm.
Potass. iodide.....	7.18 " " "	8.13 " " "

\*Barnard, Pharm. Rev. Vol. 26, No. 10, p. 308.

These tinctures were probably made up approximately in accordance with the U. S. P. requirements, but have nearly doubled in strength as a result of loss of alcohol.

**TINCTURA NUCIS VOMICÆ.** Four samples were examined of which three were found to contain less strychnine than required by the Pharmacopœa. The three samples contained respectively 0.71, 0.70 and 0.83 grams of strychnine per one hundred cubic centimeters.

**TINCTURA OPII.** Nineteen samples were examined of which sixteen contained less crystallized morphine than the standard requires. The average morphine content of these tinctures is about 1.00 gram per 100 ccm. Two of them contained respectively 0.75 and 0.63 grams of morphine. Both of these samples were bottled goods sold by grocers. Our experience has been that much of the tincture of opium sold in this way is seriously deficient in morphine. Such preparations should, therefore, be avoided by persons desiring reliable drugs. The sale of tincture of opium by grocers is in violation of the Pharmacy law, and it is to be regretted that some serious attempt is not made to enforce this act by those entrusted with its enforcement.

The following tables show the names and addresses of those persons who have been convicted of or who have paid penalties for violations of the Food and Drugs Act during the year ending October 31, 1908:

TABLE D.—SHOWING THE NAMES AND ADDRESSES OF PERSONS WHO HAVE BEEN CONVICTED OF, OR WHO HAVE PAID PENALTIES FOR THE SALE OR HAVING IN POSSESSION WITH INTENT TO SELL MILK, CONTAINING LESS THAN 12.00% TOTAL SOLIDS.

SAMPLE NUMBER.	NAME.	CITY OR TOWN.
C 332.....	James G. McKillip.....	Alloway.
H 733.....	Hygienic Milk Co.....	Atlantic City.
C 366.....	Caleb E. Shreve.....	Atlantic City.
A 9316.....	Benjamin K. Tims.....	Belvidere.
H 765.....	Murry E. Day.....	Berlin.
C 65.....	J. William Davis.....	Bridgeton.
C 64.....	Herman Pompper.....	Bridgeton.
H 627.....	Charles I. Young.....	Bridgeton.
H 726.....	James T. Hennessey.....	Camden.
H 1164.....	Cape May Farmstead.....	Cape May.
G 1291.....	James H. Exton.....	Clinton.
G 1288.....	George Buydam.....	Clinton.
G 1286.....	Emmanuel Tomson.....	Clinton.
C 249.....	Joseph G. Pierson.....	Cohansey.
A 9554.....	Raymond Coursen.....	Colesville.
C 9996.....	James J. Bradley.....	Columbus.
A 9071.....	George B. Messler.....	Delaware.
G 1026.....	James G. Higgins.....	East Amwell Township.
G 1054.....	Morris Kaufman.....	Elizabeth.
G 1215.....	Rosa Stabler.....	Elizabeth.
G 1794.....	Peter Steinburg.....	Elizabeth.
G 1055.....	William C. Tubbs.....	Elizabeth.
G 1218.....	Wolf Von der Wall.....	Elizabeth.
C 924.....	Samuel Garretson.....	Erma.
C 361.....	George Drake.....	Florence.
G 1285.....	Ellicot Young.....	Franklin Township.
A 9150.....	Samuel Friedland.....	Garfield.

TABLE D.—SHOWING THE NAMES AND ADDRESSES OF PERSONS WHO HAVE BEEN CONVICTED OF, OR WHO HAVE PAID PENALTIES FOR THE SALE OR HAVING IN POSSESSION WITH INTENT TO SELL, MILK CONTAINING LESS THAN 12.00% TOTAL SOLIDS—(Continued).

SAMPLE NUMBER.	NAME.	CITY OR TOWN.
A 9565.	Richard Rosendale.	Glen Rock.
A 8542.	John Curling.	Great Meadows.
A 8540.	Jacob Henry.	Great Meadows.
A 8564.	Nathan Hoyt.	Great Meadows.
C 85.	Walter M. Goodwin.	Greenwich.
A 8824.	Louis Kinzler.	Hackensack.
C 9521.	Thomas H. Winkworth.	Haddon Heights.
A 7487.	Charles Manger.	Haledon.
A 7870.	Frank Kimble.	Hamburg.
B 5004.	L. F. Chamberlain.	Hamilton Square.
A 9647.	Fred Exmeyer.	Hoboken.
A 9638.	Fred Lillienthal.	Hoboken.
A 9333.	Louis Fink.	Jersey City.
D 8901.	Thomas J. Gateley.	Jersey City.
A 9336.	Isaac Gumaer.	Jersey City.
A 9335.	R. J. & H. Niebanck.	Jersey City.
A 9466.	Pauline Weppler.	Jersey City.
D 9151.	Peter Mitchell.	Jutland.
G 1175.	Joseph Edelstein.	Kearny.
G 1183.	Louis Edelstein.	Kearny.
A 8701.	John H. Barber.	Lafayette.
A 8719.	Charles C. Cox.	Lafayette.
A 7788.	Charles Current.	Lafayette.
A 7779.	S. Arthur Hough.	Lafayette.
A 7796.	Jonas Simmons.	Lafayette.
A 7795.	Peter Simmons.	Lafayette.
A 8721.	Charles F. Slater.	Lafayette.
A 8505.	Larry Berdan.	Lower Preakness.
A 7482.	Charles Dorman.	Lower Preakness.
A 9048.	Daniel Peterson.	Lower Preakness.
A 7877.	Grace C. Lawrence.	McAfee.
A 8768.	Frank Simpson.	McAfee.
A 7864.	R. D. Simpson.	McAfee.
B 5010.	William T. Flock.	Mercerville.
C 175.	Joseph Hinchman, Jr.	Merchantville.
H 1209.	Willis Ackley.	Millville.
C 1061.	Luella McKeague.	Millville.
A 7836.	William D. Beemer.	Monroe.
A 7848.	Lewis Gould.	Monroe.
A 7849.	John Yetter.	Monroe.
C 8948.	Edward S. Harmer.	Moorestown.
H 719.	Elbert R. Rowand.	Mount Ephraim.
G 1169.	Alderny Dairy Co.	Newark.
H 750.	Joseph Walton.	New Egypt.
G 1415.	John Frank Lupo.	Oak Tree.
C 403.	Ira S. Champion.	Ocean City.
H 88.	Denman Bird.	Passaic.
A 9036.	Abel Baker.	Paterson.
A 9043.	Harry Cross.	Paterson.
A 7496.	James Glass.	Paterson.
A 9055.	Barney Hoekstra.	Paterson.

TABLE D.—SHOWING THE NAMES AND ADDRESSES OF PERSONS WHO HAVE BEEN CONVICTED OF, OR WHO HAVE PAID PENALTIES FOR THE SALE OR HAVING IN POSSESSION WITH INTENT TO SELL MILK, CONTAINING LESS THAN 12.00% TOTAL SOLIDS—(Continued).

SAMPLE NUMBER.	NAME.	CITY OR TOWN.
A 9050.	Theodore Meier.	Paterson.
A 8512.	Richard Rosendale.	Paterson.
A 8522.	William Thomas.	Paterson.
A 7494.	Jacob Vanderveit.	Paterson.
A 8508.	Zimmermann Bros.	Paterson.
H 1258.	John H. Keim.	Pitman.
C 880.	Elihu Reid.	Pleasantville.
G 1352.	James A. Van Schoik, Jr.	Red Bank.
A 8786.	Henry Ploch.	Richfield.
B 5020.	Thomas E. Chamberlain.	Robbinsville.
G 1358.	Terence Mulligan.	Rumson.
C 185.	Linwood Patrick.	Salem.
C 182.	Austin Cox.	Sharpstown.
A 9540.	George H. Wynant.	Sussex.
G 1632.	William Kaubach.	Townley.
A 8553.	Joseph Butchanan.	Townsbury.
A 8543.	William Marlat.	Townsbury.
A 9481.	Peter Banvard.	Totowa.
B 5338.	Herman Byer.	Trenton.
B 5271.	Edwin Carver.	Trenton.
B 5014.	Castanea Dairy Co.	Trenton.
B 5015.	Thomas Stevens.	Trenton.
A 9631.	John Draves.	Union Hill.
A 9503.	Fred Dorman.	Upper Preakness.
A 8572.	Theodore Drew, Jr.	Vernon.
A 8565.	Elijah Cox.	Vienna.
C 9004.	George M. Ellis.	Vineland.
D 9359.	Thomas Catto.	Westfield.
G 301.	Charles J. Hamilton.	West Orange.
G 1413.	Charles J. Hamilton.	West Orange.
C 8384.	John Allen.	Westville.
H 1397.	Joseph W. Anderson.	Woodbury.
C 803.	William S. Joyce.	Woodbury.
C 183.	Michael Allen.	Woodstown.
C 9751.	Frank P. Keen.	Woodstown.
C 180.	William M. Whitsell.	Woodstown.
C 179.	Edward Ziegler.	Woodstown.

TABLE E.—SHOWING THE NAMES AND ADDRESSES OF PERSONS WHO HAVE BEEN CONVICTED OF, OR WHO HAVE PAID PENALTIES FOR THE SALE OR HAVING IN POSSESSION WITH INTENT TO SELL, MILK CONTAINING ADDED WATER.

SAMPLE NUMBER.	NAME.	CITY OR TOWN.
A 8931.	Fred Kroner.	Allendale.
D 8794.	John P. Nelson.	Allentown.
C 330.	Frank S. Bell.	Alloway.
D 8887.	Charles Hoppeok.	Asbury.
D 8868.	Anthony Loftus.	Barnegat.
H 68.	George Heyl.	Belleville.
G 608.	Edward S. Morris.	Belmar.
C 9405.	John C. Stuart.	Beverly.
B 4755.	Theodore R. Stryker.	Blawenburg.
C 67.	Guise Degan.	Bridgeton.
C 9394.	Samuel B. Sharp.	Bridgeton.
D 8889.	Edward Britain.	Broadway.
D 9145.	Whitfield Stires.	Clinton.
D 9370.	Whitfield Stires.	Clinton.
G 1287.	Whitfield Stires.	Clinton.
G 1620.	Whitfield Stires.	Clinton.
G 1675.	Whitfield Stires.	Clinton.
C 9997.	Julius Bowe.	Columbus.
D 8914.	William Meyers.	Cranford.
D 8917.	Mary Russo.	Cranford.
D 8846.	Frank P. Stewart.	Cream Ridge.
D 8848.	Walter S. Bird.	Crosswicks.
C 247.	John Mullen.	Deerfield.
G 1035.	J. & J. Zimmerman.	Demarest.
G 327.	Holmes H. Bennett.	Eatontown.
G 1266.	William J. Saunderson.	Elizabeth.
C 251.	William R. Dennis.	Elmer.
C 91.	Warren Butler.	Greenwich.
C 88.	Morris Goodwin.	Greenwich.
A 8009.	Walter Pettie.	Hackettstown.
A 9517.	Richard Oelkers.	Hoboken.
H 663.	Charles Johnson.	Island Heights.
H 666.	Joseph J. Johnson.	Island Heights.
A 9343.	Leo. L. Croner.	Jersey City.
D 9146.	John H. Young.	Jutland.
D 8832.	James Harris.	Kingston.
A 7783.	Joel C. Demarest.	Lafayette.
A 8714.	Chapman Farrell.	Lafayette.
A 7794.	David H. Lautz.	Lafayette.
A 7797.	Lawrence Lawson.	Lafayette.
A 9611.	Jacob Unholz.	Lakeview.
D 8860.	Elizabeth Van Schoick.	Lakewood.
C 9512.	Samuel D. King.	Millville.
H 1682.	Joseph A. Kilbride.	Mount Holly.
G 1419.	David M. Drake.	New Brunswick.
A 8359.	Elias Currant.	Ogdensburg.
A 7639.	Mike Chapko.	Passaic.
A 7628.	Morris Feier.	Passaic.
A 9561.	Kryn Devogel.	Paterson.
C 9333.	Samuel Schultz.	Penns Grove.
G 625.	Frank O. Nelson.	Piscataway Township.

TABLE F.—SHOWING THE NAMES AND ADDRESSES OF PERSONS WHO HAVE BEEN CONVICTED OF, OR WHO HAVE PAID PENALTIES FOR THE SALE OR HAVING IN POSSESSION WITH INTENT TO SELL, MILK CONTAINING ADDED WATER—(Continued).

SAMPLE NUMBER.	NAME.	CITY OR TOWN.
A 9616.	Harry Zarow.	Preakness.
D 9349.	George Taylor.	Princeton.
A 8916.	George Hossey.	Ramsey.
A 9610.	John Lotz.	Richfield.
A 7525.	John Ploch.	Richfield.
A 7650.	John Sattong.	Rutherford.
A 8375.	Jesse Rollison.	Sparta.
A 8919.	Frank Pelz.	Suffern, N. Y.
A 9551.	Lewis Dunn.	Sussex.
B 4441.	George Reck.	Trenton.
A 8566.	Eugene Heber.	Vienna.
A 9123.	Abram Levine & Sons.	Wallington.
D 9358.	William H. Terry.	Westfield.
G 1414.	Charles W. Merdinger.	West Orange.
G 640.	John Lockwood.	Woodbridge.
H 1069.	John P. Day.	Woodbury.
C 9747.	Benjamin Chernobilsky.	Woodstown.
C 9745.	Buzzy & Miller.	Woodstown.
C 9748.	Harris Weinstein.	Woodstown.

TABLE G.—SHOWING THE NAMES AND ADDRESSES OF PERSONS WHO HAVE BEEN CONVICTED OF, OR WHO HAVE PAID PENALTIES FOR THE SALE OR HAVING IN POSSESSION WITH INTENT TO SELL, MILK CONTAINING FORMALDEHYDE.

SAMPLE NUMBER.	NAME.	ADDRESS.
G 1711.	Alex. Mullen.	Avon.
G 1293.	William Fehrenbacher.	Elizabeth.
G 1282.	Charles G. Fischer.	Elizabeth.
G 1272.	Thomas O'Brien.	Elizabeth.
G 1271.	Augusta Bachofen.	Elizabeth.
G 1249.	Anton Giesler.	Elizabeth.
G 1248.	Harry Schwartzbach.	Elizabeth.
G 1234.	Charles G. Fischer.	Elizabeth.
G 1220.	David Jacobson.	Elizabeth.
G 1221.	Catherine Riebel.	Elizabeth.
G 1189.	Mitchell Newman.	Elizabeth.
G 1185.	Augusta Bachofen.	Elizabeth.
G 1296.	Thomas O'Brien.	Elizabeth.
G 1298.	Charles G. Fischer.	Elizabeth.
G 1626.	August Kalb.	Elizabeth.
G 1448.	Ferdinand E. Schneider.	Helmetta.
H 1090.	Richard D. Ridgeway.	Mullica Hill.
C 9176.	John Berg.	Wenonah.
D 8744.	Slawson, Decker Co.	West End.
D 8751.	Slawson Decker Co.	West End.

TABLE H.—SHOWING THE NAMES AND ADDRESSES OF PERSONS WHO HAVE BEEN CONVICTED OF, OR WHO HAVE PAID PENALTIES FOR DISTRIBUTING SKIMMED MILK IN CONTAINERS NOT PROPERLY MARKED.

SAMPLE NUMBER.	NAME.	ADDRESS.
C 9233	English & Thompson	Atlantic City.
C 79	Hygienic Milk Co.	Atlantic City.
H 739	Joseph C. Smith	Atlantic City.
C 9756	Joseph H. Rexon	Audubon.
C 9395	Artic Ice and Milk Co.	Bridgeton.
C 9714	Elmer Ogden	Bridgeton.
C 9616	William H. Borden	Burlington.
C 9619	William R. Gilpin	Burlington.
C 286	Clement & Moore	Camden.
C 9122	Harry R. Reed Co.	Camden.
C 9257	Harry R. Reed Co.	Camden.
C 304	James Walker	Haddonfield.
C 914	Jasper C. Wilkins	Haddonfield.
C 9264	Jasper C. Wilkins	Haddonfield.
C 9523	Thomas H. Tinkworth	Haddon Heights.
C 9416	Randolph Rudderow	Mount Ephraim.
C 62	Furman Dubell	Mount Holly.
C 57	Joseph A. Kilbride	Mount Holly.
C 9167	William S. Joyce	Woodbury.

TABLE I.—SHOWING THE NAMES AND ADDRESSES OF PERSONS WHO HAVE BEEN CONVICTED OR WHO HAVE PAID PENALTIES FOR THE SALE OR HAVING IN POSSESSION WITH INTENT TO SELL, FOODS OTHER THAN MILK.

SAMPLE NUMBER.	FOOD.	NAME.	ADDRESS.
H 1300	Cider Vinegar	Herman Kaplan	Camden.
H 1232	Ground Cloves	Christina R. Werner	Camden.
D 9164	Ground white pep- per	Scheuer & Sons	Newark.
D 8232	Cider Vinegar	Edward J. Thompson	Newark.
D 9987	Ground Coffee	Scheuer & Bro.	Orange.
A 7858	Cider Vinegar	Harmon Grocery Co.	Paterson.
A 7859	Cider Vinegar	P. H. Van Riper & Son	Paterson.
D 9360	Ground Coffee	S. Scheuer & Sons	Westfield.

TABLE J.—SHOWING THE NAMES AND ADDRESSES OF PERSONS WHO HAVE BEEN CONVICTED OR WHO HAVE PAID PENALTIES FOR THE SALE OR HAVING IN POSSESSION WITH INTENT TO SELL DRUGS NOT COMPLYING WITH THE LEGAL REQUIREMENTS.

SAMPLE NUMBER.	DRUG.	NAME.	ADDRESS.
D 8803	Tinctura Iodi	Westley K. Bradner	Asbury Park.
D 8854	"	Arthur Schwartz	" "
G 341	"	George E. Williams	" "
G 604	"	Strauss Bros.	Bayonne.
G 603	"	Alexander Watman	" "
G 673	"	Joseph C. Saile	Bloomfield.
D 8805	"	William H. Baker	Clinton.
C 9246	"	Benjamin R. Faunce	Delanco.
D 8797	"	Peter W. Brakley	Dunnellen.
G 684	"	Henry A. Kent	Elizabeth.
G 310	"	Louis P. Laugheinz	" "
G 681	"	William H. Reibela	" "
G 315	"	Joseph Reiser	" "
G 309	"	William R. Richard	" "
G 312	"	Henry Schmidt	" "
D 8708	"	Edwin G. Bacon & Co.	Freehold.
D 8710	"	George P. Lehritter	" "
C 163	Tinctura Opii	Clarence Hepburn	Groveville.
D 8609	Tinctura Iodi	David H. Cunningham	Hightstown.
G 693	"	Emmanuel Beilman	Hoboken.
G 701	"	Frank I. Cole	" "
G 707	"	S. L. La Piana	" "
G 708	"	Francis J. Mullally	" "
G 694	"	William H. Ohlandt	" "
G 698	"	Louis Wolfstein	" "
G 602	"	Harry McDavid	Irvington.
D 8711	"	Rufus I. Walling	Keypport.
G 322	"	James Seiler	Long Branch.
D 8605	"	John H. Sterner	Lumberton.
C 9204	"	Eugene Z. Hillegas	Mantua.
D 8687	"	Conrad W. Kaulthan	Milltown.
D 8689	"	William H. Kukhkan	" "
D 8681	"	Robert Eastburn	New Brunswick.
D 8684	"	Lewis H. Hoagland	" "
G 351	"	Mary L. White	Ocean Grove.
G 585	"	James Clarke	Orange.
G 584	"	Jacob E. Keller	" "
G 371	"	Barnekor & Pelz	Perth Amboy.
G 373	"	Richard D. Garben	" "
G 500	"	James H. Terrill	Rahway.
D 8713	"	George B. Minton	Seabright.
D 9714	"	J. J. Reed	" "
D 8693	"	A. C. Parisen	South Amboy.
G 581	"	Byron Kilborn	South Orange.
D 8690	"	Henry Silk	South River.
D 8746	"	Richard Bennett	West End.
G 547	"	James J. Casey	" "
G 580	"	George J. Geiger	West Orange.
C 9249	"	Alfred Ayers	Williamstown.

TABLE K.—SHOWING THE NAMES AND ADDRESSES OF PERSONS WHO HAVE BEEN CONVICTED OR WHO HAVE PAID PENALTIES FOR THE ILLEGAL SALE OF OLEOMARGARINE.

SAMPLE NUMBER.	NAME.	ADDRESS.
C 8344.	Braun & Fitts.	Camden.
C 8938.	Central Supply Co.	Camden.
C 8984.	Central Supply Co.	Camden.
C 9799.	Mrs. Emma Claypool.	Camden.
G 922.	John D. Bronson.	Elizabeth.
G 1007.	Joseph Friedman.	Elizabeth.
A 7041.	Charles Gaedeke.	Elizabeth.
G 1009.	Elias M. Gutman.	Elizabeth.
D 8346.	William Hohnstrater.	Elizabeth.
G 1014.	William A. Potts.	Elizabeth.
D 8397.	Robert Besse.	Jersey City.
A 8001.	Clinton Fralick.	Jersey City.
D 8994.	Scheuer & Bro.	Long Branch.
D 9058.	Brand & Co.	Newark.
D 8230.	George N. Cohn.	Newark.
D 8235.	Ecker & Sanderson.	Newark.
D 8307.	Dennis W. Foye.	Newark.
D 8250.	Frank Hemming.	Newark.
D 9063.	Mayer Markowitz.	Newark.
D 8219.	Gustav Modersohn.	Newark.
D 9106.	Herman Perlman.	Newark.
D 9107.	Louis Raupp.	Newark.
D 9057.	Scheuer & Son.	Newark.
D 9102.	Louis Singer.	Newark.
D 8231.	Edward J. Thompson.	Newark.
D 8217.	Peter Van Ness.	Newark.
D 9097.	Scheuer & Bro.	Orange.
A 7987.	Joseph Obal.	Passaic.
A 8056.	Andrew Petruski.	Passaic.
A 6852.	Jacob Rosenberg.	Passaic.
A 7028.	Peter Demol.	Paterson.
A 7037.	Caesar Haefell.	Paterson.
A 7033.	Myndert Van Dyke.	Paterson.
D 9166.	Max Goldberger.	Perth Amboy.
D 9142.	Harry Levenson.	Perth Amboy.
D 8349.	Charles F. Tallman.	Plainfield.
D 8351.	William W. Wilson.	Plainfield.
H 7184.	William M. Hooley.	Somerville.
D 9350.	S. Scheuer & Sons.	Westfield.

## Report on State Laboratory of Hygiene.

BY R. B. FITZ-RANDOLPH, DIRECTOR.

*To the Board of Health of the State of New Jersey:*

GENTLEMEN—I have the honor to submit the following report of the operation of the State Laboratory of Hygiene for the year ending October 31, 1908.

The State Laboratory of Hygiene is maintained by the State Board of Health for the examination of specimens from suspected cases of communicable diseases sent by physicians throughout the State, the analysis of samples of food and drugs collected by Inspectors of the Division of Food and Drugs, the analysis of samples of water and sewage for the Division of Sewerage and Water Supplies, the analysis of samples of water and other substances for the Division of Dairies and Creameries and the Laboratory investigation of problems relating to contagious diseases for the Division of Medical and Sanitary Inspection, together with such special work as the Board may from time to time require. A detailed statement of the work done for the Division of Food and Drugs will be found in the report of the Chief of that Division, an account of water and sewage analysis will be found in the report of the Chief of the Division of Sewage and Water Supplies; this report is concerned principally with the details of the examination of specimens for diagnosis.

The Bacteriological Laboratory was organized in 1896, a small building on the campus of Princeton University having been made available for laboratory purposes through the generosity of Mr. Elmer Green. The work was conducted at Princeton until 1902, when it had increased to such an extent that the lack of proper mail facilities at that place began to be keenly felt. It was then moved to offices in the Broad Street Bank Building, Trenton, where the work was carried

on until December 1907, when the present laboratory in the State House was completed. The present laboratory is conveniently arranged and equipped with all necessary apparatus for the performance of routine work. It is not, however, supplied with a suitable place in which to keep a stock of animals for experimental purposes, and this deficiency hampers the work more and more as it grows more varied in character. Guinea pigs are frequently required to make satisfactory examinations of specimens from suspected cases of glanders. They are also needed for anthrax and frequently for tuberculosis. In doubtful cases, rabbits or guinea pigs must be used in the examination of specimens from suspected cases of rabies, and animals are frequently necessary to aid in the identification of many kinds of bacteria. When the present laboratory was designed the Director used every means of persuasion known to him to induce those in authority to provide a suitable room for housing animals, but without success. Nevertheless, if the laboratory is to keep pace with the progress of bacteriological science and render satisfactory service to physicians dependent upon it, an animal room must be provided, and that soon.

A room is also needed where special investigations may be carried on. While the equipment of the laboratory for routine work is excellent, enabling such work to be performed with accuracy and speed, the facilities for research are limited, principally by the lack of a proper room in which it can be carried on. The cattle in certain sections of the southern part of the State suffer periodically with anthrax, rendering necessary wholesale vaccinations requiring large quantities of vaccine. This vaccine could be made in the laboratory for a small fraction of its cost when purchased from drug houses, and a much more active and reliable product would be available. The preparation of anthrax vaccine is a simple operation, requiring no special equipment not now in the possession of the laboratory, but, in order that it may be made properly, a room set apart for that and similar work must be had.

In order that the results of bacterial examinations from suspected cases of communicable diseases may be of value to the physician, he must have reports stating such results at the earliest possible moment. This is especially true with

respect to diphtheria. A delay of a few hours in the administration of antitoxin by a physician who depends upon the laboratory for information may result in the death of the patient. The writer is heartily opposed to the method practised by some physicians of waiting for reports from the laboratory before administering antitoxin. Many deaths have undoubtedly resulted because of this foolish and entirely indefensible procedure. The value of diphtheria antitoxins has been so thoroughly established and its entire harmlessness so conclusively demonstrated that a physician who fails to use it when the first symptoms of diphtheria present themselves is grossly derelict in his duty toward his patient. But whether the physician waits for the laboratory report or not, it is of great importance that he should have the result of the laboratory examinations at the earliest possible moment, and every effort is made to get these results to him promptly. Diphtheria specimens are examined twice daily, at 8.00 a. m. and at 4.30 p. m., and swab examinations are made at any time when requested. The results of swab examinations when negative are notoriously unreliable and they are reported to the physician with the distinct understanding that the laboratory will not vouch for their accuracy. Reports are made to physicians by telegram at their expense whenever a telegraphic report is requested. In the opinion of the writer, a distinct gain in the efficiency of the service would be secured if all positive reports on primary specimens were sent by telegraph at the expense of the laboratory. A small additional appropriation would be needed to cover the cost of these telegrams, but there is no doubt that the increased speed in service would be appreciated by physicians throughout the State.

Specimens from suspected cases of diphtheria, tuberculosis, typhoid fever, malaria, gonorrhoea and rabies are regularly examined for physicians and outfits are provided by the laboratory for the collection and transmission of specimens from all of these diseases except rabies. These outfits conform to the requirements of the U. S. Postal regulations regarding the mailing of specimens for bacteriological examinations and are constantly kept in stock by a large number of boards of health and druggists throughout the State. The number of repositories for mailing cases increases every year

and there are now 496 places where these outfits are kept for distribution. A list of these repositories will be found on pages 249 to 258 of this report.

The laboratory will not undertake work of a private nature nor will specimens other than those from cases of communicable diseases be examined. Physicians are requested not to send specimens of urine, tumors and others of like character as they will either be destroyed or returned to the sender untouched.

Reports of the results of the examination of specimens received at the laboratory are invariably sent by mail. At the present time additional telegraphic reports will be sent at the expense of the physician if he so requests. Reports will also be made by telephone *if the physician calls the laboratory for that purpose*. On account of the possibility of mistakes due to the reception of telephone messages by unauthorized persons, and to imperfect transmission over long distances, the laboratory will not assume any responsibility for the correctness of reports issued by telephone, nor will physicians be called on the telephone for the purpose of reporting results to them.

The laboratory is open for the reception of specimens from 7.45 a. m. until 5.00 p. m. on every day except Saturday and Sunday. On Saturday the laboratory closes at noon, and on Sundays and holidays it is open from 10.00 a. m. until 12.00 m. The last mail received at the laboratory arrives at the post-office at 7.00 p. m. on week days and 12.00 m. on Sundays. Specimens coming in on these mails will be prepared that night and examined the following morning. Specimens left with the night watchman at any time before 8.00 p. m. will be delivered to the laboratory and prepared for examination on the same day.

The outfit for collecting specimens from suspected cases of diphtheria has been changed during the year and now consists of a screw capped, pasteboard lined tin box, on the outside of which is a *blue* label bearing the name and address of the laboratory. Within is a five-inch test tube containing a sterile cotton swab on the end of a flexible piece of reed somewhat longer than the tube. The box also contains a *blue* slip bearing on one side directions for preparing the specimen, and on the other a blank form which must be

completely filled in if the specimen is to receive attention. It is of the greatest importance that this form be filled in legibly and with ink. Every slip is preserved and constitutes a permanent record of its case, and confusion constantly arises because it is impossible to read the name of the physician, that of the patient, or both. *Postage on all specimens must be prepaid at full letter rates*. If this is not done specimens are liable to serious delays in the post-office. Physicians in country districts when mailing these cases should call the attention of the postmaster to the fact that these cases are prepaid at letter rates and should be forwarded with letter mail. Much delay is constantly caused by the carelessness of postmasters who frequently, because of the appearance of these outfits, regard them as fourth-class mail and treat them accordingly.

Specimens from suspected cases of diphtheria are examined after five hours incubation. If at this time diphtheria bacilli are found, a report is sent to the physician at once. If none can be found the culture is returned to the incubator and re-examined after twelve to fourteen hours incubation. Under ordinary circumstances the reports of the results of the examination of diphtheria specimens are mailed at 8.30 a. m., and should reach nearly every city in the State on the same day. Telegraphic reports which are sent at the same time should reach the physician by 10 a. m.

Persons having the bacillus of diphtheria in their throats or noses and presenting symptoms of the specific toxæmia due to the absorption of the metabolic products of the bacillus must be regarded as having diphtheria. Those having the bacilli in throat or nose, but showing no departure from health, while they cannot be regarded as having the disease, are capable of acting as sources of infection and should be treated as such. There can be little doubt that much diphtheria is spread by these unrecognized carrier cases. It some times happens that negative results are obtained in the laboratory from specimens taken from patients who undoubtedly have diphtheria. This may be due to a variety of causes and a second specimen should always be sent after a negative report has been received if the case is suspicious from a clinical standpoint. In the majority of cases, diphtheria bacilli are present in the throats and noses of con-

valescents after all visible signs of the disease have disappeared, and, in order to find out when the patient ceases to be infectious, bacteriological examinations should be made from time to time until at least two successive cultures from throat and nose have been examined with negative results. It sometimes happens that organisms which resemble the diphtheria bacillus are found but which cannot be positively identified as such. In these cases the fact that such bacilli have been found is reported and another specimen is requested. While these doubtful bacilli prove, in the majority of cases, to be organisms other than the diphtheria bacillus, it occasionally happens that a second specimen will contain typical diphtheria bacilli.

The outfit for collecting sputum from suspected cases of tuberculosis has also been changed and now consists of a single tin, screw capped, pasteboard lined can containing a screw capped glass vial partly filled with a seven per cent. solution of carbolic acid and a *white* slip bearing directions for collecting the specimen on one side and a blank form on the other. This case is considerably lighter than the double case formerly used and permits an appreciable saving in postage. *It is not mailable under the postal regulations unless there is sufficient carbolic acid in the vial to sterilize the sputum.* Care should therefore be taken to prevent loss of the carbolic acid placed in the vial in the laboratory, and if such loss does occur, the physician should add a sufficient quantity to the sputum before closing the vial.

Specimens of sputum will not be examined on Sundays or holidays, but when received on those days will be held until the following morning.

The outfit for the collection of specimens from suspected cases of typhoid fever is the same as has been used by us for several years; a sheet of aluminum having on its surface two roughened depressions to receive the blood, an aluminum wire bent at one end in the form of a small loop, used for transferring the blood to the aluminum sheet, and a yellow card, on one side of which are directions for collecting the specimen, and on the other a form to be filled in by the physician. The whole is inclosed in a stout manila envelope bearing the address of the laboratory. This outfit weighs less than one ounce and will therefore be carried for two cents by

the post-office. Physicians in collecting blood should be careful to deposit one full drop in each of the depressions in the slide and *avoid the use of heat in drying*. A temperature of about 60 degrees F. destroys the agglutinins upon which the reaction depends and misleading results will frequently be obtained from heated specimens. Specimens from cases of typhoid fever, like those from diphtheria, are now examined on every day in the year. The examinations are made by Widal's method and for convenience the results are classed in three groups: (a) Positive, when clumping and loss of motility can be observed within fifteen minutes and are practically complete within one hour at a dilution of one to thirty. (b) Negative, when neither clumping or loss of motility are manifested within an hour, and (c) Atypical, when signs of either clumping or loss of motility show themselves but the reaction is not completed within the specified time.

A positive result from a specimen examined as above described is almost certain evidence that the person from whom the specimen was taken is suffering from or has experienced in the past an invasion by the typhoid bacillus. A negative result has comparative little significance as cases frequently occur in which the reaction is delayed or absent altogether. A negative result obtained before the sixth or seventh day of the disease has no significance whatever. Atypical reactions have no meaning. Subsequent specimens may react either positive or negative.

The outfit provided for the collection or specimens of blood from suspected cases of malaria consists of a screw capped paper tube containing two glass slides and a green card, on one side of which are directions for collecting the specimen and on the other a blank form to be filled in by the physician. Over fifty per cent. of the specimens received at the laboratory from persons suspected of having malaria cannot be satisfactorily examined because the blood smears have not been properly made by the physician. It cannot be too strongly insisted on that good smears *must* be sent if reliable results are to be obtained. It is a waste of time to search for the parasite of malaria in smears that are more than one cell thick.

The demonstration of the parasite of malaria is satisfactory



evidence that the patient is suffering from the disease. A negative report has a value so small as to be negligible.

The outfit supplied for the collection of specimens from suspected cases of gonorrhœa is similar to that provided for malaria except the label on the outside of the can is white and the card pink. Specimens to be examined for the gonococcus are stained with methylene blue and by Gram's method if necessary. A positive report is good evidence that the patient has the disease, a negative report is not of much value unless repeated examinations are made extending over a considerable interval of time.

The laboratory does not furnish specimen containers for the shipment of specimens to be examined for rabies as the great variation in the size of such specimens renders the selection of a uniform package impossible. If a dog is believed to be affected with rabies *it should not be killed* but securely confined and kept under observation. If the animal really has rabies it will die within eight or nine days with symptoms which, to a trained observer, are unmistakable. This is the quickest and surest way to find out whether or not a dog is mad. If the animal is already dead and there is doubt about the diagnosis, the entire head should be amputated, surrounded by a tight covering, securely packed in ice and sent to the laboratory by express. The result of an examination can usually be reported in from twenty-four to forty-eight hours after the head has been received. In exceptional cases it may be necessary to inoculate animals, and in that case a period of from two to three weeks must elapse before definite results will be obtained.

Specimens from suspected cases of anthrax should consist of portions of the liver, spleen or blood collected under aseptic precautions and sent to the laboratory either in a sterile jar provided by the Veterinarian or in one of the sputum vials provided by the laboratory. In the latter case *every bit of carbolic acid must be carefully removed*. It is frequently necessary to resort to cultural methods or to the inoculation of animals in the examination of specimens from cases of anthrax and of course no cultures can be obtained from specimens which have been sterilized with carbolic acid.

It is to be regretted that the laboratory is not in a position to undertake the routine examination of specimens from cases

of suspected glanders. This disease always exists in this State and causes much damage in certain sections. As has already been explained, no satisfactory routine examination for glanders can be undertaken until the laboratory is provided with a place where animals can be kept for experimental purposes.

The following tables show the work of the laboratory during the past year in some detail. Table L. gives a summary of the number of specimens of each kind examined for every year that the laboratory has been in operation.

The steady increase in the amount of work performed each year over that preceding it is most gratifying as it shows that the service rendered by the laboratory to physicians is regarded as necessary by an increasingly larger number of them. We have reason to believe that the number of bacteriological specimens annually examined in this laboratory considerably exceeds that of any other State laboratory in the United States. This is due to a variety of reasons. The State Laboratory of Hygiene of New Jersey was the first State institution in the United States to undertake this kind of work systematically for physicians throughout an entire State. New Jersey is a small State and so well provided with facilities for transportation that the mail service, upon which a laboratory like this is absolutely dependent, is unusually quick and efficient (although it is susceptible of a good deal of improvement even here). Unusual efforts have been made to make the service rapid as well as accurate and the large number of repositories maintained in all sections of the State make it easy for almost any physician to obtain mailing cases at short notice. Although we have no means of knowing exactly how many mailing cases are now in circulation, it is estimated that the number must considerably exceed five thousand.

TABLE L.—SHOWING THE NUMBER OF SPECIMENS OF EACH KIND EXAMINED SINCE THE LABORATORY WAS ORGANIZED.

	1896 and 1897	1898	1899	1900	1901	1902	1903	1904	1905†	1906	1907	1908
Diphtheria . . . .	627	600	577	974	1,864	1,457	2,090	2,940	2,896	3,277	3,348	6,090
Tuberculosis . . . .	253	516	766	892	1,211	1,467	1,833	2,344	2,691	2,948	3,402	3,637
Typhoid Fever . . . .	27	175	339	431	739	884	1,333	1,272	1,268	1,556	1,975	2,543
Malaria . . . . .	4	4	*	53	113	196	151	98	109	126	149	178
Miscellaneous . . . .	7	18	*	30	23	55	132	67	84	126	119	170
Totals . . . . .	914	1,313	1,692	2,380	3,955	4,080	5,559	6,730	7,048	8,033	8,993	12,618

\*The number of these specimens has not been recorded.

†Thirteen months.



TABLE N.—SHOWING THE NUMBER OF SPECIMENS EXAMINED DURING THE YEAR, ARRANGED BY CITIES AND TOWNS—(Continued).

TOWN.	DIPH-THERIA.		TUBERCU-LOSIS.		TYPHOID FEVER.		MALARIA.		MISCEL-LANEOUS.		Total.
	Primary.	Secondary.	Primary.	Secondary.	Primary.	Secondary.	Primary.	Secondary.	Primary.	Secondary.	
Dunellen . . . . .	4		30	7	1				6	3	51
East Newark . . . . .			1						1		1
East Orange . . . . .			57	12	41	4			1		116
East Rutherford . . . . .			11				2				13
Edgewater . . . . .	16	9			1						25
Egg Harbor . . . . .	10	9	13	1	1						32
Elizabeth . . . . .	408	252	128	14	107	15					920
Elizabethport . . . . .			2								2
Englewood . . . . .	29	34	16	1	3	1	1		1		86
Englishtown . . . . .			3		1						4
Fair Haven . . . . .	12	4	1								16
Fairport . . . . .			1								3
Fanwood . . . . .	3	3	2								8
Farmingdale . . . . .					1	1					2
Flemington . . . . .		2	11	1	1						18
Florence . . . . .	6	1	9	1	10		1				28
Fort Lee . . . . .	3	1	4								8
Franklin Furnace . . . . .					1						1
Freehold . . . . .	3		19	2	10	1	2		3		40
Garfield . . . . .	1	2	14	3	2				4		26
Gibbsboro . . . . .			1								1
Gladstone . . . . .	4		4								8
Gillette . . . . .	4		2								6
Glassboro . . . . .	2							1			3
Gloucester . . . . .	23	7	2								32
Grantwood . . . . .	13	10	8		5		8				44
Greenwich . . . . .		2									2
Hackensack . . . . .	10	2	31	2	44	4	3				96
Hackettstown . . . . .	3	1	2		4	4	1				17
Haddonfield . . . . .	22	16	31	4	4		2				77
Haledon Heights . . . . .	3		3		2						7
Haledon . . . . .			1		1						2
Hamburg . . . . .	2										3
Hamilton Square . . . . .	5	2	3				1				11
Hainesport . . . . .	1										1
Hammonton . . . . .	2		2		2						6
Harrison . . . . .		3	3		5		1				9
Hatbrouck Heights . . . . .	1		7	3	9	1	3				24
Heislerville . . . . .			1		1						2
Highlands . . . . .			2		5						7
Hightstown . . . . .	31	17	7		1			1			50
Hoboken . . . . .	4		55	7	22	1	1				90
Holly Beach . . . . .	1										1
Hopewell . . . . .			6	1	4				1		12
Hudson Heights . . . . .	11	10	5		1						26
Ivington . . . . .	1	2	10		1						6
Jamesburg . . . . .											11
Jersey City . . . . .	31	3	139	16	10	1	1		3	1	204
Keansburg . . . . .	1				1						13
Keary . . . . .			10		1	1					13
Keeyport . . . . .	8	9	5		3	1					26
Lakewood . . . . .	13	3	27	1	16	3					63
Lambertville . . . . .			2	1	6						9
Laurel Springs . . . . .			1		1						2
Lawrenceville . . . . .	10	3	2		1						16
Layton . . . . .			1						1		2
Leesburg . . . . .	1	1	1								2
Leonia . . . . .											6
Lodi . . . . .	4		1								5
Long Branch . . . . .	6	1	39		74	9		1	2		137
Madison . . . . .	3	1	6				1				17
Magnolia . . . . .	1		10		7						14
Maplewood . . . . .	1		4	1	9	3					18
Malaga . . . . .									1		1
Matwan . . . . .	7	3	1		1						11
Marlton . . . . .	1				1						2
Mays Landing . . . . .	1	2	1		3						7

TABLE N.—SHOWING THE NUMBER OF SPECIMENS EXAMINED DURING THE YEAR, ARRANGED BY CITIES AND TOWNS—(Continued).

TOWN.	DIPH-THERIA.		TUBERCU-LOSIS.		TYPHOID FEVER.		MALARIA.		MISCEL-LANEOUS.		Total.
	Primary.	Secondary.	Primary.	Secondary.	Primary.	Secondary.	Primary.	Secondary.	Primary.	Secondary.	
Maywood . . . . .											
Medford . . . . .	1	2	1								4
Mendham . . . . .	1		1								4
Merchantville . . . . .			4		1						5
Metuchen . . . . .	6	4	11	3	5						29
Midland Park . . . . .	5		22	5	5			9			46
Millburn . . . . .	1	1	3		1			1			8
Millville . . . . .	1		36	5						2	44
Milltown . . . . .					2						2
Milton . . . . .			1								1
Minotola . . . . .											2
Montclair . . . . .			6		11						17
Moorestown . . . . .	14	4	9	1	39	13					71
Morris Plains . . . . .					4	2					6
Morristown . . . . .	10	2	12		40	3					82
Mt. Arlington . . . . .	1								1	1	3
Mt. Holly . . . . .	25	9	20	2	71	11					138
Mullica Hill . . . . .	2	1			2						5
Neshanic . . . . .			1								1
Netcong . . . . .	2		3		3						8
Newark . . . . .	1		54	16	2						74
New Brunswick . . . . .	6	1	103	9	35		13	2			166
Newfoundland . . . . .	1										1
Newfield . . . . .					1						1
New Lisbon . . . . .			1		1						2
New Market . . . . .	1		2		2						5
New Port . . . . .			1								1
Newton . . . . .	20	8	12	1	5	2			2		48
Norma . . . . .			1		1						2
North Branch . . . . .	6	1	1		1						9
North Long Branch . . . . .			1		1						2
Nutley . . . . .	4	9	5	1	1						19
Oakland . . . . .			1		2						3
Ocean City . . . . .			2		3						5
Oceanic . . . . .			1								1
Oceanville . . . . .											1
Old Bridge . . . . .			1								1
Oradell . . . . .	19	1	4						2		26
Orange . . . . .	1		114	17	69	14		6			226
Oxford . . . . .	1		5		3						9
Palisades Park . . . . .			3								3
Palmyra . . . . .	7	1	4		2				1		15
Park Ridge . . . . .			1								1
Parshipany . . . . .			2								2
Parsippany . . . . .	32	19	99	2	53	11	13				236
Passaic . . . . .	16		163	14	29						229
Paterson . . . . .	2		6								8
Paulsboro . . . . .	1		1								2
Pemberton . . . . .	1										1
Penns Grove . . . . .	3	1	1		2						7
Pennsville . . . . .			2								2
Pensauken . . . . .											1
Perth Amboy . . . . .			29	4	12		4		2		51
Phillipsburg . . . . .	3		8	1	1						13
Pitman . . . . .			1								1
Pitman Grove . . . . .			1								1
Plainfield . . . . .	66	33	107	14	49	9	2				280
Pleasantville . . . . .	3		1								4
Point Pleasant . . . . .	4				8	2	2				16
Porton Lakes . . . . .			7		2						9
Port Norris . . . . .	4				3						7
Princeton . . . . .	37	10	11	3	63						110
Rahway . . . . .	655	2,935	25	3	42	3		1	6	1	3,666
Ramsey . . . . .	3	1	6								10
Red Bank . . . . .			16		8						24
Ridgefield . . . . .	1										1
Ridgefield Park . . . . .	5		10		2	2	2				23

TABLE N.—SHOWING THE NUMBER OF SPECIMENS EXAMINED DURING THE YEAR, ARRANGED BY CITIES AND TOWNS—(Continued).

TOWN.	DIPH- THERIA.		TUBERCU- LOSIS.		TYPHOID FEVER.		MALARIA.		MISCEL- LANEOUS.		Total.
	Primary.	Secondary.	Primary.	Secondary.	Primary.	Secondary.	Primary.	Secondary.	Primary.	Secondary.	
Ridgewood	5	1	30	3	5	2				1	47
Riverside			1		2						3
Riverton	13	2	12	2	12				1		42
Rockaway	14		23		3				2		41
Roseling	7	3	6		78	17		1			113
Roselle	2	3	9	2	6						18
Roselle Park	6			1	1						8
Rosenhahn			1		1						2
Rutherford	17	12	20	4	6		2				61
Salem	1		14	4	14	1					34
Sayreville											2
Seabright	1		5	1	1						8
Secaucus			1	1							2
Sergeantsville			1								1
Sidman			1		2						3
Smithburg					1	1					2
Washington	1		18	3	3						25
Weehawken	1		9	2	1						13
Wenonah			2	1							3
Somerville	27	43	2	1	11	6					96
South Amboy	8		12	1	3						26
South Orange		2	59	10	19	1	1	1			93
South River			1		4						5
Springfield			2								2
Spring Lake	1										1
Stanhope			1		5						6
Stewartville	2	3									5
Stillwater			1		1						2
Stirling			1		1						2
Succasunna			3		1						4
Summit	20	5	29	3	20	2					80
Sussex					1						1
Swedesboro			4	2							6
Tenady			3		2		2				8
Titusville			1								1
Toms River	2		4								6
Town of Union	1		2		1						4
Trenton	71	30	372	62	535	109	10	2	77	10	1,278
Tuckahoe			1								1
Tuckerton			1						3		3
Union			1								1
Union Hill			5								5
Upper Montclair					1						1
Ventnor			4		3	1					9
Verona	1		7								11
Vineland	11	1	81	10	40	6					149
Waldwick			5								5
Wanquet	1										1
Westfield	21	18	26	1	7	1	1				75
West Hoboken			32	4	3						39
West Long Branch			3								3
West New York			5	1							6
West Orange			26	1	8		1	1			39
Westville			7		2	2					12
Westwood	5		14	1	6		2	1	1		30
Whippany	5	2			7	1					15
Wildwood			1		1						2
Woodbine	1		18	8							28
Woodbridge	18	12	14								46
Woodbury	7	5	11		8	1					32
Woodstown	6	6	7	2					1		22
Yardville			1		2						3
Blank	4	1	4								9
Total	2,349	3,741	3,227	410	2,201	242	161	17	149	21	12,618

Table O. gives a list of names and addresses of persons who constantly keep on hand a supply of the mailing cases provided by the laboratory for the collection of specimens from suspected cases of communicable diseases and who will distribute these cases to any physician free of charge. These mailing cases are sent to the repositories from the laboratory whenever a request is received for them. No expense is attached to their distribution by the druggist and the only cost to the physician is the postage necessary to return the container to Trenton.

In order to insure speedy transportation persons mailing these containers should not neglect to inform postmasters that they are prepaid at letter rates and that therefore they should be forwarded with the first class mail.

These containers should never be sent by special delivery. A messenger from the laboratory visits the post-office several times each day and mail reaches us more quickly when forwarded through the regular channels than when sent to the laboratory from the post-office in Trenton by messenger.

TABLE O.—LIST OF REPOSITORIES FOR MAILING CASES.

Town.	Repository.
Allentown	Carlsruhe's Pharmacy.
Alloway	W. L. Ewen, M.D.
Andover	J. C. Clark, M.D.
Annandale	Willard E. Berkaw, M.D.
Arlington	J. B. Thompson, druggist.
"	August A. Strasser, M.D.
"	W. E. Doremus, M.D.
"	F. J. La Riew, M.D.
Asbury	Board of Health.
Asbury Park	Board of Health.
Atlantic City	City Hospital.
"	A. D. Cuskaden, druggist.
"	H. H. Deakyne, druggist.
"	Charles H. Jackson, druggist.
"	P. M. F. Ridgway, druggist.
"	W. G. Clark, druggist.
"	R. Lawrence, Casino Pharmacy.
Atlantic Highlands	R. S. Matthews, druggist.
Audubon	I. G. Sieber, druggist.
Bakersville	A. R. Vickers, druggist.
Basking Ridge	F. C. Jones, M.D.
Bay Head	W. H. Katzenbach, M.D.
Bayonne	Frank N. L'Estrange, druggist.
"	J. A. Balinsky & Sons, druggist.
"	Charles H. Landell, druggist.
Beach Haven	Herbert Willis, M.D.
Belleville	A. H. Osborne, druggist.

TABLE O.—LIST OF REPOSITORIES FOR MAILING CASES—Continued.

Town.	Repository.
Belmar	Board of Health.
"	Seaside Pharmacy.
Belvidere	Faust Bros., druggists.
"	Wm. J. Burd, M.D.
Berlin	Board of Health.
Bernardsville	J. Meigh, M.D.
Beverly	J. V. Roberts, M.D.
"	Warren Street Pharmacy.
Blairstown	George A. Branigan, druggist.
"	Wm. C. Allen, M.D.
Bloomfield	Geo. M. Wood, druggist.
"	Wm. W. Keyler, druggist.
Bloomsbury	E. L. Reigle, M.D.
Boonton	John S. Taylor, M.D.
"	Cuthbert Wigg, M.D.
"	C. L. Decker, M.D.
"	A. E. Carpenter, M.D.
"	E. Knowles, M.D.
Bordentown	Wm. H. Shipp, M.D.
"	Woolley & Fitzgerald, druggists.
Bound Brook	Lloyd & McNabb, druggists.
"	Fetterly & Loree.
Bradley Beach	W. K. Bradner, M.D.
"	Rose Brothers, druggists.
Branchville	E. S. Dalrymple, M.D.
"	J. C. Price, M.D.
Bridgeton	Bridgeton Hospital.
"	Board of Health.
"	Albert S. Elwell, druggist.
"	Chas. F. Dare & Son, druggists.
"	John H. Moore, M.D.
Burlington	Board of Health.
"	John W. Davis, druggist.
"	H. B. Weaver, druggist.
Butler	S. E. Estler, druggist.
"	McCue's Drug Store.
Caldwell	Edwin E. Bond, M.D.
"	Wm. N. Hasler, druggist.
"	H. B. Whitehorne, M.D.
Califon	T. Miller, M.D.
Camden	Board of Health.
"	Cooper Hospital.
"	L. B. Hirst, druggist.
"	Barret Bros., druggists.
"	George M. Beringer, druggist.
"	George J. Pechin, druggist.
"	R. I. Haines, M.D.
"	F. S. Macpherson Co., laboratory.
"	Wm. P. Weiser, druggist.
"	Mahaffey's Pharmacy.
"	L. H. Wilson, druggist.
"	Wilbur J. Leib, druggist.
"	E. W. Collins, druggist.
"	Dr. Hummel.
"	Henry Curtis, druggist.
Cape May	James Mecray, M.D.

TABLE O.—LIST OF REPOSITORIES FOR MAILING CASES—Continued.

Town.	Repository.
Cape May	Anna M. Hand, M.D.
"	J. M. D. Marcy & Co., druggists.
Cape May Court House	Willetts Corson, druggist.
Carlstadt	Albert Niederer, druggist.
Carteret	J. J. Reason, M.D.
Cedarville	W. P. Glendon, M.D.
Chatham	Wm. J. Wolfe, M.D.
"	Jos. E. Pollard, M.D.
Chester	Harris Day, M.D.
"	W. A. Green's Pharmacy.
"	C. F. Fisler, M.D.
Clayton	Wm. H. Baker, druggist.
Clinton	L. B. Parsall, M.D.
Closter	C. A. Richardson, M.D.
"	W. A. Lake, M.D.
Cold Spring	Wm. A. Chamberlain, druggist.
Collingswood	J. E. Dubell, M.D.
Columbus	John Marien, druggist.
Cranford	John R. Reay, druggist.
"	Charles L. Dey, M.D.
Crosswicks	Edgar Carroll, M.D.
Dayton	H. L. Cooper, M.D.
Deerfield	H. K. Weiler, M.D.
Delanco	Eugene Way, M.D.
Dennisville	Kilgore & White, druggists.
Dover	J. E. Pratt, M.D.
Dumont	P. W. Brakeley, M.D.
Dunellen	Edward Pennock, druggist.
"	D. C. Main, M.D.
"	Gillbard's Drug Stores.
East Orange	Grove Street Pharmacy.
"	Frank L. Fieger, druggist.
"	Wm. E. Odgen, M.D.
East Rutherford	Paul Boldberg, druggist.
Edgewater	Wm. Mayenweck, Jr., druggist.
Egg Harbor City	V. P. Hoffman, city clerk.
"	Board of Health.
Elizabeth	Henry J. Schmidt, druggist.
"	E. W. Parsons, druggist.
"	Richard Frohwein, druggist.
"	Henry Schmidt, druggist.
"	Walter I. McCann, druggist.
"	David Strauss, druggist.
"	Oliver & Drake Co., druggists.
"	George J. Martin, druggist.
"	William Rufus Richart, druggist.
"	Fred M. Egger, druggist.
"	William H. Reibel, druggist.
"	Elizabeth General Hospital.
Elmer	Board of Health.
Englewood	L. Rockefeller Co., druggists.
"	Wm. E. H. Schneider, druggist.
"	Lewis W. Brown, druggist.
"	Englewood Pharmacy.
"	Englewood Hospital.
Englishtown	Wm. E. Anderson, M.D.

TABLE O.—LIST OF REPOSITORIES FOR MAILING CASES—Continued.

Town.	Repository.
Englishtown	Asher T. Applegate, druggist.
Fairton	Irwin W. Kirk, M.D.
"	H. E. Lore, M.D.
Fanwood	F. W. Westcott, M.D.
Farmingdale	V. Bacon, druggist.
"	W. R. Kinnmouth, M.D.
Flemington	Franklin C. Burk.
Florence	A. G. Sheppard, M.D.
Forked River	Board of Health.
Fort Lee	Max Wyler, M.D.
"	Carl L. Richter, druggist.
Franklin Furnace	C. M. Dunning, M.D.
Freehold	W. B. Duryee, druggist.
"	J. H. Rosell, Jr., druggist.
Frenchtown	F. H. Decker, M.D.
Garfield	United States Pharmacy.
German Valley	Chas. N. Miller, M.D.
Gladstone	M. C. Smalley, M.D.
Glassboro	F. G. Thomann, druggist.
"	E. Mortimer Duffield, M.D.
Gloucester City	Atlantic Pharmacy.
"	W. S. Hilliard, druggist.
Grantwood	Margaret P. Brewster, M.D.
"	H. F. Goemann, druggist.
Guttenburg	Jacob B. Zimmerman, druggist.
"	Henry J. Gordon, druggist.
Hackensack	Hackensack Hospital.
"	Eugene A. McFadden, druggist.
"	Alex. Denig, druggist.
"	T. E. Van Stone, druggist.
"	R. G. Bredin, druggist.
Hackettstown	C. V. S. Rea, druggist.
"	L. Farrow, M.D.
Haddonfield	R. Willard, druggist.
Haddon Heights	C. E. Shillett, druggist.
Hainesport	W. C. Parry, M.D.
Haledon	W. Clause, druggist.
Hamburg	Joseph G. Coleman, M.D.
Hammonton	J. L. O'Donnell, town clerk.
"	Chas. Cunningham, M.D.
Harrison	Board of Health.
"	E. S. Goudy, M.D.
"	Squier's Pharmacy.
"	Charles E. Rothe, druggist.
Harrisonville	Samuel F. Stanger, M.D.
Hasbrouck Heights	J. A. Powelson, druggist.
Highlands	Grandin V. Johnson, druggist.
"	Dr. Opperman.
Hightstown	H. G. Rue, druggist.
"	D. Hart Cunningham, druggist.
"	F. O. Cole, druggist.
oboken	Board of Health.
"	H. B. Rue, M.D.
"	Charles H. Schmidt, druggist.
"	Adolph Schmidt, druggist.
"	Victor Schmidt, druggist.

TABLE O.—LIST OF REPOSITORIES FOR MAILING CASES—Continued.

Town.	Repository.
Hoboken	Wm. Kamlah, druggist.
"	Charles Sunkel, druggist.
"	L. Kinson, druggist.
"	J. F. Zenneck, M.D.
Holly Beach	M. F. Lummis, M.D.
"	Cohen Drug Co.
Holmdel	F. M. Wood, M.D.
Hopewell	George E. Pierson, druggist.
Hudson Heights	William T. Lins, Jr., druggist.
"	Wm. C. Fink, druggist.
Imlaystown	Franklin C. Price, M.D.
Irvington	Harry McDavid, druggist.
"	A. C. Christian, M.D.
Island Heights	Henry N. Davis, M.D.
Jamesburg	State Home for Boys.
Jersey City	Board of Health.
"	George H. White, druggist.
"	L. E. Carpenter, druggist.
"	James D. Adams, druggist.
"	John C. Gallagher, druggist.
"	A. Tod, druggist.
"	Stein & Co., druggists.
"	Frank O. Cole, druggist.
"	Herman J. Lohmann, druggist.
"	Wm. Buchbinder, druggist.
"	Lyons & Ziegler, druggists.
"	Benjamin F. Bache, druggist.
"	R. E. Wilhelm, druggist.
"	J. M. Holloway, M.D.
"	J. E. Ryan, druggist.
"	Herman A. Bruckner, druggist.
"	Charles H. Rogers, druggist.
"	Herman Roder, druggist.
"	Herman W. Mayer, druggist.
"	Charles Zoeller, druggist.
"	James Foulke, druggist.
"	Lischke Bros., druggists.
Juncton	M. R. Albright, druggist.
Keary	A. E. Geissler, sanitary inspector.
Keypoint	William E. Warn, druggist.
"	Board of Health.
Kingsland	John W. Clark, M.D.
Lakehurst	M. Priest, druggist.
Lakewood	D. H. Hills & Co., druggists.
"	Grenelle & Schenck, druggists.
Lambertville	S. W. Cochran & Co., druggists.
Lawrenceville	Lawrenceville School.
"	De Witt's Drug Store.
Layton	M. D. Hughes, M.D.
"	E. W. Jones, M.D.
Leesburg	S. Eldridge Ewing, M.D.
Lodi	David A. Himach, druggist.
Long Branch	Board of Health.
"	Monmouth Memorial Hospital.
"	Wm. J. Smythe, Jr., druggist.
"	L. Rothenberg & Co., druggists.
"	Frank K. Gano, druggist.

TABLE O.—LIST OF REPOSITORIES FOR MAILING CASES—Continued.

Town.	Repository.
Lumberton.	J. H. Stermer, druggist.
Madison.	Charles B. Gee & Son, druggists.
"	Wm. F. Brown, druggist.
"	W. H. Larison, druggist.
"	F. H. Seward, M.D.
"	Harvey E. De Hart, druggist.
Magnolia.	L. C. Lyon, M.D.
Maplewood.	B. B. Ransom, M.D.
Marlton.	W. H. Zelle, druggist.
Matawan.	Nathan Ervin, M.D.
"	C. C. Straughn, M.D.
Mauricetown.	George C. Spence, M.D.
Mays Landing.	H. C. James, M.D.
Maywood.	Frank Freeland, M.D.
Medford.	Henry P. Thorn, druggist.
Mendham.	Leo Robinson, druggist.
Merchantville.	J. W. Kohlerman, druggist.
Metuchen.	Board of Health.
"	George H. Hahm, druggist.
"	C. A. Prickett, druggist.
Middle Valley.	Maxwell S. Simpson, M.D.
Midland Park.	Wm. J. Benjamin, druggist.
"	E. B. Thornton, druggist.
Milford.	C. H. Darmon, druggist.
Millburn.	Geo. S. Campbell, druggist.
Millville.	John T. Doughty, druggist.
"	George W. Weber, druggist.
"	Reeve's Pharmacy.
"	Emergency Hospital.
Milton.	Joseph P. Riggs, M.D.
Montclair.	Board of Health.
"	David H. Baldwin, bacteriologist.
"	Loeser's Pharmacies.
"	Wm. L. Johnson, druggist.
"	Mountainside Hospital.
Moorestown.	Frank G. Stroud, M.D.
Morris Plains.	State Hospital.
Morristown.	H. M. Smith, druggist.
"	Brown & O'Connell, druggist.
"	All Souls Hospital.
"	Morristown Drug Co.
Mount Holly.	Edward B. Jones, druggist.
"	H. B. Allen, druggist.
Mullica Hill.	S. F. Ashcraft, M.D.
Netcong.	Red Cross Pharmacy.
Newark.	W. H. Warren & Co., druggists.
"	Theodore W. Corwin, M.D.
"	Wm. R. Ward, M.D.
"	A. V. Wendel, M.D.
New Brunswick.	G. H. Bissett, druggist.
"	Van Deursen Pharmacy.
"	Skillman & Van Pelt, druggists.
"	Wm. Rust & Sons, druggists.
New Egypt.	W. C. Jones, druggist.
Newport.	S. E. Robinson, M.D.
Newton.	Board of Health.
"	H. O. Ryerson, druggist.

TABLE O.—LIST OF REPOSITORIES FOR MAILING CASES—Continued.

Town.	Repository.
Norma.	David M. Rappaport, M.D.
North Paterson.	W. Sprick, druggist.
North Plainfield.	Board of Health.
Nutley.	Henry T. Lefferts, druggist.
Oakland.	E. W. Hamilton, M.D.
Ocean City.	Bourse Pharmacy.
Ogdensburg.	L. C. Burd, M.D.
Old Bridge.	I. C. Crandall, M.D.
Oradell.	F. O. Blenckstone, M.D.
Orange.	Board of Health.
"	Orange Memorial Hospital.
"	Sumpter L. Beegle, druggist.
"	J. F. Behrens, druggist.
"	Abram Mosler, druggist.
"	C. E. Dowling, M.D.
Oxford.	James A. Allen, druggist.
Palmyra.	L. L. Sharp, M.D.
Park Ridge.	Henry C. Neer, M.D.
Passaic.	Berger & Richter, druggists.
"	Carroll Drug Company.
"	Van Riper & Co., druggists.
"	Passaic General Hospital.
"	St. Mary's Hospital.
"	Otto Laue, druggist.
"	Post & Friedrich Co., druggists.
"	Peter's Pharmacy.
"	Board of Health.
Paterson.	Keller's Totowa Drug Store.
"	George T. Evans, druggist.
"	Board of Health.
"	Gurdon E. Pellett, druggist.
"	Maxwell Bukofzer, druggist.
"	Keller's Totowa Pharmacy.
Paulsboro.	C. E. Donnelly, druggist.
"	W. T. Moore, druggist.
Peapack.	R. B. Dearborn, M.D.
Pemberton.	L. B. Hollingshead, M.D.
Penns Grove.	C. P. Lummis, M.D.
"	Robbins' Pharmacy.
Perth Amboy.	G. W. Tyrell, M.D.
"	Sexton's Drug Store.
"	M. S. Menzer, M.D.
"	Board of Health.
"	City Hospital.
"	Wm. E. Ramsay, M.D.
"	F. A. Seaman, druggist.
Phillipsburg.	C. E. Griffin's Drug Store.
"	John D. Hornby, druggist.
Fitman Grove.	C. B. Phillips, M.D.
Plainfield.	Board of Health.
"	Justus H. Cooley, M.D.
"	Hodge's Pharmacy.
"	A. H. Dundon, M.D.
"	W. H. Murray, M.D.
"	Frank Dencklau, druggist.

TABLE O.—LIST OF REPOSITORIES FOR MAILING CASES—Continued.

Town.	Repository.
Pleasantville.	Thos. F. Crawford, druggist.
"	J. H. North, Jr., druggist.
Point Pleasant.	A. B. Johnson, druggist.
Pompton Lakes.	Wm. Schuyler Colfax, M.D.
Port Norris.	S. T. Day, M.D.
"	E. B. Bradford, M.D.
Princeton.	Wm. L. Briner, druggist.
"	Marsh & Burke, druggists.
Rahway.	W. E. Cladek, M.D.
"	George F. Brown, druggist.
"	New Jersey Reformatory.
"	Joseph G. Smith, druggist.
Ramsey.	Vanderbeek Drug Co., druggists.
"	J. B. Harvey, druggist.
"	H. R. Parvin, druggist.
Raritan.	A. B. Rohn, Jr., druggist.
Red Bank.	Chas. A. Minton, druggist.
Ridgefield Park.	Henry C. Elsing, M.D.
"	C. A. Knox, M.D.
Ridgewood.	Wm. L. Vroom, M. D.
"	H. A. Tice, druggist.
Ringoes.	P. C. Young, M.D.
Riverside.	Warren C. Pine, druggist.
Riverton.	Alex. Marcy, Jr., M.D.
Rockaway.	George H. Foster, M.D.
"	F. W. Flagg, M.D.
Rocky Hill.	Board of Health.
Roebing.	Paul Traub, M.D.
Roselle.	Jay W. Rewalt, druggist.
Roselle Park.	G. H. Howming, druggist.
Rutherford.	Board of Health.
Salem.	Board of Health.
"	John E. Davis, druggist.
"	W. H. Andrews Co., druggists.
Seabright.	Seabright Pharmacy.
Seaside Park.	Manhaffett's Pharmacy.
Shiloh.	E. G. Hummell, M.D.
Skillman.	New Jersey Epileptic Village.
Somerville.	John D. Case, druggist.
South Amboy.	E. V. Meachem, M.D.
South Orange.	W. H. Britton.
"	H. A. Pulsford, M.D.
"	Wm. C. Brown, druggist.
South River.	S. E. Selover, M.D.
"	F. W. Bissett, M.D.
"	Silk's Drug Store.
Spottswood.	J. C. Shinn, M.D.
Springfield.	J. A. Sutes, M.D.
Spring Lake.	Ann May Memorial Hospital.
"	D. H. Hills & Co., druggists.
Stanhope.	Nelden's Pharmacy.
Stewartville.	Frank W. Curtis, M.D.
Stillwater.	E. W. Landes, M.D.
Succasunna.	N. H. Adsit, M.D.
Summit.	W. T. Green, druggist.
"	Wm. H. Rogers, druggist.

TABLE O.—LIST OF REPOSITORIES FOR MAILING CASES—Continued.

Town.	Repository.
Swedesboro.	Guest & Guest, druggists.
Tenafly.	J. B. W. Lansing, M.D.
Titusville.	Irvine E. P. Turner, druggist.
Toms River.	Frank Brouwer, M.D.
Town of Union (Weehawken).	August Frank, druggist.
"	David Weismann, druggist.
"	R. F. Hellstern, druggist.
Trenton.	Brown's Pharmacy.
"	H. S. Hughes, druggist.
"	M. Riggs, druggist.
"	I. J. Keuper, druggist.
"	W. H. Barnes, druggist.
"	State Laboratory of Hygiene.
"	Board of Health.
"	H. N. Richards, druggist.
"	Mercer Hospital
"	St. Francis Hospital.
"	McKinley Hospital.
"	Oliver Twist, druggist.
"	John J. Strasser, druggist.
"	James L. Mathis, druggist.
"	Stuckert Pharmacy.
"	Lewis W. Long, druggist.
"	D. Wiley Baker, druggist.
"	C. S. Thatcher, druggist.
"	G. D. Laird, druggist.
"	Holcombe Brothers, druggists.
"	David E. Stretch, druggist.
"	Oscar Davison, druggist.
"	Tidd's Pharmacies.
"	Chas. Young, druggist.
"	Chas. D. Scott, druggist.
"	New Jersey State Prison.
Tuckahoe.	Marshall's Drug Store.
"	J. S. Douglass, M.D.
Tuckerton.	Reeve's Pharmacy.
Union Hill.	Weismann & Kost, druggists.
"	O'Delaine's, druggist.
Upper Montclair.	J. H. Laubenheimer, druggist.
Verona.	Verona Pharmacy.
Vineland.	M. R. Faulkner, M.D.
"	Alfred M. Pierson, druggist.
"	West Side Pharmacy.
"	Baker House Pharmacy.
"	Red Cross Pharmacy.
"	V. B. Matlack.
Waldwick.	3. A. Ver Nooy, M.D.
Washington.	Chas. M. Williams, M.D.
"	Jenkins & Meeker, druggists.
Weehawken.	Vm. Kyvitz, druggist.
Westfield.	33yard Pharmacy.
"	Geo. W. Frutchey, druggist.
West Hoboken.	Joseph Parentini, druggist.
"	Frank H. Eckert, druggist.
"	E. Stener, Pharmacy.
West New York.	L. H. Schenier, druggist.



TABLE O.—LIST OF REPOSITORIES FOR MAILING CASES—*Continued.*

Town.	Repository.
West Nutley.....	James Crammond, druggist.
West Orange.....	G. T. Geinger, druggist.
".....	A. N. Dretzfield, druggist.
Westville.....	C. E. Davis, druggist.
Westwood.....	Taeodore E. Townsend, druggist.
".....	G. M. Levitas, M.D.
Wharton.....	H. W. Kice, M.D.
White House Station.....	W. W. Pursell, M.D.
Wildwood.....	Cohen Bros., druggists.
Windsor.....	Geo. A. Silver, M.D.
Woodbine.....	E. J. Asnis, M.D.
".....	J. P. Behrman, M.D.
Woodbridge.....	Board of Health.
".....	Ira T. Spencer, M.D.
".....	B. W. Hoagland, M.D.
Woodbury.....	J. W. Merritt, druggist.
Woodstown.....	Buzby's Pharmacy.
".....	Harry Guest, druggist.
Wykoff.....	W. F. Keating, physician.

## THE OUTBREAK OF DIPHThERIA AT THE RAHWAY REFORMATORY.

During the winter and early spring of 1908, diphtheria was epidemic among the inmates of the Rahway Reformatory. An account of this epidemic will be found in the report of the Chief of the Division of Medical and Sanitary Inspection, but it seems desirable to call attention here to certain facts which developed during its course which relate chiefly to the results of bacteriological examinations made in this laboratory, of specimens from inmates of the Reformatory. The first case of diphtheria was recognized on December 22, 1907. The second case appeared on January 15, 1908, more than three weeks later, at which time the outbreak proper began. The first cases were isolated in a small building located in one corner of the grounds remote from the other buildings. This improvised hospital was soon overcrowded and a large drill hall on the third floor of the rear wing of the main building was used as a hospital and isolation ward for suspects. At the beginning of the outbreak, specimens for bacteriological examination were taken only from those inmates who exhibited throat lesions or other symptoms of the disease. When it became apparent that the outbreak was rapidly getting beyond control, specimens were taken from every inmate of the institution and all officers and employees. This examination disclosed the fact that an unusually large number of carriers existed, and that the diphtheria bacillus had become distributed throughout the institution. The greatest number of clinical cases and carriers were found, as was to be expected, in those men who lived in the overcrowded parts of the building. The carriers were at once transferred to the drill hall where some of the clinical cases were already confined, and kept there, daily specimens from them being sent to the laboratory. Specimens from all the inmates not in quarantine were repeatedly taken, resulting in the detection of further large numbers of carriers until the total number of persons who were found at one time or another to have diphtheria bacilli in their throats or noses amounted to 246, of which only 39 were clinical cases; that is, for every clinical case there were six well persons carrying diphtheria bacilli. The total number of specimens examined in the laboratory during the outbreak was 3,547. This infection of nearly half

of the entire number of inmates was undoubtedly brought about by the greatly overcrowded condition of the institution which resulted in repeated close personal contacts between most of the inmates. The habits of the inmates also favored the spread of the disease. All the inmates, except those quarantined, were assembled three times daily in one room for meals and sat at crowded tables. The men were engaged in various manufacturing operations during the day in shops attached to the institution, and while at work, especially in the shops devoted to the manufacture of overalls, where garments were constantly passed from hand to hand, they had excellent opportunities for infecting each other. Nearly half of the inmates slept on cots located in the corridors and dome, these cots being placed about a foot apart so that the heads of the sleepers were separated by a space of little more than three feet. It is not difficult to understand, taking into account the low grade of intelligence possessed by most of these men, and their naturally uncleanly and untidy habits, how, under these circumstances, the diphtheria bacillus became distributed throughout all parts of the institution within a short time after the disease appeared. Only one of the officers except the physician attached to the institution appears to have become infected. These officers mingled with the inmates in the discharge of their duties, but slept in a different part of the building, and did not come in intimate personal contact with them. Their comparatively greater immunity from infection must be attributed largely to their greater intelligence which enabled them to more successfully carry out the preventive measures laid down for them.

It is usually believed that the bacillus of diphtheria does not persist in the throats or noses of well persons for any length of time, but usually disappears within a day or two. The examinations made in connection with this outbreak show that, under the somewhat abnormal conditions which existed in the Reformatory, this was not the case. In a number of these persons the diphtheria bacillus persisted for long periods of time. In sixty-seven out of the 246 cases diphtheria bacilli persisted for two weeks or more. Of these 67 cases, the duration of infection was between two and three weeks in 14, between three and four weeks in 13, between

four and five weeks in 10, between five and six weeks in 9, between six and seven weeks in 4, between seven and eight weeks in 6, and over eight weeks in 11. During all this time specimens were examined from all these cases at short intervals, usually daily, and in several instances results were obtained which seemed to show that the throats and noses of these persons had become free of diphtheria bacilli and subsequently second infections had occurred. In 21 of the 67 cases above referred to two consecutive negative results were obtained and the diphtheria bacillus was subsequently found. In 12 of these 21 cases a period of a week or more elapsed during which time their throats and noses were free from bacilli. While it is possible that, during this time, bacilli were present in such small numbers as to escape detection, yet it seems much more probable that the bacilli actually disappeared and subsequently reinfection took place. It is also possible that the long periods during which some of these cases carried the diphtheria bacillus may be accounted for by the method of isolation employed which afforded the fullest opportunity for continuous reinfection. The clinical cases and carriers were all confined in one room and had unrestricted access to all parts of it. Most of these men were perfectly well and moved about freely, coming in constant contact with each other. In order to relieve the monotony of their confinement they indulged in various games which involved the passage of articles from hand to hand and indirectly from mouth to mouth. The writer, while on a visit to the institution, observed numbers of these inmates, while in quarantine in the drill hall, playing cards and checkers and handling the articles used in these games with fingers wetted by constant application to their lips. A better method of keeping men infected could hardly be devised.

The futility of relying upon the result of a single negative culture as a basis for release from quarantine is well shown by the records of the 67 cases above referred to. In not one of these cases was there an unbroken series of positive cultures from the beginning to the end of the infectious period. In 17 of these cases one negative culture was obtained during the infectious period; in 16, two negative cultures; in 20, three negative cultures and in 14, four or more negative specimens. The longest unbroken series of positive results

was obtained from inmate Coblasky, from whom 51 consecutive positive specimens, covering a period of 56 days, were secured. It is interesting to note that at no time did this man have any symptoms of diphtheria.

During the course of the outbreak antitoxin was freely used on the clinical cases and every inmate of the institution received at least two immunizing doses. While the disease was promptly checked as a result of this immunization no apparent effect was produced on the persistence of the diphtheria bacilli in the throats and noses of well persons. Toward the end of the outbreak, when all the sick had recovered, cultures from twelve of the carriers were tested for virulence on animals and were all found to be non-virulent. As a result of this test the quarantine on all inmates was raised and they were returned to their permanent quarters. No further cases developed.

During the course of the outbreak and after its close an attempt was made to disinfect the institution, but because of the peculiar construction of the building, and because of lack of proper facilities, it seems very doubtful if any satisfactory results were obtained.

This outbreak is of special interest because of the unusual circumstances surrounding it. A study of the results of our investigations seem to point to the following conclusions:

1. The rapid distribution of the diphtheria bacillus was made possible by the overcrowded condition of the building and the frequent assembling of all the inmates in one place.

2. This widespread distribution of infection was also facilitated by the uncleanly and untidy habits natural to men of the kind confined in the reformatory.

3. The unusually large number of carriers in proportion to the number of clinical cases was due to the same causes.

4. The persistence of the diphtheria bacillus in the throats of a considerable number of well persons may most readily be accounted for on the assumption that they became reinfected from time to time. It is shown that the methods of isolating carriers was such that reinfection could hardly be avoided.

5. While the use of antitoxin for immunizing and curative purposes promptly checked the disease, it had apparently no

effect on the persistence of the diphtheria bacilli in the throats and noses of well persons or convalescents.

6. A single negative result is utterly unreliable as an indication that the diphtheria bacilli have disappeared from the throat and nose. Even two consecutive negatives are not always to be relied upon.

## Report of the Division of Sewerage and Water Supplies.

*To the Board of Health of the State of New Jersey:*

GENTLEMEN—I have the honor to submit the following report of the work of the State Sewerage Commission and the Division of Sewerage and Water Supplies during the year commencing November 1, 1907.

In accordance with Chapter 296 of the Laws of 1908, the State Sewerage Commission was abolished on April 16, 1908, and its powers and duties vested in the Board of Health by Chapter 297 of the same laws.

Upon the organization of the new board, the Division of Sewerage and Water Supplies was created and the work of the State Sewerage Commission and of the Water Department of the former Board of Health was placed in this division, and the work which has been done in each of them is embodied in this report.

It has been proven beyond a doubt that water is the means of transmitting either directly or indirectly some of the most dreaded diseases: namely, enteric fevers, diarrhoea, cholera, bubonic plague, malaria and, possibly, tuberculosis, but unfortunately the idea has become implanted in the mind of the ordinary citizen that no matter how grossly polluted, the water of a stream will purify itself in distances of from five to twelve miles, and that our creeks and rivers were designed and given us by Providence for open sewers. This fallacy has been exploded and, consequently, it becomes our duty to protect the waters of the State against pollution.

Marshall O. Leighton, in Water Supply and Irrigation paper No. 72 says, "Having reviewed the more important conditions and influences that affect the character of normal water, let us consider the economic value of water to the community. Intercepted and stored in reservoirs it has become indispensable to large communities for domestic and

manufacturing uses; from prehistoric times large rivers have been used as avenues of transportation; as motive power water has been used for ages; vast harvests of ice are gathered from the surface of Northern rivers; \* \* \* \* \* it may be the source of food supply through fisheries, and its presence in a country is valuable from a purely æsthetic point of view, lakes and fountains forming a natural nucleus for parks, resorts and places of rest and recreation."

When a river becomes badly polluted by sewage it is valueless for any of these uses except navigation for business purposes—boating for pleasure has to be abandoned as is illustrated by the Passaic river—and portions of the Raritan and Delaware rivers are rapidly approaching the same condition. They cannot be used as sources of water and ice supplies without grave menace to the health of the consumers, and pleasure parks and recreation grounds are forced to seek a more congenial atmosphere. Where the water is impounded for power purposes it becomes offensive. It cannot be used in some lines of manufacturing, and even the better class of food fishes gradually disappear. Thus we are given the choice of either protecting our streams for the many useful purposes to which they may be applied or else converting them into foul, disease-breeding sewers which will depreciate the value of all adjacent real estate and drive away the inhabitants.

There is another feature which is worthy of serious consideration, as it involves millions of dollars. The people generally throughout the country have awakened to the fact that a number of typhoid fever epidemics were caused by the use of infected shellfish and they are demanding a safe article of food. Already a number of our sister states require, or are formulating requirements, that only clams and oysters taken from comparatively unpolluted beds shall be exposed for sale within the territory under their jurisdiction.

The New Jersey shell fisheries are already beginning to feel the effects of this movement which is still only in its infancy, but is growing rapidly. The Amboy bay oyster is scarcely heard of today; the luscious Shrewsbury oyster, which fifteen years ago was the delight of epicures, is left to fatten and rot in the bed of the river; that king of bi-valves, the Shark river oyster, is only a memory and, owing to the failure

of our State to provide a proper sewerage disposal plant at the Sea Girt Camp grounds, the Manasquan clam, one of the finest taken from our waters, can no longer be used with impunity.

The same is true to a greater or lesser degree regarding the majority of the clam and oyster beds situated in other sections of the State. The summer population at the southern seacoast resorts is rapidly increasing, and there are now no less than eleven municipalities, including Atlantic City, discharging raw sewage into the thoroughfares and bays which line this section of our coast, and which are either artificial or natural clam and oyster beds.

Perhaps the best-known and most popular Jersey oyster of the day is the Maurice Cove, which derives its name from the vicinity in which it is grown. Raw sewage from Millville is discharged into the Maurice river about eighteen miles above, and what seems incredible, the very men engaged in the oyster business have privies and water-closets discharging their contents over and near the floats where the shellfish are stored, as shown by accompanying views.

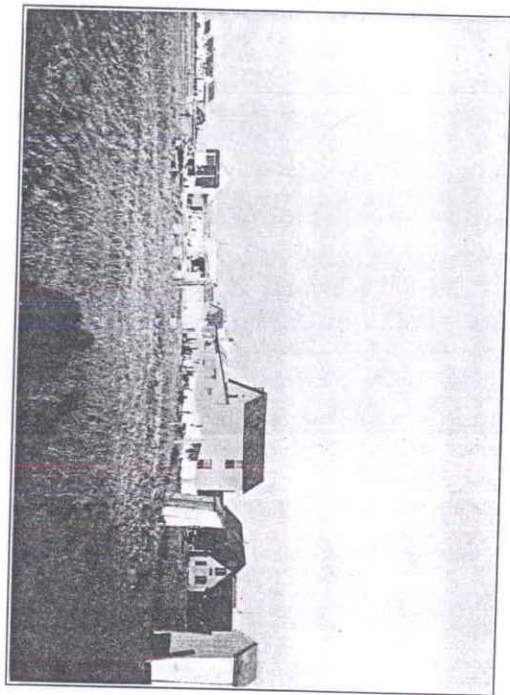
At the mouth of the Delaware river and in Delaware bay are located, probably, the largest oyster fields north of the Chesapeake bay. No one will deny that the Delaware river is more or less polluted below Philadelphia. The average flow of the Delaware river at Philadelphia during the driest month (see Geological Survey of New Jersey, Volume 3, Page 309) does not exceed one billion, two hundred and eighty-three million gallons per day and the estimated amount of raw sewage discharged into the river and its tributaries above and including Philadelphia and Camden is one hundred eighty-eight million, seven hundred and twenty-one thousand gallons per day, which would give a proportion of one part of sewage to six and eight-tenths parts of the river water. It should be borne in mind that owing to the deforestation of the upper watershed, the flood flow is increasing and the dry weather flow diminishing, while at the same time, the amount of sewage is increasing at the rate of about thirty per cent. (30%) in ten years. This latter is a constant factor and does not vary as the flow of the river. Below Philadelphia there is an additional twenty-five million gallons of sewage emptying into the river from New Jersey, Pennsylvania and Delaware. Unless this gross pollution is checked in the near future, the water of the Delaware river will not only be unfit for domestic use but also worthless for the production of shellfish. Can the State allow this to continue?

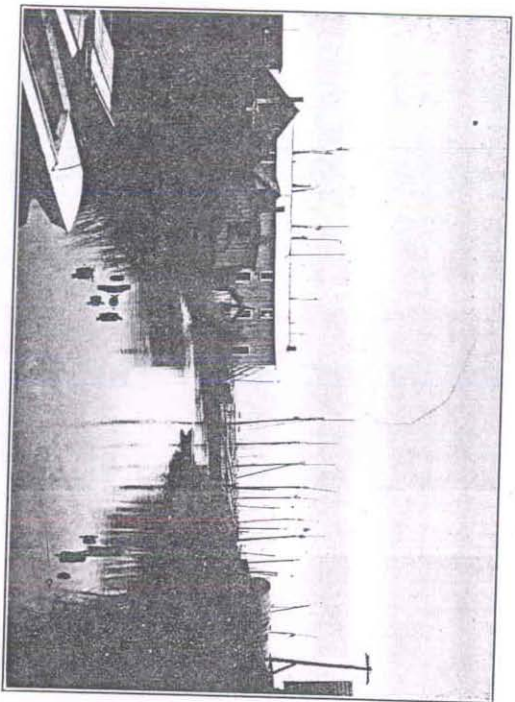
The annual amount realized from the sale of our shellfish is about three millions of dollars. At least two-thirds of these come from the Delaware river and bay and two millions of dollars, the value of one year's product, would under a conservative estimate install sewage purification plants on all the systems in this State, which are now discharging raw sewage into the Delaware river.

It is fast approaching the condition of the Passaic river which still remains a disgrace to our State.

Inspections have been made covering six hundred and thirty-two miles of riparian frontage on the Delaware, Raritan, Rahway, Elizabeth, Rockaway, Shark and Shrewsbury rivers and their tributaries, together with the lakes along the Monmouth county seashore; eight hundred and eight individual or minor pollutions, were discovered and reported upon. These were acted upon by the Board and six hundred and

SALE MARSH ON DEVIL'S GUT WHICH IS COVERED WITH HIGH WATER, SHOWING HOUSES AND PLOTS.



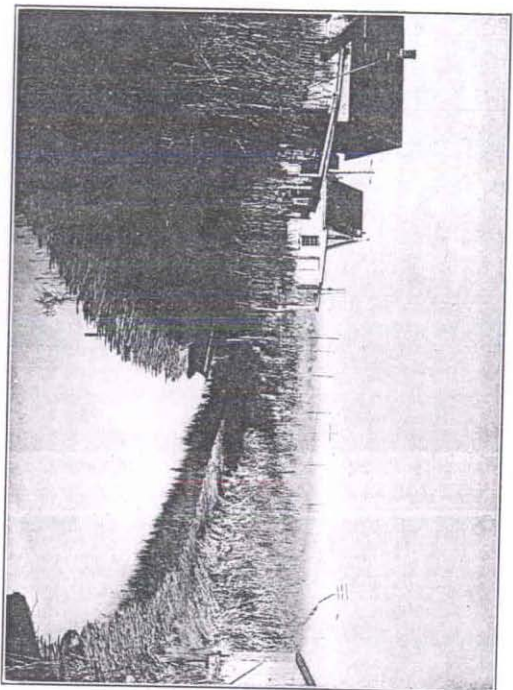


FISH HOUSE AT OPENING OF DEVIL'S CUT.



POINT NEAR OPENING OF DEVIL'S GUT.





A POINT NEAR HEAD OF DEVIL'S CUT.

ninety-eight notices to cease polluting were served. One preliminary injunction was granted against an individual polluter, and twelve more cases have recently been placed in the hands of the Attorney-General for action. Suits have been commenced under Chapter 72 of the Laws of 1900, and the supplements and amendments thereto, to restrain five municipalities, namely, Phillipsburg, Woodlynne, Seabright, Jersey City and West Hoboken from polluting the waters of this State. Action in the suit against the Town of Roebling has been suspended pending the installation of a purification plant. Plans and specifications for 37 sewerage systems, extensions and disposal plants were examined and approved; plans and specifications for 8 sewerage systems, extensions and disposal plants were disapproved and returned for revision and amendments, and one plan is now being held for consideration, making a total of 46 plans and specifications acted upon.

Our seashore resorts have at last awakened to the seriousness of making their beaches the dumping grounds for their own sewage and, with one exception, are planning to install disposal plants before the opening of next season. This will have a tendency to revive the popularity of the Monmouth county resorts which, owing to the foul condition of the beaches during the past few seasons, have fallen into disrepute by many of the summer visitors.

Allenhurst and Loch Arbor deserve commendation for having taken the initiative last season by installing sedimentation tanks with deep-sea outlets. It is believed that this method of treating the sewage will prove satisfactory for a number of years to come. Care should be taken, however, to have the mouth of the outlet pipe well elevated above the bed of the ocean to avoid "sanding" over.

Cases are discovered almost daily where persons, through ignorance no doubt, have laid small sewers or drains discharging into water courses without first having obtained the approval of this Board, and recently, in at least two instances, municipalities were found installing entire sewerage systems, the plans for which had not been approved. Good citizens, who would consider it a crime to discharge their water-closet wastes upon a neighbor's back-lot do not hesitate to deliver the same wastes at his front-door, or even upon his

dinner-table provided it has passed through a few lengths of terra cotta pipe and been diluted with a little water.

Section 6 of Chapter 72 of the Laws of 1900, says "It shall be unlawful for any person, corporation or municipality to build any sewer, drain or sewerage system from which it is designed that any sewerage or other harmful and deleterious matter, solid or liquid, shall flow into any of the waters of this State, so as to pollute or render impure said waters, except under such conditions as shall be approved by the State Sewerage Commission."

Attention to and strict compliance with this law by both municipalities and individuals would save considerable expense to all parties interested.

An inspection has been made of all the public sewerage disposal plants throughout the State, and catch samples of the crude sewage and effluents taken for analysis. Arrangements are now being made whereby composite samples of the raw sewage and effluents from all the disposal plants will be collected and monthly analysis made. This will enable this department to watch closely the work being done by each plant and have such changes made for their betterment as the board deems desirable. A travelling case has been fitted with the necessary apparatus for taking samples and for bacterial work in the field, and by this means the bacterial work and the test for dissolved oxygen are done on the premises. The bacteriological inoculations are brought the same day to the laboratory for incubation, and the samples for chemical analysis are chloroformed at the plant and analyzed later in the laboratory.

The analytical routine follows closely the standard methods, the chief point to be noted being the use of direct nesslerization in lieu of distillation for the estimation of nitrogen.

Owing to the limited number of analyses made this season of catch samples only, it is deemed best not to attempt to make a "percentage of purification" comparison as it might prove misleading.

There are now 39 sewerage disposal plants in operation throughout the State serving either towns or public institutions, with 15 in various states of construction, all of which will probably be in operation before June first next. The majority of these are doing fairly good work as is shown by

the appended table of analyses and the individual reports, but there are others which, owing to the criminal carelessness in the management or to the poor construction, are doing very inferior work. This is specially noticeable at the county institutions, Overbrook excepted.

It is to be regretted that our State does not set an example for cleanliness and have due regard for the health, comfort and property of her citizens by the installation of model purification plants at State institutions which discharge their sewage directly into the streams. Particular attention is called to the conditions at the New Jersey Reformatory, at Rahway, where the crude sewage is discharged directly into the Rahway river; to the New Jersey State Village for Epileptics, at Skillman, which pollutes the Millstone river and the State Camp grounds, at Sea Girt where, during the term of encampment, the sewage and refuse from the entire camp is discharged into a tidal bay of the Manasquan river and which, according to evidence given before the State Sewerage Commission "created such a stink that the people living along the shores were compelled to keep their windows closed on summer evenings."

It is to be hoped that sufficient appropriations will be made this winter to these institutions so as to enable them to at once install proper disposal plants which may be a credit and an honor to our State. The disposal fields at the State Reformatory School at Jamesburg, should be practically rebuilt.

In order to obtain analytical results which are necessary for use in connection with the work done by the Division of Sewerage and Water Supplies, a laboratory is maintained especially for work with sewage and water, as a part of the State Laboratory of Hygiene.

Two analyst-inspectors are employed; one giving his entire time to the examination of sewage while in the laboratory, and inspecting disposal plants outside with a view toward increasing their efficiency. The examination of sewage is made both from a chemical and bacteriological standpoint. The most approved methods are used and accuracy is demanded above all else. It is the desire of the Division to establish periodical examinations of composite samples of both raw sewage and effluents from each disposal plant in the State, and already this work has been started, the results being very gratifying.

The water analyst devotes his time to the examination of samples of water sent to the laboratory and also to the inspection of public water supply plants. Samples from many public supplies are received each month, and it is desired that many more companies will see the value of such work and make application for permission to join the periodical list. Besides water from public supplies, many samples of private wells, sent in by local Boards of Health are received each month.

Analysis of such waters reveals the presence or absence of polluting material, which if present in the water renders it unsafe for use. In addition, all water used by creameries and dairies is examined, thus insuring safe supplies to those engaged in that business. All water analyses are made in accordance with tests approved by the Committee on Standard Methods of the American Public Health Association, both bacteriological and chemical results being given.

The equipment of the laboratory is of the best, and an invitation for inspection is extended to all those interested in such work. The laboratory is maintained for the purpose of obtaining results which may assist in solving questions concerning public health, and a more thorough understanding of its scope cannot help but result in more hearty cooperation upon the part of the general public.

The work has increased at a wonderful rate during the year, and such an increase in the coming year will mean that more men and more space will be required. Two men should remain in the laboratory continually, leaving two for thorough inspection of sewage and water plants, and another room should be provided in order that when necessary all four could work together without the crowding which is now apparent. Such an arrangement would make possible thorough supervision of the plants throughout the State, and also permit the laboratory work to go on without the delays which are now apparent and avoid the crowding which now hinders the work greatly.

The State should also maintain a separate experimental laboratory where problems relating to treatment of trade wastes of all kinds and new methods of sewage and water purification could be worked out successfully.

The laboratories of the State Board of Health are doing good work in all lines, but public pride should see to it that such provisions are made as will render it possible for work better than that of any other State to be done.

Following are detailed reports on various supplies, sewerage systems and disposal plants:

#### PUBLIC WATER SUPPLIES OF NEW JERSEY.

Each year brings a greater need for the careful supervision of public water supplies, and where these are derived from streams it is important that a thorough inspection of the entire watershed should be made at least twice each year, and in some communities more frequently or until the people have learned to respect the rights which others may have to the use of the waters and the laws governing same. The consumer of public water desires to feel safe in using the same for all domestic purposes, and each company should take pride in being able to prove that fact to the satisfaction of all concerned.

Artesian supplies are usually safe to use although not always wholly acceptable to the consumer on account of the extreme hardness or excess of iron. It is in unfiltered surface supplies from rivers, lakes, or shallow wells that most danger lurks, and careful inspection of all such sources should be made often. It should be fully recognized that complete safety may be obtained as regards a surface supply only by proper filtration, unless such stream be entirely protected from the drainage of habitations or animal contamination; a condition which in this State is frequently impossible.

The North and South Branches of the Raritan river from which Flemington, Raritan and Somerville obtain their supplies, are being rapidly freed from sources of pollution and out of over two hundred and fifty cases originally found, less than a score have failed to comply with the orders of this Board, and will require legal action to compel them to do so.

The Delaware river, being an interstate stream, presents a more complicated problem, but as Pennsylvania and New York are working in harmony with us, it is reasonable to expect that greatly improved conditions will soon prevail throughout this watershed.

Purity must be secured at any cost, for the dependence of a community upon its public water supply is so great that any pollution is liable to cause great discomfort, if not real sickness. Too many cases of serious epidemics due to impure water are on record, to cause those in authority to lessen their attempts to secure safe water supplies for towns; on the contrary, more work should be done along this line and all such attempts should be met with the heartiest cooperation upon the part of local authorities or companies.

The railroads are a source of dangerous contamination when they cross or follow beside streams which constitute a water supply.

The toilets of the cars are left unlocked and are freely used, thus becoming a ready means of transmission of typhoid bacilli and other disease germs. The recent epidemic of typhoid at Scranton was traced to a similar source. All passenger cars should be provided with either retention tanks or else some method for thoroughly sterilizing the excrement which is usually deposited along the roadbed or into the streams. In the meantime, the doors of all toilets should be locked while in the vicinity of or crossing water supplies.

The cost of producing and maintaining a safe water supply is small when compared with the loss of health or life due to the use of polluted or impure water. Legislation should give to those in authority more power to cause private companies or municipalities furnishing water to keep the same clean, wholesome and safe, in order that the consumers may feel secure in accepting it for their domestic uses.

During the year the following public supplies have been examined periodically: Asbury Park, Boonton, Bridgeton, Long Branch, Moorestown, Millville, Mount Holly, New Brunswick, Plainfield, Phillipsburg and Rahway.

The following public supplies have been examined at various times during the year: Allentown, Anglesea, Belvidere, Bound Brook, Beverly, Bloomfield, Cape May, Clinton, Collingswood, Cranbury, Dover, Egypt, Elizabeth, Englewood, East Orange, Flemington, Freehold, Gloucester, Haddonfield, Hightstown, Hopewell, Jamesburg, Kearny, Lakewood, Lambertville, Madison, Manasquan, Merchantville, Metuchen, Milford, New Lisbon, Perth Amboy, Passaic, Red Bank, Roebling, Salem, Somers Point, Somerville, South River, Summit, Vineland and Wildwood.

The artesian well supplies throughout the State are in good condition. Various communities served with this kind of water complain because of the hardness of the same, but outside of this feature there is no need to question the supplies as being safe for domestic use. In regard to surface supplies, the same cannot be said. There are many such sources of public water in the State, which, served without any purification to the consumers, are open to continuous suspicion. There are a few which are at present safe, although later may become contaminated.

Some of the surface supplies are filtered and, in most cases, well purified. There are few, however, whose filtration plants are not in best of condition and these should be carefully watched in order to see that the plants do the work required. The mere passing of water through a filter does not purify it unless the filter is clean and in good working order, and sometimes the effluent is worse than the raw water, simply because of the fact that the organic material held back has decomposed and now becomes an additional source of pollution to the water.

The Division of Sewerage and Water Supplies is making periodical analyses of many public water supplies and offers its aid in this direction to any water company desiring to have such work done.

The following table gives the analyses of all the public supplies examined during the year:

TABLE I.—CONTINUOUS RECORD OF ANALYSES OF WATER FROM

DATE.	No.	SOURCE OF SUPPLY.	Color.		Odor, Cold.	Odor, Hot.	Turbidity.	Total Solids.		Loss on Ignition.	Mineral Residue.
			0	1-m				0	0		
June 15, 1908	B 5432	Allentown	30	0	0	0	0	53	40	13	
June 15, 1908	B 5433	"	0	0	0	0	0	59	41	18	
July 20, 1908	B 5440	Anglesea	0	0	0	0	365	529	313	63	
Nov. 7, 1907	B 4620	Asbury Park Kisners	0	0	0	0	96	20	65	67	
Nov. 7, 1907	B 4621	"	0	0	0	0	96	29	67	67	
Dec. 9, 1907	B 4878	"	0	0	0	0	81	18	63	63	
Dec. 9, 1907	B 4880	"	0	0	0	0	92	28	67	67	
Jan. 17, 1908	B 4956	"	0	1-m	0	0	99	27	72	72	
Jan. 17, 1908	B 4957	"	0	0	0	0	81	8	8	73	
Feb. 3, 1908	B 4356	"	0	0	0	0	96	20	65	67	
Feb. 3, 1908	B 4357	"	0	0	0	0	81	18	63	63	
Feb. 3, 1908	B 4358	"	0	0	0	0	71	21	50	50	
Feb. 18, 1908	B 4370	"	0	0	0	0	72	19	53	53	
Feb. 18, 1908	B 4371	"	0	0	0	0	72	29	43	43	
Apr 16, 1908	B 4417	"	0	0	0	0	92	28	67	67	
Apr 16, 1908	B 4418	"	0	0	0	0	102	21	81	81	
Apr 16, 1908	B 4419	"	0	0	0	0	89	12	77	77	
June 5, 1908	B 5309	"	0	0	0	0	92	20	72	72	
June 5, 1908	B 5311	"	0	0	0	0	93	26	67	67	
July 13, 1908	B 5535	"	0	0	0	0	87	27	60	60	
July 13, 1908	B 5536	"	0	0	0	0	79	17	62	62	
Aug. 21, 1908	B 5737	"	0	0	0	0	103	19	94	94	
Sept. 2, 1908	B 4513	"	0	0	0	0	87	15	72	72	
Sept. 2, 1908	B 5559	"	0	0	0	0	0	0	0	0	
Sept. 2, 1908	B 5561	"	0	0	0	0	0	0	0	0	
Sept. 2, 1908	B 4365	"	0	0	0	0	0	0	0	0	
Sept. 2, 1908	B 4367	"	0	0	0	0	0	0	0	0	
Sept. 2, 1908	B 4366	"	0	0	0	0	0	0	0	0	
Oct. 15, 1908	B 5930	"	0	1-m	0	0	0	0	0	0	
Oct. 15, 1908	B 5931	"	0	0	0	0	0	0	0	0	
Oct. 15, 1908	B 6041	"	0	0	0	0	83	20	63	63	
Oct. 15, 1908	B 6042	"	0	0	0	0	85	25	60	60	
Dec. 24, 1907	B 4811	Athenia	0	0	0	0	95	33	62	62	
Apr 14, 1908	B 4547	Belvidere	10	0	0	0	38	24	14	14	
Apr 14, 1908	B 4548	"	10	0	0	0	38	30	8	8	
Apr 14, 1908	B 5247	"	10	0	0	0	34	23	11	11	
Apr 14, 1908	B 5804	"	0	0	0	0	26	29	9	9	
Apr 21, 1908	B 5805	"	0	0	0	0	72	26	36	36	
Aug. 21, 1908	B 5806	"	0	0	0	0	200	62	138	138	
Nov. 15, 1907	B 4842	Bernardsville	0	0	0	0	72	27	45	45	
Mar. 3, 1908	B 4347	Beverly	0	0	0	0	132	64	68	68	
Mar. 3, 1908	B 4348	"	0	0	0	0	136	66	70	70	
Mar. 14, 1908	B 5316	"	0	0	0	0	175	84	91	91	
Oct. 29, 1907	B 4856	Bloomfield	0	0	0	0	0	0	0	0	
Oct. 29, 1907	B 4857	"	0	0	0	0	0	0	0	0	
Oct. 29, 1907	B 4854	"	0	0	0	0	0	0	0	0	
Nov. 12, 1907	B 4913	"	0	0	0	0	0	0	0	0	
Feb. 12, 1908	B 4351	"	0	0	0	0	0	0	0	0	
Feb. 12, 1908	B 4352	"	0	2-v	0	0	0	0	0	0	
July 18, 1908	B 4355	"	20	1-m	0	0	0	0	0	0	
May 1, 1908	B 4454	Boonton	5	0	0	0	57	34	23	23	
Mar. 13, 1908	B 4455	"	0	0	0	0	33	11	22	22	
May 1, 1908	B 5158	"	0	0	0	0	41	27	24	24	
June 24, 1908	B 5156	"	0	0	0	0	0	38	25	13	
June 24, 1908	B 5110	"	20	0	0	0	29	13	16	16	
July 20, 1908	B 5555	"	20	0	0	0	39	25	14	14	
July 20, 1908	B 5556	"	30	1-m	0	0	37	25	12	12	
Aug. 24, 1908	B 5802	"	30	1-m	2	2	101	18	61	61	
Aug. 24, 1908	B 5803	"	15	0	0	0	75	35	43	43	
Aug. 24, 1908	B 5801	"	20	0	0	0	77	34	43	43	

THE PUBLIC SUPPLIES OF NEW JERSEY.—PARTS PER MILLION.

Appearance on Ignition.	Nitrogen as				Chlorine.	Alkalinity.	Hardness, Total.	Iron.	Bacteria per cc. 37°	Red Colonies per cc. 37°	B. Coll. Communis.
	Ammonia.	By Ferrous Ferricyanide in Solution.	Nitrites.	Nitrates.							
Sit dark.	.016	.228	.005	.88	4.00	7.00					
Sit dark.	.016	.154	.003	1.20	4.00	7.00					
No dark.	.528	.132	.002	.20	118.	141.					In 1 cc. Absent.
Black.	.004	.028	.001	.20	8.00	12.00					"
No dark.	.008	.024	.001	.20	4.00	12.00					"
No dark.	.004	.040	.001	.08	3.00	52.00					"
No dark.	.008	.200	.007	.32	8.00	12.00					"
Sit dark.	.000	.032	.002	.32	41.00						"
Sit dark.	.008	.072	.002	.32	5.00						"
Sit dark.	.012	.060	.002	.000	8.00	2.00					"
Sit dark.	.012	.056	.002	.24	8.00	2.00					"
Black.	.016	.064	.001	.32	6.00	2.00					"
No dark.	.004	.040	.000	.000	2.5	40.00					"
Sit dark.	.008	.056	.001	.16	4.5	5.00					"
Sit dark.	.012	.072	.001	.000	4.00	43.00					"
No dark.	.000	.072	.002	.24	6.00	7.00					"
Sit dark.	.004	.032	.001	.24	7.5	15.00					"
No dark.	.004	.012	.002	.08	3.00	42.00					"
Dark.	.012	.052	.000	.12	7.00	17.00					"
Black.	.012	.080	.000	.12	7.5	17.00					"
No change.	.040	.048	.000	.000	10.00	18.00					"
..	.018	.044	.000	.000	10.00	40.00					In 10 cc. Absent.
..	.020	.036	.001	.000	4.00						"
..	.052	.092	.003	.20	9.00						"
..	.024	.112	.002	.12	8.00						"
..	.048	.036	.003	.20	9.5						"
Dark.	.012	.048	.000	.00	10.5	9.0					In 1 cc. Absent.
Dark.	.012	.022	.002	.000	3.5	47.00					"
Dark.	.012	.038	.000	.000	11.00	10.00					"
Dark.	.016	.030	.001	.00	11.0	12.0					"
..	.000	.004	.001	.00	5.00	34.00	47				"
..	.020	.134	.002	.28	1.5	7.00	14.3				"
Sit dark.	.016	.128	.002	.28	1.5	7.00	14.3				"
Sit dark.	.024	.132	.002	.28	1.5	7.00	14.3				In 10 cc.
Sit dark.	.012	.128	.002	.28	1.5	7.00	14.3				"
Black.	.030	.140	.001	.20	2.00	32.00					In 1 cc.
Black.	.032	.134	.002	.20	2.5	150.00					In 10 cc.
..	.080	.080	.000	.00	25.00	35.00					In 0.1 cc.
No dark.	.000	.008	.000	3.20	12.00						"
No dark.	.000	.008	.000	3.20	11.5	2.00	35.1				In 0.1 cc. Absent.
No dark.	.012	.040	.004	3.20	25.00	4.00					"
..	.0	.052	.001	.28							"
..	.004	.004	.002	20.00	14.00						"
..	.0	.032	.014	2.40	36.00						"
..	.004	.020	.001	3.00	12.00						In 1 cc.
..	.004	.032	.002	.000							"
..	.016	.078	.002	2.00	4.5						In 0.1 cc. Absent.
..	.012	.052	.003	.36	3.00						"
..	.012	.098	.002	.20	4.5						"
Sit dark.	.044	.098	.002	.016	3.00	13.00					"
Sit dark.	.006	.104	.002	.12	4.00	8.00					In 10 cc. Absent.
Sit dark.	.000	.082	.001	.08	3.00	6.00					"
Sit dark.	.008	.116	.003	.16	4.00	6.00					"
Black.	.012	.118	.001	.12	2.00	11.00					"
Black.	.008	.118	.001	.12	1.5	11.00					In 10 cc.
Sit dark.	.008	.144	.001	.12	1.0	12.00					"
Sit dark.	.012	.142	.001	.12	1.0	12.00					"
Black.	.030	.168	.003	.120	3.5	36.00					In 1 cc.
Dark.	.008	.210	.002	.000	2.00	31.00					"
Dark.	.052	.170	.002	.04	1.5	31.00					In 0.1 cc.

TABLE I.—CONTINUOUS RECORD OF ANALYSES OF WATER FROM

Table with columns: DATE, No., SOURCE OF SUPPLY, Color, Odor, Cold, Odor, Hot, Turbidity, Total Solids, Loss on Ignition, Mineral Residue. Rows include data for various locations such as Boonton, Bound Brook, Bridgeton, Collingswood, Cranbury, Delaware Water Gap, Dover, East Orange, Englewood, Fanwood, Flemington, Freehold, and others.

THE PUBLIC SUPPLIES OF NEW JERSEY.—PARTS PER MILLION—(Continued).

Table with columns: Appearance on Ignition, Ammonia, By Permanganate in Solution, Nitrites, Nitates, Chlorine, Alkalinity, Hardness, Total, Iron, Bacteria per cc. 37°, Red Colonies per cc. 37°, B. Coll Communis. Rows include various chemical analysis results and their corresponding biological findings.

TABLE I.—CONTINUOUS RECORD OF ANALYSES OF WATER FROM

DATE.	No	SOURCE OF SUPPLY.	Color.	Odor, Cold.	Odor, Hot.	Turbidity.	Total Solids.	Loss on Ignition.	Mineral Residue.
April 30, 1908	B 5301	Gloucester.	0	0	0	0	96	21	82
April 30, 1908	B 4400	"	0	0	0	0	117	44	99
Oct. 26, 1908	B 6088	"	40	0	1-m	3-m	153	58	97
Oct. 22, 1908	B 6087	"	0	0	0	0	183	60	123
Oct. 22, 1908	B 6089	"	0	0	0	0	139	31	108
Mar. 11, 1908	B 4451	Haddonfield.	0	0	0	0	165	38	127
Sept. 17, 1908	B 5888	Highlands.	0	0	0	0	111	47	64
Sept. 17, 1908	B 5889	"	alt	0	0	0	139	31	108
Sept. 17, 1908	B 5990	"	26	0	0	0	28	10	18
Oct. 8, 1908	B 6057	Hightstown.	0	0	0	0	111	47	64
Oct. 8, 1908	B 6058	"	0	0	0	0	28	10	18
Oct. 8, 1908	B 6059	"	0	0	0	0	28	10	18
April 22, 1908	B 5249	Hopewell.	0	0	0	0	33	11	22
Oct. 3, 1908	B 6214	Jamesburg.	0	0	0	alt	0	34	19
Mar. 20, 1908	B 4459	Kearney.	0	0	0	0	56	20	36
Mar. 20, 1908	B 4460	"	0	0	0	0	48	14	34
Mar. 20, 1908	B 4461	"	0	0	0	0	50	4	32
Mar. 20, 1908	B 4462	"	0	0	0	0	36	23	32
May 7, 1908	B 5306	"	0	0	0	0	67	39	28
June 6, 1908	B 5395	"	20	1-m	1-m	alt	67	39	28
Nov. 21, 1907	B 4929	Lakewood.	0	0	0	0	109	30	79
Sept. 9, 1908	B 5978	Lambertville.	0	0	2-m	0	77	22	55
Sept. 9, 1908	B 5979	"	0	0	1-m	1-m	80	24	58
Mar. 5, 1908	B 4349	Long Branch.	5	1-m	1-m	alt	74	38	36
Mar. 5, 1908	B 4350	"	0	0	0	0	90	39	47
June 10, 1908	B 4397	"	0	0	0	0	95	25	70
June 11, 1908	B 5403	"	45	1-e	2-e	alt	91	26	65
July 16, 1908	B 5486	"	65	2-s	3-s	alt	91	26	65
July 16, 1908	B 5487	"	0	0	0	0	95	25	70
July 16, 1908	B 5488	"	65	1-m	2-m	alt	97	27	70
July 16, 1908	B 5489	"	0	0	0	0	89	29	64
Oct. 8, 1908	B 6033	Atlantic Township.	40	1-e	2-e	alt	25	109	35
Oct. 5, 1908	B 6034	Long Branch.	5	5-2-m	3-m	alt	83	35	57
Oct. 5, 1908	B 6035	"	0	0	0	0	164	64	100
June 16, 1908	B 5438	Madison.	0	0	0	0	47	21	26
Mar. 12, 1908	B 4434	Manasquan.	10	0	0	0	47	21	26
Mar. 12, 1908	B 4436	"	10	0	0	0	52	25	33
Mar. 18, 1908	B 4456	Merchantville.	50	1-sul	2-sul	30	55	22	37
Mar. 18, 1908	B 4457	"	15	1-e	1-e	0	41	20	30
Mar. 18, 1908	B 4458	"	15	1-e	1-e	0	49	22	33
June 9, 1908	B 5345	"	30	69	29	30	69	29	40
June 27, 1908	B 5480	"	0	0	0	0	0	0	0
June 27, 1908	B 5481	"	10	0	0	0	0	0	0
June 27, 1908	B 5482	"	0	0	0	0	0	0	0
June 27, 1908	B 5483	"	0	0	0	0	0	0	0
June 24, 1908	B 5476	"	2	1-e	1-e	alt	61	23	38
June 24, 1908	B 5477	"	0	1-e	1-e	alt	60	22	38
June 24, 1908	B 5478	"	25	2-v	3-v	15	47	35	12
June 24, 1908	B 5479	"	450	1-e	1-e	400	203	49	154
July 3, 1908	B 5541	"	0	0	0	0	54	21	33
Aug. 25, 1908	B 5349	"	0	0	0	0	48	16	32
Oct. 20, 1908	B 5961	"	0	0	0	0	23	72	162
May 18, 1908	B 5374	Metuchen.	0	0	0	0	39	26	13
Aug. 10, 1908	B 5883	Millford.	30	2-m	3-m	0	49	29	29
Sept. 3, 1908	B 5839	Milltown.	45	3-m	3-m	0	53	23	30
Sept. 3, 1908	B 5840	"	55	3-m	3-m	0	52	33	19
Sept. 3, 1908	B 5841	"	0	0	0	0	49	27	13
Feb. 1, 1908	B 4329	Millville Peoples.	60	3-m	5-m	0	29	27	20
Feb. 1, 1908	B 4330	Water Co.	45	3-m	3-m	0	29	27	20
Mar. 7, 1908	B 4430	"	0	0	0	0	40	12	28
Mar. 7, 1908	B 4432	Peoples.	13	1-m	2-m	alt	34	29	5
Mar. 7, 1908	B 4433	Water Co.	15	1-m	2-m	alt	31	23	8
Mar. 7, 1908	B 4435	"	15	1-m	2-m	alt	31	23	8

THE PUBLIC SUPPLIES OF NEW JERSEY.—PARTS PER MILLION.—(Continued).

Appearance on Ignition.	Nitrogen as				Chlorine.	Alkalinity.	Hardness, Total.	Iron.	Bacteria per cc. 37°	Red Colonies per cc. 37°	E. Coli Communis
	Ammonia.	By Peroxide in Solution.	Nitrites.	Nitrates.							
No dark.	.004	.060	.000	.000	5.5	35.00	28.5				
No dark.	.114	.086	.002	.000	5.5	35.00	38.5				In 1 cc.
Dark.	.012	.072	.001	0.24	12.5	51.0					
Dark.	.080	.162	.090	0.24	14.0	52.0					In 0.1 cc.
No dark.	.008	.092	.006	6.00	3.00	60.0					
No change.	.012	.032	.002	.040	7.00	96.00	19.00				Absent.
No change.	.012	.036	.001	.48	17.00	24.00					
No change.	.034	.052	0.02	.40	10.00	75.00					
No change.	.022	.036	0.0	0.0	2.5	27.0					
No change.	.020	.032	0.0	0.0	2.5	27.0					
No change.	.022	.032	0.0	0.0	2.5	27.0					
No change.	.024	.094	.001	2.40	5.00						
Slt dark.	.000	.036	.001	0.08	3.5	1.0					
Slt dark.	.000	.036	.002	.08	2.5	7.00					
Slt dark.	.000	.046	.002	.08	2.5	7.00					
Slt dark.	.000	.048	.001	1.2	2.5	7.00					
Slt dark.	.008	.094	.002	12	3.5	7.00					
Slt dark.	.008	.094	.002	12	3.5	7.00					
Slt dark.	.000	.008	.000	4.00	5.00						
Slt dark.	.008	.104	.006	1.20	3.00	64.00					In 1 cc.
No dark.	.016	.128	.002	.40	1.5	10.00					In 10 cc.
Slt dark.	.012	.086	.002	.40	1.5	7.00	18.9				
Black.	.012	.104	.001	.32	7.00	25.00					Absent.
Dark.	.012	.164	.003	.20	10.00	16.00					2.00
Slt dark.	.012	.040	.002	.20	8.00						2.5
Slt dark.	.008	.208	.003	.08	5.00	31.00					2.00
Dark.	.040	.112	.000	.28	5.5	27.0					.000
No change.	.038	.196	.010	.24	9.5	0					4.5
No dark.	.012	.086	.001	.200	7.0	25.0					0.6
No dark.	.000	.024	.004	1.6	5.5	85.00					0.2
No dark.	.044	.148	.002	.000	10.00	1.00					Absent.
No dark.	.000	.056	.001	.60	9.00	1.00					1.2
Slt dark.	.000	.056	.001	.60	3.5	4.00	16.9				4.00
Slt dark.	.000	.056	.001	.60	3.5	4.00	16.9				7
Slt dark.	.020	.084	.008	.72	6.5	3.00					6.00
Slt dark.	.012	.048	.001	.32	3.00						In 0.1 cc.
Slt dark.	.020	.044	.001	.32	3.00						
Slt dark.	.008	.056	.001	.32	3.00						
No dark.	.012	.036	.001	.32	3.00						
No dark.	.008	.070	.001	.20	3.00	9.00					2.5
Slt dark.	.008	.032	.000	.24	3.00	13.00					4.00
Slt dark.	.068	.098	.006	.92	6.00	9.00					27.00
Slt dark.	.024	.142	.000	.24	4.00	9.00					In 0.1 cc.
Slt dark.	.032	.062	.000	.20	2.5						In 10 cc.
No change.	.012	.050	.007	.32	2.00	10.00					Absent.
No change.	.012	.030	0.0	0.16	2.0	13.00					1.1
Black.	.008	.098	.002	.72	3.5	92.00					
Dark.	.044	.168	.001	.000	1.5	17.00					1
Black.	.008	.154	.000	4.00	4.5						In 0.1 cc.
Black.	.068	.198	.003	.000	4.5						In 1 cc.
Dark.	.044	.176	.002	.000	2.5						In 0.1 cc.
No dark.	.000	.008	.001	.000	2.5	3.00					
Black.	.008	.074	.001	.04	3.00	1.00					Absent.
Black.	.012	.078	.001	.04	3.00	1.00					
No dark.	.004	.074	.001	.04	3.00	1.00					
Slt dark.	.004	.028	.000	.16	3.5	1.00					
Slt dark.	.004	.102	.000	.16	3.5	1.00					
Slt dark.	.004	.120	.000	.16	3.5	1.00					







TABLE 1.—CONTINUOUS RECORD OF ANALYSES OF WATER FROM

DATE.	No.	SOURCE OF SUPPLY.	Color.	Olor. Cold.	Olor. Hot.	Turbidity.	Total Solids.	Loss on Ignition.	Mineral Residue.
Aug. 13, 1908.	B 5739	Rahway.	20	2-mus	3-mus	0	170	29	141
Aug. 13, 1908.	B 5740	"	0	0	0	0	197	26	171
Sept. 10, 1908.	B 5928	"	0	0	0	0	185	40	145
Sept. 10, 1908.	B 5929	"	10	2-w	3-w	0	182	40	142
Oct. 22, 1908.	B 5939	"	0	0	0	0	207	63	144
Oct. 22, 1908.	B 6044	"	0	1-e	2-e	set	220	70	150
Aug. 26, 1908.	B 5873	Ridgewood.	0	0	0	0	116	32	84
Aug. 26, 1908.	B 5874	"	10	0	0	0	122	45	77
Jan. 6, 1908.	B 4813	Red Bank.	150	3-sul	3-sul	slt	64	16	48
Jan. 6, 1908.	B 4819	"	20	2-w	3-w	slt	108	43	63
Jan. 6, 1908.	B 4820	"	60	1-sul	3-sul	slt	69	23	46
Jan. 10, 1908.	B 4824	"	25	0	0	0	68	21	47
Jan. 6, 1908.	B 4997	"	200	2-sul	4-sul	50	198	58	140
Nov. 2, 1907.	B 4835	Roebling.	15	1-m	3-m	0	0	0	0
Nov. 2, 1907.	B 4836	"	25	2-m	4-m	0	0	0	0
Nov. 11, 1907.	D 8952	"	0	0	0	set	0	0	0
Nov. 19, 1907.	B 4925	"	0	0	0	0	0	0	0
Nov. 22, 1907.	B 4933	"	0	0	0	0	0	0	0
May 12, 1908.	B 5296	"	10	1-sul	2-sul	13	135	26	109
May 12, 1908.	B 5295	"	0	0	0	0	0	0	0
Apr. 5, 1908.	B 4822	"	0	0	0	0	0	0	0
July 29, 1908.	B 4938	"	0	0	0	0	0	0	0
Oct. 24, 1908.	R 5949	"	0	0	0	0	127	55	72
Oct. 28, 1907.	B 4828	"	0	1-m	2-m	0	0	0	0
Oct. 28, 1907.	B 4829	"	0	1-m	2-m	0	0	0	0
Oct. 28, 1907.	B 4830	"	0	1-w	1-w	0	0	0	0
Oct. 28, 1908.	B 6126	Rumson.	0	0	0	0	30	7	23
Aug. 13, 1908.	D 9449	Salem.	0	0	0	0	0	0	0
Oct. 1, 1908.	B 5742	"	0	0	0	slt	271	57	214
Oct. 1, 1908.	B 5743	"	0	0	0	slt	320	54	266
Oct. 1, 1908.	B 5744	"	5	2-v	3-v	slt	69	30	39
Sept. 9, 1908.	D 9462	"	0	0	0	0	84	20	64
Jan. 15, 1908.	B 4948	Somers Point.	0	0	0	0	189	58	131
Jan. 22, 1908.	R 4898	South Plainfield.	0	0	0	0	152	58	96
Jan. 22, 1908.	B 4899	"	0	0	0	0	149	57	92
Jan. 22, 1908.	B 4900	"	0	0	0	0	31	20	11
Sept. 23, 1908.	B 5959	South River.	0	0	0	0	182	52	130
Sept. 23, 1908.	B 5960	"	0	0	0	0	221	46	175
Oct. 5, 1908.	B 5973	Summit.	0	1-e	2-e	0	110	44	66
Oct. 5, 1908.	B 5974	"	0	0	0	0	220	53	167
Mar. 24, 1908.	B 4468	Vineland.	0	0	0	0	0	0	0
June 26, 1908.	B 5460	"	0	0	0	0	0	0	0
July 20, 1908.	B 5441	Wildwood.	0	0	0	0	603	183	420
July 20, 1908.	B 5442	"	0	0	0	0	567	65	502
July 20, 1908.	B 5443	"	0	0	0	0	565	159	406

THE PUBLIC SUPPLIES OF NEW JERSEY.—PARTS PER MILLION—(Continued).

Appearance on Ignition.	Nitrogen as				Chlorine.	Alkalinity.	Hardness, Total.	Iron.	Bacteria per cc. 37°	Red Colonies per cc. 37°	D. Coli Communis.
	Ammonia.	By Permanganate in Solution.	Nitrites.	Nitrates.							
Black.	.050	.120	.008	.28	8.00	59.00					
Slt dark.	.008	.068	.004	.28	8.00	52.00					In 1 cc.
Slt dark.	.024	.090	.002	.48	8.00	54.00					Absent.
Black.	.046	.142	.009	.32	8.00	71.00					In 10 cc.
Slt dark.	.012	.074	.002	0.12	7.0	81.0					In 1 cc.
Dark.	.028	.128	.008	.04	7.0	86.0					In 10 cc.
Set dark.	.012	.028	.003	.88	3.5	50.00					In 1.0 cc.
No change.	.012	.052	.003	.88	3.5	53.00					Absent.
No dark.	.020	.060	.001	.000	2.00	23.00					6.00
No dark.	.004	.052	.001	.000	5.00	108.00					4.00
Slt dark.	.020	.044	.001	.000	2.00	32.00					3.5
No dark.	.012	.036	.001	.08	3.00	22.00					3.00
Black.	.008	.210	.001	.000	3.5	25.00					15.00
	.004	.032	.001	.60	3.5						
	.008	.084	.003	.28	5.00						In 1 cc.
	.004	.086	.003	.40	3.5						In 0.1 cc.
	.000	.052	.002	.28	5.00						In 1 cc.
	0	.024	.000	.80	1.5						In 0.1 cc.
Slt dark.	.064	.036	.000	.000	4.5						Absent.
	.008	.032	.001	.24	2.5						5.00
	.032	.118	.002	.48	2.5						.24
	.016	.102	.002	.20	3.5						
Slt dark.	.012	.068	.011	0.16	3.5	51.0					In 10 cc.
	.008	.049	.001	.20	4.5						In 0.1 cc.
	.004	.072	.001	.20	4.00						
Set dark.	.004	.024	.002	2.00	8.00						In 1 cc.
	.050	.024	0.0	5.0	5.0	2.0					Absent.
	.160	.050	.006	.08	5.5	165.00					In 1 cc.
Slt dark.	.196	.045	.000	.000	6.00						1.6
Slt dark.	.198	.054	.002	.000	8.00						In 0.1 cc.
Slt dark.	.022	.324	.002	.08	6.00	168.00					2.5
No dark.	.008	.052	.004	.000	6.5						.6
No dark.	.000	.090	.001	.72	1.00	1.00					.000
No dark.	.016	.158	.004	1.60	6.5	74.00					.6
No dark.	.000	.118	.005	1.60	6.5	75.00					4.0
No dark.	.000	.076	.004	1.60	6.5	75.00					4.4
Dark.	.012	.014	.000	.24	2.0	3.00					.0
No change.	.014	.104	.002	.000	2.5	11.00					.8
Dark.	.012	.066	.002	0.16	5.0	95					0.0
No change.	.012	.116	.005	.000	4.5	63					0.13
No change.	.012	.100	.003	1.2	5.0	94					0.1
	.000	.052	.001	1.20	5.5	3.00					7.9
	.020	.020	.002	1.8	5.00	16.00					
No dark.	.960	.138	.002	.000	170.0	81.00					.8
Slt dark.	.960	.248	.008	.000	21.0	177.00					0.0
No dark.	1.170	.196	.002	.000	182	105.00					.5

PRIVATE WATER SUPPLIES.

During the year there have been examined 249 private wells. Of this number, 130 were condemned as unsafe for use, 19 were regarded as suspicious, 41 could be reported as probably safe, and only 50 of the entire number could be passed upon as being really good and above any suspicion. The large number condemned, over 50 per cent., shows very clearly the condition of private wells throughout the State, since the samples examined were from all sections. It is a fact that many epidemics of disease have sprung from the use of polluted well water, and the sooner this source of evil is removed, the better will be the health of communities in general.

The ordinary dug well in this State is nothing more than a shallow hole open to all kinds of surface contamination. Oftentimes cesspools are found within ten or twelve feet and examination of the surroundings has revealed

TABLE 2.—CONTINUOUS RECORD OF ANALYSES OF WATER FROM

DATE.	No.	SOURCE OF SUPPLY.	Color.	Odor, Cold.	Odor, Hot.	Turbidity.
July 10, 1908.	B 5626	Allentown Dairy Association.....	0	0	0	0
June 23, 1908.	B 5399	Alloway, F. Shivers.....	60	1-m	2-m	0
Oct. 2, 1908.	B 5912	Annandale, Marchant Bros.....	0	0	0	0
Oct. 7, 1908.	A 9660	Augusta.....	0	0	0	0
Feb. 11, 1908.	B 4316	Baptistown, Scott.....	0	0	0	0
Feb. 17, 1908.	B 4376	Baptistown, Scott.....	0	0	0	0
Sept. 9, 1908.	B 5903	Barley Sheat, Amwell Dairy.....	0	0	0	0
Aug. 4, 1908.	B 5642	Belle Mead Farmers Exchange.....	0	0	0	0
Oct. 21, 1908.	B 6184	Bloomsbury, C. W. Van Natta.....	0	0	0	0
Sept. 30, 1908.	B 5913	Bridgeton Condensed Milk Co.....	5	0	0	slt
July 24, 1908.	B 5837	Bridgeville, Henry Rauch.....	0	0	0	0
July 21, 1908.	B 5634	Caldwell, H. T. Backes.....	0	0	0	0
Oct. 2, 1908.	B 5910	Califon, C. C. Demarest.....	0	0	0	0
Oct. 21, 1908.	B 6114	Chester, Seiler Bros.....	0	0	0	0
Oct. 2, 1908.	B 5915	Clinton, Jas. Wyoff.....	0	0	0	0
July 23, 1908.	B 5636	Columbus, Sapples & Sons.....	0	0	0	0
July 17, 1908.	B 5832	Cranbury, Middlesex Creamery.....	0	0	0	60
July 16, 1908.	B 5631	Colt's Neck Creamery Co.....	10	1-sul	1-sul	slt
Sept. 2, 1908.	B 5798	Daretown, C. H. Oliphant.....	0	0	0	0
Sept. 2, 1908.	B 5796	Elmer, I. B. Reed.....	0	0	0	0
Sept. 2, 1908.	B 5797	Elmer, C. H. Oliphant.....	0	0	0	0
Oct. 15, 1908.	B 6116	Flemington, Seiler Bros.....	0	0	0	0
Oct. 22, 1908.	B 6119	Flanders, W. McLaughlin.....	0	0	0	0
Oct. 22, 1908.	B 6115	Flanders, Willwood Farm.....	0	1-e	2-e	slt
Oct. 16, 1908.	B 6178	Frenchtown, Harberson Co.....	0	0	0	slt
Oct. 21, 1908.	B 6113	German Valley, J. T. Welch.....	0	0	0	0
Oct. 21, 1908.	B 6185	Hampton Junction, Marchant Bros.....	0	0	0	0
Oct. 5, 1908.	A 9655	Hamburg.....	0	0	0	0
July 10, 1908.	B 5628	Harbourton, S. A. Burns.....	0	0	0	0
Sept. 3, 1908.	B 5628	Harmersville, J. Q. Davis.....	0	0	0	0
July 6, 1908.	B 5168	Hartford, T. Pickett.....	0	0	0	0
Oct. 2, 1908.	B 5914	Hoffman's, I. H. Hoffmann.....	0	0	0	0
July 10, 1908.	B 5630	Hopewell, Hernig & Northrup.....	15	0	0	0
Aug. 6, 1908.	B 5639	Hopewell, Hernig & Northrup.....	0	0	0	0
Oct. 22, 1908.	B 5922	Idell, Wm. Strauss.....	0	0	0	0
Oct. 16, 1908.	A 9665	Lafayette, Newark Milk and Cream.....	0	0	0	0
Oct. 16, 1908.	B 6117	Little-York, Stewart Eckel.....	0	0	0	0
Sept. 29, 1908.	B 5911	Milford, H. Hauptthuner.....	0	0	0	0
Nov. 12, 1907.	B 4908	Monroe, Fulbom Dairy Co.....	40	2-sul	2-sul	25
July 6, 1908.	B 5172	Montgomery, Farmers Ex. Co.....	0	0	0	0
Aug. 6, 1908.	B 5645	Montgomery, Farmers Ex. Co.....	0	0	0	0
Sept. 2, 1908.	B 5649	Monroeville, Atl. City Hyg. Milk.....	0	0	0	0
Sept. 2, 1908.	B 5647	Monroeville, Atl. City Hyg. Milk.....	125	2-e	2-e	25

the fact that the sewage has completely saturated the ground, and is finding its way into the well through direct channels.

Local health officers should not hesitate to close a well if upon analysis it is found to be polluted. In this connection the Division of Sewerage and Water Supplies, of the State Board of Health, is ready when requested by local Boards of Health, to perform such work in connection with private wells as is necessary to determine the condition of the water in question.

CREAMERY SUPPLIES.

During the year 78 samples of water from creameries were examined. Out of this number 15 were reported as unfit for use. The majority of creamery supplies come from driven wells, and such waters are usually found to be safe for use.

The following table gives the result of the analyses made:

THE SUPPLY OF CREAMERIES—PARTS PER MILLION.

Ammonia.	Nitrogen as			Chlorine.	B. Coll. Communis.
	By Permanganate in Solution.	Nitrates.	Nitrites.		
.024	.088	.001	.56	12.0	In 10 cc.
.044	.298	.005	.16	4.5	In 0.1 cc.
.006	.042	.002	1.40	3.00	"
.024	.068	.000	1.40	1.50	Absent.
.000	.032	.007	1.00	39.5	In 10 cc.
.000	.044	.008	1.00	32.5	In 1 cc.
.020	.034	.002	1.00	2.00	Absent.
.000	.014	.002	1.60	13.00	In 0.1 cc.
.024	.048	.002	0.08	1.5	"
.024	.026	.006	2.40	5.5	Absent.
.004	.044	.003	4.00	13.50	"
.008	.048	.001	3.20	10.5	In 1 cc.
.006	.018	.001	0.48	2.00	In 0.1 cc.
.024	.064	.004	0.48	3.00	In 1.0 cc.
.006	.054	.001	3.60	17.00	Absent.
.034	.070	.006	.000	4.5	"
.020	.020	.020	.20	2.5	"
.012	.088	.000	.000	3.00	"
.004	.022	.002	2.40	3.00	"
.122	.100	.006	.80	12.00	In 0.1 cc.
.072	.062	.050	7.20	19.00	Absent.
.116	.024	.008	2.20	14.5	"
.012	.116	.002	0.12	1.5	In 1 cc.
.012	.064	.001	0.44	1.5	In 0.1 cc.
.016	.028	.000	5.60	59.00	Absent.
.014	.028	.001	.08	1.5	"
.008	.028	.001	1.68	8.00	"
.008	.048	.0025	1.00	2.5	In 10 cc.
.016	.062	.004	1.00	3.5	"
High	.054	.001	.000	13.00	Absent.
.032	.096	.003	8.00	10.00	"
.082	.082	.000	0.12	3.10	In 0.1 cc.
.016	.084	.001	1.40	2.5	"
.008	.056	.002	2.00	3.00	In 1 cc.
.024	.028	.003	0.0	8.0	Absent.
.012	.036	.004	.48	1.5	"
.016	.028	.000	.32	2.5	"
.028	.028	.000	.60	2.5	In 1 cc.
.010	.012	.002	.000	4.5	Absent.
.094	.068	.002	.000	21.5	In 0.1 cc.
.008	.044	.001	3.00	16.5	"
.012	.056	.002	3.20	17.5	Absent.
.032	.032	.001	1.80	67.5	"
High	.092	.040	1.60		

TABLE 2—CONTINUOUS RECORD OF ANALYSES OF WATER FROM

DATE.	No.	SOURCE OF SUPPLY.	Color.	Odor, Cold.	Odor, Hot.	Turbidity.
Oct. 5, 1908.	A 9654	Monroe, E. G. Smith.	0	0	0	slt
Oct. 15, 1908.	A 9662	Monroe, Newark Milk and Cream.	0	0	0	0
Oct. 16, 1908.	B 6122	Mt. Pleasant, Geo. H. Scott.	0	0	0	0
Oct. 6, 1908.	A 9656	McAfee, McAfee Creamery.	0	0	0	0
Oct. 22, 1908.	B 6104	Naughtright, Du Bois Bros.	0	0	0	0
July 6, 1908.	B 5169	Femberton, Montgomery & Smith.	250	1-w	2-w	0
Aug. 5, 1908.	B 5641	Femberton, Montgomery & Smith.	150	2-m	2-m	0
Oct. 7, 1908.	A 9661	Papakating.	0	0	0	0
July 8, 1908.	B 5171	Raritan, Raritan Creamery.	0	0	0	0
Oct. 15, 1908.	B 6125	Reaville, Farmers Ex. Co.	0	0	0	0
Oct. 15, 1908.	B 6151	Ringoes, Harberson Dairy.	0	0	0	0
Oct. 23, 1908.	B 6112	Rosemont, Wm. Strauss.	0	0	0	0
Oct. 21, 1908.	A 9668	Roy's Crossing, Fulbarn Dairy.	0	0	0	0
July 24, 1908.	B 5638	Roxbury, E. Worthington.	0	0	0	0
Nov. 18, 1907.	B 4924	Salem, Abbot's Ald. Dairies.	0	1-mus	1-mus	0
Nov. 18, 1907.	B 4925	Salem, Abbot's Ald. Dairies.	0	1-iron	3-iron	slt
Oct. 23, 1908.	B 6124	Salem, J. Q. Davis.	10	1-m	2-m	slt
July 9, 1908.	B 5406	Sergeantville, Wm. Strauss.	0	0	0	0
Aug. 6, 1908.	B 5644	Skillman, J. B. Longshore.	40	0	0	0
Nov. 12, 1907.	B 4730	Sparta, Monroe Creamery.	0	0	0	0
Oct. 16, 1908.	A 9664	Sparta, Geo. Ihnken.	0	0	0	0
Oct. 19, 1908.	A 9669	Sillwater, McDermott.	0	0	0	0
Oct. 12, 1908.	A 9663	Sussex, Horton-Lewis Milk.	0	0	0	slt
Oct. 13, 1908.	B 6103	Sussex, Dennis Reardon.	0	0	0	0
Oct. 21, 1908.	A 9667	Swartwood, Geo. Lodes.	0	1-e	2-e	0
Sept. 9, 1908.	B 5904	Three Bridges, Amwell Dairy.	0	0	0	0
Oct. 6, 1908.	A 9658	Price Crossing, Vernon.	0	0	0	0
Oct. 6, 1908.	A 9657	Vernon Springs.	0	0	0	0
Oct. 16, 1908.	A 9666	Warbasse, H. Lefferwin.	0	0	0	0
Oct. 21, 1908.	B 6183	West Portal, C. W. Van Natta.	5	1-c	2-c	slt
July 9, 1908.	B 5173	Wertsville, Hernig & Northrup.	0	0	0	slt
Aug. 6, 1908.	B 5646	Wertsville, Hernig & Northrup.	20	0	0	slt
Sept. 29, 1908.	B 6002	White House, A. C. Durling.	0	0	0	0
Sept. 2, 1908.	B 5902	Woodstown, C. F. Moore.	0	0	0	0
Sept. 2, 1908.	B 5650	Woodstown, J. McIntyre.	20	0	0	0
			0	0	0	0

THE SUPPLY OF CREAMERIES—PARTS PER MILLION—(Continued).

Ammonia.	Nitrogen as			Chlorine.	B. Coll Communis.
	By Permanganate in Solution.	Nitrites.	Nitrates.		
.012	.074	.002	2.60	5.0	In 0.1 cc.
.012	.070	.002	1.40	4.5	In 1.0 cc.
.004	.036	.005	2.00	2.0	Absent.
.012	.032	.005	2.6	2.5	Absent.
		.001	0.4	4.00	In 0.1 cc.
.022	.182	.001	.12	1.0	Absent.
.004	.184	.006	.40	2.5	In 0.1 cc.
.024	.056	.002	1.20	3.5	In 10 cc.
.008	.098	.00	.48	1.50	Absent.
.012	.024	0.0	.68	3.5	In 1 cc.
.016	.028	.004	0.82	5.0	Absent.
.024	.042	.006	64.28	4.5	"
.068	.034	.002	0.0	11.5	"
.004	.144	.003	.28	18.5	"
.004	.056	.007	.000	2.00	In 0.1 cc.
.000	.012	.002	.000	138.00	Absent.
.014	.028	.002	0.44	2.5	In 10 cc.
.030	.100	.002	.32	6.00	In 1.0 cc.
.020	.040	.003	1.00	6.00	In 0.1 cc.
.004	.046	.001	4.80	3.5	In 10 cc.
.018	.056	.002	0.0	1.00	Absent.
.012	.024	0.0	0.28	1.0	In 0.1 cc.
.008	.024	0.0	2.0	1.5	In 10.0 cc.
.014	.060	0.0	0.28	4.5	Absent.
.108	.122	.010	.04	1.0	In 1 cc.
.010	.034	0.0	.04	2.5	"
.012	.034	0.0	.00	4.0	In 0.1 cc.
.018	.124	.050	.72	3.5	Absent.
.016	.080	.004	1.08	10.00	In 10 cc.
.012	.136	.003	.32	4.0	Absent.
.022	.092	.002	.72	6.5	"
.016	.026	.004	.80	8.00	In 1 cc.
.068	.060	.001	.00	18.5	Absent.
.072	.060	.007	4.8	4.00	"
				22.5	"

## DAIRY SUPPLIES.

195 samples of water from dairies were examined during the year, out of which 115 were condemned as being unfit for use. This large figure is due to

TABLE 3.—CONTINUOUS RECORD OF ANALYSES OF WATER FROM

DATE.	No.	SOURCE OF SUPPLY.	Color.	Odor, Cold.	Odor, Hot.	Turbidity.
Dec. 19, 1907.	C 9675	Audubon, W. A. Sutman.	0	0	0	0
Feb. 4, 1908.	C 9874	Audubon, F. Peters.	0	1-w	2	0
Dec. 20, 1907.	C 9676	Audubon, F. Peters.	0	1-w	0	0
Feb. 13, 1908.	B 4303	Belleville, Jas. Daly.	0	15	25	w
Jan. 22, 1908.	B 4304	Belleville, R. Foyence.	0	0	0	0
Mar. 10, 1908.	C 55	Beverly, J. C. Stuart.	0	0	0	0
Mar. 10, 1908.	C 53	Beverly, J. S. Stewart.	0	0	0	0
Nov. 11, 1907.	C 9499	Blackwood, P. H. Peters.	0	0	0	0
Nov. 12, 1907.	B 4813	Bloomfield, Hallinan Bros.	0	0	0	0
Nov. 12, 1907.	B 4911	Bloomfield, J. L. Thompson.	0	0	0	0
Oct. 29, 1907.	B 4853	Bloomfield, M. L. Thompson.	0	0	0	0
Oct. 29, 1907.	B 4352	Bloomfield, Mrs. Brower.	0	0	0	0
Apr. 6, 1908.	B 4396	Bordentown, John Murphy.	0	1-mus	2-mus	0
Apr. 6, 1908.	B 4905	Bordentown, A. Austin.	0	Le	Le	0
Feb. 14, 1908.	E 1978	Bordentown, E. O. Downs.	0	0	0	0
Dec. 2, 1907.	A 7916	Bound Brook, James Malloy.	0	5-sew	10 sew	slt
Mar. 3, 1908.	A 8341	Branchville, F. Dalrymple.	0	0	0	0
Mar. 3, 1908.	A 8342	Branchville, Geo. Harton.	0	0	0	0
Nov. 4, 1907.	D 8950	Burlington, Geo. Tallman.	0	2 sew	2 sew	0
Dec. 9, 1907.	D 8966	Burlington, Geo. Tallman.	0	0	0	0
Mar. 10, 1908.	C 54	Burlington, A. S. Wills.	0	1-v	1-v	0
Oct. 29, 1917.	D 8937	Chesterfield, Rutherford Potts.	0	0	0	0
July 23, 1908.	B 5635	Chesterfield, Rutherford Potts.	0	0	0	0
Oct. 29, 1907.	B 4386	Chesterfield, C. H. Atkinson.	0	0	0	slt
Oct. 29, 1907.	B 4865	Chesterfield, Chas. F. Sexton.	0	0	0	0
Oct. 29, 1907.	B 4864	Chesterfield, Geo. H. Sexton.	0	0	0	0
Oct. 29, 1907.	B 4363	Chesterfield, Geo. H. Sexton.	0	0	0	0
Oct. 28, 1907.	D 8936	Chesterfield, Walter Oldry	0	0	0	0
Oct. 28, 1907.	D 8935	Chesterfield, Walter Oldry	0	0	0	0
Oct. 28, 1907.	D 8934	Chesterfield, J. B. Black.	0	0	0	0
Oct. 22, 1907.	B 4862	Chesterfield, Chas. Atkinson.	0	0	0	0
Apr. 1, 1908.	B 5192	Chesterfield, Zezeiki Mount.	5	1-v	2-v	0
Nov. 11, 1907.	C 9408	Chews Landing, I. E. Beakley.	0	0	0	0
July 29, 1908.	D 9432	Clark Twp, Isaac Walker.	0	0	0	0
Nov. 21, 1907.	C 9501	Colestown, J. H. Coles.	0	0	0	0
Nov. 20, 1907.	C 9502	Colestown, S. T. Coles.	0	0	0	0
Nov. 20, 1907.	C 9503	Delaware Twp, F. W. Shivers.	0	0	0	0
July 24, 1908.	B 4939	East Milstone, John Schmidt.	25	1-v	2-v	0
Oct. 8, 1908.	B 6118	Elizabeth, Cornelius W. rd.	0	0	0	0
Oct. 19, 1908.	B 6120	Elizabeth, Jacob Emde.	0	0	0	slt
Oct. 19, 1908.	B 5430	Elizabeth, Joe Cornell.	0	1-m	2-m	slt
Oct. 8, 1908.	B 5920	Elizabeth, Matthew McCu.	0	0	0	0
Oct. 8, 1908.	B 5918	Elizabeth, Geo. Eisenrich.	0	0	0	0
Oct. 8, 1908.	B 5919	Elizabeth, Henry Glesbi.	0	0	0	0
Aug. 13, 1908.	D 9451	Elsinboro, Harold Smith.	0	0	0	0
Oct. 7, 1908.	B 5916	Elizabeth, Emil Erman.	0	0	0	0
Feb. 5, 1908.	D 9043	Englewood, P. Holland.	0	0	0	0
Feb. 5, 1908.	D 9042	Englewood, Henry Feeck.	0	0	0	0
Feb. 5, 1908.	D 9044	Englewood, F. G. Simmons.	0	0	0	0
Feb. 5, 1908.	B 4332	Englewood, Henry Cole.	0	0	0	0
Apr. 4, 1908.	B 4903	Ewing, S. Heaths Estate.	0	0	0	0
Apr. 3, 1908.	B 5023	Fernwood, W. Bainbridge.	0	0	0	0
Apr. 3, 1908.	B 5022	Fernwood, W. Bainbridge.	0	0	0	0
Jan. 29, 1908.	B 4893	Flanders, S. M. Drake & Bros.	0	0	0	0
ct. 30, 1907.	B 4832	Florence, Horace Carty.	0	0	0	0

the dependence of the average dairyman upon a supply taken from a shallow dug well usually situated in such a spot that the water cannot help but become hopelessly polluted.

The following table gives the result of the analyses of the dairy wells examined:

THE SUPPLY OF DAIRIES—PARTS PER MILLION.

Ammonia	Nitrogen as			Chlorine.	Alkalinity.	Hardness, Total.	Iron.	B. Coit Communis.
	By Permanganate in Solution.	Nitrites.	Nitrates.					
.004	.066	.003	20.00	19.8				Absent.
.004	.060	.002	24.00	20.5				"
.000	.090	.001	14.00	41.5				"
.000	.066	.000	6.00	7.00				"
.004	.180	.003	6.00	12.5				"
.000	.072	.002	16.00	22.5				"
.000	.072	.000	3.20	2.5				"
.004	.008	.009	3.40	15.5				"
.004	.020	.001	2.60	11.5				"
.004	.052	.002	.000	4.5				In 10 cc.
.004	.024	.005	18.00	29.5				In 1 cc.
.004	.028	.002	10.00	11.00				In 0.1 cc.
.004	.098	.002	16.00	130.5				Absent.
.004	.060	.002	1.80	19.00				"
.000	.110	.000	2.000	12.000	61.00			In 1 cc.
.000	.088	.002	8.00	88.00				"
.012	.106	.002	18.00	39.5				Absent.
.000	.066	.006	2.80	21.00				In 1 cc.
.032	.074	.009	6.80	20.5				In 0.1 cc.
.016	.064	.001	8.00	37.5				In 10 cc.
.004	.040	.001	16.00	15.5				Absent.
.028	.084	.001	3.60	57.00				In 0.1 cc.
1.340	.184	.005	24.00	92.5				In 0.1 cc.
.076	.002	1.00	66.5					Absent.
.028	.005	6.00	39.00					In 1 cc.
.040	.005	12.00	51.00					In 0.1 cc.
.032	.006	12.00	67.00					In 1 cc.
.000	.001	10.00	13.00					"
.000	.020	0.00	2.20	5.5				"
.004	.001	0.00	10.00	24.00				Absent.
3.370	.228	.018	18.00	75.00				"
.008	.025	10.00	60.00					"
.048	.154	.002	2.20	38.00				In 1 cc.
.0	.020	.030	8.00	11.5				In 0.1 cc.
.0	.028	.003	18.00	14.00				Absent.
.0	.048	.004	38.00	59.00				"
.078	.274	.030	4.80	15.5				"
.046	.074	.006	2.60	29.0				In 0.1 cc.
.012	.062	.007	12.8	49.00				In 10 cc.
.052	.060	4.00	62.5					Absent.
.028	.090	.030	4.0	45.0				In 10 cc.
.016	.062	.002	6.00	35.5				Absent.
.020	.054	.000	3.6	19.0				"
.082	.082	.006	5.80	107				In 0.1 cc.
.038	.110	.006	2.80	46.00				"
.016	.056	.002	6.80	41.5				"
.008	.118	.001	6.40	8.5				"
.012	.108	.002	4.80	8.00				Absent.
.012	.188	.008	24.00	30.5				"
.008	.144	.008	3.60	9.5				"
.004	.082	.001	3.60	8.00				"
.004	.252	.004	1.40	8.00				In 10 cc.
.056	.112	.015	8.00	12.5				"
.004	.028	.007	10.00	25.00				Absent.
.004	.088	.001	40	96.5				In 10 cc.

TABLE 3.—CONTINUOUS RECORD OF ANALYSES OF WATER FROM

DATE.	No.	SOURCE OF SUPPLY.	Nitrogen as			
			Colbr.	Odor, Color.	Odor, Hot.	Turbidity.
Oct. 31, 1907.	D 8942	Florence, Alfred D. Stevens.	0	0	0	0
Nov. 2, 1907.	B 4834	Florence, Eugene Carty.	0	2-w	2-w	0
Oct. 30, 1907.	D 8933	Florence, W. Wainwright.	0	0	0	0
Nov. 4, 1907.	D 8948	Florence, W. Wainwright.	0	0	0	0
Oct. 31, 1907.	D 8940	Florence, J. Cavanaugh.	0	0	0	0
Oct. 31, 1907.	D 8941	Florence, D. F. Frazier.	0	0	0	0
Nov. 12, 1907.	D 8933	Florence, W. H. Carter.	0	0	0	0
Dec. 9, 1907.	D 8907	Florence, Horace Carty.	0	0	0	0
Aug. 19, 1908.	B 5783	Franklin, Baker.	0	0	0	slt
Dec. 6, 1907.	B 4764	Franklin, John S. Clark.	10	1-m	2-m	0
Aug. 19, 1908.	B 5787	Franklin, W. H. Pulmley.	0	1-v	2-v	0
Dec. 6, 1907.	B 4762	Franklin, Park W. Garretson.	0	0	0	0
July 16, 1908.	B 4774	Franklin, A. V. Polkemus.	0	0	0	0
Dec. 11, 1907.	B 4763	Franklin, John Sylvester.	0	0	0	0
Aug. 12, 1908.	B 5780	Franklin, Edward Smallley.	0	1-v	2-v	0
Aug. 19, 1908.	B 4962	Franklin, Herman Leonard.	0	0	0	0
Aug. 19, 1908.	B 5949	Franklin, Jacob Levine.	0	0	0	0
Mar. 26, 1908.	C 101	Glassboro, Jos. M. Adams.	0	0	0	0
Mar. 26, 1908.	C 102	Glassboro, J. G. Shults.	0	0	0	0
Feb. 17, 1908.	C 9970	Gloucester, Wm. D. Redrow.	10	1-v	2-v	0
Oct. 22, 1907.	D 8928	Green Grove, John Topper.	0	0	0	0
Oct. 22, 1907.	D 8927	Green Grove, John Topper.	0	0	0	0
Jan. 14, 1908.	C 9734	Haddon Heights, Geo. P. Rapp.	0	0	0	0
Feb. 28, 1908.	C 9989	Haddon Heights, Geo. L. Rapp.	0	1-v	2-v	0
Apr. 24, 1908.	C 284	Haddon Heights, Jas. McGowan.	0	0	0	0
Apr. 25, 1908.	C 285	Haddon Heights, R. S. Brown.	0	0	0	0
Oct. 22, 1907.	D 8925	Hamilton, Aaron L. Smock.	0	0	0	0
Oct. 22, 1907.	D 8926	Hamilton, Romeo White.	0	0	0	0
May 12, 1908.	D 9388	Hamilton, A. Wardell.	0	0	0	0
Sept. 5, 1908.	B 5901	Hamilton, Walter D. Johnson.	0	0	0	0
Nov. 11, 1907.	B 4910	Hampton, Len H. Morris.	0	0	0	0
Aug. 12, 1908.	B 5779	Hillsborough, John Staszak.	0	0	0	0
Aug. 11, 1908.	B 5778	Hillsborough, John Staszak.	0	0	0	0
Aug. 11, 1908.	B 5777	Hillsborough, John G. Voorhes.	10	2-v	3-v	0
Aug. 11, 1908.	B 5776	Hillsborough, John G. Voorhes.	0	0	0	0
Sept. 14, 1908.	B 5980	Hoboken, Salvatore Polizziano.	0	0	0	0
Dec. 16, 1907.	B 4958	Hopewell, C. Shuster.	0	9	0	0
Dec. 16, 1907.	B 4958	Hopewell, C. Shuster.	0	9	0	0
Jan. 17, 1908.	B 4897	Hopewell, C. Shuster.	0	0	0	0
Apr. 2, 1908.	B 5197	Hopewell, Wm. Hildebrand.	25	1-w	2-w	slt
Apr. 2, 1908.	B 5195	Hopewell, Wm. Thompson.	0	0	0	0
Apr. 2, 1908.	B 4995	Hopewell, A. H. Burrows.	0	0	0	0
July 7, 1908.	B 5170	Hopewell, Albert Blackwell.	20	0	0	0
May 25, 1908.	D 9431	Howell, Chas. H. Okerzon.	0	0	0	30
May 25, 1908.	D 9430	Howell, Willard T. Sutphin.	0	0	0	0
Oct. 20, 1908.	B 5180	Hopewell, David Sheppard.	0	0	0	slt
Jan. 2, 1908.	C 9726	Juliestown, F. R. Kelly.	0	0	0	0
Jan. 2, 1908.	C 9727	Juliestown, F. R. Kelly.	0	0	0	0
May 4, 1908.	D 9365	Kingston, E. Sorter.	0	0	0	0
Feb. 17, 1908.	C 9971	Laurel Springs, Wm. Redrow.	0	0	0	0
Aug. 17, 1908.	C 5627	Lawrence, Jennie Phillips.	10	0	0	0
Aug. 25, 1908.	B 5799	Lawrence, Jennie Phillips.	0	1-e	0	0
Aug. 17, 1908.	B 5855	Lawrence, Gertrude Scudder.	0	0	0	0
April 16, 1908.	D 9345	Lawrence, Gertrude Scudder.	0	0	0	0
Aug. 19, 1908.	B 5857	Lawrenceville, A. Pierson.	0	0	0	0
Aug. 19, 1908.	B 5907	Lawrenceville, T. C. Hill.	0	0	0	0
Sept. 17, 1908.	B 5905	Lawrenceville, Gertrude Scudder.	0	0	0	0
Sept. 17, 1908.	B 5905	Lawrenceville, Gertrude Scudder.	0	0-off	4-off	0
Sept. 17, 1908.	B 5908	Lawrenceville, Thos. C. Hill.	0	0	0	0
Sept. 17, 1908.	B 5906	Lawrenceville, Richard Cook.	0	0	0	0
Oct. 21, 1908.	B 5175	Lebanon, The Resd.	0	1-v	2-v	0
Aug. 13, 1908.	D 5175	Lebanon, The Resd.	15	2-v	3-v	25
Feb. 25, 1908.	D 9079	Leonia, Conrad Peck.	0	0	0	0
Aug. 13, 1908.	B 5754	Lower Creek, Wm. M. Hancock.	0	0	0	0
Nov. 4, 1907.	D 8945	Mansfield, Wm. Schieve.	0	1-fh	3-fh	slt

THE SUPPLY OF DAIRIES—PARTS PER MILLION—(Continued)

Nitrogen as						Alkalinity.	Hardness, Total.	Iron.	B. Cell Communis.
Ammonia.	By Ferruginate in Solution.	Nitrites.	Nitrates.	Chlorine.					
.004	.060	.003	1.20	33.5					In 10 cc.
.316	.088	.090	26.00	84.5					In 1 cc.
.0	.024	.065	18.00	24.5					In 10 cc.
.004	.042	.006	18.40	21.5					
.004	.008	.002	6.00	23.00					In 1 cc.
.004	.005	.005	4.8	7.5					In 10 cc.
.076	.002	2.80	40.00						
.048	.152	.005	8.00	15.00					
.000	.114	.012	12.00	39.00					In 0.1 cc.
.164	.120	.090	4.00	3.00					In 10 cc.
.020	.052	.090	6.00	20.00					In 0.1 cc.
.008	.020	.002	.80	6.00					Absent.
.016	.052	.002	.32	3.00					In 10 cc.
.000	.040	.002	2.00	4.5					In 0.1 cc.
.084	.122	.008	1.20	5.00					Absent.
.028	.056	.006	2.40	6.00					In 0.1 cc.
.020	.078	.007	2.80	6.00					In 0.1 cc.
.000	.084	.002	1.80	5.00					Absent.
.032	.072	.008	24.00	39.00					
.004	.080	.002	24.00	48.00					
.0	.060	.005	14.00	28.00					
.0	.040	.001	16.00	17.00					In 0.1 cc.
.000	.066	.004	16.00	64.00					Absent.
.016	.092	.020	12.00	37.00					In 10 cc.
.008	.018	.002	1.20	5.5					Absent.
.008	.126	.003	15.60	95.00					
.004	.116	.002	24.00	90.00					
.004	.138	.112	16.00	118.00					In 10 cc.
.004	.084	.005	3.00	48.5					Absent.
.012	.038	.002	16.80	15.00					In 1 cc.
.000	.024	.002	10.00	7.00					In 10 cc.
.040	.114	.002	1.60	5.5					In 1 cc.
.056	.128	.012	4.00	15.00					In 0.1 cc.
.214	.012	.004	.20	0.5					
.006	.094	.001	3.20	6.00					In 10 cc.
.004	.104	.002	4.00	15.5	37.00	0			Absent.
.008	.138	.004	2.80	13.00					In 1 cc.
.004	.070	.002	3.20	13.5					In 1 cc.
.004	.040	.010	3.60	15.5					In 1 cc.
.008	.068	.001	1.60	28.00					Absent.
.066	.003	1.80	8.5						
.060	.210	.025	3.52	64.5					In 0.1 cc.
.020	.090	.014	16.00	72.00					Absent.
.000	.092	.004	4.00	10.5					In 0.1 cc.
.012	.028	0.0	8.00	18.5					In 10 cc.
.004	lost.	.002	8.00	18.5					Absent.
.048	.108	.002	2.80	58.5					
.000	.056	.002	14.00	17.00					In 1 cc.
.056	.116	.004	15.20	32.00					In 10 cc.
.003	.036	.003	2.80	5.5					In 0.1 cc.
.008	.052	.005	7.20	13.5					In 10 cc.
.000	.024	.002	2.40	5.5					In 10 cc.
.008	.068	.008	4.00	43.00					Absent.
.004	.016	.004	1.20	5.5					
.000	.020	.002	.80	2.00					
.024	.050	.002	2.40	4.5					In 1 cc.
too high	.174	1.000	6.00	23.00					In 0.1 cc.
.008	.016	.001	1.80	4.00					In 1 cc.
.006	.040	.003	2.20	5.5					In 10 cc.
.024	.040	.002	3.60	6.5					Absent.
.056	.330	.005	3.20	6.5					In 1 cc.
.000	.132	.004	24.00	39.5					In 0.1 cc.
too high	.040	.040	4.00	33.00					Absent.
.004	.234	.020	1.20	10.5					In 0.1 cc.





## WATER SUPPLIES OF STATE INSTITUTIONS.

During the year the sixteen State institutions were visited and an inspection made of their various water supplies. Samples were collected and the analyses are given in a table at the end of the report on State Institutions.

## STATE SCHOOL FOR BOYS.

## JAMESBURG.

This school has three sources of supply. First, the so-called old supply from springs underdrained with terra cotta pipe. Springs situated in a small piece of woods on the grounds of the institution. The soil around these springs is very marshy and soft. Water passes into a covered receiving basin made of brick, 8'x12' wide, situated on the edge of a small lake which is connected in such a manner that it may be used for fire purposes if necessary. This supply is apparently open to contamination since the pipes are laid with open joints at various points from 3' to 5' below the surface, and the ground is in such condition that polluting material is liable to enter the line.

A second supply not now in use, is taken from Englishtown Brook, and springs in the ground immediately surrounding the pump house, which is located about  $1\frac{1}{2}$  miles from the buildings on the edge of a cultivated field. On account of iron in this water the supply was cut off in the fall of 1907.

A third supply is called the Monroe supply. This system is composed of tile pipes which drain a large field about a mile from the school, carrying the water thus obtained to a small brook nearby. The brook is open for a quarter of a mile when it is dammed up and a portion of the water carried by a cast-iron pipe a distance of 1,000 feet to a collecting basin beneath a small pump-house. From this basin an electric pump forces the water to a brick and cement reservoir 60'x150' covered with boards and fenced in. This supply is apparently well protected at present, although contamination may take place at various times of heavy rains. All water is pumped to a standpipe 75'x8' covered, holding 30,000 gallons.

Samples of water from all the supplies were taken, also a sample representing the water coming from the standpipe and being delivered to the buildings.

The water for this institution is open to suspicion, and a filtration plant should be installed for the purpose of purifying the supply.

## SCHOOL FOR COLORED CHILDREN AT BORDENTOWN.

Delaware river water pumped direct is used for general purposes. Water for drinking comes from a well in Ironsides Pottery,  $\frac{1}{4}$  of a mile distant. This is collected two or three times a day in casks and distributed through the buildings in pails. The well in question is located under one of the pottery buildings. It is 14'x8', and dug into white sand. From the well it is pumped into a small standpipe and from there distributed to the company's houses, in one of which the School for Colored Children obtain their supply from the tap. Some of the drinking water for the school is stored in open casks in the yard. From one of these a sample was obtained. A second from the well at the pottery and a third from a tap in one of the kitchens delivering Delaware river water. Although the drinking water is probably safe, arrangements should be made for a better method of distribution to the institution, or a new supply sought.

## STATE HOME FOR GIRLS AT TRENTON.

Water is supplied by two artesian wells, 150' deep 4" in diameter, beneath the boiler-house, cased 100' to rock. The water is pumped to a covered tank holding 10,000 gallons. 20,000 gallons used daily.

A sample was collected from tap in boiler-room after water comes from standpipe. This supply is undoubtedly safe for domestic use.

## STATE PRISON.

This institution uses the Trenton Public Supply for all purposes. A sample was obtained from a tap in the Commissary's office.

## NEW JERSEY STATE VILLAGE FOR EPILEPTICS, AT SKILLMAN.

The water supply for the majority of the buildings is derived from an artesian well 475' deep and 10" in diameter. It is cased to rock a distance not given. On account of the hardness of the water, treatment by the use of lime and soda is necessary in amounts determined by the builders of the plant, W. B. Skafe & Company. For this purpose, three wooden tanks are employed each with a capacity of 27,000 gallons where the chemicals are added and allowed to mix with the water. Thorough mixing and sedimentation takes place. From the tanks the water runs to two sand filters filled with about five feet of sand, the tanks being 10'x10' circular, these filters are cleaned by forcing the water back from the bottom. This operation is performed when the engineer deems it necessary. The sediment from the large tanks is removed when about 18" has accumulated.

From the filters the water passes to a covered concrete reservoir of 55,000 gallon capacity, is pumped from this to a covered wooden standpipe of 50,000 gallon capacity and distributed to the mains.

A second well about  $\frac{1}{4}$  of a mile from the first supplies one house, the administration building and the barns. This well is driven 240' x 8" cased to rock. Water is raised directly to a wooden tank and distributed by gravity to the buildings which it supplies. Daily supply 20,000 gallons.

Samples of water before chemical treatment, after treatment and filtration were collected, also a sample from the second well, analyses of which are on file.

The supply is safe but not entirely acceptable on account of excessive hardness.

## NEW JERSEY SANITORIUM FOR TUBERCULOUS DISEASES AT GLEN GARDNER.

The water supply is obtained from five springs, two at a distance of half a mile from the pump-house, piped to a receiving chamber beneath the pump. The other three springs are located from 100' to 150' from the pump-house, and their water simply flows to the receiving chamber through a ground channel. An electric pump forces the water from the collecting basin to a covered cement reservoir of 160,000 gallon capacity, and from this it is fed by gravity to the buildings. It is expected that a mechanical filtration plant will soon be in operation, and it is probable that when this is completed the water will be above any suspicion.

## SCHOOL FOR THE DEAF AND DUMB AT TRENTON.

The general water supply of this institution is the Trenton supply. For drinking purposes, the Trenton water is boiled in a large iron boiler, cooled to some extent by passing through numerous coils of pipe and finally fed into drinking tanks where the water is held in coils of pipe surrounded by ice.

A sample of the general supply was taken from a tap in the wash-room and a sample of the drinking water was obtained from one of the tanks used for that purpose.

## NEW JERSEY STATE HOSPITAL AT MORRIS PLAINS.

The water supply for all buildings except the barns and dairy is obtained from two sources. First, a reservoir known as the Ice Pond, situated about one-quarter of a mile from the main building on the opposite side of the road from the institution. This pond is supplied by springs and a small stream. The capacity of the reservoir is 9,000,000 gallons. Water from this pond is pumped to the distributing mains and also to a small storage reservoir in the rear of all the buildings, known as the garden reservoir. The second source is called the High Service Reservoir. This is situated about 1½ miles from the institution on a high hill. The basin is built of cement both sides and bottom and has a capacity of 9,000,000 gallons. It is fed by 12 springs and a small stream which is apparently well protected from contamination. The basin is fenced in to prevent any animals getting to the water. From this reservoir the water is fed by gravity to the distributing mains.

A third source used only for the stables and dairy is an overflow from the garden reservoir above-mentioned. It is well protected from contamination.

The day's supply of the New Jersey State Hospital at Morris Plains is figured at 500,000 gallons. The pressure is high and good fire protection is obtained. The institution owns the land on both sides of the two small streams used in the water system and endeavors at all times to prevent any pollution. Five samples were collected at the institution and the analyses are now on file.

## THE SOLDIERS HOME AND HOME FOR FEEBLE-MINDED WOMEN.

The Soldiers Home and Home for Feeble-Minded Women, at Vineland, are both supplied by the Vineland Water Company. This supply comes from six 6" driven wells between 120-130' deep and six 4" wells between 100-120'. The plant is located in an open field near the tracks of the Central Railroad of New Jersey, about 1½ miles from the centre of the town. The water is pumped to a covered standpipe in the town and from this distributed.

Samples of water were collected at each of the above mentioned institutions and from a tap in the pumping station of the water company. The analysis of these samples shows the supply to be of good quality.

## SOLDIERS HOME AT KEARNEY.

This institution obtains its water from an artesian well 600' deep by 4" in diameter under pump-house floor. It is cased for a depth of 150'. The well is about 500' from the Passaic river and its bottom is said to be much lower than that of the river. Water is raised by suction and forced to a covered cement reservoir of unknown capacity. From this it is forced by a second pump to a covered wooden tank of about 10,000 gallons capacity and then by gravity to the distributing mains.

A sample of the well water was collected and the analyses is now on file.

## HOME FOR FEEBLE-MINDED CHILDREN.

This institution, situated at Vineland obtains its water supply from 3 driven wells 120'x4" in diameter, cased to bottom with strainer attached to end of pipe. The wells are located in an open space in the rear of the main building and apparently have no source of pollution.

The supply obtained from these wells varies between 80,000 and 100,000 for 24 hours. A covered tank of 50,000 gallons capacity is attached to the pipe line and is used as a receptacle for the excess of water pumped over the necessary supply. Two samples of water were collected, one directly from the pump in the engine-room and a second from a point farthest away from the pumping-station.

The analysis showed the water to be of good quality and safe for potable purposes.

## STATE NORMAL SCHOOL.

The supply for this institution is the regular Trenton supply.

## NEW JERSEY CHILDREN'S HOME AT TRENTON.

The supply for this institution is the regular Trenton supply.

## NEW JERSEY REFORMATORY AT RAHWAY.

The water supply for this institution is the public supply of Rahway, filtered by a series of two pressure filters after entering the building. With this method of double filtration, the water being first filtered at the city plant, it would seem that the supply is in good condition.

## NEW JERSEY STATE HOSPITAL AT TRENTON.

The water supply for this institution is from a set of three driven wells, 260 feet deep, located north-east of the main building near the boiler-house at the new annex. Water is pumped from these wells directly to the mains and also to a standpipe nearby. This standpipe is 140 feet high and 25 feet in diameter and has a capacity of half a million gallons.

It is probable that a new well will be drilled before long since the present supply, although good, is liable to become inadequate as the institution becomes larger.

The following table shows the analyses of the water supplies of the State institutions:

TABLE 4.—CONTINUOUS RECORD OF ANALYSES OF WATER FROM

DATE.	No.	INSTITUTIONS.								
			Color.	Odor, cold.	Odor, hot.	Turbidity.	Total solids.	Loss on ignition.	Mineral residue.	
Apr. 1, 1908.	B 4448	School for Colored Children.	0	0	0	0				
Apr. 1, 1908.	B 4450	" " " "	0	0	0	0				
Apr. 1, 1908.	B 5194	" " " "	15	2-m	3-m	slt				
Apr. 1, 1908.	B 4906	" " " "	0	0	0	0				
Mar. 31, 1908.	B 5178	Tuberculosis Sanatorium.	0	0	0	0				
Mar. 31, 1908.	B 5177	" " " "	0	0	0	0				
Aug. 21, 1908.	B 5859	" " " "	0	0	0	0				
Sept. 10, 1908.	B 5772	" " " "	0	0	0	0				
Oct. 23, 1908.	B 5947	" " " "	0	0	0	0	66	24	42	
Oct. 23, 1908.	B 5948	" " " "	0	0	0	0				
Apr. 7, 1908.	B 5232	Jamesburg.	10	0	0	0				
Apr. 7, 1908.	B 5233	" " " "	10	1-e	0	0				
Apr. 7, 1908.	B 5234	" " " "	10	0	2-e	0				
Apr. 7, 1908.	B 5231	" " " "	10	0	0	0				
Apr. 4, 1908.	B 4549	Soldiers' Home, Kearney.	15	1-v	1-v	slt				
Feb. 18, 1908.	B 4383	Mercer Co. Work House.	0	0	0	0	15			
Feb. 18, 1908.	B 4382	" " " "	0	0	0	0				
Feb. 18, 1908.	B 4381	" " " "	0	0	0	0				
Feb. 25, 1908.	B 4343	" " " "	0	0	0	40				
Feb. 25, 1908.	B 4342	" " " "	0	1-m	m	slt				
Feb. 25, 1908.	B 4341	" " " "	0	0	0	0				
Feb. 25, 1908.	B 4341	" " " "	0	0	0	0				
Apr. 4, 1908.	B 5199	Morris Plains Asylum.	0	0	0	0				
Apr. 4, 1908.	B 5226	" " " "	0	0	0	0				
Apr. 4, 1908.	B 5200	" " " "	0	0	0	0				
Apr. 4, 1908.	B 5227	" " " "	0	1-m	1-m	slt				
Feb. 8, 1908.	B 4336	Rahway Reformatory.	0	1-m	1-m	0				
Apr. 11, 1908.	B 5243	" " " "	0	1-m	1-m	0				
Apr. 16, 1908.	B 5242	" " " "	0	0	0	0				
Apr. 11, 1908.	B 5241	" " " "	0	1-m	1-m	0				
Apr. 6, 1908.	B 4904	Epileptic Village.	0	0	0	0				
Apr. 6, 1908.	B 5228	" " " "	0	0	0	0				
Apr. 6, 1908.	B 5229	" " " "	0	0	0	0				
Mar. 27, 1908.	B 5021	State Hospital.	0	0	0	0				
Mar. 27, 1908.	B 4447	" " " "	0	0	0	0				
Mar. 27, 1908.	B 4446	" " " "	0	0	0	0				
Mar. 27, 1908.	B 4447	" " " "	0	0	0	0				
Sept. 23, 1908.	B 5845	" " " "	0	0	0	0	113	52	61	
Sept. 23, 1908.	B 5846	N. J. State Hospital.	0	0	0	0	128	46	82	
Apr. 6, 1908.	B 5230	State Home for Girls.	0	0	0	0				
Apr. 4, 1908.	B 5251	" " " "	0	0	0	0				
Apr. 1, 1908.	B 5183	State Prison.	15	1-mus	2-mus	30				
Mar. 31, 1908.	B 4470	State School for Deaf.	10	1-m	1-m	slt				
Mar. 30, 1908.	B 4469	" " " "	10	1-m	1-m	slt				
Mar. 24, 1908.	B 4463	Soldiers' Home.	0	0	0	0	38	26	12	
Mar. 24, 1908.	B 4464	Home for Feeble-Minded Child'n	0	0	0	0	44	26	18	
Mar. 24, 1908.	B 4465	" " " "	0	0	0	0	47	32	15	
Mar. 24, 1908.	B 4467	" " " " Women	0	0	0	0	41	31	10	

THE SUPPLY OF STATE INSTITUTIONS.—PARTS PER MILLION.

Appearance on ignition..	Nitrogen as				Chlorine.	Alkalinity.	Hardness, total.	Iron.	SOURCE OF SAMPLE.	B. Coll Communis
	Ammonia.	By permanganate in solution.	Nitrates.	Nitrates.						
..	.008	.060	.001	2.20	14.00				Dug well 17' deep.	Absent.
..	.008	.094	.002	12	11.5				Barrel used for holding drinking water.	In 1 cc.
..	.024	.096	.005	60	2.5				Tap in kitchen.	In 0.1 cc.
..	.004	.032	.000	.28	2.5				Dug well 14' x 8' water used for drinking and cooking.	In 10 cc.
..	.000	.032	.002	1.00	1.00				Tap in kitchen.	Absent.
..	.004	.152	.002	1.00	1.5				Reservoir.	
..	.010	.060	.002	6.00	2.5				Spring in swampy ground.	In 0.1 cc.
..	.004	.018	.000	.88	3.00				Spring.	In 10 cc.
No change.	.012	.054	.002	0.28	1.0	31.0	0.0		Filtered water from tap in kitchen.	In 10.0 cc.
..	.012	.054	.001	0.12	1.0				Small brook to be used as part of water supply.	Absent.
..	.004	.056	.003	20	9.5				Collecting basin.	"
..	.016	.102	.003	3.60	6.00				Small reservoir.	"
..	.012	.106	.003	2.40	6.00				Tap in engine room.	In 10 cc.
..	.052	.139	.004	6.0	5.5				English brook.	"
..	.012	.056	.002	2.40	8.5				Artesian well 600' x 4' pipe, under engine room floor.	Absent.
..	.004	.148	.001	.48	3.5				Tap in Warden's office. Drinking water from spring.	In 1 cc.
..	.028	.080	.000	2.00	6.5				On low ground.	Absent.
..	.024	.182	.001	.48	3.5				Ice pond fed by springs.	In 10 cc.
..	.008	.142	.001	.48	3.5				Dug well 18' x 12'.	Absent.
..	.000	.052	.000	2.00	6.00				Spring from which drinking water is obtained.	"
..	.000	.080	.001	.48	3.5				Tap in Warden's office.	In 10 cc.
..	.016	.114	.002	.12	5.00				Reservoir in garden.	Absent.
..	.028	.128	.002	1.000	4.00				High source reservoir.	In 10 cc.
..	.028	.174	.003	1.00	5.5				Ice pond. Water from springs and small stream.	Absent.
..	.004	.174	.002	.72	4.5				Ice pond near garden reservoir.	"
..	.016	.040	.001	1.20	8.00				Water used in the institution.	"
..	.024	.112	.001	.60	5.5				Tap on mains leading from filters in boiler room.	"
..	.008	.102	.001	.60	6.00				Tap on main leading to filters.	In 10 cc.
..	.008	.102	.001	.48	6.00				Tap in Administration building. Filtered water.	Absent.
..	.008	.036	.008	2.20	11.5		97.1		Artesian well 240' x 8'.	"
..	.012	.084	.002	.28	17.00	106.00	478.5		Artesian well 475' x 10'.	"
..	.016	.072	.003	.28	17.00	36.00	41.6		Same as B 5228.	"
..	.000	.044	.001	1.00	6.00				Well No. 2 collected from tap on pump.	"
..	.000	.044	.001	1.00	6.00				Well No. 3, sample taken from tap on pump.	"
..	.000	.044	.002	1.00	8.00				Well No. 1, sample from tap on pump.	"
No change.	.004	.020	.000	.88	5.00				Main in boiler house.	"
No change.	.004	.008	.000	.60	5.00				Tap in machine shop.	"
..	.000	.056	.001	.20	6.5		60.00		Artesian wells, two in number, each 150' x 4'.	"
..	.008	.084	.003	20.00	65.5				Dug well 25' x 3'.	In 1 cc.
..	.012	lost	.003	.32	1.5				Tap in Commissary office.	Absent.
..	.076	.078	.002	.28	3.00				Sample taken from tap on fountain.	"
..	.008	.078	.002	.28	3.00				Tap in wash room.	In 10 cc.
No darkening.	.004	.046	.001	1.20	5.80				Tap in lavatory.	Absent.
No darkening.	.004	.032	.001	1.60	5.00		14.3		Tap in boiler room.	"
No darkening.	.004	.032	.001	1.60	5.5	1.00	14.3		Tap in milk house. Artesian wells	"
No darkening.	.000	.052	.001	1.20	5.5	3.00	7.9		Tap in boiler house.	"

## SPRING WATERS OF NEW JERSEY.

There are many people in this State who, for various reasons, do not desire to drink the water served through the service pipes in their cities, and this fact leads to the use of bottled spring waters for drinking purposes. In this State there are several such waters sold which are produced within the State. The principal ones are from Watchung Spring in Plainfield, Culm Rock Spring at Pluckamin and Washington Rock Spring at Dunellen.

The following reports of inspections of the three sources of spring water referred to show the condition of the springs in question and the method of preparing the product for market. A table at the close of this report gives the analysis of samples of water collected from the springs at the time of inspection.

## WATCHUNG SPRING WATER.

The water from the Watchung Spring is used in New Jersey probably to as great, if not greater, extent than any other spring water on the market. The spring is located at the base of Watchung Mountain on the main road between Plainfield and Newark, about one-quarter mile back from the road. The nearest house is about one-quarter mile on lower ground than that drained by the spring. At the present time there is an institution for aged nuns being erected at a distance of  $\frac{1}{4}$  mile from the spring on higher ground, but an inspection of the ground shows that any drainage from this building would go in the opposite direction from the spring.

The output of the spring is delivered in two-quart bottles with cork stoppers, two-quart bottles with patent rubber stoppers and five-gallon demijohns. In the summer time there is quite an amount of carbonated water put out by this company and this is delivered in half-pint bottles with patent caps. The manager stated that as regards the small bottles, such as the half-pint and two-quart sizes, it was their custom to sterilize the bottles by passing live steam through them after subjecting them to a washing in a weak solution of sal soda. This sterilization is accomplished by placing the bottles on small spouts connected to a main line of steam pipe and then turning the steam on at the ordinary boiler pressure which is about 25 to 30 pounds. For the five-gallon carboys, the general method is to wash the outside with tepid solution of sal soda and rinse the inside with a solution of sal soda a bit stronger heated to about boiling temperature. When filling the bottles, it is customary to rinse them once or twice with a small amount of spring water and then complete the filling.

The spring, itself, may be divided into two springs. One, a collection spring and the second, a storage spring. The first-named is a circular basin about six feet in diameter, the depth of the water being about two feet. The walls of this basin are stone, filled with plaster or cement and carried up to a sort of a dome-shaped house completely covering the water. The bottom of this spring is left in a natural condition, being sort of a grayish white sand through which the water may be seen bubbling up. From this first, or collecting spring, a galvanized pipe two inches in diameter connects with the storage spring about three feet distant. The storage basin is made of cement sides and bottom and is about 8 feet long by 4 feet wide, and about 5 feet deep, although the water is never allowed to rise to more than two feet, an overflow being provided at this point. The walls of this basin are also built up above the ground to a distance of about 5 feet and a watertight roof provided. This storage basin is cleaned out every two weeks, the water being all drained off and with the aid of a broom the sides thoroughly cleaned, the tank flushed out and then refilled. From the storage tank a galvanized iron pipe two inches in diameter runs to the filling house located about 300 feet distant at a lower level, so that the water runs from the spring by gravity. At the filling-house the pipe is connected to a nickel-plated pipe having two arms, thus admitting

the filling of two bottles at one time. The ends of the pipe are fitted with a filter composed of fine gravel having a copper screen at either end. This filter is about six inches in length by two inches in diameter.

## CULM ROCK SPRING.

The Culm Rock Spring is owned by James Brown, Jr., of Somerville, N. J. It is situated on the main road between Somerville and Pluckamin, about  $\frac{1}{2}$  mile back from the road. The spring, itself, is located half-way up a hill about 400 feet high. The collecting gallery of the spring is a cement basin with sand bottom through which the water bubbles up. The walls of the gallery are built up and extended so as to form a house about 6 feet high by 8 feet long in which is the containing gallery itself, being about 5 feet long by 4 feet wide and 3 feet deep, is located. The water is allowed to run by gravity from this basin to the bottling house about 200 feet distant and about 50 feet lower than the spring itself.

The water from Culm Rock Spring is bottled in two-quart patent-stoppered bottles and also in five-gallon demijohns. During the summertime, the output of the spring is also used in the manufacture of soft drinks. This latter business has been carried on for five years.

The method of washing all bottles is the same; they are first placed in a vat with boiling water and allowed to soak for a short time; they are then scrubbed inside and out with clean hot water (a rough bristle brush, cylindrical in shape being used for the purpose). No soda, lye or other cleansing salt is used. After the bottles are thus cleaned, they are placed on a rack made of small pipes through which a stream of water coming from the spring itself is allowed to pass into the bottles for about three minutes. Judging from the surroundings there is no chance of contamination of the spring in question.

## WASHINGTON ROCK SPRING.

Washington Rock Spring is situated about two miles west of Dunellen, N. J. on what is known as the back road between Bound Brook and Plainfield. So far as could be learned, the water from the spring is used only in the manufacture of soft drinks, and that principally in the summer time. At the time of inspection the bottling establishment was closed and evidently had been closed for some length of time. The spring itself is situated in an open field at the bottom of a small hill. The collecting basin is made of cement about 8 feet long by 4 feet wide by 5 feet deep, the water rising to a level of about 3 feet.

This basin is completely housed over with a wooden structure having a shingle roof with a covered ventilator.

NAME.	DATE.	Color.	Odor, hot.	Odor, cold.	Turbidity.	Total solids.	Loss on ignition.	Mineral residue.	Nitrogen					Iron.	B. Coli Communis.		
									Ammonia.	Ferruginous.	Nitrites.	Nitrates.	Chlorine.			Alkalinity.	Hardness, total.
Watchung Spring..	Feb. 8, 1908.	0	0	0	0	84	34	50	.000	.042	.000	.000	2.00	16.00	22.00	.000	Absent.
Culm Rock Spring..	Feb. 11, 1908.	0	0	0	0	128	34	94	.000	.028	.001	.000	1.5	46.00	56.00	.000	Absent.
Washington Rock..	Feb. 14, 1908.	0	0	0	0	79	46	33	.000	.024	.002	.020	2.5	91.00	95.70	.000	Absent.

## REPORTS OF THE EXAMINATION AND INSPECTION OF PUBLIC WATER SUPPLIES.

## ALLENTOWN PUBLIC WATER SUPPLY.

The Allentown public water supply is taken from a pond fed by Indian Run, a branch of Doctor's Creek which empties into Crosswick's creek at Borden-town. The pond is fed also by underground field drains and small springs.

The pond itself is about 300 feet long by 50 feet wide and its maximum depth is 10 feet. It is situated on the outskirts of the town with no dwelling-houses nearby, and from inspection no visible source of pollution either at the pond itself or the various feeders was found.

The plant is controlled by the borough and consists of a vertical gas engine with a Gould's triplex pump capable of furnishing 250 gallons per minute. This supply is filtered through a Jewel circular mechanical filter of a size 10 feet in diameter, 8 feet high and containing 5 feet of a filtering material. From the filter, water is passed to a storage basin made of concrete, 14 feet in diameter by 12 feet deep. The borough requires a supply of about 30,000 gallons per 24 hours; this is supplied through the mains from a standpipe made of wrought-iron and open at the top, 80 feet high by 12 feet in diameter, allowing a pressure of 52 pounds to the square inch.

The water obtained from the pond is in such condition that no coagulant is used in the process of filtration. The simple method of sand filtration alone apparently being very efficient.

The plant has been in operation for about one year and, at the present time is furnishing public water to about 100 houses.

Two samples were collected at the plant, one a sample of raw water collected from the pond, the second a sample of filtered water which had been in storage in the standpipe, collected from tap in Albert Nelson & Company's hardware store on Main street.

## BEVERLY.

On March 3, 1908, an inspection was made of the Beverly public water supply, said supply being furnished by the Delaware River Water Company. Water is obtained from 5 driven wells of an average depth of 65 feet with a diameter of 8 inches, cased to the bottom and the supply drawn from them by suction entirely. A fine strainer is placed on the end of each suction pipe. The company supplies Beverly, South Beverly, Delanco, Riverside and Edge water Park. Two standpipes are in use, one at Beverly holding 90,000 gallons and the second of about the same size, at Riverside.

The average supply for 24 hours is 400,000 gallons. Arrangements have been made for monthly collection of samples of this water.

## BRIDGETON.

On January 9, 1908, an investigation was made of the Bridgeton public water. The source of supply is 6 driven wells, 3 of which are 50 feet deep and three 80 feet deep; one well driven 215 feet deep and a dug well 28x30 feet. The driven wells are used in summer time only when the demand for water is great. At such times as the driven wells are used, the water from them and the dug well is run into a covered connected gallery 400 feet long, 12 feet deep and 20 feet wide, where the water is aerated before being pumped into the main. At the present time, water is supplied to the town from the dug well only. The reservoir above mentioned is built of iron plates. It is 25 feet high by 30 feet in diameter, and has a capacity of 2,000,000 gallons. It was stated that this was used only for storage purposes and that ordinarily

water was pumped directly from the station into the distributing mains. The normal consumption of the town is 1,250,000 gallons per day.

A sample of water was collected from a tap in the pumping station and analysis made.

## EAST ORANGE.

The water supply is derived from 40 artesian wells situated in the Orange Mountains about 10 miles from East Orange city hall. These wells vary from 110 feet to 260 feet in depth and 6 inches to 8 inches in diameter. The water is for the most part pumped directly from the wells to the city mains, although a small cement-covered reservoir of 5,000,000 gallons capacity is maintained. The pumping-station is equipped with 2 Snow pumps, each having a capacity of 4,000,000 gallons.

The water is supplied to about 28,000 people, the average daily consumption being 2,700,000 gallons.

Arrangements have been made with the Water Commissioner for periodical examination of the water.

Samples of the water for analysis were collected from various sections of the city.

## GLOUCESTER.

The water supply of Gloucester is derived from 28 artesian wells varying in depth from 280 feet to 360 feet, and from 3" to 8" in diameter. The water is pumped from the wells to 4 mechanical filters built by the Pittsburg Filtering Company. No chemical is used in filtering, the water merely passing through the sand which, it is claimed, removes the greater portion of the iron present. The filters have a capacity of 2,500,000 gallons per day. They are washed from 15 to 20 minutes every 12 hours.

The water on leaving the filters goes to an open concrete reservoir of 1,500,000 gallons capacity. A standpipe 75 feet in height and 18 feet in diameter is also maintained for pressure purposes.

Connection is also maintained with Newton creek which flows about 20 feet from the pumping-station. This creek gives every evidence of pollution. At the present time, about 10 per cent. of the water used is taken from this creek. However, the creek is not called upon when the wells are capable of supplying the demand upon them, but at present the flow from the wells is not sufficient to meet that demand.

At the time of inspection, water was being pumped directly from the wells and creek into the city mains. This was due to the fact that the pump delivering water to the filters had broken down. Assurances were given that this was of rare occurrence, and that the raw water would only be pumped into the mains for a short time.

Water is supplied to about 8,000 people, the average daily consumption being 1,500,000 gallons.

Samples of the raw water, the filtered water and the creek water were collected for analysis.

Arrangements were made with the superintendent of the pumping-station for periodical examination of the water.

## HADDONFIELD.

On March 11, 1908, Haddonfield was visited for the purpose of inspecting the public water supply of that town, furnished by the Haddonfield Water Company. This supply is obtained by underdraining an area of 500 to 700 square feet with tile pipe laid with open joints and small terra cotta pipes placed about 2 feet underground and leading into 5 collecting wells made of brick 4 feet in diameter by 6 feet in depth, and from thence carried into a reservoir

built of earth with a capacity of 2,000,000 gallons. This company supplies Haddonfield, West Haddonfield and Hadden Hights. It operates two stand pipes one in Haddonfield proper with a capacity of 150,000 gallons and the other at Goat Hill with a capacity of 80,000 gallons. The average daily supply at the present time is 240,000 gallons, run into the mains of the company at a pressure of between 70 and 75 pounds. There is some chance of this supply being polluted since the area drained is near three dwelling-houses and a fairly large farm, with the slope of the land toward the area drained. The engineer of the plant stated that all sources of pollution known to them to exist on the premises had been removed, and that they were endeavoring in every way possible to keep the supply unpolluted. It is estimated that about two-thirds of the population of Haddonfield use the water supplied by this company. A sample of the water was collected from a tap in the boiler-room of the pumping-station and an analysis made.

There is no system of filtration used, the water being pumped directly from the reservoir into the standpipe and thence into the mains of the company.

## HIGHLANDS.

In response to a complaint entered in this office regarding the condition of the public water supply at Highlands, an inspection of the source of the above-mentioned supply was made on September 17, 1908.

Water for the Borough of Highlands is obtained from 2 driven wells 4" in diameter, one of which is 287 feet deep, the other 213 feet deep, situated on fairly high ground about  $\frac{1}{2}$  mile from the shore of the Shrewsbury rivers. In addition to this, a portion of the supply is drawn from a natural spring which is walled up into a chamber 12x8x20 feet. This spring has a flow of about 60 gallons per minute. The supply proper is a mixture of these water obtained from the 2 artesian wells and the spring.

It is estimated that the daily consumption is about 150,000 gallons per 24 hours. A standpipe is used to equalize the pressure on the mains. This is made of iron and, at present, uncovered although the water company already have plans to cover it before the winter.

A sample of water was taken from the spring, one from a tap in the pumping-station representing a mixture of the two kinds of water and a third, taken from a tap on the premises of Mr. Dorsett, who made the complaint. Analytical figures obtained from these three samples failed to show trace of any polluting matter or substances detrimental to health.

In regard to the sample collected from a tap on Mr. Dorsett's premises, there was some trace of an excess of iron, due perhaps to the fact that this tap is situated near a "dead end" on the main, and the mains have not been properly flushed out since they were put in.

## HIGHTSTOWN.

The water for the town supply is drawn from 4 artesian wells of which only two are used regularly. The wells are all within 400 feet of the pumping-station. They are 6" in diameter and average 250 feet in depth.

The water is aerated at the pumping-station by means of an aerating pump and is then pumped about  $\frac{3}{4}$  of a mile to a standpipe 95 feet high and 10 feet in diameter.

The average consumption is about 150,000 gallons per day. No authoritative figures as to the number of consumers could be obtained. As far as could be ascertained from inquiries made, the water is looked upon with favor by the inhabitants of the town.

Samples of the water for analysis were collected from the pumping-station and from different parts of the town.

## KEARNEY.

On Friday, March 20, 1908, at the request of Doctor J. A. Exton, of the Board of Health, an inspection was made of the water supply of the Town of Kearney. This supply is obtained from Little Falls. Four samples were collected, one at each of the four points of the town and analysis of these samples made.

Arrangements were made for the collection of monthly samples of the town supply.

## LONG BRANCH.

On March 5, 1908, an inspection was made of the public water supply of Long Branch, furnished by the Tintern-Manor Water Company.

This supply is drawn from two sources; in the winter time from a lake formed by the widening of Swimming river and situated at West End, and in the summertime from Newman's springs situated a short distance outside of Red Bank. This company operates a system of filters composed of 10 Hyatt filters of the vertical type, through which water is forced at a pressure of 60 pounds. The plant at Newman's springs is not in operation at the present time, and will not be until the summer colonists of Long Branch begin to arrive. At this plant, a series of Jewell mechanical filters are in operation.

The supply for 24 hours varies from 3,000,000 in the winter time to 7,000,000 gallons in the summertime. The filters in use at West End are cleaned out every 24 hours by forcing water upwards through them. In case of much turbidity in the water a small amount of alum is added, varying from one to three grains per gallon. Arrangements have been made with the local Board of Health to forward a monthly sample of the Long Branch water supply.

## MERCHANTVILLE.

In response to a request sent by Doctor Joseph D. Lawrence, Merchantville, N. J., that place was visited on March 18, 1908, for the purpose of investigating the source of water supply and doing something regarding the complaints which have been made to Doctor Lawrence about the same.

The supply of Merchantville comes from 5 artesian wells, varying between 100 and 150 feet in depth with a diameter of 6 inches. The plant is located on the banks of Pensauken creek about  $1\frac{1}{2}$  miles from the center of the town. It has been in operation for about 10 years. Previous to that time, the water was taken directly from Pensauken creek.

The company maintains two standpipes in the center of Merchantville, the total capacity of the two being 500,000 gallons. The daily supply is 800,000 gallons, furnished at an average pressure, according to contract, of thirty pounds. This water supplies, besides Merchantville, the Towns of Collingswood, Delair and Pensauken.

In regard to the complaints made to Dr. Lawrence, it was learned that the people were objecting to the water on account of its odor and color, these being very variable; the first, from the odor of dead fish to that of earth; the color varying from a slight red to a very deep red, presumably due to iron.

These two features have only been noticed to any great extent during the past ten days or two weeks. Before that time, the water had always seemed to be of good quality and no objections had been made to it. The above conditions may have been due to the fact that when the plant was first built it was with the intention of supplying the Town of Merchantville alone, and now with the supplying of other towns, it may be that too great a strain has been placed upon the wells used for furnishing the water, in this way changing the condition of the supply.

Three samples of water were collected; one from a tap on the pump in the pumping-station, a second from the schoolhouse and the third, from a private dwelling-house where complaint had been made.

Arrangements have been made with Dr. Lawrence for the collection of monthly samples of Merchantville water.

## MILLVILLE.

On Saturday, February 1, 1908, the water supply of the City of Millville was investigated. The public water is furnished by two companies, one the Millville Water Company, the oldest, established about 27 years ago; the second, known as the People's Water Company, established two years ago. The first-named company obtains its water from Union Lake, which is an enlargement of the Maurice river. A filtration plant is operated consisting of 4 mechanical filters. The raw water used is usually of a very high color and the people complain that the water they receive through the mains is usually of high color, and it is the general impression that not all of the water furnished is passed through the filters.

The amount of supply from this company is about 1,000,000 gallons per 24 hours, and they furnish water to about two-thirds of the population of Millville. According to the engineer in charge of the filtration plant, 12 hours are allowed for sedimentation, and the tank is cleaned out about every two or three months. The filters themselves are cleaned every two or three hours according to the turbidity of the water.

A standpipe for obtaining the necessary pressure, which is 57 pounds, is located in about the center of the town. It is made of iron plates and its dimensions are 128 feet in height by 12 feet in diameter; it is uncovered at the top.

The second company, the People's Water Company, obtain their supply from 6 driven wells varying between 100 and 115 feet in depth, all of them having a diameter of 8 inches with a filter attached to the end of each casing about 12 in length. The soil bored through in obtaining each well was of various kinds of sand, no heavy rocks being found in that vicinity.

These wells are all located near the Maurice river in a very marshy place which sometimes is overflowed, the depth of water in such cases varying from three inches to one foot. One well is located about 400 feet from the river bank and the others vary from that distance to 1,000 feet. This company supplies an amount of water varying from 300,000 gallons to 750,000 gallons per 24 hours, and, at the present time, is supplying about one-third of the population of Millville. About a year ago, one-half the population were obtaining their water from the People's Water Company, but on account of a well which contained an excessive amount of iron being connected with the supply, many of the consumers went back to the old company. The standpipe, which is used to obtain the 70-pounds pressure kept in the mains of this company, is made of iron plates and is 120 feet high by 14 feet in diameter.

Samples of the different water supplies of Millville were collected and analysis made. Arrangements have been made for a monthly examination of their supply through the local Board of Health.

## RED BANK.

In accordance with the wish expressed by Dr. B. H. Garrison, Secretary of the Red Bank Board of Health, in a letter addressed to Dr. Henry Mitchell, Red Bank was visited on January 6, 1908, for the purpose of investigating the public water supply of that town.

The source of supply consists of one driven well 600 feet deep and eight inches in diameter, cased to the bottom of the well; also 4 driven wells of a depth of 195 feet and a diameter of 3 inches.

At the present time, the water is being drawn from the 600 foot well only, pumped into a reservoir and then distributed to the mains. This well has been in use since July, 1907, and at different times the inhabitants of Red Bank have complained because the water appeared to them to be very dirty.

On examining the reservoir, it was found that an iron sediment had encrusted the sides and bottom of the basin, varying in thickness between the inch at the extreme top and about six inches at the bottom. It was learned that the reservoir had not been cleaned for a long time. Another complaint of some of the consumers is that oftentimes their pipes are filled with air. Upon close investigation it was found that this applies only to residents of four houses, and that these have connections on the line of pipe which runs from the pumping station to the reservoir and not on the regular distributing mains. The reason for the air in the pipes may probably be found in the fact that the pump forcing the water into the reservoir delivers its volume through a 6-inch pipe into a 12-inch main.

Samples of water were collected from the well now in use at the pumping station, also one of the 4 wells which may be used later, the reservoir, and from a tap in one of the houses where complaint was made of air being in the pipes; also from a tap on the regular distributing mains of the Red Bank Water Company.

Analysis of these were made.

## RIDGECWOOD.

An examination of the public water supply of Ridgewood, furnished by the Bergen Aqueduct Company, was made August 26, 1908. The public supply in Ridgewood is furnished from 3 artesian wells, 212 feet in depth with a diameter of 8 inches. All three wells are cased at the bottom and the suction pipe is fitted with the ordinary type of strainer.

The plant furnishes about 700,000 gallons per 24 hours as an average supply in the height of the summer running somewhat about this figure. The water is pumped directly to the mains of the company with an iron standpipe located in the center of the town as a container for surface water.

By use of this standpipe it is unnecessary to pump continuously during the day. The tank holds a sufficient quantity to keep the pressure at almost an even standard.

There has been some complaint in one section of the town about the water supply. Upon investigation, it was learned that at times, the water in this section became muddy or giving the consumers the idea that it was dirty and perhaps, containing a quantity of iron rust. From analysis, the water taken directly from the artesian wells was found to be of good quality, clean and containing no harmful features.

A sample of water was collected from the kitchen spigot of one of the consumers making complaint, and upon examination this water was found to be slightly turbid and contained a quantity of iron.

Since the pumps of the company are not run continuously and the water, therefore, during such times is drawn from the standpipe alone, it would seem that the standpipe needs cleaning and at such times as the water is drawn from it, there is sediment from the stagnant water in the tank and quantities of iron, probably coming from the sides of the tank or the pipes in close proximity to it.

It would seem probable that a thorough cleaning of the standpipe would result in the elimination of such objectionable features as the consumers now complain about.

## TRENTON.

It is probable that when the Delaware river was first used as a source of water supply for the City of Trenton, conditions above that city were far better than they are now. A careful examination of the river and its tributaries at the present time, however, could scarcely fail to convince the intelligent citizen that the river water in its raw state is totally unfit for potable purposes.

For the purpose of obtaining information regarding the condition of the Upper Delaware, a special inspection was made of that stream during the summer of 1908. Starting from the point where the river enters the State, just below Port Jervis, N. Y., the stream was followed to the intake of the Trenton Water Company and the condition of the water noted at various points, especially where tributaries entered. At Port Jervis, the total raw sewage of the town is carried into the river through four pipes. Besides Port Jervis with a population of about 9,000, there are 11 towns in New York State with an average population of 400, which allow sewage to flow into the stream, only two of which have purification plants.

At Delaware Water Gap, various hotels maintain direct connection with the river, and here also enters Broadhead creek carrying the waste fluids from the towns of Stroudsburg and East Stroudsburg.

Belvidere, with its Pequest creek, adds greatly to the impurity of the water because of the many private pollutions which exist on the stream. From that point only minor pollutions exist until Phillipsburg and Easton are reached. Both of these cities empty their crude sewage into the stream, which shows the effect of the polluting matter thus received for a distance of a mile below the towns.

At Easton, enters the Bushkill river carrying tar and oil in addition to various other kinds of filth. Also at this point enters the wonderful Lehigh bringing the sewage of 12 towns and cities with a total population of 141,000 and in addition, waste water from the coal mines and other sources of industrial pollution. Thus this river is, at times, as black as can be imagined and at other times there is a reddish tinge apparent as it enters the Delaware.

During the inspection of the Delaware river at this point it was noticed that all the houses situated on the banks of the stream used it as a natural garbage repository, throwing therein anything from potato parings to dead cats and dogs, of which latter five were found during the inspection. Even Easton, as a whole, dumped about 150 barrels of garbage into the river until the practice was stopped a short time ago by Dr. Dixon, Health Commissioner of Pennsylvania.

With the Pohatcong, enters the waste from various small towns like Washington, while the Musconetcong brings the filth from towns like Hackettstown and Bloomsbury having a population of 3,000 and 2,000 respectively. At Lambertville, Swan Creek adds much or little filth according to the time of year and flow of the stream. During the year, inspection revealed the fact that over 50 minor sources of pollution existed in this one creek, and the offenders were notified to cease polluting.

The Town of Lambertville itself maintained a city garbage dump on this stream until ordered to clean it up by the State Board of Health.

Below Lambertville, there are many small camping spots, which during the summer and early fall months add their share of garbage and camp refuse to the water.

A table attached to this report gives the analysis of samples of water collected from various points in Trenton during the year. It is to be noted that only twice was the *B. coli communis* absent. This organism comes from the intestines of human beings, and its presence in the water denotes the fact that the supply is being contaminated by fecal discharges. Another fact worthy of notice is that the solids found in the water at the river vary very little from those found on the same day in the water collected from a city tap, thus showing that any straining done has little effect on this feature of the water. This is more forcibly brought to the consumer's attention upon drawing water for a bath.

Without any regard to analytical figures, a casual examination of the river at the point of intake of the Trenton Water Company during the various times in the year could not help but make one hesitate about drinking the liquid.

But it is to be remembered that there is a remedy for all this. Allen Hazen, M. Am. Soc. C. E., in 1900, made a complete investigation of the Trenton water supply with regard to purification, and announced that slow sand filters established in the vicinity of Scudder's Falls would provide a safe public water for the city. Figures were also given showing the cost of such a plant.

Taking into consideration the fact that Trenton is the capitol city of the state, and therefore should have the best possible municipal improvements; that a poor water supply is one of the greatest detriments to a city while a safe water supply is the most valuable asset; and that already the way to such a supply has been pointed out, how can a good citizen hesitate to raise his voice in a protest against the public water supply now in use, and demand that conditions be bettered.

During the year, samples were taken and analysis made monthly of this water, the results of which are shown by the following table. Special attention is called to the fact that out of the ninety-nine (99) samples, only two (2) show the absence of *E. coli*.



TABLE 6—CONTINUOUS RECORD OF ANALYSES OF WATER FROM THE PUBLIC

DATE.	No.	SOURCE OF SUPPLY.	Color.	Over, cold.	Over, hot.	Turbidity.	Total solids.	Loss on ignition.	Mineral residue.
Oct. 23, 1907	B 4744	Delaware river.	20	2-m	4-m	slight			
Oct. 23, 1907	B 4743	Trenton Reservoir.	30	3-m	3-m	slight			
Oct. 23, 1907	B 4745	Pumping station.	20	2-m	4-m	slight			
Oct. 23, 1907	B 4746	Tap, 451 Chesnut street.	20	2-m	3-m	slight			
Oct. 30, 1907	B 4869	Tap, Residence.	15	2-m	4-m	20			
Oct. 30, 1907	B 4868	Trenton Reservoir.	25	3-m	4-m	40			
Oct. 30, 1907	B 4867	Trenton Reservoir.	25	3-m	4-m	30			
Oct. 30, 1907	B 4868	Pumping station.	25	3-m	4-m	30			
Nov. 7, 1907	B 4748	Delaware river.	80	2-m	4-m	50	140	38	102
Nov. 7, 1907	B 4917	Trenton reservoir.	30	2-m	4-m	50	74	28	46
Nov. 7, 1907	B 4748	Tap, Stockton street.	30	2-m	4-m	50	79	29	49
Nov. 7, 1907	B 4747	Pumping station.	60	3-w	70	142	28	114	
Nov. 14, 1907	B 4871	Trenton reservoir.	15	2-m	4-m	slight	44	28	42
Nov. 14, 1907	B 4873	Delaware river.	15	2-m	4-m	slight	51	31	48
Nov. 14, 1907	B 4872	Pumping station.	15	2-m	4-m	slight	51	31	48
Nov. 14, 1907	B 4807	Tap, 402 Broad street.	15	2-m	4-m	slight	51	31	48
Dec. 13, 1907	B 4964	Tap, 45 Southard street.	15	2-m	4-m	slight	51	31	48
Dec. 13, 1907	B 4965	Pumping station.	40	3-w	5-w	30	81	27	54
Dec. 13, 1907	B 4966	Delaware river.	40	3-w	5-w	60	206	107	99
Dec. 18, 1907	B 4942	Delaware river.	10	2-m	3-m	20	67	25	42
Dec. 18, 1907	B 4941	Trenton reservoir.	10	2-m	3-m	20	67	25	42
Dec. 18, 1907	B 4940	Tap, 38 Grant avenue.	10	2-m	3-m	20	66	25	41
Dec. 18, 1907	B 4943	Pumping station.	20	2-w	3-w	30	60	26	34
Jan. 6, 1908	B 4946	Delaware river.	10	1-m	2-m	slight	70	28	42
Jan. 6, 1908	B 4945	Trenton reservoir.	10	1-m	2-m	slight	84	30	54
Jan. 6, 1908	B 4944	Tap, private residence.	10	1-m	2-m	slight	58	22	36
Jan. 6, 1908	B 4947	Pumping station.	10	1-m	2-m	slight	78	24	54
Jan. 16, 1908	B 4950	Tap, 424 Princeton avenue.	30	2-w	4-w	60	87	30	57
Jan. 16, 1908	B 4949	Trenton reservoir.	30	2-w	4-w	60	105	22	43
Jan. 17, 1908	B 4955	Pumping station.	15	2-mus	5-mus	slight	59	16	43
Jan. 17, 1908	B 4956	Delaware river.	15	2-mus	5-mus	slight	273	33	40
Jan. 23, 1908	B 4308	Pumping station.	30	1-w	3-w	slight	70	28	42
Jan. 23, 1908	B 4307	Tap in State House.	10	2-w	4-w	slight	68	25	43
Jan. 28, 1908	B 4313	Pumping station.	0	1-w	2-w	0	91	40	51
Jan. 28, 1908	B 4314	Tap in State House.	0	1-m	2-m	0	75	34	41
Feb. 4, 1908	B 4360	Pumping station.	0	0	0	slight	91	36	55
Feb. 4, 1908	B 4361	Tap in State House.	0	0	0	slight	84	32	52
Feb. 13, 1908	B 4374	Pumping station.	10	1-m	1-m	0	93	43	50
Feb. 13, 1908	B 4375	Tap in State House.	10	1-m	1-m	0	87	31	46
Feb. 21, 1908	B 4386	Tap in State House.	10	1-m	2-m	15	80	29	51
Feb. 21, 1908	B 4385	Pumping station.	20	2-m	4-m	15	84	27	57
Feb. 28, 1908	B 4490	Pumping station.	20	2-m	4-m	15	80	29	51
Feb. 28, 1908	B 4490	Tap in State House.	10	1-m	2-m	60	157	34	123
March 20, 1908	B 4418	Pumping station.	20	1-m	2-m	60	133	29	104
March 20, 1908	B 4416	Pumping station.	20	1-m	2-m	40	135	28	108
April 9, 1908	B 5273	Tap in State House.	15	1-m	1-m	15	76	18	58
April 9, 1908	B 5274	Tap in State House.	10	1-m	2-m	slight	67	28	39
April 25, 1908	B 4399	Tap in State House.	10	1-m	2-m	slight	49	27	22
April 25, 1908	B 5275	Pumping station.	10	0	0	0	53	23	36
May 2, 1908	B 5313	Tap in State House.	15	1-m	2-w	30	51	22	29

SUPPLY OF TRENTON, OCT. 23RD, 1907, NOV. 1ST, 1908—PARTS PER MILLION.

Appearance on ignition.	Nitrogen as					Iron.	Bacteria per cc. 37°	B. Coli Communis.
	Ammonia.	By permanganate in solution.	Nitrates.	Nitrates.	Chlorine.			
.....	.004	.076	.002	.40	3.5	.....	.....	In 1 cc.
.....	.004	.096	.003	.40	3.5	.....	.....	.....
.....	.004	.072	.002	.40	3.5	.....	.....	.....
.....	.004	.076	.002	.40	3.5	.....	.....	.....
.....	.004	.130	.002	.28	3.5	.....	.....	In 10 cc.
.....	.004	.130	.002	.28	3.5	.....	.....	In 0.1 cc.
.....	.004	.082	.002	.28	4.00	.....	.....	In 1 cc.
.....	.004	.154	.002	.28	4.00	.....	.....	In 0.1 cc.
Blackened	.004	.108	.002	.28	4.5	12.00	.....	In 1 cc.
Blackened	.004	.076	.002	.28	4.5	12.00	.....	In 0.1 cc.
Blackened	.004	.056	.002	.28	4.5	12.00	.....	In 1 cc.
Blackened	.004	.162	.002	.28	4.5	12.00	.....	In 0.1 cc.
Blackened	.004	.102	.001	.40	3.5	12.00	.....	.....
Blackened	.004	.082	.001	.40	3.5	19.00	.6	In 1 cc.
Blackened	.004	.082	.001	.40	3.5	19.00	.5	.....
Blackened	.004	.116	.001	.40	3.5	19.00	.9	.....
Darkening	.004	.158	.002	.40	2.00	7.00	1.00	In 10 cc.
Darkening	.004	.188	.002	.20	2.00	7.00	2.00	In 1 cc.
Darkening	.004	.188	.002	.20	2.00	6.00	1.5	In 10 cc.
Darkening	.004	.120	.002	.16	2.00	20.00	.7	In 1 cc.
Darkening	.004	.102	.002	.08	2.00	20.00	7.00	In 10 cc.
Darkening	.004	.102	.004	.18	2.00	20.00	.6	In 1 cc.
Darkening	.004	.120	.004	.16	2.00	20.00	.7	.....
Darkening	.004	.088	.002	.60	2.00	20.00	8	170
Darkening	.012	.120	.002	.60	2.00	20.00	.6	70
Darkening	.004	.084	.002	.60	2.00	20.00	.8	190
Darkening	.012	.112	.002	.60	2.00	20.00	1.6	145
Blackening	.008	.104	.002	.40	1.5	4.00	1.5	87
Blackening	.008	.104	.002	.40	1.00	4.00	1.3	130
Darkening	.008	.092	.002	.40	1.5	17.00	.6	58
Blackened	.008	.092	.002	.40	1.5	17.00	.6	58
Darkening	.004	.066	.002	.60	1.5	22.00	.4	130
Darkening	.004	.098	.002	.40	1.5	22.00	.4	47
Darkening	.008	.074	.001	.48	3.00	15.00	.4	In 10 cc.
Darkening	.008	.096	.001	.48	3.00	21.00	.4	30
Darkening	.008	.154	.001	.60	1.00	32.00	.3	52
Darkening	.008	.158	.001	.60	1.00	38.00	.4	50
Darkening	.004	.090	.002	.50	1.5	23.00	1.1	.....
Darkening	.004	.090	.002	.60	1.5	20.00	.2	.....
Blackening	.016	.164	.001	.40	1.00	14.00	.8	36
Blackening	.016	.130	.001	.48	1.00	14.00	.8	36
Blackening	.020	.168	.001	.20	2.00	10.00	4.00	44
Blackening	.024	.148	.001	.28	2.00	10.00	3.2	38
Blackening	.004	.104	.002	.28	2.5	13.00	3.00	.....
Darkening	.004	.090	.002	.28	2.5	13.00	.7	In 10 cc.
Darkening	.028	.112	.003	.28	2.5	17.00	.4	In 0.1 cc.
Darkening	.018	.108	.003	.28	2.5	17.00	.3	In 10 cc.
Darkening	.008	.078	.002	.32	4.5	16.00	.2	.....
Darkening	.008	.084	.002	.32	4.5	16.00	.2	.....
Blackened	.036	.124	.002	.16	3.00	19.00	.7	In 0.1 cc.

TABLE 6—CONTINUOUS RECORD OF ANALYSES OF WATER FROM THE PUBLIC

DATE.	No.	SOURCE OF SUPPLY.	Color.	Odor, cold.	Odor, hot.	Turbidity.	Total solid.	Loss on ignition.	Mineral residue.
May 2, 1908	B 5314	Pumping station.	5	1-m	2-m	slight	59	27	32
May 8, 1908	B 5321	Pumping station.	10	1-c	2-c	150	274	55	219
May 8, 1908	B 5322	Tap in State House.	10	1-c	1-c	slight	53	24	34
May 15, 1908	B 5325	Tap in State House.	20	1-m	2-m	slight	54	19	35
May 15, 1908	B 5324	Pumping station.	35	1-m	2-m	slight	106	27	79
May 21, 1908	B 5330	Tap in State House.	10	1-m	1-m	slight	66	26	40
May 21, 1908	B 5331	Tap in State House.	20	1-c	2-c	30	90	28	64
May 27, 1908	B 5382	Pumping station.	10	1-m	1-m	slight	54	25	29
May 27, 1908	B 5379	Pumping station.	10	1-m	1-m	slight	72	33	39
June 5, 1908	B 5398	Tap in State House.	10	1-m	2-m	0	76	33	43
June 5, 1908	B 5398	Tap in State House.	25	1-m	2-m	slight	60	26	24
June 12, 1908	B 5405	Tap in pumping station.	10	0	0	0	69	21	43
June 12, 1908	B 5404	Tap in State House.	10	0	0	0	64	20	44
June 19, 1908	B 5418	Tap in State House.	20	1-m	2-m	slight	101	42	59
June 19, 1908	B 5411	Pumping station.	30	2-m	3-m	slight	84	46	38
June 26, 1908	B 5400	Pumping station.	20	1-m	2-m	0	78	44	34
June 26, 1908	B 5354	Tap in State House.	20	1-m	2-m	0	76	37	39
July 3, 1908	B 5353	Tap in State House.	7	1-m	1-m	0	87	25	62
July 3, 1908	B 5552	Tap in pumping station.	20	1-m	2-m	15	94	28	66
July 5, 1908	B 5554	Tap 147 Broad street.	2	2-off	3-off	slight	85	43	45
July 11, 1908	B 5580	Tap in State House.	10	1-m	2-m	slight	88	27	61
July 11, 1908	B 5579	Pumping station.	15	1-m	2-m	10	90	30	60
July 17, 1908	B 5563	Pumping station.	20	1-m	2-m	slight	115	58	57
July 17, 1908	B 5566	Tap in State House.	20	1-m	2-m	slight	108	55	53
July 25, 1908	B 5573	Tap in State House.	0	1-m	2-m	0	117	51	66
July 31, 1908	B 5716	Tap in State House.	5	1-m	2-m	slight	93	42	52
July 31, 1908	B 5575	Pumping station.	5	1-m	1-m	slight	94	42	52
Aug. 7, 1908	B 5718	Pumping station.	10	1-m	2-m	0	99	25	74
Aug. 7, 1908	B 5718	Tap in State House.	10	1-m	1-m	0	93	34	59
Aug. 14, 1908	B 5827	Tap in State House.	30	1-m	1-m	0	103	15	88
Aug. 14, 1908	B 5826	Pumping station.	0	1-m	1-m	0	103	28	75
Aug. 21, 1908	B 5861	Pumping station.	10	1-m	1-m	0	111	39	72
Aug. 21, 1908	B 5862	Tap in State House.	10	1-m	1-m	0	105	33	72
Aug. 27, 1908	B 5892	Pumping station.	10	1-m	1-m	0	115	50	65
Aug. 27, 1908	B 5893	Tap in State House.	30	2-m	3-m	60	111	62	49
Sept. 3, 1908	B 5976	Pumping station.	0	1-m	2-m	0	104	28	78
Sept. 3, 1908	B 6009	Tap in State House.	0	1-m	2-m	0	100	24	76
Sept. 19, 1908	B 6023	Tap in State House.	10	1-w	2-w	0	116	44	72
Sept. 25, 1908	B 6022	Pumping station.	0	1-m	2-m	0	143	66	77
Sept. 25, 1908	B 5966	Tap in State House.	0	1-m	2-m	0	145	84	61
Sept. 29, 1908	B 5986	Tap in State House.	5	1-m	2-m	slight	131	45	86
Sept. 29, 1908	B 6080	Tap in State House.	5	1-m	2-m	slight	140	47	93
Oct. 13, 1908	B 6079	Pumping station.	0	1-m	2-m	0	101	41	60
Oct. 19, 1908	B 5668	Tap in State House.	0	1-m	2-m	0	105	37	68
Oct. 19, 1908	B 5667	Pumping station.	0	1-m	2-m	0	107	39	68
Oct. 27, 1908	B 6212	Tap in State House.	0	1-m	2-m	0	109	39	64
Oct. 27, 1908	B 6211	Pumping station.	0	1-m	2-m	0	122	50	72
Oct. 30, 1908	B 6221	Tap in State Laboratory.	5	1-m	2-m	40	142	53	89
			0	1-m	2-m	slight	108	40	68

SUPPLY OF TRENTON, OCT. 23d 1907, NOV. 1st, 1908—PARTS PER MILLION.

Appearance on ignition.	Nitrogen as				Chlorine.	Alkalinity.	Iron.	Bacteria per cc. 37°	B. Coli Communis.
	Ammonia.	By permanganate in solution.	Nitrates.	Nitrates.					
Darkening.	.016	.084	.002	.16	3.00	19.00	.3		In 0.1 cc.
Blackened.	.012	.244	.001	.16	2.00	15.00	5.5		In 0.01 cc.
Blackened.	.014	.106	.001	.16	2.00	15.00	.3		In 0 cc.
Darkening.	.008	.102	.002	.24	2.00	14.00	.3		Abs mt.
Darkening.	.016	.122	.002	.24	2.00	14.00	1.8		In 1 cc.
Darkening.	.024	.124	.001	.21	2.00	14.00	.3		In 0.1 cc.
Blackening.	.016	.132	.001	.21	2.00	14.00	.5		In 1 cc.
Blackening.	.004	.086	.002	.12	2.5	18.00	.3		In 1 cc.
Blackening.	.004	.098	.005	.12	2.5	18.00	.4		In 1 cc.
Blackening.	.004	.108	.002	.20	2.00	17.00	.3		In 1 cc.
Blackening.	.004	.080	.002	.24	2.00	17.00	.3		In 1 cc.
Darkening.	.028	.134	.004	.16	2.5	36.00	.0		In 10 cc.
Darkening.	.010	.092	.002	.16	2.5	32.00	.2		In 10 cc.
Darkening.	.012	.134	.009	.24	2.00	35.00	.4		In 0.1 cc.
Darkening.	.012	.174	.008	.12	1.00	35.00	.4		In 0.1 cc.
Blackening.	.018	.112	.006	.28	2.5	46.00	.5		In 1 cc.
Blackening.	.012	.078	.003	.28	2.5	37.00	.2		In 0.1 cc.
Darkening.	.024	.128	.001	.24	3.00	47.00	.1		In 1 cc.
Blackening.	.024	.134	.005	.28	3.00	51.00	.2		In 1 cc.
Darkening.	.024	.102	.006	.20	3.00				In 1 cc.
Darkening.	.008	.080	.002	.20	3.00	47.00			In 10 cc.
Darkening.	.024	.148	.003	.16	3.00	47.00			In 0.1 cc.
Darkening.	.008	.142	.006	.16	3.00	52.00	.1		In 10 cc.
Darkening.	.032	.110	.003	.20	2.00	47.00	.1		In 10 cc.
Darkening.	.008	.116	.004	.28	3.00	48.00	.1		In 1 cc.
Blackening.	.008	.104	.002	.48	0.5	46.00	.2		In 1 cc.
Blackening.	.012	.118	.004	.48	1.00	46.00	.2		In 0.1 cc.
Darkening.	.024	.160	.008	.24	2.00	54.00	.4		In 10 cc.
Darkening.	.024	.204	.002	.24	2.00	47.00	.2		In 10 cc.
Blackened.	.030	.104	.003	.20	4.00	53.00	.3		In 10 cc.
Blackened.	.030	.142	.008	.20	4.00	53.00	.2		In 0.1 cc.
Blackened.	.028	.152	.006	.20	4.00	57.00	.2		In 1 cc.
Blackened.	.032	.154	.001	.20	4.00	57.00	.0		In 10 cc.
Blackened.	.012	.146	.005	.28	3.00	34.00	1.2		In 0.01 cc.
Blackened.	.012	.112	.004	.28	3.00	52.00	.6		In 0.1 cc.
Darkening.	.024	.110	.004	.08	3.5	5.8	.2		In 10 cc.
Darkening.	.022	.110	.001	.12	3.5	5.8	.2		Absent.
Darkening.	.012	.078	.003	.20	4.00	64.00	.0		In 10 cc.
Darkening.	.012	.078	.002	.28	4.5	65.00	.0		In 0.1 cc.
Darkening.	.014	.072	.006	.28	4.5	65.00	.0		In 0.1 cc.
Darkening.	.016	.080	.006	.28	4.5	66.00	.4		In 0.1 cc.
Darkening.	.024	.098	.007	.28	4.00	65.00	.5		In 0.01 cc.
Darkening.	.014	.080	.002	.08	4.5	64.00	.2		In 10 cc.
Darkening.	.014	.106	.002	.08	4.5	64.00	.2		In 10 cc.
Darkening.	.012	.098	.000	.16	3.00	65.00	.2		In 10 cc.
Darkening.	.016	.102	.008	.16	3.0	65.00	.2		In 1 cc.
Darkening.	.012	.084	.000	.20	3.5	55.00	.3		In 0.1 cc.
Darkening.	.012	.128	.003	.20	3.5	55.00	1.0		In 0.01 cc.
Darkening.	.012	.086	0	0.2	3.5	54.00	0.3		In 0.1 cc.

## SEWERS, DRAINS AND DISPOSAL SYSTEMS.

## ALLOWAY CREEK.

At a meeting of the State Sewerage Commission held January 16, 1908, a communication was received from W. B. Dunn, City Recorder of Salem, complaining of pollution of the Salem City water supply by drainage from the property of Burgoyne Cuff at Quinton, and the secretary was directed to notify Burgoyne Cuff to show cause at a meeting of the Commission to be held January 23, 1908, why he should not be notified to cease polluting Alloway creek.

At a meeting of the Commission held February 6, 1908, Commissioner Chew reported that he had investigated the pollution at Alloway creek complained of by the authorities of the City of Salem, and had found that drainage from property occupied by Charles Cuff, at Quinton, was permitted to discharge into the water supply of the City of Salem, causing a serious nuisance and possible injury to health.

On motion, the following resolution was unanimously adopted: WHEREAS, The State Sewerage Commission has found that the waters of Alloway creek are being polluted to the injury of inhabitants of this state in their health, comfort and property, therefore, BE IT RESOLVED, That in accordance with the provisions of Chapter 72 of the Laws of 1900, and the supplements and amendments thereto, the State Sewerage Commission hereby notifies Charles Cuff to cease polluting the waters of Alloway creek prior to April 1, 1908, and to make such disposition of his sewage and other polluting matter as shall be approved by this Commission.

The secretary was directed to have a notice in writing served in accordance with the foregoing resolution.

At a meeting of the Commission held April 16, 1908, a communication was received from Robert Gwynne, Jr., Mayor, and William Guest, Water Superintendent of the City of Salem, thanking the Commission for its action in stopping pollution of the Salem water supply.

## ASYLA.

At a meeting of the State Sewerage Commission held November 7, 1907, Messrs. Jacobson and Chew, as a committee, were appointed to consult with the authorities of Camden county in relation to a sewage disposal plant at Asyla.

At a meeting of the Commission held December 5, 1907, Messrs. Jacobson and Chew, as a committee appointed to inspect the sewage disposal plant at Asyla, reported that they had inspected the plant on November 23, 1907; that the condition of the plant had been improved by changes in the distributing apparatus, but that there were still more alterations necessary to increase the efficiency of the plant; that a nuisance was caused by the solid matters removed from the screening chamber and placed as a compost heap nearby; that there were present in the septic tank a great number of flies and other insects which carried infection to the neighboring institutions; that the scum in the septic tank was very thin and much less in quantity than on the occasions of previous inspections; that the siphons in the distributing apparatus were not operating; so that intermittent dosing was prevented; that the iron channels, through which the sewage was distributed over the filter beds, were laid loosely and without proper grades, and that a by-pass leading from the screening chamber direct to the brook showed evidences of having been

used. The committee recommended the removal of the by-pass from the screening chamber to the stream; the removal of the screens, or the arrangement of the screening chamber so that the screenings would be passed into the septic tank; that the openings of the septic tank be screened, or other effective means used to destroy the flies and other insects in the tank; that the siphons in the dosing chamber be placed in proper working order; that the distributing channels on the filter beds be properly arranged and graded, and that the surfaces of the filter beds be occasionally raked to grade. The committee also reported that it had been informed that sewage is discharged directly into Big Timber creek between Asyla and Blackwood by residents in the vicinity, especially at Blackwood.

On motion of Commissioner Herbert, the report of the committee was received and filed and the recommendations made therein were approved by the Commission. On motion, the secretary was directed to notify the Board of Chosen Freeholders of Camden county, that the Commission required the improvement of the sewage disposal plant at Asyla in accordance with the recommendations made by the committee of the Commission.

At a meeting of the Commission held December 19, 1907, a communication was received from George J. Bergen, Counsel to the Board of Chosen Freeholders of Camden county, acknowledging receipt of a communication from the Commission making requirements for the improvement of the sewage disposal plant at Asyla, stating that the same would be forwarded to the committee of the board having charge of the matter.

On July 2, 1908, inspection was made of this plant and found to be in the following condition:

At Asyla, in the Township of Gloucester, in Camden county, the Camden Board of Chosen Freeholders has constructed a sewage disposal plant, serving the insane asylum and the almshouse belonging to the county.

At the time of this inspection, the inmates and attendants in these institutions numbered 458, and the daily consumption of water was said to be 60,000 gallons. As all this water is supposed to pass through the sewers, the dry-weather flow of sewage may be roughly estimated at 60,000 gallons per day, which may be greatly increased in wet weather because of the roof-spouts of the buildings.

The disposal plant stands close beside and discharges into a small stream, which empties a quarter of a mile below into the South Branch of Timber creek. About a mile below at Blackwood there is a dam. About three miles below the dam the South Branch and North Branch unite and form Big Timber creek which empties into the Delaware river, six and a half miles away, about a mile below Gloucester. Tide-water sets back to the Blackwood dam. The water from Blackwood pond, I am told, is still used for domestic supplies and ice is also cut therefrom. The disposal works consist of a two-compartment screening chamber, a double septic tank, four primary filters, four secondary filters and one filter bed to receive contents of septic tank in case it becomes necessary to empty or clean the septic tank.

The plant has been in operation about four years and is fed by the sewage and roof water from the two institutions through an 8" terra cotta sewer about 200 yards long.

The screening chambers are somewhat V shaped with sewer entrance at small end and two iron bar screens at the larger ends. These screens have 1½" openings.

Great quantities of paper and other solid matters, as rags, clothing, bedding, feces, etc., are stopped by these screens and are raked out and

piled on the ground nearby until, I am told, as much as two or three carloads sometimes collect. At the time of inspection, only a small pile had collected on account of recent removal of past screenings. This, however, was offensive and objectionable.

The screening chambers lead directly into the masonry septic tank, 60x22x6½, roofed over and divided into two compartments by a longitudinal partition. Twenty feet from the outlet end is a cross multi-perforate partition dividing both sections into two portions one twice the size of the other. The small sections are filled with large cobblestones, while the larger ones contain only sewage. No scum on the surface of the sewage was visible through the openings in the roof and, apparently, the tank was doing good work.

The septic effluent leads into a circular flush tank provided with a 3" siphon which does not work, consequently, a steady (instead of an intermittent) flow goes to the next chamber where it divides into two portions, each one going directly to a distributor. The distributors consist of 3 double 3" cast-iron crosses, the side arms of which empty into 3 parallel rows of 4" channel irons. The distributor-crosses are located in the center and feed a bed on either side. The channel irons lead out over the entire length of each bed and are supposed to overflow evenly, thus producing three long lines of wetted area down the beds. At present, such is not the case, because of leaks and low places all the sewage enters the beds in a few holes making a total wetted area of about 15 to 20 square feet.

The filters are simple excavations, boarded up at the sides and contain porous materials about 3 feet deep. The top surface is of cinders.

The secondary filters are of similar construction, but at a lower grade and receive the effluent from the primary filters through two dosing siphon tanks. These siphons were found working (at 1 P. M.) although it is doubtful whether they would empty fast enough to cut off when the sewage flow is greater; on timing them, it was found that it took 20 minutes to fill the chamber (7½ feet in diameter by 1 foot deep) and 10 minutes to empty it.

The distributors on the secondary filters are like the primary ones and the condition is just as bad, or worse, as to evenness of distribution, about 5 to 10 feet square were wetted. In two minutes after a dose strikes the filter top, it can be noticed at the outlet. The outlet of the underdrains empties into the stream and appears quite good-looking although not entirely free from odor. No sewage fungi were visible.

The bed to receive septic sludge is a square one, excavated in the marsh and filled with porous materials and covered with a layer of coarse sand. It has underdrains and vertical air pipes, but no outlets to drains. This bed has never been used.

There is also a by-pass back of the screening chamber by which the entire sewage flow may be turned into the creek.

#### ATLANTIC CITY.

At the suggestion of the Attorney-General, an inspection was made of the plant of the Consumers Gas & Fuel Company, at Atlantic City, on June 10, 1908, and samples secured of the water which was being discharged into the thoroughfare from a box-drain and pipe leading from the gas-house.

At the request of the officials of the company, the Chief of the Division of Sewerage and Water Supplies, M. H. M. Herbert, visited the plant on August 8, 1908, and met Mr. Burgeois, attorney for the company, Mr. F. B. Aldrich, general manager, and Mr. Charles W. Hoy, general superin-

tendent. These gentlemen claimed that the company had recently been reorganized and come under a new management, and that ample provision had been made to extract the tar products from the waste water which was being discharged into the thoroughfare.

It was found, upon examination, that a tank provided with baffles (top and bottom) had been placed on the outlet pipe-line and the effluent discharging at that time was clear and free from objectionable pollution.

This was reported to the Board at the meeting held August 11, 1908, and they instructed the Attorney-General to allow the suit against the Consumers Gas & Fuel Company to go by default.

On October 31, 1908, at the suggestion of Mr. F. Herbert Snow, the consulting engineer for the Atlantic City Sewerage Company, Mr. H. M. Herbert met with the officials of that company at Atlantic City and made a thorough land and water inspection of the system.

It was found that during the year considerable work had been done in the way of changing and enlarging of sewers as per agreement with the city and that, according to statements of the officials, over \$50,000 had been expended on this work. Only three sewers are now discharging into the Inside Thoroughfare (all the others having been removed) these are the Dover avenue, the Columbia avenue and the Hartford avenue mains. Arrangements are about complete for the removal of the Hartford avenue outlet. The time granted the company for discharging the Dover avenue sewerage into the Inside Thoroughfare is about to expire and this will also have to be removed.

Some provision should be made to prohibit the taking of shellfish from this thoroughfare until such time as the discharge of all sewage therein has been removed.

#### ATLANTIC HIGHLANDS.

At a meeting of the State Sewerage Commission held February 6, 1908, a communication from John L. Sweeney, borough attorney of Atlantic Highlands, in relation to engineering advice as to the disposal of sewage at Atlantic Highlands, was received, and filed, and the secretary was directed to furnish to Mr. John L. Sweeney a copy of the report on the disposal of the sewage at Atlantic Highlands made to the Commission by G. Everett Hill, C. E.

At a meeting of the State Board of Health held August 11, 1908, the following resolution was adopted:

WHEREAS, At a meeting of the State Sewerage Commission held on August 29, 1907, it was

RESOLVED, That the Borough of Atlantic Highlands be notified to cease to pollute the waters of New York Bay prior to the first day of July, 1908, which notice was served on J. H. VanMater, Mayor, on September 6, 1907, and

WHEREAS, The said Borough of Atlantic Highlands has neglected to comply with said notice, therefore,

BE IT RESOLVED, That the Attorney-General be requested to at once bring proper legal proceedings under Chapter 72 of the Laws of 1906, and the supplements and amendments thereto, against the Borough of Atlantic Highlands to enforce said notice.

At a meeting of the Board held August 25, 1908, Mr. Herbert presented a telegraphic request from the Borough of Atlantic Highlands for an extension of time until June 1, 1909, in which to install a sewage disposal plant. Motion was made and carried that the suit instituted against Atlantic Highlands be withdrawn from the office of the Attorney-General

and that an extension of time until June 1, 1909, be granted in which to install a plant.

AVALON.

At a meeting of the Board held June 9, 1908, plans were presented by Mr. Ralph L. Goff, C. E., on behalf of Avalon, for a sewerage system at that place. Upon motion, the plans were disapproved and returned as no method for the purification of the sewage was shown.

On August 5, 1908, Messrs. Chew and Herbert, constituting a special committee, visited Avalon and made inspection of the outlets of present sewers. They decided that the sewage should receive purification treatment before entering the thoroughfare.

BEAVER BROOK.

At a meeting of the Commission held January 9, 1908, reports of R. L. Reed, of inspection of three sources of pollution of Beaver Brook above the intake of the Clinton Water Company, were received and filed, and the secretary was directed to notify the parties reported to be polluting Beaver Brook to show cause at the meeting of the Commission to be held January 23, 1908, why they should not be notified to cease such pollution.

At a meeting of the Commission held January 23, 1908, a report was received from R. L. Reed, of pollution of the water supply of Clinton by drainage from property of G. N. Rhinehart, of Annandale. The secretary was directed to notify G. N. Rhinehart to show cause at a meeting of the Commission to be held February 6, 1908, why he should not be notified to cease polluting Beaver Brook.

On motion of Commissioner Herbert, the following resolution was unanimously adopted:

WHEREAS, The State Sewerage Commission has found that the waters of Beaver Brook are being polluted to the injury of inhabitants of this state in their health, comfort and property, therefore, be it

RESOLVED, That, in accordance with Chapter 72 of the Laws of 1900, and the supplements and amendments thereto, this Commission hereby notifies Sylvester Alpaugh, G. N. Rhinehart and Frank Sutton to cease polluting the waters of Beaver Brook prior to March 1, 1908, and to make such disposition of their sewage and other polluting matters as shall be approved by this Commission.

The secretary was directed to have notices in writing served in accordance with the foregoing resolution.

BELVIDERE.

At a meeting of the Commission held January 16, 1908, the following report as to the proper provision of sewerage facilities and sewage disposal plant at Belvidere, was received from G. Everett Hill, C. E.:

NEW YORK, January 11, 1908.

To the Honorable, The State Sewerage Commission of New Jersey.

GENTLEMEN:—

In obedience to your commands, I have made a preliminary study of the Town of Belvidere, Warren county, with a view to determining the approximate cost of installing sewerage and sewage disposal works. This study is based upon

- (a) an examination of the topography of the town, reinforced by surveys wherever the course of the sewers was not perfectly obvious, where alternate lines of outlet were practicable or where two or more locations for disposal were available;
  - (b) an investigation of water consumption, character and quantity of manufacturing wastes, rate of increase in population and other factors entering into a determination of the volume and kind of sewage produced by the town;
  - (c) data of the flow of the streams in drought and flood, and the use of the Delaware river by riparian communities below Belvidere and within the radius of pernicious pollution;
  - (d) information concerning existing sewers, local prices of materials and labor, character of soil to be encountered in excavation and other matters bearing upon the cost of the proposed work.
- No working plans have been prepared, and more detailed study would doubtless develop ways in which the scheme herein outlined might be improved; but the practicability of sewerage of the town and of disposing of the sewage without danger or offence have been definitely ascertained, and the approximate cost of constructing an effective installation has been determined.

Belvidere, a town of 1,900 inhabitants, lies on the east bank of the Delaware river 65 miles above Trenton. The Pequest river, dammed twice for power, traverses the most closely built portion of the town. On the southwestern edge of the settlement, where houses are few, runs a small stream called Pophandusing creek. Between these two streams (1,900 feet apart on the Delaware shore line and 3,400 feet apart on a parallel line half a mile to the east) the ground forms a ridge 13 feet high at Dupue street (the street nearest to and parallel with the Delaware river) and rising to a crest 43 feet high near the eastern edge of the town. Within this territory lies 75 per cent. of the total length (about 6 miles) of built-up streets and 60 per cent. of the population. North of the Pequest river the ground rises sharply; but North Water street, which parallels the Pequest river, is low and subject to flood invasion. Between the Pequest river and Pophandusing creek the Delaware river has but slight fall—about one foot.

The Belvidere Water Company, a private corporation, supplies the town with water, taken from the Delaware river about ½ mile above the town and distributed without filtration or any treatment. The consumption varies from 100,000 to 125,000 gallons per day. Of this, 36,000 to 40,000 gallons is used by factories and by the railroad for purposes which preclude its entrance into the sewers. The per capita consumption is therefore but 45 gallons per day. This is abnormally low. The introduction of sewerage will, of course, result in more lavish use. I have based all my calculations, therefore, upon a per capita of 75 gallons per day.

Manufacturing wastes are negligible. The only industries of size are a wood-working mill, a silk weaving mill (which receives its material washed and dyed) and a felt-mill. The last alone will contribute trade wastes to the sewer and these will consist only of spent aniline dyes and wash-water to the amount of about 5,000 gallons a month. This can be discharged so slowly that the sewage will never be appreciably affected by it. The total outflow of the town can be treated as typical domestic sewage.

The town is growing very slowly and there is no reason to expect more rapid increase. In 1890, its population was 1,768; in 1900, 1,784; in 1906, 1,869. In planning for street sewers, which should always be of a

size suitable for ultimate needs, the lines have been made large enough to serve the territory covered, irrespective of inhabitants. In designing the disposal works, which can be enlarged at any time by the addition of new units, an increase of 1 per cent. over present population has been provided for in the initial installation.

The flow of the streams which drain Belvidere is widely variable. The Delaware at this point ranges from 2,000 cubic feet per second, the lowest record since June, 1886, to 152,760 cubic feet per second, the flood record of 1841, though the nearest approach to the latter in recent years is the record of the flood of October, 1903, when the flow was 105,000 cubic feet per second. No official records of the flow of the Pequest river at Belvidere exist; but I have seen the stream a mere trickling thread of water, absolutely incapable of removing, or even of covering, garbage thrown into its bed. At the time of my survey, however, when the stream was said to be higher than it had been for two years, weir measurements on the Market street dam indicated a flow of over 700 cubic feet per second. Apart from all consideration of the use of water as a domestic supply by communities below, the dry weather flow of both the Pequest and Pophandusing creek are so uncertain that these streams could not be depended upon for the prompt removal of sewage discharged into them. The safety of Belvidere itself is menaced by the sewers now emptying into the Pequest river. (I found none delivering into Pophandusing creek.)

The flow of the Delaware river, on the other hand, has, even at its minimum rate of drought-flow (2,000 cubic feet per second), ample capacity to receive, dilute and digest, without sensory offence, all the sewage of Belvidere and of a score of towns like it, for the estimated maximum rate of discharge from the main sewer of Belvidere is but 0.37 cubic feet per second. But so long as this stream is used as a source of water-supply—and such use, for the present at least, is unavoidable,—the discharge into it of any raw sewage, no matter how small the quantity, is a menace to life and health. The following towns, lying below Belvidere, take water for domestic purposes from the Delaware river:

PHILLIPSBURG, N. J., lies 14 miles below Belvidere. Of the 14,000 inhabitants, about 6,000 get water from the People's Water Company; the rest depend upon cisterns. One-half to two-thirds of the water supplied by the company is drawn from the Delaware river, the balance from a spring on the site of the pumping-station, a thousand feet or more from the river bank. The intake of the river supply is a well sunk in gravel on the edge of the river. The filtration incident to the passage of the water from the river, through the gravel, into the well, is the only treatment the water received. About 1,100,000 gallons are pumped daily to a reservoir having a capacity of 2,000,000 gallons, so that there is no extended period of storage before distribution and consumption. Eleven cases of typhoid have been reported recently. The sewage of Phillipsburg empties into the Delaware river without treatment.

LAMBERTVILLE, N. J., lies 48 miles below Belvidere. Its water supply comes from springs and wells remote from the river; but I learned that an emergency intake from the river exists, though it is seldom, if ever used.

TRENTON, N. J., draws its entire supply from the Delaware river. The intake lies in the river channel and the water flows by gravity into sump-wells, 200 feet away, whence it is pumped to a reservoir having a capacity of 115,000,000 gallons and a stand-pipe holding 2,000,000 gallons more. The suction is screened, but there is no filtration and no attempt to assist with coagulant the sedimentation which the size of the reservoir permits. The daily consumption ranges from 12,000,000 gallons to 14,000,000

gallons, distributed to 94,000 people—84,000 in Trenton itself and 10,000 in districts outside of the city limits. When the river is high and turbid, the pumps are stopped and the reserve supply drawn upon until the river is clear again. Recent analysis of the city water indicate the constant presence of *B. coli communis*. Typhoid is epidemic in the city. 48 cases were reported in November and 32 cases in the four days immediately preceding my investigation. Doctor Fell, the Health Officer, attributes the sickness to the drinking-water having satisfied himself that no other sufficiently comprehensive source of infection exists. Doctor Phillips and Doctor Ivins, other leading physicians of Trenton, concur in this opinion.

On the Pennsylvania side of the Delaware, Easton and Morrisville depend upon the river for water supply. Milford, Frenchtown and Stockton have water systems supplied entirely from sources other than the Delaware river.

At present, about 600 inhabitants of Belvidere are discharging crude sewage into the Delaware or its tributary, the Pequest river.

On Second street runs an 8-inch main, laid some years ago by the Belvidere Sewer Company, a corporation which has since forfeited its charter. This line with its laterals (one taking all the sewage of the Belvidere Hotel save the basement wastes) is about 1½ miles long. It empties directly into the Delaware at the foot of Second street.

Another 8-inch sewer runs from the school building at Fourth and Mansfield streets, through Fourth street, to a direct outlet into the river. The school has accommodations for 400 pupils.

Several private drains run from single houses or groups of houses on Front street north to an outlet in the Pequest river. The discharge from the Crane Felt Company mill empties into the Mill Race at Prospect street, and into this same race runs the sewage from the bar and water-closets in the basement of the Belvidere Hotel. Into the head race goes the drainage from several stables. The outhouse of the silk mill stands on the edge of the Pequest river, and nearly a dozen private sewers discharge into this stream within sight of Market street bridge.

The sewers on Fourth street and Second street and possibly some of the laterals of the latter can be utilized as part of the general system. All the other sewers must be abandoned, save so far as they may serve as house-drains leading to new municipal sewers.

The town owns good gravel and sand-pits, also a quarry and a stone-crusher. Local prices for other materials and for labor are reasonable.

The topography of Belvidere precludes the introduction of a sewerage system that will bring all sewage, by gravity, to a point high enough for treatment and for gravity discharge of the effluent into the river under such conditions of flood as may be expected to recur yearly or bi-yearly. Much of the elevation by which it would be foolish to sacrifice the advantages of elevation by carrying the sewage from high levels to the lowest part of the system and pumping it up again to the elevation necessary for disposal.

I have divided the town, therefore, into three sewer districts, called respectively:

- (1) The North Low Level District;
- (2) The High Level District, and
- (3) The South Low Level District.

The first includes the whole watershed lying north of the Pequest river and certain streets and properties south of this stream and too low to enter the High Level system. The part north of the Pequest drains to a low point on North Water street west of the railroad crossing, and the sewage is carried thence by an inverted siphon under the river to a point on South Water street. The flow from certain high level streets in this tract is to be collected in a large flushtank and discharged, automatically, at intervals, for the purpose of flushing and scouring the siphon. At the southern end of this siphon the flow from that portion of the district south of the river also collects, and near this spot a small local disposal plant can be erected (several suitable sites are

available) capable of treating the sewage and discharging the effluent by gravity unless the river be abnormally high. For use during flood conditions—say, possibly, for an average of five or six days each year—a small centrifugal pump should be installed, to lift the sewage to the High Level system. This pump can be water-driven without cost; for, whenever pumping may be advisable, the Pequest river will be wasting a thousand times the power needed. It is possible that enough power can be had throughout the year to warrant the constant pumping of the North Low Level sewage; but this can be determined only after more careful and extended study of the flow of the stream.

The second, or High Level District, takes in all territory south of the first, running to and including Fourth street as far west as the railroad. The Second street sewer and the school sewer on Fourth street can be used at their present grades as part of this system. All the sewage from this district can be led to a common point and passed through disposal works at elevations high enough to permit gravity discharge of the effluent even under conditions of exceptional flood. Several sites suitable for this purpose were found.

The third, or South Low Level District, includes the rest of the town, but the only portion now needed is that draining the southern end of Dupue street. A small disposal plant can be constructed at the end of this line, near Pop-handusing creek, capable of treating the sewage independently at all times, save during very exceptional floods.

Practically all of the built-up streets can be sewered by 5.13 miles of pipe, and my estimates are based upon this quantity. It is possible, that the town would be acceptably served for a few years by even less. The minimum size of sewer recommended (save in siphon and force-main) is 8-inch and the maximum size will not exceed 12 inches in diameter. All laterals will be provided with means for flushing—some by automatic flush-tanks fed from the water supply, and others by flushing-gates from the mill-ponds, the race or the Pequest river. The estimated cost of sewers includes flush-tanks, manholes and house-connection Ys, but not the laying of house drains from private properties to the street sewers.

No system of disposal will be adequate which does not make it practically impossible for a living typhoid germ to pass from the sewers into the Delaware river. I advise, therefore, the adoption of sand filtration as the only method reasonably sure of accomplishing this result. To facilitate the operation of the plant, minimize the cost of purification and reduce the area needed for effective service, I advise that this filtration be prefaced by septic tank treatment and by passage of the septic effluent through horizontal roughing filters of coke, capable of withholding the gelatinous and albuminous matters escaping from the tank and detrimental to the operation of the sand beds.

My plans include for each of the three installations:

- (a) A septic tank with a capacity for six hours' average flow of the estimated volume of sewage, each tank to be built of masonry, roofed with steel and concrete and divided into two chambers of unequal size, for convenience of control;
- (b) Roughing filters, of masonry, three for each unit, filled with coke, each chamber capable of holding the average flow of thirty minutes. One chamber is to be used at a time, the other two resting and aerating;
- (c) Sand filters, three feet deep and underdrained, each unit consisting of three beds, for alternate use, and each with area sufficient to make the total day's application of clarified tank effluent not more than eighteen inches deep. To the High Level plant is added an extra sand bed capable of treating the North Low Level septic effluent during floods. The purified water from the sand beds is to be collected and carried by iron pipe to a suitable point of outlet in the river.

I estimate the cost of the proposed construction as follows:

## SEWERAGE AND WATER SUPPLIES.

327

High Level sewers and effluent outlet .....	\$ 9,408	
High Level disposal plant.....	13,394	\$22,802
North Low Level sewers.....		
Iron siphon under Pequest river.....	7,855	
Pump-well, pumping machinery and force-main.....	1,200	
North Low Level disposal plant.....	2,232	18,652
South Low Level sewers.....		
South Low Level disposal plant.....	509	
	869	1,378
Engineering and contingencies.....		42,832
		4,283
		<b>\$47,115</b>

To this price must be added the cost of acquiring needed land and rights-of-way. The total area required will be slightly less than two acres; but additional land should be secured sufficient for future needs—say four acres in all.

Respectfully submitted,

G. EVERETT HILL.

BERNARDSVILLE.

At a meeting of the Commission held November 21, 1907, the secretary was directed to have an analysis made of sewage and effluent from the sewage disposal plant at Bernard's Inn, in Bernardsville.

At a meeting of the Commission held December 19, 1907, a communication was received from Dr. R. M. Connolly, reporting that he had visited the Bernard's Inn and had been unable to secure samples of the effluent from the sewage disposal plant at the Inn which would be of value for bacteriological analysis.

At a meeting of the Commission held December 26, 1907, the following report of chemical analysis of samples taken from Mine Brook at the Bernard's Inn, at Bernardsville, from H. B. Baldwin, was received and filed:

Newark, N. J., December 24, 1907.

*The Honorable the State Sewerage Commission of New Jersey.*  
GENTLEMEN—I have examined the sample of sewage and effluent from the sewage disposal works at Bernard's Inn marked thus: "A," brook water before receiving effluent and "B," brook water after receiving effluent, and beg to report as follows:

## PARTS PER MILLION.

	"A"	"B"
Color.....	15	10
Total solids.....	220	201
Volatile solids.....	52	53
Free ammonia.....	00.45	00.46
Total organic.....	00.80	00.81
Nitrites.....	00.09	00.09
Nitrates.....	4.5	5.0
Total oxygen consumed.....	1.2	1.2
Suspended oxygen consumed.....		
Chlorine.....	27.00	27.00

The system of sewage disposal at this place consists of a large cesspool located within a few feet of the hotel and another covered rectangular excavation, about 12 x 25 feet filled with ashes which received the overflow from the cesspool. The outlet from this is directly into a small stream which flows

through a tile pipe and empties into "Mine Brook" a few hundred feet away. At the time of my visit with Dr. Connolly, there was very little, if any, effluent from the place, none was visible and the only apparent way to make an examination was to get a sample of the stream just before and after the point of entrance of the effluent. The analysis of these samples showed that the water of the stream was badly polluted before reaching the point of discharge, and that there was little, if any, difference after that point.

At present, there is practically no effluent and the brooks into which it would find its way collect the natural drainage of an unsewered village.

Very respectfully,

HERBERT B. BALDWIN.

BORDENTOWN.

At a meeting of the Commission held December 12, 1907, a communication was received from John C. Friedrich, Chairman of the Committee on Streets and Sewers of the Common Council of the City of Bordentown, requesting on behalf of the Common Council, engineering advice for the sewerage and the disposal of the sewage of the City of Bordentown, and enclosing a copy of a resolution of the Common Council directing the Committee on Streets and Sewers to make such application. The secretary was directed to employ an engineer for the purpose of reporting to the Commission as to the best plan of sewerage system and sewage disposal plant for the City of Bordentown.

At a meeting of the Commission held February 6, 1908, the secretary reported that he had been consulted by D. R. Brown, of the City Council of Bordentown, in relation to engineering advice requested by that city.

At a meeting of the Commission held March 26, 1908, the following report on the disposal of sewage at Bordentown was received from George W. Fuller, C. E.:

March 19, 1908.

*Secretary, State Sewerage Commission, 1 Montgomery street, Jersey City, N. J.:*

DEAR SIR—Pursuant to the request of the Commission, I beg to report the results of my findings upon the main features of providing sewage disposal works for the City of Bordentown, N. J.

This city is located on the east bank of the Delaware river 7 miles below Trenton, and 10 and 28 miles above Burlington and Philadelphia, Pa., respectively. The two latter cities use the Delaware river as a source of public water supply.

The present population is approximately 4,000 people, the great majority of whom are resident upon a fairly level plateau some 50 to 60 feet above the level of the Delaware river. This plateau has quite precipitous slopes on the south adjoining Black's creek and on the west adjoining the Delaware river. Immediately north of the city, Crosswick's creek enters the Delaware river and this creek in turn is joined by Thornton creek which flows through a portion of the built-up area of the town.

The railroad tracks of the Amboy division of the Pennsylvania Railroad pass through the business center of the city, through a cut some 20 to 25 feet below the level of the neighboring streets.

About a dozen years ago, a system of separate sewers was designed for Bordentown by Messrs. Waring, Farquhar & Chapman. As stated in your annual report presented to the Legislature of 1907, there are but a few scattered sewers now in existence. The combined system as designed provided for two outfalls, one into Crosswick's creek near its mouth and the other into the Delaware river. Only one sewer has recently been constructed and that is a 24-inch line following the banks of Thornton creek. It receives the sewage of the worsted mills.

The old sewers in the business district scarcely seem serviceable for future requirements, and I judge that they had best be devoted to the removal of storm water. For the new sewerage system, the sewers should be on the separate system, that is, with pipes which will receive sanitary wastes, and such trade wastes as are necessary, but no street water or rain water.

In accordance with the policy decided upon by your Commission in conjunction with the State Health Department of Pennsylvania, notice was served upon the City of Bordentown to cease pollution of the Delaware river within a certain stipulated period. Uncertainty on the part of the local authorities as to how best to proceed to comply with the requirements of your Commission has caused the present inquiry to show in general terms the best procedure for the city to adopt as to location and arrangement of the disposal works.

Mr. A. L. Dabney, assistant engineer, and I have each visited the City of Bordentown and examined the topography and various sites which might serve for the location of disposal works. In these examinations we have been much assisted by the Hon. David R. Brown, of Bordentown, who has furnished us with valuable records and assisted us in securing other information.

We find that at the present time the water consumption in Bordentown averages about 350,000 gallons daily with an uncertain portion of this quantity used by the Pennsylvania Railroad. It is probable that not more than 3,000 people make use of the public water supply. Based upon experiences with other communities of similar size, we advise that sewage disposal works be designed of a normal capacity of at least 400,000 gallons of sewage daily during dry weather periods, and capable of operating for limited periods at 50 per cent. above this rate. During times of very heavy rain it is probable that this average flow of 100 gallons per capita will be substantially increased unless the sewers are laid with much care. In places also the ground seems to be very coarse at Bordentown and care in making joints of the sewer pipes tight is necessary in order to prevent the sewage seeping into the ground to an objectionable degree.

In considering the location for disposal works we find that there are a number of available sites, one of which is on the east side of Black's creek about one mile from its mouth. Another site is on the west side of Black's creek about 2,500 feet distant from its mouth, and just south of the Trenton and Camden trolley line. Another site may be noted on the east bank of Crosswick's creek about  $\frac{3}{4}$  of a mile north of Thornton creek. There are several other sites that might be mentioned, but we do not think that they can be compared with any of the sites above referred to, on account either of inadequate isolation or of expensive pumping requirements or both.

Our inspection of the disposal question in the field brought clearly to the front at once several points which must be kept clearly in mind. One of these is that extreme high water in the Delaware river reaches some 15 to 20 feet above ordinary low tide, thus making it impracticable to locate the works as advantageously as it might appear at first glance. Another factor is, that the works should be located with a view to discharging all of the sewage to the works that it is possible to do by gravity. Still another feature is, that there are several places in the vicinity of Bordentown where considerable coarse porous sand is to be found and such as would be entirely suitable for the use of intermittent sand filtration. This method, as you well know, has been practiced with marked success at a number of places in Massachusetts, such as Brockton, Framingham, Pittsfield, etc.

Taking into account all the various local conditions including the desirability of keeping the plant suitably isolated during future years and as the city increases in size, it is my belief that the most advantageous site to be selected is that first mentioned above and which would be about 1,200 feet (or more) distant from Mill street, directly back of the sand and gravel pits from which materials were being excavated during our recent visits there. Such a location is not only suitably isolated, but is sufficiently large to take care of all



future requirements. We believe from our examinations of the material being removed from the pits that it is quite probable that in this immediate locality sufficient filtering material may be secured to provide adequate work for the present population. We have not been able to secure sufficient data to permit us to form an opinion as to how much of this filter sand will be found in place at a suitable elevation, and how far it may be necessary to form earth banks by stripping the soil with wheel scrapers and filling the sand bed with material brought from some little distance. This matter requires attention from the engineers for the city, and it is one that can be settled without difficulty. I am convinced that in the neighborhood there is sufficient sand to make the intermittent sand filtration a much less expensive proposition than a method of disposal involving filtration through broken stone or cinders. I advise that two acres of intermittent sand filters be prepared with an average effective depth of at least 30 inches and arranged in at least five separate beds to which the sewage may be applied in rotation. The effluent from such filters receiving sewage from which the coarser suspended matters have been freed will be brilliant in appearance and free from objectionable odors and bacteria.

As to preparatory treatment, it is my opinion that it will be wisest to build tanks holding about 100,000 gallons and through which the sewage may be first passed in order to deposit the coarse solid matters. If this were not done, it would be necessary to double the area of sand filters and at a cost greater than that of building a 100,000-gallon tank and two acres of sand beds.

In regard to the septic treatment as applied to this settling basin, my experience leads me to believe that it is not judicious to use the septic process in connection with intermittent sand filters. The reason is that the evolution of gas carries too much fine sludge onto the sand surface with the result that the efficiencies of the sand beds are materially lessened or the cost of filter maintenance is greatly increased or both. In view of these experiences and with the present status of the Cameron Septic Tank patent I recommend that the settling basins not be operated as septic tanks, but be arranged more or less after the fashion of the so-called Dortmund tank. By this it is meant that the bottom of the tank would be arranged as a series of hoppers. The sides of each hopper compartment will slope from 30 to 45 degrees to the vertical. At the bottom of each of these hopper arrangements connections would be made to a piping system through which the sludge once a day would be forced by the weight of the water above it through a sludge drain into a sludge pit. As to the sludge pit, I would arrange this simply as an earthen excavation, with an overflow which could be treated on a small special filter bed. Over the sludge pit itself I would arrange to place boards to cover the sludge which would undergo septic treatment in this pit and over the boards there could be placed earth for protection during cold weather. After the first sludge pit became filled with solid matters I would abandon it and develop other sludge pits as required, but to all of which there would be a pipe connection to take the overflow onto special filter beds.

It would take a considerable amount of field work to show just the best arrangement of such a method of disposal as above outlined and also prepare a close estimate of the cost. The approximate figures which I have made indicate, however, that this method of disposal would cost only about two-thirds as much, under local conditions, as it would to apply such a method, for instance, as that which is necessary under the conditions at Madison, New Jersey.

The greater portion of the sewage can be applied to this disposal plant by gravity. Outside of the portion of the city which is thickly built up, we have had no surveys such as are necessary in order to locate exactly the best route for the outfall sewer. In general, it would start at the center of the town and follow along Farnsworth, or one of the parallel streets so far as is practicable, and then cross private lands. The sewage from the northern portion of the business district would presumably pass under the railroad cut through an

inverted siphon. A small automatic electric outfit would be necessary to lift the sewage from the valley of Thornton creek in the vicinity of Third street and like-wise from a low-lying area in the vicinity of Olive street into the gravity lines. It is probable that the remainder of the town could be satisfactorily taken care of by gravity with the exception of a few scattering properties such, for instance, as the Pennsylvania Railroad station and a few other buildings, situated below the top of the bluffs. These properties could be taken care of by automatic electric pumping equipments or, perhaps more simply, and with equal satisfaction, by having them adopt individual disposal plants according to some one of the numerous methods which are successfully practiced for country estates.

## RECOMMENDATIONS.

I recommend that a system of sanitary sewers practically as designed by Messrs. Waring, Chapman and Farquhar, be built for the City of Bordentown, but arranged to deliver by gravity as much as possible of the sewage to the site on the east bank of Black's creek above described.

The low-lying areas in Thornton creek valley and also near Olive street should have automatic electric pumping outfits to lift the sewage to the gravity lines.

The disposal works should comprise an uncovered settling basin of a capacity of 100,000 gallons with a hopper-shaped bottom and arranged to discharge its effluent on to a series of intermittent sand filters having an average depth of at least 30 inches and having an aggregate area of at least two acres. Sludge from the settling tank should be removed daily to a covered sludge pit, the overflow from which should be applied to specially constructed sand beds.

The main sand filters should be constructed well above high water, and the same is true of the sludge pit.

Very truly yours,

GEORGE W. FULLER.

## BOUND BROOK.

At a meeting of the Board held August 25, 1908, plans were presented for two extensions to the sewers of Bound Brook. The plans were laid over until the next meeting.

At a meeting of the Board held September 8, 1908, Mr. Joshua Doughty, engineer for the Borough of Bound Brook, appeared before the Board and presented plans for extensions to the sewers of said borough. Motion was made and carried that plans for extension on North and Talmadge avenues be approved and that the plans for the extension on Maple avenue be approved provided that the sewer on said avenue is extended to Vosseler avenue, said approval to be subject to the notice heretofore given by the State Sewerage Commission to the Borough of Bound Brook to cease polluting the Raritan river prior to July 1, 1911.

At a meeting of the Board held October 6, 1908, plans for an extension to the sewers of Bound Brook were presented by Mr. Herbert, and he recommended that they be approved. Motion was made and carried that plans for an extension on Maple avenue to the sewers of Bound Brook be approved subject to the notice heretofore given by the State Sewerage Commission to the Borough of Bound Brook to cease polluting the Raritan river prior to July 1, 1911.

## BRIDGETON.

On July 22, 1908, a letter was sent to the authorities of Bridgeton, asking if any steps had been taken in the direction of ceasing to pollute the waters of Cohansey creek as ordered by the State Sewerage Commission prior to May 1, 1908.

At a meeting of the Board held August 25, 1908, a committee consisting of Mr. Albert McAlister and Mr. Barton F. Sharp, from Bridgeton, appeared before

the Board in reference to the disposal of sewage from said city into Cohansay river. Mr. McAlister stated that as city solicitor, he had called the attention of the City Council to the matter, and advised that action should be at once taken to either comply with the request of the Board or else fight it. Nothing was done, however, until a short time ago, when a letter addressed to the Mayor by this Board was handed to Mr. McAlister, and he and Mr. Sharp were asked to appear before the Board and make this explanation. Mr. McAlister said that under a new charter adopted last November, they hoped soon to elect representative men as members of council. The new men will be elected in November next, and Mr. McAlister requested that the matter be allowed to rest until the new men are in office when it will be taken up promptly. It was suggested that a resolution be passed by the City Council of Bridgeton asking for an extension of time. The committee agreed to adopt this suggestion.

At a meeting of the Board held September 29, 1908, a communication was received from Mr. A. McAlister, City Solicitor of Bridgeton, requesting an extension of time in which to install a sewage disposal plant for said city. Mr. Chew moved that the time for the installation of said plant be extended to January 15, 1909. Motion was carried.

#### BRIELLE.

At a meeting of the Commission held November 21, 1907, a communication was received from George C. Plume, in relation to the disposal of sewage from that section of Brielle known as Wylie Park, suggesting the construction of a sewerage system to accommodate all of the property owners in that section. The secretary was directed to employ an engineer for the purpose of advising the Commission in relation to the disposal of sewage at Brielle. James Owen, C. E., of Newark, was employed for this purpose.

At a meeting of the Commission held January 9, 1908, the following report as to the disposal of sewage from the property of George C. Plume, of Brielle was received from James Owen, C. E.:

Newark, N. J., Jan. 6th, 1908.

#### To the State Sewerage Commission:

GENTLEMEN—In reply to your request to examine into the discharge of sewerage from the house of Mr. George C. Plume, at Brielle, N. J., into the Manasquan river, I would report as follows:

In examining the property at Brielle I found that Mr. Plume's present method of disposal was to have all sewage from his house collected into a tight cesspool, and from that discharged into the Manasquan, a proceeding not allowable. I carefully examined the premises and considered possible plans to obviate the difficulty, and then had a personal interview with Mr. Plume. I suggested at that time that he abandon his present supply of drinking water and sink a deep well that would be beyond any danger of contamination, as his principal objection to any change of the existing sewerage of the place lay with the possibility of such contamination.

With the drinking water thus safely disposed of, an ordinary leaching cesspool could then be constructed and used as an annex for the present existing tight vault, and in this manner all the overflow that now runs into the river would be absorbed, thus abolishing all future nuisance from that source.

To this plan Mr. Plume agreed, considering that both the State and his personal interests would be well served, and I would suggest that when Mr. Plume successfully carries out such a performance your Commission should quiesce and give it your endorsement, he being notified that the plan is satisfactory.

The successful adoption of such a method would be a good precedent in dealing with many of the seashore places that are now maintaining a nuisance.

Hoping that this plan will be satisfactory, I remain,

Yours respectfully,

JAS. OWEN.

#### BURLINGTON.

At a meeting of the Commission held December 5, 1907, F. S. Carter, a member of the Board of Health of the City of Burlington, consulted with the Commission in relation to the sewage disposal plant of the Burlington Sewer Company. He stated that the company had not properly repaired the filter beds of the sewage disposal plant; that it had not been successful in repairing the breaks in the main sewer leading to the disposal plant; that pumping was not done regularly; that the sewage backed up in the system, overflowing into some cellars, and that a large amount of sewage had been discharged on the meadows in the southerly section of the town, causing considerable nuisance. Commissioner Herbert was appointed a committee of one to examine the sewerage system and sewage disposal plant of the Burlington Sewer Company, and to make such requirements on behalf of the Commission for the improvement of the disposal plant as might be necessary.

At a meeting of the Commission held December 12, 1907, Commissioner Herbert reported, as a committee of one to examine the sewerage system and sewage disposal plant of the Burlington Sewer Company, that he had visited Burlington and made an examination of the sewerage system and disposal plant on Tuesday, December 10, 1907; that he found that the main sewer had been plugged in order that the leaking joints might be cemented, and that the sewage was overflowing from a manhole to the meadows in the lower section of the city, causing a considerable nuisance; that the pumps were idle and that the contents of the septic tank had been permitted to flow back into the sump-well and overflowed at that point; that the beds were not in proper repair or been properly cleaned; that no work was being done at the time of his visit because of rain, and because it was desired to permit the cemented joints to harden; that he had instructed the sewerage company that the plug must be removed from the sewer within twenty-four hours; that he would reinspect the plant and make a further report to the Commission in relation to the condition of the plant.

At a meeting of the Commission held December 19, 1907, a communication from Samuel G. Shaw, superintendent of the Burlington Sewerage Company, stating that the plug had been removed from the main sewer of that company in accordance with the requirement made by Commissioner Herbert at the time of his inspection of the plant, was received and filed.

On July 8, 1908, an inspection was made, of which the following is a report:

The City of Burlington is located at the mouth of Assisuncunk creek, on the Delaware river, in Burlington county. Its population is about 7,500.

In 1901 and 1902, a sewerage system and disposal plant were constructed by the Burlington Sewerage Company. The system consists of 9.6 miles of terra cotta sewers ranging in size from 8 to 24 inches. There are about 910 house connections. The sewage is chiefly domestic, but a small quantity of manufacturing waste enters the sewers, consisting for the most part of aniline liquor. Owing to the low level of the ground, considerable ground water leaks into the sewers and, in some places, the pipes lie in ground water and quicksands. Since the repairs have been made in some of the lines, the amount of ground water entering has been materially reduced.

The daily dry-weather flow is estimated to be about 500,000 to 800,000 gallons. The disposal plant is located just south of the city along the railroad tracks. The sewage is conducted to the plant in a long flat 24-inch trunk sewer which empties into a sump-well 9¼ feet in diameter and 11 feet deep. From this it is pumped by two 5-inch centrifugal pumps to a circular reservoir located just above the filter-beds upon which the sewage flows by gravity.

Under new conditions the sewage is not allowed to collect in the well and trunk sewer for any length of time, nor is it allowed to back up toward the town, but is kept pumped down, one or the other of the pumps being run continuously, or at least as long as there is any sewage to pump. The records show that the pumps averaged over 22 hours per day.

The circular tank 44.5 feet in diameter and 20 feet deep was formerly used as a septic tank but, at present, owing to the rapid flow through, not very much septic action goes on. There is no scum on the top and very little evolution of gas is manifest. The outlets lead into a broad flat, wooden trough extending across a circular well 13 feet in diameter and 7 feet deep. The sewage flows over the sides and through holes in the bottom of the trough and falls about 3 feet to the surface of the liquid in the well. From this well it is distributed to the 4 beds by 4 iron pipes.

The beds cover an area of about 6 or 8 acres and are separated by embankments. Owing to the slope of the ground, they are somewhat terraced and the lower terrace is underdrained with 8" horse-shoe tile drains. These drains empty directly into a ditch which in turn runs to the large surface run coming from the town. This is subsequently pumped into the Delaware river by the city at their pumping plant.

The sewage brought to the beds is discharged through tees into a ditch at the head of the beds. From this ditch it flows out laterally through a wide row of coarser broken stone. This stone is occasionally forked over and is not very dirty. Considerable trouble has been experienced in the past by having the sewage flow over the surface instead of through the ground, and also many animal burrows existed.

Recently a good deal of work has been done and is still going on. The embankments were raised, grass and weeds are kept under better control, holes filled up, stone cleaned, more care is being taken of the distribution, new cross dykes with coarse stone are being laid, burrowing animals are being destroyed. Owing to the steep slope of the field it was found that to remove the sod meant serious washes when the first rain came; so it was decided to fill up holes and let the sod remain.

On the other hand, the sewage on the beds comes dangerously near the ditch and, in some cases, the writer found it actually breaking through. This, however, is being watched, and it is hoped will cease altogether just as soon as the men get the upper portions of the beds in better condition. At present, 3 beds are run continuously and one is rested for one month.

The effluent is good-looking and the ditch is in pretty good condition.

On September 10, 1908, another inspection was made of the Burlington Sewerage Company's disposal plant, at which time things were found to be in pretty bad shape. Difficulty was being experienced in handling the flow while the large settling tank was being cleaned out. About 5 feet of sediment has to be removed and during the present work the beds are much flooded. Something must be done to cause the sewerage to go down evenly into the soil and not run over the surface as it now does. At present, the sewage flows right down to the bottom of the field and either breaks through the banks or runs out by some short cuts with but little purification. The advisability of keeping that heavy coating of grass and weed stubble on the surface is seriously questioned. Much clogging results, especially as there is no septic tank or screen to remove any of the larger suspended matters. Of course, it would cost a large sum to properly level the field but, as it was explained to Mr. Ubil, some system of narrow terraces or parallel transverse furrows might be used to keep the ground from washing; then keep the sand stirred up so as to allow the sewage to percolate quickly and evenly. The beds are all sand, though rather fine, and if put in proper order ought to give a first-class effluent. But without proper attention, the sand packs down like a board and the sewage flows over it like it would over a concrete floor. It does not seem as though there are sufficient underdrains, because they extend for only 1-4 or 1-3 the distance up the field. They seem to be too near the surface at the bottom of the field, i.e., more sand could be put on the lower beds and the grade raised thereby and, at the same time, provide a better safeguard against outbreaks. Now, breaks in the rear bank are of common occurrence.

On September 25, 1908, Mr. Herbert sent a letter to the Burlington Sewerage

Company, asking that a representative call at the office of the State Board and discuss the question of repairs to the filter beds, etc., in response to which communication, Mr. H. F. Huy, engineer for the Burlington Sewerage Company, called and discussed the situation in full with Mr. Herbert.

CALDWELL.

At Caldwell, a system of sewage disposal by sub-surface irrigation was installed by Essex county about thirteen years ago to care for the sewage from the county penitentiary.

On the day of this inspection, July 14, 1908, the population numbered just 300. The daily consumption of water is said to be between 30,000 and 40,000 gallons, practically all of which goes into the sewers. The sewers are 6-inch and 8-inch terra cotta pipes about 300 feet long and laid at a very steep grade. The inlet is not trapped, but the liquid escapes into a fushtank by a trapped pipe outlet drawing from a point a little more than two feet from the floor.

The settling tank is cleaned out about once every three months, several cart loads of scum and settled solids being removed and buried. It was cleaned two months ago and, at present, there is a scum of about 6 inches on the surface.

Chloride of lime is used periodically in the sinks and closets, and other disinfectants are used in the scrubbing waters. About 200 pounds of chloride of lime is thus used monthly, and, as a result, there is very little, if any, septic action in the settling tank.

The fushtank is similar to the settling tank except the sides are vertical. This tank holds about 1,750 gallons and discharges by siphon during the day once in about 2½ hours. At the time of inspection, the siphon was out of order and the flow was continuous. The old unsafe roofs of these tanks have been replaced by new ones. The flow from the fushtank leads to a distributing chamber from which run three lines of 4-inch terra cotta pipe. These lines extend down the slope of the hill towards the road, and every 4 feet, 3-inch lateral branches extend outward for about 100 feet or more and are 18" below the surface of the ground. The sewage is allowed to run into one of these systems until it fills up, which takes from 10 to 20 days. The flow is then diverted to the next system and so on in rotation. Last fall, another bed was finished and connected on; this makes a total of 4 beds and a total area of about 8 acres.

The soil, especially at the lower end of the field, is sand and gravel with some loam, and absorbs the water easily. No underdrains are necessary and no effluent has ever made its appearance.

Only a faint odor as from urine was detected near one of the tanks, and this was said to be unusual, there generally being none at all.

On September 29, 1908, an inspection was made to investigate reported sources of pollution along a small nameless stream running through the town.

About every house along the stream from the prison road down through Caldwell to Essex Falls had a cesspool drain, privy overflow, sink drain, stable drain, garbage dump or some other source of pollution which empties directly into this brook.

This brook flows on through these sections and empties into the Passaic river from which the East Jersey Water Company pump water at Little Falls. Some complaints had been made against the Essex Falls disposal plant. This was found in very fair condition and the effluent seemed well purified; the chemical analysis was very good and purification was better than at the last visit. The disposal system of the private institution of Dr. Gardner (Oak Hill Sanatorium) is questionable. Without a complete analysis it would be impossible to say to what extent purification has been attained, but some precaution should be taken to prevent the final overflow from washing into the brook during the rain. Perhaps a few furrows at the bottom of the hillside along the stream would be sufficient. Attention is called to the lack of protection of the drinking water of the sanatorium against contamination.

The well is a shallow one and is covered by two large flat stones at the level of the ground. Quite a large crack exists between the stones and a good-sized square hole stopped by a round boulder. Through the crack, or through the hole, snakes, toads and other polluting substances might easily fall.

## COHANSEY CREEK.

At a meeting of the Board held September 29, 1908, Mr. Walter H. Bacon and Mr. Benjamin F. Alford appeared before the Board in reference to notice sent to the Cumberland Glass Manufacturing Company to show cause why they should not cease to pollute the waters of Cohansey creek. Mr. Bacon stated that the entire plant is sewerd into the Cohansey river, but that nothing but clear water gets into the river from said plant; that no oil is discharged into the stream, but that oil is used as fuel; that, as a result of an accident which occurred about a year ago, a part of a carload of oil reached the waters of the creek; that no chemicals from the factory reach the creek; that on account of the location they are obliged to take care of a great deal of surface water and that as oil sometimes drops on the ground, some of it might be carried into the creek by the surface water. Mr. Bacon stated in response to questions, that sewage from water-closets at the works is discharged into the creek as is all the sewage from the City of Bridgeton. He said the plant was not in operation at the present time, but that the company was willing to do anything it could to remedy any unsatisfactory factory conditions. Mr. Bacon was informed that the matter would be looked into.

Mr. Fowler appeared before the Board in reference to this case and stated that the overflow from a tank of oil is discharged through a pipe into a ditch and thence into Cohansey creek. He said the plant was not in operation at the time of inspection, but that there was evidence that oil had been discharged through said pipe quite recently. Mr. Theodore Backes, of the Attorney-General's office, also appeared before the Board and gave further information in regard to this matter.

The following resolution was adopted:

WHEREAS, The Board of Health of the State of New Jersey has found that the waters of Cohansey creek are being polluted to the injury of inhabitants of this State in their health, comfort and property, therefore,

BE IT RESOLVED, That, in accordance with Chapter 72 of the Laws of 1900, and the supplements and amendments thereto, the Board of Health of the State of New Jersey hereby gives notice to the Cumberland Glass Manufacturing Company that they must *at once* cease to pollute the waters of Cohansey creek by the discharge of oil from their plant, and that prior to the fifteenth day of January, 1909, they must cease to pollute the waters of said creek by the discharge of sewage from their premises and make such disposition of their sewage and other polluting matter as shall be approved by the said Board of Health.

## CAPE MAY.

At a meeting of the Board held August 11, 1908, Mr. Herbert made verbal report of inspection of sewers at Cape May City on August 4, 1908. He stated that these sewers discharge into Cape Island creek, and that raw sewage was observed at the bottom of the creek. He recommended that notice be served on the City of Cape May to show cause at the meeting of the State Board of Health, to be held August 25, 1908, why they should not cease to pollute the waters of Cape Island creek. Motion was made and carried that notice be served in accordance with said recommendation.

At a meeting of the Board held September 8, 1908, the following resolution was adopted:

WHEREAS, The Board of Health of the State of New Jersey has found that the waters of Cape Island creek are being polluted to the injury of inhabitants of this State in their health, comfort and property, therefore,

BE IT RESOLVED, That, in accordance with Chapter 72 of the Laws of 1900, and the supplements and amendments thereto, the Board of Health of the State of New Jersey hereby gives notice to the City of Cape May that prior to the first day of June, 1909, it must cease to pollute the waters of Cape Island creek and make such disposition of its sewage and other polluting matter as shall be approved by the said Board of Health.

## CARLSTADT.

At a meeting of the Commission held March 12, 1908, plans for a sewerage system and a sewage disposal plant consisting of a septic tank for the purification of the sewage of the Borough of Carlstadt were submitted to the Commission by Colin R. Wise, Borough Engineer. On motion of Commissioner Herbert, the plans submitted by the Borough of Carlstadt providing for a sewerage system and a purification plant consisting of a septic tank, the effluent to discharge into Berry's creek, such disposal plant to care for all of the sewage of the Borough of Carlstadt excepting such as might be discharged through the sewers of the Borough of East Rutherford, were approved subject to such conditions of construction, operation and purification as this Commission may from time to time require.

## CHATHAM.

At a meeting of the Commission held March 19, 1908, plans for a sewerage system and a sewage disposal plant, consisting of sedimentation tanks and sand filters, to discharge into the Passaic river, were submitted to the Commission on behalf of the Borough of Chatham by Williams, Proctor & Potts, engineers.

On motion, the plans submitted by the Borough of Chatham were laid over until formal application for their approval should be made by the Borough authorities.

## CRANFORD.

At a meeting of the Commission held February 20, 1908, the secretary was directed to notify the authorities of Cranford to show cause at a meeting of the Commission to be held Thursday, March 5, 1908, at two o'clock in the afternoon, why they should not be notified to cease polluting the Rahway river.

At a meeting of the Commission held March 5, 1908, in response to notice to show cause why the Township of Cranford should not be notified to cease polluting Rahway river, Berkeley C. Austin, Attorney for the Township of Cranford, appeared before the Commission and stated that the outlet main of the sewerage system of the Township of Cranford discharged into the Rahway river at Rahway and was polluting the Rahway river; that he understood that notice to cease polluting had already been given to the City of Rahway and that he did not believe the Township of Cranford would complain if treated in the same manner as other parties similarly situated; that by two borough incorporations, the Township of Cranford had lost considerable of its territory, and that it was not financially in a position to take action at the present time, and that on its behalf he requested that as much time as possible be given to the township in which to comply with any order of the Commission to cease polluting the Rahway river.

On motion of Commissioner Herbert, the following resolution was unanimously adopted:

WHEREAS, The State Sewerage Commission has found that the waters of the Rahway river are being polluted to the injury of the inhabitants of this State in their health, comfort and property, therefore,

BE IT RESOLVED, That, in accordance with Chapter 72 of the Laws of 1900, and the supplements and amendments thereto, the State Sewerage Commis-

sion hereby gives notice to the Township of Cranford that prior to the first day of November, 1911, it must cease to pollute the waters of the Rahway river and make such disposition of its sewage and other polluting matter as shall be approved by this Commission.

On motion, the secretary was directed to have notice in writing served on the Township of Cranford in accordance with the foregoing resolution.

The notice was not served regularly, and on June 16, 1908, at a meeting of the Board, motion was made and carried that the Township of Cranford be notified to cease polluting the waters of the Rahway river prior to the first day of November, 1911, which notice was served.

#### COLLINGSWOOD.

At a meeting of the Commission held January 2, 1908, two communications were received from Richard T. Collings, in relation to the Collingswood sewage disposal plant, the disposal of the sewage of West Collingswood, the disposal of sewage from the property of the Bettlewood Land Company at Oaklyn, and requesting an opportunity to consult with the Commission. The secretary was directed to request Richard T. Collings to attend the next meeting of the Commission.

The secretary reported that he had been notified by the Collingswood Board of Health that it desired to make complaint as to the condition of the Collingswood sewage disposal plant. Commissioners Herbert and Chew were appointed a committee to examine the sewage disposal plant at Collingswood and consult with the Collingswood Board of Health.

At a meeting of the Commission held January 9, 1908, Commissioners Herbert and Chew, as a special committee to investigate the complaints made by the Board of Health of the Borough of Collingswood against the sewage disposal plant of the Collingswood Sewerage Company, reported that they had visited the plant on January 8, 1908, in company with John S. Smith, W. L. Patterson and Dr. W. Sheldon, representing the Board of Health of the Borough of Collingswood, and Richard T. Collings, President, and his son, the Superintendent, of the Collingswood Sewerage Company; that the members of the committee of the Board of Health stated that the residents of Eldridge avenue, near the sewage disposal plant, had complained of odors during muggy weather, or when the wind blew from the direction of the plant; that an inspection showed the plant to be in active operation and that it was agreed that the sewage was pumped both on week days and Sundays; that the septic tank was performing its duties, excepting that it was overworked, and that its effluent was remarkably clear; that this was partially accounted for by dilution caused by an excess of ground water due to recent heavy rains; that the primary beds although showing evidences of recent attention were not as clean as they might be kept; that the secondary beds were practically at the creek level and that there were evidences that the tide backed up over a portion of them; that at high tide each day, the water raised behind the sluice-gate, which leaked, until about  $\frac{1}{4}$  of these beds were covered; that there were 4 of these secondary beds and that the area drowned out each day was equal to the area of one whole bed; that the committee also examined a by-pass, but that the representatives of the company stated that this by-pass had not been used for nearly a year; that at the time of the inspection, practically no odor was noticed from the plant and that the committee believed that with a few changes and proper care, there would be no nuisance from the plant; that carelessness and the use of the by-pass might cause the objectionable conditions complained of; that the plant at present cared for the sewage from 500 houses, and that it appeared to the committee that the plant was being worked beyond its capacity; that the committee recommended a thorough cleansing of the filter beds, the abandonment and the permanent stoppage of the present leaky sluice-gate and the erection of a new and efficient sluice-gate, the construction of more filter beds and the enlargement of the septic tank.

The committee also reported that it had examined the outlet of the sewer at the foot of Taylor avenue in West Collingswood, discharging into Newton

creek without purification sewage from 105 houses in West Collingswood; that this sewage was spread over the flats by action of the tide and that a nuisance was thereby created; that much of the odor complained of by the residents of Collingswood might well come from this sewage, as the prevailing south and southwest winds of the summer would carry the smell in the direction of the houses of the citizens making the complaint; that this nuisance should be abated without delay, and that the committee was informed that plans would probably be submitted to the Commission in the near future, designed to properly dispose of this sewage.

The committee also reported that it had examined a sewer in the Borough of Oaklyn which is discharging the sewage from 8 houses into a small lake emptying into Newton creek without treatment; that the committee was informed that the Bettlewood Land Company which owned this sewer was preparing plans for the purification of the sewage by the construction of a coke filter.

Residents of Collingswood also complained to the committee of the nuisance caused by the discharge of crude sewage from the Borough of Woodlyne into Newton creek, and they were informed by the committee that the Commission had brought suit to abate this nuisance.

The secretary was directed to notify the Collingswood Land Company to show cause at a meeting of the Commission to be held January 23, 1908, why it should not be notified to cease polluting Newton creek by the discharge from its sewerage system at West Collingswood.

The secretary was directed to notify the Collingswood Sewerage Company that the Commission required at once the cleansing of its filter beds, the abandonment and the permanent stoppage of the present sluice-gate, and the construction of a new and efficient sluice-gate, and that it be required in the near future the construction of an additional filter bed.

The secretary was directed to notify the Bettlewood Land Company to show cause at a meeting of the Commission to be held January 23, 1908, why it should not be notified to cease polluting Newton creek by the discharge from its sewer at Oaklyn.

Richard T. Collings, President of the Collingswood Sewerage Company, consulted with the Commission in relation to the sewage disposal plant of the Collingswood Sewerage Company and the sewage being discharged into Newton creek at West Collingswood and Oaklyn. He stated that the Collingswood Sewerage Company was willing to construct a new sluice-gate to take the place of the one at present in use at the plant and was considering plans for the enlargement of its plant for the purpose of accommodating sewage at present being discharged from the system of the Collingswood Land Company at West Collingswood; that Bettlewood Land Company was also considering plans for the disposal of the sewage from its sewer at Oaklyn; that a contract between the Collingswood Sewerage Company and the Collingswood Land Company was now being prepared for the purification of the sewage from West Collingswood, and that he hoped that the matter would soon be arranged.

At a meeting of the Commission held January 23, 1908, in response to a notice to show cause why it should not be notified to cease polluting Newton creek, G. Franklin Davis appeared before the Commission on behalf of the Collingswood Land Company, and stated that the company owned a sewerage system discharging into Newton creek in West Collingswood; that the discharge of sewage caused a nuisance; that the Collingswood Land Company had been trying to make arrangements with the Collingswood Sewerage Company for several years to have this sewage taken care of in the Collingswood sewage disposal plant, and that negotiations were still pending; that although the Collingswood Land Company owned these sewers, it did not contribute any sewage to them, the sewers having been laid by it in order to facilitate the sale of lots owned by it; that it was the opinion of the company that the responsibility for the present discharge of sewage should not be placed on it alone, but also on the individual owners of these lots who discharge sewage into the sewers; that he would be glad to furnish a list of these property owners to the Commission; that his company had applied to the Borough

Council of Collingswood for the passage of an ordinance permitting it to charge a rental for its sewers, and that if this were done, the company would erect a disposal plant and extend its sewerage system; that this ordinance was still pending in the Borough Council, no action having been taken on it for some time.

The secretary reported that a notice to show cause why it should not be notified to cease polluting Newton creek had been forwarded to the Bettletwood Land Company, but that no reply had been received.

Commissioner Chew reported that on January 17, 1908, he had inspected the main sewer of the Collingswood Sewerage Company, at the request of John S. Smith, representing the Board of Health of the Borough of Collingswood; that he had found that the sewage overflowed from the main sewer at a man-hole located in the rear of a farm on Collings road, owned by William French, from whence it flowed into Newton Lake causing a considerable nuisance; that he had been informed by residents of the vicinity that the overflowing of sewage at this point was frequent and had been going on for a long time, and that the traces of the continued overflow were apparent.

The secretary was directed to notify the Collingswood Sewerage Company that it should at once take proper and efficient measures to prevent the overflow of sewage from the manholes of its sewerage system.

At a meeting of the Commission held January 30, 1908, a communication was received from Richard T. Collings, stating that the Collingswood Sewerage Company would take care of the purification of sewage from the property of the Bettletwood Land Company at Oaklyn; and that lumber had been purchased for the construction of a new sluice-gate at the Collingswood sewage disposal plant.

The secretary was directed to request from G. Franklin Davis, Manager of the Collingswood Land Company, a list of names of parties using the company's sewer at West Collingswood, which he had promised to submit to the Commission.

At a meeting of the Commission held February 6, 1908, a communication was received from G. Franklin Davis, manager of the Bettletwood Land Company, acknowledging receipt of a request for the names of the users of the company's sewerage system in West Collingswood, and stating that he believed that the Commission should secure these names.

On motion of Commissioner Chew, the following resolution was unanimously adopted:

**WHEREAS**, The State Sewerage Commission has found that the waters of Newton creek are being polluted to the injury of inhabitants of this State in their health, comfort and property, therefore,

**BE IT RESOLVED**, That, in accordance with Chapter 72 of the Laws of 1900, and the supplements and amendments thereto, the Commission hereby notifies the Collingswood Land Company that prior to the first day of April, 1908, it must cease to pollute the waters of Newton creek and make such disposition of its sewage and other polluting matter as shall be approved by this Commission.

The secretary was directed to have a notice in writing served in accordance with the foregoing resolution.

At a meeting of the Commission held February 13, 1908, communications were received from Richard T. Collings and C. R. Shinn, of Collingswood, stating that there had been no overflow of sewage from manholes in the sewerage system of the Collingswood Sewerage Company for over a year.

The secretary was directed to prepare such information as might be necessary to submit to the Attorney-General in order to have proper action taken to compel the Collingswood Sewerage Company to comply with the requirements of the Commission for the operation of its sewerage system and disposal works.

At a meeting of the Board held June 9, 1908, a resolution was passed that an inspection of the Collingswood plant be made, report of such inspection follows: (June 12, 1908)

The Collingswood plant is at present receiving sewage from 535 houses. The plant itself is composed of septic tank, primary and secondary contact beds as described in the report of the State Sewerage Commission for 1906. A change is being made in the manner of emptying the effluent into Newton creek. The old automatic gate has been abandoned and a new one, 1'x4' dimensions, is now being built at the extreme end of the wall enclosing the secondary contact beds. It is believed that this will be in operation in another week and will remedy the trouble now experienced, that of having the secondary beds flooded by the rising tide.

Pumping is carried on seven days each week, 9½ hours per day, but it is evident that in case the company increase the number of house-connections, it is understood that over 100 applications for sewer connection are on file, that more pumping will have to be done and the plant enlarged.

Under present conditions, the plant seems to be doing good work, especially in the septic tank action. The primary beds appear to produce a good effluent and it is probable that the new outlet gate will allow the secondary contact beds to do better work since it is believed that flooding will cease.

At a meeting of the Board held June 16, 1908, Mr. Chew moved that the Collingswood Sewerage Company be required to submit plans at once for the enlargement and improvement of their sewage disposal system at Collingswood. Motion was carried.

At a meeting of the Board held August 11, 1908, the following resolution was adopted:

**WHEREAS**, The Board of Health of the State of New Jersey has found that the waters of Newton creek are being polluted to the injury of inhabitants of this State in their health, comfort and property, therefore,

**BE IT RESOLVED**, That, in accordance with Chapter 72 of the Laws of 1900, and the supplements and amendments thereto, the Board of Health of the State of New Jersey hereby gives notice to the Borough of Collingswood that prior to the first day of September, 1909, they must cease to pollute the waters of Newton creek and make such disposition of their sewage and other polluting matter as shall be approved by the State Board of Health.

Report of inspection made July 29, 1908, is as follows:

The Borough of Collingswood, including West Collingswood, and the Town of Collingswood, is a suburban residence district in Camden county, four miles from Camden City. In 1901, they constructed a system of separate sewers and a sewage disposal plant.

The present total population is 3,850, and the area of the borough is 1,257 acres. There are 10½ miles of sanitary sewers now working, one mile laid that is not yet working and about one mile more to be laid as soon as possible. The size of the sewers varies from 6" to 18".

There are now 535 house connections and about 100 are expected to be added yearly.

Nearly all of the area covered by the town lies on a watershed which drains into Newton creek, an estuary rather than a stream, traversing meadow lands and marsh, and emptying in the Delaware river at Gloucester. The creek is dammed below Collingswood. The outfall main was carried past the dam along the bank of the creek to West Collingswood about a mile from Collingswood itself. Here the creek has an average tidal fluctuation of about 5.8 feet. At the railroad bridge at West Collingswood, the tidal water seems to be held back somewhat by the narrow sluice-way under the bridge. At one observation made on July 30, 1908, at 11:10 A. M., about ½ hour after the tide had turned flood, it was found that the tide below the bridge had to rise just 20 inches before the water was on a level with that above the bridge and the current ceased to flow out.

The disposal plant located close to Newton avenue in West Collingswood consists of a circular septic tank surrounding a circular pump-well, 4 primary coke contact filters and 4 secondary wave beds made of coke and stone, mixed.

The two concentric circular wells are 21 feet, 2 inches and 40 feet, 6 inches in diameter and 22 feet deep. The working depth to the level of the invert of the inlet sewer is 5 feet. The outer and inner walls are connected by a single radial septum wall. The outer compartment forms the septic tank around which the sewage flows and enters the inner well or pump-sump, through openings in the inner wall near the septum. The sewage thus rises in the tanks until the pumps are started in the morning, or until it reaches the overflow. This overflow empties onto one of the secondary wave beds.

The pumps (centrifugal in type) are located on a platform over the tanks and pump out the sewage through a 4-inch pipe directly to 3 of the 4 coke primary filters. The pumps are driven by gasoline engines and one is worked at a time. It is run about 9 or 9½ hours per day and nearly the same time on Sundays. A day's pumping usually lowers the tanks about 10 or 12 feet. On account of so much ground-water entering the system, the flow varies greatly and the effect of the pumping is by no means constant. A rough estimate made on the afternoon of July 20, 1908, indicated that the approximate 24-hour flow was about 200,000 gallons. This is in excess of the capacity of the plant and enlargements should be made immediately. The scum on the septic tank is from 6 to 15 inches thick. The short time of detention in the tank and the disturbance caused by pumping results in conveying an excessive amount of solid materials to the coke filters.

This causes clogging and necessitates scraping out one or more wheelbarrow loads of fine mud-like material from each bed every day it is used.

These beds are about 2 feet 8 inches deep, 37"x37" on top and taper to 22"x22" at the bottom. Three are used at a time for the 9½ hours' pumping. Then one is rested and a new one is used with two of the others. This gives a bed two days' work and one day rest.

Each bed has its own outlet leading to its own siphon chamber across Newton avenue. The siphons of these discharge upon brick aprons along the top of their corresponding wave beds. These wave beds are 36"x35 feet and are composed of crushed stone and coke from 3 to 6 inches in depth. They have quite a slope and the sewage running through them collects in a reservoir below formed by a dyke to keep out the tide. A sluice-gate opens at low tide and lets out the effluent. Under the first two of these beds, boards are laid on the mud, but the other two have the stone and coke directly on the earth bottom.

These beds sooner or later become clogged; especially the first one which receives the overflow from the septic tank just as soon as the tank fills up in the night. They are then washed by connecting on a hose to the pump pipe and using the stream of nearly raw sewage to turn over the stone and wash the clogging materials directly into the effluent reservoir. This is a bad practice which results in putting the filters of the whole plant out of use while washing is going on and pouring out into the final effluent and stream, the whole pumped sewage and the washings from the beds. The practice of allowing the overflow from the septic tank to by-pass the primary filters and to clog and run over the secondary ones is also bad. The secondary filters are also too shallow to accommodate the flow so that quite a lot runs down over the beds without ever touching the stone.

The new gate has been put in place and at the time of inspection was working well and prevented the beds from being submerged.

Some sort of a sewer system exists in West Collingswood, which empties its raw sewage from 120 houses into the marsh below the disposal plant. This causes pollution and nuisance. The sewerage company are laying a new system in West Collingswood, and propose to connect this on to their own at the disposal works. When that is done, the other polluting drains should be stopped immediately.

In view of this new addition and of the present over-loaded condition of the plant, the proposed enlargements should be made at once.

About September 15, 1908, Richard T. Collings, President of the Collingswood Sewerage Company, called at this office and stated that he wished to have plans prepared for enlarging the contact beds; that he wished to have them large enough to properly purify 200,000 gallons of sewage per day, so that it would not be necessary to enlarge the beds for a number of years.

On September 26, 1908, Mr. Herbert wrote Mr. Collings a letter to the effect that the Board would suggest that the new contact beds be increased to at least 4½ times their present size and to have an efficient depth of not less than 6 feet. That the septic tank should have a capacity of at least 250,000 gallons and be divided into two compartments of one-third and two-thirds total capacity respectively.

At a meeting of the Board on October 27, 1908, Mr. Chew moved that Mr. Daniels be instructed to visit Collingswood and make an inspection of the sewers at that place. This motion was carried.

#### DELAWARE RIVER.

At a meeting of the Commission held April 2, 1908, a communication from Dr. Eugene H. Porter, State Health Commissioner of New York, was received, enclosing a copy of a report prepared by Theodore Horton, Chief Engineer of State Department of Health of New York, as to the pollution of the Delaware river in the State of New York, with recommendations for its prevention, and the secretary was directed to acknowledge the receipt of a report made by the State Department of Health of New York on the pollution of the Delaware river, and to inform the State Health Commission of New York that the Commission noted with pleasure that the recommendations of the report conformed to the agreement made between the State Health Departments of Pennsylvania and New York and this Commission. The report of the New York State Department of Health on the pollution of the Delaware river in New York State, follows:

January 15, 1908.

*Mr. Theodore Horton, Chief Engineer, State Department of Health, Albany, N. Y.:*

DEAR SIR—I beg to submit the following report of an investigation of the character and sources of pollution of the Delaware river and its tributaries within the State of New York:

#### GENERAL DESCRIPTION.

The watershed of the Delaware river, in-so-far as it lies in New York State, is confined chiefly to the broken plateau to the southwest of the Catskill Mountains. The West Branch, commonly called the main stream, rises in a small lake almost on a line between Delaware and Schoharie counties, and flows in a general southwesterly direction through the centre of Delaware county for a distance of 70 miles. On reaching the Broome county line, the stream turns almost at right angles and runs southeasterly, forming the boundary between New York and Pennsylvania to Carpenter's Point, just below Port Jervis. Then it turns southerly, forming the boundary between Pennsylvania on the west and New Jersey on the east. The main tributary is the East Branch, so-called, which enters also from Delaware county, about 14 miles below the right-angle bend. One tributary enters from Pennsylvania on the west, the Lackawaxan river, with a drainage area of 597 square miles, but practically all the remaining area of 3,252 square miles, given by U. S. Census reports as the drainage area above Port Jervis, is in New York State, so that the New York State drainage area is about 2,650 square miles.

This area is included almost entirely in the two counties of Delaware and Sullivan, their combined area being 2,662 square miles. Small amounts of Orange and Ulster county are added and the northern part of Delaware county, which is in the Susquehanna Basin, is omitted. The general surface of both

counties is very much broken, and even mountainous, except in the northern part, where the main river drains a more open, cultivated and better developed country. In the south the ruggedness increases, a large number of picturesque and beautiful lakes adding to the scenic attractiveness of the region.

There are four railroads, which either pass through the area, or are sufficiently near to have been of aid in the development of the territory. The New York, Lake Erie and Western follows the Delaware river from Port Jervis along the southwestern boundary of both Sullivan and Delaware counties. This road was built in 1838, and was of infinite benefit to the settlers in the two counties. The next road was the Allegheny & Susquehanna, leased in 1870, to the Delaware & Hudson Canal Company, and now operated as a part of its system. This road does not actually enter the Delaware watershed, and yet, approaching so near as it does, it affords valuable facilities to many portions of the district. From Oneonta, for example, there is easy communication into the Towns of Franklin and Meredith. There was for many years a daily stage by way of Elk Creek through Delhi and from Unadilla and Sidney, communication is now had into the western towns of Delaware county. A third attempt to provide entrance into and egress from the district was made by the road now operated under the name of New York, Ontario and Western. This crosses the district from Sidney on the north boundary through Walton and Rock Rift, passing through the valley of the West Branch, then across and down the valley of the East Branch, leaving it at Cadonia, and then through nearly the middle of Sullivan county through Livingston Manor and Liberty, leaving the county at Summitville. One branch extends from Walton to Delhi, and a second extends from Port Jervis to Monticello with a connection from Summitville to Kingston on the Hudson.

Finally, the Ulster and Delaware skirts the extreme eastern edge of the district, leaving the Hudson at Kingston, and wending its way through the mountains to Oneonta, touching this watershed only at a few towns in the extreme northeast.

The Delaware and Eastern follows the East Branch from Cadonia through to Arkville, at which point it connects with the Ulster and Delaware just mentioned.

#### HISTORICAL.

While the tanneries have been in the past a large industry, the clearing and lumbering have long since exhausted the supply of bark, and this industry has, therefore ceased to be of consequence. Since the tanneries have ceased operation, a new industry has developed which is using up the hard woods. This is the manufacture of wood alcohol with its by-products, some 25 of these acid factories, as they are called, being scattered through the two counties. The location is shown on the map submitted herewith by a large circle.

The industry best adapted to the country, and one which has persisted from early times, is dairying, a large amount of the milk supply of New York City now coming from this region. The steep hillsides alternate with narrow but fertile valleys, and the number of creameries scattered throughout the watershed bears eloquent witness of the main industry of the region. On the map submitted herewith the creameries are shown by small black dots.

#### SOIL AND GEOLOGY.

The underlying rock formation is limestone of different formations, the Catskill formation being particularly in evidence. In Delaware county, the only valuable quarries are those of flagging stone, which have been found in several localities. In the neighborhood of the village of Delhi, particularly, these quarries have been worked to great advantage. In Sullivan county, the limestone changes to sandstone, much of it colored red by the addition of iron. No coal deposits occur and no minerals of any value have been discovered within the limits of the county, although a small lead mine, known as the Shawangunk Mine, has been opened, and some galenite taken out. The

vein of ore found extends from Elmville through Red Ridge and Wurtsborough, parallel to the range of hills and the western boundary of the county, but the amount of mineral found is too small to be profitably extracted. The sandstone is useful for building material, but the extensive deposits of brick clay which have been found near every town, make practically the only mineral wealth of the region. Evidences are to be found of glacial drift, beds of clay, sand and gravel being found in the valleys, and large boulders occasionally being stranded on the hill-tops.

#### MAIN RIVER.

The Delaware river at Trenton, 133 miles from the Atlantic, reaches the head of its navigation as well as the head of tidewater. The only navigation on the Delaware river above Trenton is that of pleasure craft, although formerly a large lumber industry was carried on by rafts in the river and in early times large flat-bottomed scows operated from Trenton up, forming the only method of transportation for the early settlers on the river. The principal lumber deposits which still remain on the upper Delaware are at Delhi and Deposit on the West Branch, at Hancock at the junction of the two branches and at Callicoon and Cohecton on the main river below Hancock.

At the time of high water in the spring, rafts may be brought down from Delhi to Easton, 165 miles, in about 48 hours, the mean velocity, therefore, being about 4 miles per hour, the elevations in the river are shown on the following table, taken from the census report of 1880:

LOCALITY.	Distance	Elevation	Distance	Fall	Fall per
	from Trenton.	above tide.	between points.	between points.	mile between points.
	Miles.	Feet.	Miles.	Feet.	Feet.
Trenton, below falls. . . . .	0	0)			
Yardley R. R. crossing. . . . .	3	8)-	3	8	2.67
Bull's Island. . . . .	26	74)-	23	66	2.90
Easton crossing of L. V. R. R. . . . .	54	159)-	14	76	5.40
Belvidere. . . . .	68	235)-	13	66	5.10
Watergap, Walker's Ferry. . . . .	81	310)-	46	149	3.20
Erie R. R. crossing 4 miles above Port Jervis. . . . .	127	450)-	19	150	7.90
Lackawaxan. . . . .	146	600)-	66	384	5.80
Deposit. . . . .	212	984)-	68	902	13.30
Headwaters. . . . .					

On the river there are no falls or rapids of special importance, although a number of rifts produce rapids extending over a distance of a mile or more, the actual fall varying from 5 to 10 feet. The declivities of the tributaries are much more rapid than of the main river.

#### TRIBUTARIES.

The Neversink, entering the Delaware about one mile below Port Jervis, drains a narrow valley, its area measuring nearly 350 square miles, and comprising a wild and broken country, very little developed. It rises in the western part of Ulster county about 45 miles in a straight line from Port Jervis. This stream is the main outlet for the drainage of the Catskill Mountains on the south, most of the Catskill drainage passing to the east by means of the Esopus creek and its branches.

The next important tributary of the Delaware is the Mongaup, a small stream draining about 230 square miles. It rises about 30 miles north of Mongaup



and empties into the river about 7 miles above Port Jervis. This tributary is fed by over 20 lakes and ponds, some of which are of considerable size, so that its flow is probably more uniform than the other branches of the river. Its basin, like that of the Neversink, is a wilderness formerly dotted by saw-mills and tanneries, but abandoned since lumber and bark have become scarce. Several high falls occur on this branch, particularly on its lower end.

Callicoon creek, about 40 miles above Port Jervis, is similar to the Mongaup. This stream is also fed by a number of lakes and its watershed was formerly the site of a large lumber business.

The next large tributary enters the river on the left from Pennsylvania about 15 miles above Port Jervis, and is the largest tributary which the river receives in this part of its course, namely the Lackawaxan river. This river is formed by the union of two branches, both of which rise in the northern part of Wayne county, and flow nearly south, uniting at Honesdale, from which point the river flows southeast, and then east through Pike county to the main river. The watershed is hilly and broken, a part of the high plateau characteristic of this region. The basin is dotted with numerous lakes and ponds, which have been improved for use by the Delaware and Hudson Canal. This stream has a fall of about 15" per mile in its lower 25 miles, and a much greater fall above, grades which probably correspond closely with those of the tributaries entering the river on the east.

The east branch of the Delaware is the next tributary and rises in the extreme eastern part of the Delaware county, flowing southwest about 50 miles to the main river. It drains an area of about 920 square miles, comprising a region but little developed with no large towns and with but a few mills, except small grist mills and saw mills. The slope of the stream is gradual, the bed gravel and sand, and the flow subject to large variations. The largest branch of this tributary is Beaver Kill, draining about 320 square miles. One of its affluents Trout Brook, rises in one of the larger lakes of the country known as Long Pond, about 2 miles long.

The main branch of the Delaware, flowing parallel to the East Branch, drains a similar area. The flow is gradual and only a few power developments have been realized.

A small stream, the Oquaga creek, enters at Deposit from Broome county, where this main river turns at right angles.

The banks of all the tributaries are steep and mountainous. Formerly covered with pines and hemlock, they are now largely grown up with the second-growth hard woods and with small bush. The bottom lands or valleys have been cleared or cultivated and are largely used for pasture. The southern part of the watershed is occupied with sand rocks, and the soils are chiefly light, sandy loams containing a large amount of silica. These sometimes exist as fine white quartzose sand, sometimes as gritty red sand. The northern part of the watershed, particularly that in Delaware county, is glacial drift, blue clay lying about 14" deep over the limestone rocks which are everywhere to be found. The amount of water area found in the watershed is very small, the numbers of lakes and ponds in Sullivan county, is very small, since the ponds themselves, though numerous, are very limited in area. Long Pond, which forms the headwaters of Trout Brook, 2 miles long and about  $\frac{1}{2}$  of a mile wide, is the largest pond in the region.

#### IMPROVED LAND.

\* In Delaware county, according to the census report of 1900, out of a total area of 1,580 square miles, or 1,022,000 acres, 796,000 acres are in farm lands of which 502,000, or about  $\frac{1}{2}$  is improved. In Sullivan county, containing 1,082 square miles, or 692,000 acres, 478,783 acres are reported as farm land, of which 201,000 are improved, or less than one-third, the balance in both cases being wild, unimproved hillsides, probably grown up with thicket and second growth.

#### CITIES AND VILLAGES.

The incorporated villages on the watershed are 15 in number, no cities being found. The following table gives the list of incorporated villages, with their population according to the 1905 census:

Andes Village	370
Delhi "	1,781
Deposit "	1,298
Hancock "	1,381
Hobart "	503
Liberty "	2,124
Margaretville	583
Monticello Village	1,388
Port Jervis	9,695
Roxbury Village	418
Stamford "	2,230
Walton "	2,911
Wurtsboro "	508

25,190

The population outside of the incorporated villages is chiefly rural, only a few villages of any size being found. The following table gives the list of unincorporated villages whose population is over 300:

Arkville	600
Barryville	340
Bloomville	350
Callicoon	800
Callicoon Centre	300
Cannonsville	350
Downsville	600
East Branch	400
Fremont Centre	300
Griffins Corners (Fleishmans)	800
Hamden	375
Huguenot	300
Jeffersonville	450
Livingston Manor	800
Long Eddy	665
Luzon Station	550
Narrowsburg	550
North White Lake	300
Pond Eddy	350
Rockland	325
Roscoe	700
Sparrow Bush	700
Summitville	400
White Lake	300

11,655

The population in the townships outside of the villages given above is as follows:

Township.	County.	Population.
Meredith.....	Delaware	735
Stamford.....	"	491
Roxbury.....	"	1,347
Bovina.....	"	916
Delhi.....	"	1,127
Hamden.....	"	1,011
Walton.....	"	2,185
Masonville.....	"	373
Middletown.....	"	1,836
Andes.....	"	1,490
Colchester.....	"	2,470
Tompkins.....	"	1,927
Deposit.....	"	597
Hancock.....	"	3,920
Mardenburg.....	Ulster	438
Denning.....	"	344
Fremont.....	Sullivan	1,145
Rockland.....	"	1,839
Callicoon.....	"	476
Neversink.....	"	669
Liberty.....	"	2,809
Delaware.....	"	1,814
Bethel.....	"	1,554
Fallsburg.....	"	2,540
Cohecton.....	"	1,123
Thompson.....	"	2,777
Mamakating.....	"	692
Tusten.....	"	357
Highland.....	"	635
Lumberland.....	"	399
Forestburg.....	"	544
Deer Park.....	Orange	867
Total.....		41,347

Diagram No. 1 shows the change in the population in the last 15 years, the population of these incorporated villages for 1890 being 22,714; for 1900, 25,190 and for 1905, 26,621. In 15 years, therefore, the population has increased 3,807, or 17%, a very slow increase compared with similar villages in other parts of the State.

Of the incorporated villages named above, the following have sewer systems: Liberty, Port Jervis and Stamford. The total population, therefore, sewerage directly through public sewer systems into the river is 14,049.

The following villages have private sewers, the numbers of persons using them being about as given:

Hancock.....	650	Deposit.....	120	Callicoon.....	106
Roscoe.....	200	Margaretville.....	150	Hobart.....	300
Roxbury.....	50	Fleishman's.....	400	Livingston Manor.....	25

The private sewers at Fleishman's, Hobart, Roscoe and Margaretville, which are credited above with about half of the total amount, are summer resorts, and the population given is largely the hotel population for whom the sewers have been built. In the winter the number would be very much reduced.

Taking the summer population and estimating the number contributing pollution to the river through private sewers as 2,001, as just given, the total number of persons contributing sewage to the river through both public and private sewers is about 16,000, or about 20 per cent. of the entire population on the watershed.

The total population on the watershed exclusive of that tributary to the Lackawaxan river, may be divided as follows:

Population in incorporated villages.....	25,190
Population in unincorporated villages.....	11,655
Township population outside of villages.....	41,347
	78,192

The total area of the watershed being about 2,650 square miles, the density of population is as follows:

Density, including all villages.....	29.5 per sq. mile.
Density including only unincorporated villages.....	20.0
Density of rural population.....	15.06

The sparseness of the population is therefore shown unmistakably by those figures, and the fact that of the incorporated villages only three have sewer systems, reduces the amount of pollution even below that shown by the figures just given.

The following table shows the drainage areas of the main river, and of its principal tributaries:

	Square miles.
Delaware river at Port Jervis below mouth of Neversink river.....	3,600
Delaware river at Port Jervis above mouth of Neversink river.....	3,254
Neversink river at mouth.....	597
Lackawaxan river at mouth.....	597
Mongaup creek at mouth.....	231
Callicoon river at mouth.....	138
Delaware river below junction of branches at Hancock.....	1,604
West Branch of Delaware river above mouth at Hancock.....	685
West Branch of Delaware river above Oquago creek at Deposit.....	519
East Branch of Delaware river at mouth at Hancock.....	919

The following tables give the monthly discharge of the East and West Branches of the river as determined by the United States Geological Survey:

## WEST BRANCHES.

Month.	DISCHARGE IN SECOND-FEET.		
	Maximum.	Minimum.	Mean.
1902.			
October, 15-31.....	8,090	378	1,812
November.....	1,980	184	622
December.....	12,662	366	2,439
1903.			
March, 16-31.....	12,560	1,341	3,471
April.....	2,726	378	1,170
May.....	208	37	119
June.....	3,421	21	782
July.....	1,256	92	381
August.....	9,368	184	1,100
September.....	2,509	109	604
October.....	33,740	136	3,492
November.....	5,582	187	1,013
December.....	7,460	418	2,431

Month.	DISCHARGE IN SECOND-FEET.		
	Maximum.	Minimum.	Mean.
1904.			
March, 7-31.	31,830	2,760	10,803
April.	6,791	857	2,666
May.	2,627	346	1,013
June.	1,528	53	420
July.	1,680	129	410
August.	3,860	440	1,247
September.	2,670	196	761
October.	9,560	332	1,532
November.	1,680	300	669
December, (1-9, 28-31).	8,920	300	1,696

1905.			
January.	7,850	473	1,899
March, 19-31.	13,240	4,110	8,544
April.	4,760	523	1,894
May.	614	196	396
June.	1,204	113	454
July.	1,352	113	270
August.	1,322	144	397
September.	4,630	482	1,344
October.	1,859	196	652
November.	5,636	144	681
December.	10,520	402	2,026

## EAST BRANCHES.

1902.			
October, 15-31.	10,400	903	2,821
November.	3,424	679	1,270
December.	23,960	903	5,093

1903.			
March, 16-31.	20,210	2,733	6,010
April.	6,601	744	2,434
May.	679	270	416
June.	10,670	198	2,252
July.	4,055	403	909
August.	10,750	490	1,817
September.	3,520	368	962
October.	50,510	334	5,724
November.	9,571	782	2,205
December.	12,440	1,320	2,914

1904.			
March, 22-31.	72,480	4,449	33,320
April.	11,680	1,892	5,162
May.	4,554	793	1,677
June.	2,054	308	848
July.	6,615	3,222	897
August.	3,222	589	1,305
September.	1,435	322	656
October.	19,240	589	2,842
November.	4,215	748	1,329
December.	10,590	1,274	3,064

Month.	DISCHARGE IN SECOND-FEET.		
	Maximum.	Minimum.	Mean.
1905.			
January.	10,210	804	3,261
March, 19-31.	15,920	5,010	11,330
April.	9,645	1,125	3,123
May.	1,082	402	698
June.	1,227	252	555
July.	1,485	252	455
August.	2,752	252	548
September.	4,215	804	1,946
October.	2,707	420	1,112
November.	8,910	492	1,088
December.	17,760	924	2,837

The minimum flow shown by these tables was in the West Branch in June, 1903, 21 c.f. per second. The minimum discharge on the East Branch was in June, 1903, 193 c.f. per second. This reduces to a minimum flow per square mile on the watershed of the West Branch of 13 c.f. per second. From the East Branch the minimum flow per square mile reduces to .20 c.f. per second. If .15 c.f. per second per square mile be adopted as a minimum flow for all the individual drainage districts in the region, the following table will show the minimum flow of the stream:

West Branch at Deposit.	.15 x 519 =	77.85
East Branch at Hancock.	.15 x 919 =	137.85
Mongaup creek, at mouth.	.15 x 231 =	34.65
Callicoon river, at mouth.	.15 x 138 =	20.70
Neversink river, at mouth.	.15 x 346 =	51.90
Delaware river, at Port Jervis.	.15 x 3600 =	540.00

The minimum flow at Port Jervis is able, therefore, to assimilate without nuisance the sewage of 103,000 persons, or nearly twice the entire resident population, and the tributaries are equally competent to prevent a nuisance on account of the large flow in relation to the population contributing sewage thereto.

The following table shows the capacity of the tributaries, assuming 5 cu. ft. per second, to satisfactorily care for the sewage of 1,000 persons, and the actual population in villages of 300 or more resident on the watershed.

Name.	Capacity.	Present Population.
West Branch.	15,570	8,500
East Branch.	27,570	7,027
Mongaup creek.	6,930	4,662
Callicoon river.	4,140	1,050
Neversink river.	10,380	2,586
Delaware at Port Jervis.	103,000	37,723

There are, in spite of this apparent improbability of a nuisance, some cases of local nuisance on account of improper arrangements of sewer outfall. The village of Stamford, some years ago, built a sewage disposal plant treating the sewage chemically, and holding back in this way the solids which formerly caused a nuisance in the small stream there. Similarly, Liberty, near the headquarters of the Mongaup, has an elaborate sewage disposal plant, treating the sewage by sedimentation, by contact in broken stone beds and by aeration in wave beds. The population of these two villages should, therefore, not be considered in estimating the pollution of the river by domestic sewage.

The private sewers from Livingston Manor discharge into a small stream called Cat-tail creek, which, when low in summer, becomes polluted and objectionable.

Delhi, one of the largest villages, uses cesspools entirely, but feels the need of a sewer system. Plans have been prepared for a comprehensive system to include a disposal plant.

At Hamden, there are several houses whose privies and cesspools are near enough to the stream to contaminate the water of the Trout Hollow Brook, which is used for the domestic supply of the village.

Walton, like Delhi, has felt the need of a sewer system, and plans have been prepared, although no construction has been undertaken.

At Pond Eddy, complaints have been made of the pollution of a brook which enters the Delaware at that point, the sewage from certain residences being discharged directly into the brook.

At Callicoon, complaints have been made of the pollution of a small brook, tributary to the river at that point. The hotels in Callicoon discharge their private sewers into the brook, which is practically dry in the summer.

#### POLLUTION BY MANUFACTURING WASTES.

The most prominent source of pollution of the Delaware river and of its tributaries is due to the presence of the acid factories. In the process, which subjects hard woods to distillation, the creosote obtained being afterwards refined, there is produced a certain amount of tarry refuse. In some of the plants this refuse is utilized, and in some others no attempt is made to produce anything except wood alcohol. In the latter case, the wastes, when thrown into the streams, or onto the banks to be washed by rains, have the effect of giving to the water a strong naphtha or gasoline-like odor, and, when the wastes are abundant, of giving to the water a black, tar-like appearance. The results in either case seem to be disastrous to fish, and many complaints have been made to the Forest, Fish and Game Commission on this account. Even where the wastes are utilized completely, the gasoline odor may be transmitted apparently by rain water to the ground, and in one case at least, the characteristic odor has been transmitted through the ground water to the water of wells several thousand feet away. The odor is so objectionable that the well waters cannot be used, so that no danger to health can be anticipated, but that the result is a public nuisance is unquestioned. These factories are, however, the chief industry in existence in that region, and in most cases, the annoyance is tolerated for the sake of the livelihood provided by employment in the factory. There are 23 of these factories reported by the inspector, or about one in every 100 square miles of the wilderness area.

There are a large number of milk stations, creameries, condensed milk factories, etc., the dairies of the two counties being famous for their high-grade cattle, the quality of their butter and cheese, and for the amount of milk produced per cow. The inspector has reported 74 of these creameries, etc., in active operation, although some of them employ only one or two operatives. The waste matter of these creameries is generally discharged directly into the streams, and in many cases is productive of a nuisance at times of low water. The effect of such discharges should probably be considered in the light of a local nuisance rather than as a permanent detriment to the stream, and yet the present pollution of the stream is, next to the discharge of sewage and to the wastes of the acid factories, caused principally by the wash water and wastes from creameries.

Of the many tanneries which formerly were in operation in this region, only two remain in operation, one at Monticello, employing 30 to 40 operators, making bookbinders' leather, and the other at Sparrow Bush, employing 75 operators and making sole leather. The first discharges an odorless and colorless effluent into the Black river, a tributary of the Mongaup river, and apparently has no bad effect on the stream.

The second discharges a stream which is discolored and affected with the odor of the hides into the Delaware river about 3 miles above Port Jervis. A cesspool has been built on the discharge pipe so that the heavier solids are retained. About 8,000 barrels of lime and sulphide are used a year besides tan liquor, bi-chromate of potash and glucoase.

#### WATER SUPPLY.

There are in the State of New York no public water supplies taken from the main river and since the river below Port Jervis flows for about 50 miles through an unsettled country with no towns and villages, the effect of any population contributed in New York State is almost negligible.

Belvidere and Easton in Pennsylvania, according to "Manual of American Water Works," take their water supply from the Delaware river.

Some of the smaller villages secure their domestic water supply from lakes and reservoirs on the headwaters of the tributaries which are subject to, if not already experiencing, local pollution. This should be prevented by the enactment of suitable water rules and regulations. Hamden, for example, has a supply which may be polluted by privies of houses on the bank of the stream above the reservoir. Hobart has a surface supply which is liable to pollution from surface washings, and complaints have been made of the polluted condition of the Roscoe public supply.

Walton, on the other hand, is a village which has adopted rules formulated and enacted by the State Department of Health and where careful inspections are made to detect violations of the rules.

The other villages are supplied either by private wells or from springs on the mountainside above the villages.

#### SUMMARY.

- (1) The watershed is largely wilderness with steep wooded hillsides and narrow, cultivated valley bottoms.
- (2) The population is scattered and sparse, 12.0 per square mile outside of the village.
- (3) There are no cities in the region, the largest village, Port Jervis, having a population of 9,695.
- (4) The total population is incorporated villages and in unincorporated villages with a population of 300 or more is 36,845, distributed among 37 villages.
- (5) The pollution of the waters of the Delaware river within the State results from the discharge of raw domestic sewage from those villages provided with public and private sewer systems not having purification works, and from the discharge of industrial wastes from the acid factories, creameries and tanneries.
- (6) The villages which discharge unpurified sewage into these waters include Port Jervis, having a population of 9,695, and the 9 smaller villages referred to above, having a combined population of about 2,000. The total population thus causing direct domestic sewage pollution is 11,695. The villages of Liberty and Stamford are both provided with sewage purification works.
- (7) The industries which discharge their wastes into these waters include 23 acid factories, 74 creameries and 2 tanneries.
- (8) There are no water supplies taken from the river within the State of New York or from tributary streams, except in their head waters.
- (9) There are no water supplies taken from the river in the States of Pennsylvania or New Jersey within a distance of 50 miles from the point where it leaves New York State—the first municipality taking such supply being Belvidere situated about 53 miles below the New York State line.

#### CONCLUSIONS AND RECOMMENDATIONS.

In view of the foregoing statements, I wish to present the following conclusions and recommendations:

(1) That owing to the sparsely populated character of the watershed of the Delaware river, and the relatively small number of villages which are provided with sewerage systems, the pollution of these waters by domestic sewage is not at the present time of a serious nature, not large in comparison with other watersheds of the State more densely populated.

(2) That in order to maintain its present relative purity and ultimately to eliminate all pollution of this character that now exists upon the watershed, I recommend that the general policy of the Department be:

(a) To prohibit the discharge of sewage from any new sewerage system constructed in the future, unless these are provided with proper and adequate works for sewage purification.

(b) To prohibit any extensions or additions to existing sewer systems unless disposal works are provided for a purification of the sewage of the entire system.

(c) To require under the Public Health Law, or otherwise induce, the villages which now discharge raw sewage into these waters, to introduce means for sewage purification as rapidly as it is possible and practicable.

(3) That in order to reduce, and ultimately eliminate the pollution of these waters by industrial wastes, I further recommend that the Department deny in the future all applications to discharge any industrial wastes from new industries which may be established along these streams in the future, or any increase in the discharge of these wastes from existing industries, unless suitable means for the disposal of such wastes are in each case provided.

(4) That the State Department of Health give every assistance possible, through its Laboratory and Engineering Divisions, in the investigation of disposal of wastes from acid factories, creameries and tanneries, in order to aid the owner of the establishments situated upon the watershed to reach a decision as to the most practicable means for the disposal of these objectionable wastes.

(5) That this investigation and report, and the conclusions and recommendations here stated, are in full accord with the resolutions adopted at the joint meeting of the State Health Departments of New York, New Jersey and Pennsylvania, held at Atlantic City, N. J., on September 14th, 1906, at which time it was mutually agreed that an investigation be made of the pollution of the Delaware river and its tributaries lying within the three states by each of the respective departments of health, and that there be adopted by each department the policy of demanding the removal of all existing pollution, and of preventing all future pollution, by requiring of all public and private corporations that they first purify their sewage or other wastes before discharging the same into these streams.

Respectfully submitted,

H. N. OGDEN,

*Special Assistant Engineer.*

At a meeting of the Board held October 6, 1908, Mr. Chew moved that Mr. Herbert be authorized to visit Harrisburg and confer with the Pennsylvania authorities concerning the work which they are doing along the Delaware river, with a view to informing this Board as to this work. Motion was carried.

#### REPORT ON HARRISBURG CONFERENCE.

A conference was held at Harrisburg, between Dr. Dixon and Mr. F. Herbert Snow, of the Pennsylvania Department of Health, and Mr. H. M. Herbert and Mr. Arthur G. Fowler, representing New Jersey, on October 14, 1908, at which time special reference was made to concerted action on the part of Pennsylvania and New Jersey in relation to causing pollution on the Delaware river to cease.

Mr. Herbert, for New Jersey State Board of Health, gave a resume of the work done by the Board relative to pollution cases, both as regards individuals and towns. Phillipsburg was mentioned as now being in the Court of Chancery.

Trenton, Bordentown and Riverton were mentioned as being under orders to produce purification plants within a given time. The work of inspectors was reviewed with regard to individual pollutions, with methods used by this board for dealing with individuals as regards hearings and final notice.

Dr. Dixon replied with reference to Pennsylvania, that inspection on the Pennsylvania side was being carried on continually with regard to the Delaware and its tributaries. Specific instances were given, such as Philadelphia being under orders to cease pollution prior to 1912. Individual pollutions numbering about 1,000 for the year, were cited as being evidence of the work done along the lines of individual pollutions.

Dr. Dixon expressed himself as being heartily in favor of cooperation with the New Jersey Board in relation to the Delaware, and promised to keep in touch by means of the exchange of reports, in order that the work of the two States might be balanced.

He also stated that the City of Easton had voted against a proposition to purify its sewage before entering the Lehigh and Delaware rivers. That under the present laws of Pennsylvania, it was impossible for him to compel them to install plants unless they applied for an approval of plans to extend their system. That at the present time Easton was growing rapidly and would soon be compelled to extend its sewers and that when that time arrived, he would compel the city to install a purification plant.

That Bristol has adopted plans for a disposal plant which will be installed in the near future, and that Mauch Chunk and other places on the Schuylkill river are at work on installing disposal plants.

Reference to garbage pollution at Easton was made by Mr. Herbert. Arrangements were made for a visit to Easton by an inspector from each State on Thursday, October 22, 1908, in order to catch the offenders in the act and bring about immediate stoppage of the nuisance.

In regard to removing the pollution by Delaware Water Gap hotels, it was decided that this should be investigated at an early date.

Dr. Dixon expressed the opinion that New Jersey was in advance of Pennsylvania in general health work, owing to its laws. He also stated that both New York and Pennsylvania were holding New Jersey up as a sort of model to their people in an endeavor to induce them to pass more stringent laws.

A visit of inspection was made to the Harrisburg Water Company's filtration plant and the process used was explained by Mr. Snow.

The following letter is a copy of the notice served on the City of Easton:

HON. HENRY MCKEEN,  
*Mayor, Easton, Pa.*

October 23, 1908.

DEAR SIR—Acting on complaints made to this Department by residents of Pennsylvania and on complaints made to the State Board of Health of New Jersey by citizens of that State, a joint investigation has recently been made by representatives of the two States of the source of refuse pollution of the Delaware river and its tributaries above Trenton.

It has been ascertained that the city of Easton is one of the principal offenders. I have ascertained that the city owns and operates its scow which receives the offal collected in the city and transports it down stream from which the offal is deposited into the river. It becomes my duty to notify you that this practice must cease, and I respectfully request that you put such orders into effect immediately as may be necessary to stop the discharge of all garbage or refuse by the city into any of the waters of the State. It will not do for any one to pass over the New Jersey shore and deposit the garbage there because the New Jersey authorities will take corresponding action within their jurisdiction. If there are any private individuals who are thus disposing of garbage, I shall thank you to inform me of the fact.

Hoping to receive an early reply, I beg to remain,

Very truly yours,

S. E.

[SAMUEL G. DIXON.]

On August 19, 1908, a letter was received from his Excellency the Governor, J. Franklin Fort, enclosing a letter from Mr. Richard L. Austin, of Philadelphia, Pa., complaining of the dumping of mud into the Delaware river near Raven Rock, requesting that an inspection be made of the same. An inspection was made and report is as follows:

On September 2, 1908, Raven Rock was visited to investigate the reported dumping of mud into the Delaware river at that point.

It was found that the Delaware & Raritan Canal Company (Pennsylvania Railroad) keeps a dredge and a force of men at work for the greater part of the year dredging out the sand and silt from the bottom of the canal. This material is for the most part utilized to keep the banks and tow-path in good condition; but that which is dredged from the entrance of the canal down to the lock at Raven Rock is scowed back to the river and dumped into the stream. The company has a dam across the Delaware just below this point which backs up the water for some distance. This lessens the current and allows the dumped material to settle very quickly. On the other hand, it was said that as soon as a freshet comes, the greater part of this material is washed away and goes down the river. There seems to be no other place to put this material except at great expense on account of the height of the banks. The company claims that they only put back into the river what is washed therefrom, and that appears to be true, there being no appearance of pollution along the canal for that short distance.

As for actual pollution, one is unable to approve or condemn the practice until more elaborate tests are made upon the material itself. At the time of inspection, the material was *almost* wholly sand. There was a very small amount of silt and a few remains of dead leaves. No odor could be detected in any of the material, and it was not very dark colored. It was estimated that about 10,000 yards of material were dredged and dumped into the Delaware river last season. On general principles, nothing of that character should be put into the river at all, and if some satisfactory arrangements could be made it would be better, perhaps, to make other use of the material. On the other hand, as far as actual pollution goes, it *may* do no harm, yet it will always be an open question.

Mr. Theodore VanCamp, the supervisor, said that occasionally a scow-load of material dredged out at Lambertville is dumped along the river bank at that point. This should not be allowed under any circumstances, because the canal at that point is too heavily polluted to allow any of its material to go into the river.

Copy of this report was forwarded to Governor Fort on September 10, 1908.

Complaint having been made that the Delaware river was being polluted by the Pennington Seminary, at a meeting of the Board held June 9, 1908, a resolution was passed to send notice to the Pennington Seminary Trustees to show cause at the meeting of June 16, 1908, at one o'clock, why they should not be notified to cease polluting the waters of the Delaware river.

At a meeting of the Board held June 23, 1908, Dr. Frank Moore, President of Pennington Seminary, appeared before the Board in reference to disposal of sewage from said institution. The matter was laid over for further consideration.

At a meeting of the Board held June 30, 1908, Colonel Olcott made a verbal report in reference to inspection of sewage disposal plant at Pennington Seminary. Motion was made and carried that the report be received, and that the matter be referred to the Chief of the Division of Sewerage and Water Supplies.

An inspection of the Delaware river was ordered, and at a meeting of the Board held August 11, 1908, the following resolution was adopted:

WHEREAS, The Board of Health of the State of New Jersey has found that the waters of the Delaware river and its tributaries are being polluted to the injury of inhabitants of this State in their health, comfort and property, therefore be it

RESOLVED, That, in accordance with Chapter 72 of the Laws of 1900, and the supplements and amendments thereto, the Board of Health of the State of New Jersey hereby gives notice to Jacob P. Frome, M. B. Bowers, Andrew W. Trimmer, Mrs. John Timms and Mrs. Edward Lamson that prior to the first day of September, 1908, they must cease to pollute the waters of the Delaware river and its tributaries, and make such disposition of their sewage and other polluting matter as shall be approved by the State Board of Health.

The following resolution was adopted:

WHEREAS, The Board of Health of the State of New Jersey has found that the waters of the Delaware river and its tributaries are being polluted to the injury of inhabitants of this State in their health, comfort and property, therefore, be it

RESOLVED, That, in accordance with Chapter 72 of the Laws of 1900, and the supplements and amendments thereto, the Board of Health of the State of New Jersey hereby gives notice to Dr. Frank Cook that prior to the first day of December, 1908, he must cease to pollute the waters of the Delaware river and its tributaries, and make such disposition of his sewage and other polluting matter as shall be approved by the State Board of Health.

At a meeting of the Board held September 8, 1908, motion was made and carried that the Pennsylvania Railroad Company and the Philadelphia & Reading Railroad Company be notified to appear before this Board on September 22, 1908, to show cause why they should not cease to pollute the waters of the Delaware river by discharge of fecal matter from trains.

Complaint having been made that there was pollution of the river at Lambertville, parties were notified to appear before the Board, and at a meeting of the Board, held September 8, 1908, Mr. James H. Reynolds, City Clerk of Lambertville, appeared in reference to the pollution of the Delaware river from the city garbage dump. He stated that they had no sewers emptying into the river and that no garbage was dumped in the river, but that garbage was dumped on a plot of ground in West Amwell Township. Mr. F. E. Daniels, inspector, then appeared before the Board in response to their request, and stated that he had found garbage dumped in a ravine from which in times of rain it would be washed into a creek and thence into the river; that he also observed garbage in the creek itself which had evidently been washed there recently or been dumped there. He stated that he was informed that it was the practice to dump garbage into the creek, but that this was not done by the city employees but by outside parties. Mr. Reynolds admitted that what Mr. Daniels said was undoubtedly true; that he did not know of this state of affairs until recently informed; that a meeting in regard to the same had just been held and men secured to put the dump in good condition. Mr. Reynolds agreed to take the matter up and try to find a place for the dumping of garbage where there would be no danger of contaminating the waters of the river from the same.

The following resolution was adopted:

WHEREAS, The Board of Health of the State of New Jersey has found that the waters of the Delaware river and its tributaries are being polluted to the injury of inhabitants of this State in their health, comfort and property, therefore, be it

RESOLVED, That, in accordance with Chapter 72 of the Laws of 1900, and the supplements and amendments thereto, the Board of Health of the State of New Jersey hereby gives notice to the City of Lambertville that prior to the first day of October, 1908, it must cease to pollute the waters of the Delaware river and its tributaries and make such disposition of its sewage and other polluting as shall be approved by the said Board of Health.

The following resolution was adopted:

**WHEREAS**, The Board of Health of the State of New Jersey has found that the waters of the Delaware river and its tributaries are being polluted to the injury of inhabitants of this State in their health, comfort and property, therefore, be it

**RESOLVED**, That, in accordance with Chapter 72 of the Laws of 1900, and the supplements and amendments thereto, the Board of Health of the State of New Jersey hereby gives notice to Mrs. Catherine Callan that prior to the first day of November, 1908, she must cease to pollute the waters of the Delaware river and its tributaries, and make such disposition of her sewage and other polluting matter as shall be approved by the said Board of Health.

At a meeting of the Board held September 22, 1908, Mr. Herbert made verbal report in regard to sweeping out of cars of the Philadelphia & Reading Railroad Company, while said cars were in use, and presented a letter from the company stating that the practice would be discontinued.

A. W. Preston, representative of the Pennsylvania Railroad Company, appeared before the Board in response to a notice in regard to the discharge of sewage from the shops of the company into the Delaware river at Lambertville. Mr. Preston promised to see that the pollution was discontinued.

William Lisbon, Andrew Reilly and George Massey appeared before the Board in reference to pollutions of tributaries of the Delaware river at Lambertville. Mr. Lisbon admitted that he had a pipe carrying waste water from a sink into the creek, but stated that no other sewage entered the pipe or creek from his premises. He was informed that he should discontinue the pollution. Mr. Reilly stated that he had a heap of manure on his premises, located within 12 or 15 feet of the brook, also that a privy was situated near the brook on his premises. He expressed a willingness to do anything that the Board recommended to prevent pollution of the stream, but did not think he was polluting the stream at the present time. Mr. Massey said he represented the Gas Light Company, and that he also appeared in regard to pollutions from other properties. He said that lime is thrown into the creek by the gas company to kill the bad odor of the water of the creek, and that it is not a pollution but that it really purifies the water. He said that a retaining wall is built along some of the properties referred to, for the purpose of keeping polluting material from reaching the stream, but he admitted that water from a sink on one premises is discharged into the stream. He stated that he had notified tenants not to throw garbage into the stream, but to provide garbage cans, and he believed that pollution of the stream from this cause would not occur in the future. Mr. Massey agreed to do whatever he could to cause a discontinuance of the pollution.

Edward R. Solliday, representing the New Jersey Rubber Company, of Lambertville, stated that they used water and sulphuric acid to wash old rubber at the works; that the acid is drawn off and the rubber then washed in a large quantity of water, and it is this water which is discharged into the stream. He said the inspectors had called his attention to the fact that dust from old shoes should not be thrown into the river, and he stated that this practice would be discontinued.

C. M. Woodruff, representing the Valentine & Bentley Silk Company, at Newton, N. J., admitted that dye from a silk mill flows into a tributary of the Delaware river; he presented a sketch of the place showing that the dye stuff is discharged into a large swamp and stated that it is quite thoroughly filtered out of the water before the water from the swamp reaches the stream. He stated that the company was not allowed to discharge dye stuff into the sewerage system, but that water-closets at the mills would be connected with the sewer within a week or ten days. Mr. Woodruff presented samples of water collected at different points from the stream referred to.

The following resolution was adopted:

**WHEREAS**, The Board of Health of the State of New Jersey has found that the waters of the Delaware river and its tributaries are being polluted to the injury of the inhabitants of this State in their health, comfort and property, therefore, be it

**RESOLVED**, That, in accordance with Chapter 72 of the Laws of 1900, and the supplements and amendments thereto, the Board of Health of the State of New Jersey hereby gives notice to Valentine & Bentley Silk Company and the Merriam Shoe Company that prior to the first day of December, 1908, they must cease to pollute the waters of the Delaware river and its tributaries and make such disposition of their sewage and other polluting matter as shall be approved by the said Board of Health.

The following resolution was adopted:

**WHEREAS**, The Board of Health of the State of New Jersey has found that the waters of the Delaware river and its tributaries are being polluted to the injury of inhabitants of this State in their health, comfort and property therefore, be it

**RESOLVED**, That, in accordance with Chapter 72 of the Laws of 1900, and the supplements and amendments thereto, the Board of Health of the State of New Jersey hereby gives notice to the New Jersey Rubber Company, Charles M. Bloomer, Margaret Banchoff, Mrs. S. Brady, John Wofford, Ann Williams, John Slack, Anderson Slack, The Gas Light Company, New Hope Delaware Bridge Company, E. Ocem, Thomas O'Rourke, Edward McDermont, William Lisbon, William Mangan, Harry Montgomery, J. G. Lear, for F. F. Lear Estate, John Liley, John Kelly, Lambertville Rubber Company, C. A. Horne, Alex. B. Allen, P. J. Hazen, W. H. Gandy, Gewas Ely, Joseph Curtis, John M. Casey, William P. Colligon, John Call. Joe Ardishey, George Massey, Andy Riley, Scovey Massey and the Pennsylvania Railroad Company that prior to the first day of December, 1908, they must cease to pollute the waters of the Delaware river and its tributaries and make such disposition of their sewage and other polluting matter as shall be approved by the said Board of Health.

Motion was made and carried that the Attorney-General be requested to institute suit against Jacob P. Frome, of Port Murray, Warren county, N. J., (P. O. Oxford, R. F. D.) for permitting drainage from offal and carcasses of dead horses to pollute the waters of a tributary of the Delaware river in violation of the provisions of Chapter 72 of the Laws of 1900, and the supplements and amendments thereto.

At a meeting of the Board held September 29, 1908, Mr. Chew said he wished to respond to a notice sent to Harding B. Steelman, of Delair, in reference to sewage being discharged from Mr. Steelman's premises into the Delaware river. Mr. Chew further stated that Mr. Steelman and other small property owners asked if they must discontinue their small pollutions while larger pollutions were allowed to continue, and Mr. Chew said he wished to request the Board that this matter be left until the larger pollutions are cleaned up. It was recommended that Mr. Chew notify Mr. Steelman to build a cesspool.

Harry Montgomery, of Lambertville, appeared before the Board in reference to pollution of the Delaware river and stated that he had just completed the building of a cesspool on his property; that pipes carrying sewage from sink and bath tub would at once be connected with said cesspool, and that no drainage would hereafter be discharged into the river from his premises.

The following resolution was adopted:

**WHEREAS**, The Board of Health of the State of New Jersey has found that the waters of the Delaware river and its tributaries are being polluted to the injury of inhabitants of this State in their health, comfort and property, therefore, be it

RESOLVED, That, in accordance with Chapter 72 of the Laws of 1900, and the supplements and amendments thereto, the Board of Health of the State of New Jersey hereby gives notice to Mrs. P. A. Allen, William H. Ashley, Henry G. Biddle, M. C. Biddle, John S. Bioren, Central Trust Company, Harry Denman, John Deveney, Christian Dick, Eugene Dollner, B. C. Boyle, Dreer's Nursery, Mrs. R. J. Elwell, John Evald, C. C. Fidler, N. Myers Fidler, J. C. W. Fuchstmutth, Richard Hawley, J. T. Hildebrant, T. B. Hagstoz, F. T. Jones, Mrs. John J. Kelly, J. R. Maul, Lilly H. Nelson, S. S. Pancoast, Peter Parr, Pennsylvania Railroad Company, Philadelphia & Reading Railroad Company, Mrs. B. C. Potts, Harry Price, A. Ridgway & Son, Edward B. Showell, J. B. M. Showell, T. C. Stell, Henry Taubel & Son, William F. Taubel, Thomas P. Thomas, Mrs. Sayer Upperman, Charles Winhoevel and Charles A. Wright, that prior to the first day of December, 1908, they must cease to pollute the waters of the Delaware river and its tributaries and make such disposition of their sewage and other polluting matter as shall be approved by the said Board of Health.

At a meeting of the Board held October 6, 1908, a committee of six gentlemen from the St. Mary's Hall, Bordentown, appeared before the Board in reference to pollution of the Delaware river by sewage from said institution. E. C. Worl, sanitary engineer, spoke for the committee. He presented plans of the sewage disposal system of said institution and explained the same, stating that a part of the sewage is discharged directly into the river and the remainder undergoes treatment. It was stated that the effluent after the treatment of the sewage is moderately clear. It was agreed that changes would be made by which all sewage would be treated before it is discharged into the river, and it was requested that the institution be allowed as much time as possible in which to make said changes.

Thomas Devlin and Lewis McGrath, of the Devlin Manufacturing Company of Burlington, appeared before the Board and admitted that drainage is discharged from their works into the Delaware river. It was stated to Mr. Devlin that no waste water should be discharged into the river and he agreed to make changes to discontinue the practice.

Samuel M. Roberts appeared before the Board and stated that he represented General E. B. Grubb and E. S. Adams, in reference to pollution of the Delaware river from their premises. Upon being informed that this pollution must be discontinued, Mr. Roberts immediately withdrew without making any statements.

Alexander P. Gest, representing the Pennsylvania Railroad Company, appeared before the Board in reference to pollution of the Delaware river and other streams from passenger cars of the company. He stated that orders had been given to employees to discontinue dumping garbage from dining-cars into streams, but said he did not see how such pollution as might occur from water closets in the cars could be avoided unless the closets were taken out of the trains entirely. He said the company was willing to do anything they could to cooperate with the Board of Health.

George D. McIlvaine, of Beverly Township, appeared before the Board and admitted that sewage from his property is discharged into the Delaware river. It was suggested to Mr. McIlvaine that he build a cesspool and discharge the overflow through sub-surface drains.

Charles A. Coddling appeared before the Board in reference to pollution of the Delaware river from the premises of S. Bonfield, of Beverly, and admitted that sewage from this property is discharged into the river. It was stated to Mr. Coddling that this practice should be discontinued.

At a meeting of the Board held October 13, 1908, Lucius Hires and Harry Ayres appeared before the Board and admitted that waste from their canning factory at Quinton is discharged into a tributary of the Delaware river. It was suggested to Mr. Hires that he should build a check tank to receive this waste, having a discharge pipe from said tank. It was also stated that the matter would be looked into by the Board.

Mr. Reginald Branch, of Burlington, stated that he represented Henry B. Grubb, C. Ross Grubb, the Florence Iron Works and Mrs. Louis Rodman. Mr. Branch stated that sewage from these premises is discharged into the Delaware river, but that Mr. H. B. Grubb and C. R. Grubb would be glad to connect with the Burlington City sewer if pipes were laid in the streets near their premises as they should be. He said they were willing to cooperate with the Board, but thought the Board should take up the question of laying of sewer with the City of Burlington. It was stated to Mr. Branch that this was a matter of local government.

Mr. Franklin Carter, member of the Board of Health of Burlington, said that he appeared in response to a notice in regard to the disposal of garbage from the city, and that the matter would be attended to. Mr. Carter also gave information in regard to a number of sewer connections in Burlington which he wished the Board to investigate.

Mr. E. Brakely, of Bordentown, admitted that waste water from his canning factory finally reaches the waters of a tributary of the Delaware river. Mr. Brakely made a long statement in regard to the operation of his factory, and stated that the waste water from his factory is discharged into the sewers of Bordentown and not directly into the stream.

Eugene C. Gallagher, representing the Pennsylvania Railroad Company, appeared before the Board in reference to pollution of the Delaware river from the station at Bordentown. He stated that he appeared in place of Mr. Shepherd, who wished him to say that the trouble would be corrected as soon as possible.

William E. Taylor, representing the U. S. Cast Iron Pipe and Foundry Company, of Burlington, admitted that the waste water is discharged from this premises into the Delaware river. He stated that it was impossible for them to connect with the sewer as it had not been extended near them, but that they would be glad to cooperate with the Board in the matter.

Oscar Neidt appeared before the Board in reference to pollution of a tributary of the Delaware river by waste materials from his rendering establishment in Burlington county. Mr. Neidt stated that nothing but water is discharged from his premises into the stream.

Colonel Olcott moved that a special inspection be made of Mr. Neidt's premises. Motion was carried.

At a meeting of the Board held October 27, 1908, Mr. Chew read a report of an inspection of the premises of Oscar Neidt. Motion was made and carried that the report be received and referred to Mr. Herbert.

Report of special inspection of the premises occupied by Oscar F. Neidt, on Crosswicks creek made on October 24, 1908, by Arthur G. Fowler, Assistant-Chief of the Division of Sewerage and Water Supplies:

The premises above-mentioned are occupied by Mr. Oscar F. Neidt, who carries on at that place a horse-rendering plant.

The products of the factory are fertilizers, bone-meal and extracted fats and grease which latter products are sold to persons making cheap soaps. The principal complaint of this factory from the standpoint of health is the fact that certain waste materials are allowed to flow into a small tributary of Crosswicks creek and thence into the Delaware river. The chief pollution occurs from the waste refuse allowed to go from the tanks in which portions of the carcasses of dead animals are boiled and then removed for the purpose of grinding. During the operation of steaming in the above-mentioned tanks, certain oils and fatty liquids settle at the bottom of the vessels. These liquids are allowed to run off through a wooden trough into a small tributary of the main creek at a point about 150 to 200 feet from the factory. These liquids are decidedly putrescible and obnoxious and undoubtedly the presence in the water is dangerous to health. From the top of the steaming tanks, of which there are four, a large iron pipe carrying off the excess steam leads directly to Crosswicks creek, out of this there can nothing come except the excess steam or perhaps on very rare occasions when pressure is at a very high point a few particles of solid matter. This steam when condensed into water is obnoxious,



but I do not believe it can be called dangerous since the temperature maintained in the tanks is of such a degree that bacterial life could hardly exist in it.

From the general condition of the ground surrounding the factory I should be inclined to believe that it would be possible to build and operate successfully a cesspool or other tank for the sewerage and removal of the waste liquids above referred to which come from steaming tanks. Although this liquid contains a certain proportion of fatty material, I think it would be possible at a small expense to provide for natural filtration by means of a series of lateral drains in the adjoining ground and thus do away with the pollution of Crosswicks creek.

As far as the factory itself goes, and its operation, it is apparently kept in as clean a condition as can be expected on premises given over to such work. It is impossible to get rid of all odors at times, but it would seem that the location of the building is far enough back from the main road and away from dwellings so that no extreme nuisance may arise.

At a meeting of the Board held October 27, 1908, in response to notices to appear and show cause the following persons appeared before the Board:

Edwin J. Morris, for Morris & Company, appeared and stated that he discharged waste from a dye house at his mill at Grovesville into the Crosswicks creek; that a privy is also located over this raceway, but that he did not think any pollution of the creek would occur from either the dye house or the privy. He was informed that the privy must be removed from the stream. This he agreed to do.

H. Nutt, of Clay street, Trenton, stated that rubbish on the banks of the Assanpink creek on his premises was not deposited there by him, and further, that the rubbish is not thrown into the creek. It was suggested to Mr. Nutt that he should put up a notice to stop this practice.

A representative of the DeLaval Steam Turbine Company, of Trenton, stated that nothing but the overflow from a septic tank is discharged from their premises into the Assanpink creek. He asked suggestions as to the best method to take care of this waste, and was informed that the matter would be looked into.

In response to the notice sent to Peter Schlicher, of the Trenton Abattoir Company, his representative stated that some waste water from the abattoir is discharged into Assanpink creek, but he did not think any pollution of the waters of the creek was caused thereby. He said the waste from the slaughterhouse is discharged into the city sewers. It was stated that a reinspection would be made of the plant.

The representative of the Pennsylvania Railroad Company, A. P. Gest, stated that he appeared in response to a notice in reference to the discharge of sewage from a water-closet at the Trenton station into the Assanpink creek, and asked to be informed in regard to the location of said closet, as he had been unable to locate it. He also asked information in regard to a letter he had received in reference to septic tank being installed by the company without having plans approved. He said he did not know where the tank was situated. Mr. Gest also asked to be informed in regard to the exact location of water-closet at the station at Bordentown, notice in regard to said closet having been received some time since. Mr. Gest was informed that information in regard to these matters would be forwarded to him.

The gentleman representing the Trenton Rubber Manufacturing Company and the Joseph Stokes Rubber Company, stated that no sewage from water-closets at the works of the Trenton Rubber Company is discharged into Assanpink creek, but that they have a pipe to carry away the water from the settling basins. This water comes in contact with old rubber, but he did not believe it contaminates the water of the creek. He was not sure whether sewage from water-closets at the Joseph Stokes Rubber Company's plant is discharged into the creek, but thought the same conditions prevailed as at the factory first named. He agreed that if water-closets were found to be connected with the stream, they would be removed.

Norman E. Rulon, of Trenton, stated that he had removed the water-closets which previously polluted the waters of the creek.

The representative of the Acme Rubber Manufacturing Company, of Trenton, admitted that sewage from water-closets at their plant is discharged into Assanpink creek. It was stated to him that this pollution must be discontinued.

The representative of F. A. Strauss & Company, admitted that washings from wool at their mill and sewage from water-closets is discharged into the creek, but stated that they have a settling basin and that the water used in washing wool first passes through this basin before it is discharged into Assanpink creek and, therefore, he did not think it polluted the waters of said creek. He agreed to have the water-closets disconnected from the stream.

#### DELFORD.

An inspection was made on August 7, 1908, and the following is the report submitted:

The Borough of Delford is situated in Bergen county, on both sides of the Hackensack river. The population of the Borough is about 1,000. At New Milford, the Hackensack river is dammed by the water company which has its plant located at that point.

Practically all of the inhabited territory of the Borough is sewerage. The sewers range from 8 to 20 inches in diameter, and are of the ordinary vitrified terra cotta pipe and aggregate about 6¼ miles in length. Some ground water enters the system, but storm water is excluded except at the extreme end of some of the sewers, one house may be connected in order to supply a flush. House connections, 99.

The sewage flow is not known and as both the inlet to and the outlet from the septic tank are covered, it is difficult to make a close examination and get an accurate estimate.

The disposal plant consists of a septic tank only. This tank is located on the west bank of the Hackensack river some distance below the dam. It is built of concrete and covered by a wooden roof freely ventilated. The internal dimensions are 38½ feet by 13 feet 8 inches, and the average depth is about 7 feet. The tank seemed to be working very well, although the effluent discharge was plainly visible in the river. There is considerable rise and fall of tide in the stream and at the time of inspection the tide was down. The roof has recently been painted and occasionally some one removes the mud of the river deposited around the outlet.

This is about all the attention the plant gets or requires.

#### EAST RUTHERFORD.

At a meeting of the Commission held January 30, 1908, the secretary reported that Colin R. Wise, C. E., had consulted with him in relation to the purification of the sewage from the new sewerage system of the Borough of East Rutherford; that plans for a septic tank were being prepared providing for sufficient fall for the use of filters in case they were subsequently required by the Commission, land having already been purchased for this purpose.

At a meeting of the Commission held March 12, 1908, plans for the disposal of sewage from the proposed system of sewers of the Borough of East Rutherford were submitted to the Commission, on behalf of that Borough, by Colin R. Wise, Borough Engineer. On motion of Commissioner Herbert, the plans submitted by the Borough of East Rutherford, providing for the purification of the sewage of that Borough by a septic tank, the effluent to discharge into Berry's creek, were approved subject to such conditions of construction, operation and purification as this Commission may from time to time require.

## ELIZABETH RIVER.

At a meeting of the Commission held March 12, 1908, a communication was received from J. W. Whelan, Secretary of the Elizabethtown Water Company, complaining of pollution of the streams used by it as a source of water supply, by 33 parties. The secretary was directed to investigate the complaints of pollution of the Elizabeth river made by the Elizabethtown Water Company.

At a meeting of the Commission held March 19, 1908, a communication was received from J. W. Whelan, Secretary of the Elizabethtown Water Company, in relation to pollution of the Elizabeth river above the intake of the water company.

The secretary submitted reports of inspection of sources of pollution of the Elizabeth river made by David H. Townley.

On motion of Commissioner Capstick, the following resolution was unanimously adopted:

**WHEREAS**, The State Sewerage Commission has found that the waters of the Elizabeth river are being polluted to the injury of inhabitants of this State in their health, comfort and property, therefore, be it

**RESOLVED**, That, in accordance with Chapter 72 of the Laws of 1900, and the supplements and amendments thereto, this Commission hereby gives notice to A. L. Ball, James Bowers, N. Drake, Board of Play Ground Commissioners of East Orange, William Foley, A. Maybaum & Sons, J. A. Martens, Mrs. J. G. Voorhees, Louis Voorhees, J. G. Boschen, Mrs. Emma Ball, George Bauer, Sylvester Baldwin, Joseph Cummitson, James Crawford, Elmer Day, Doctor Alvin Eaton, William Elberson, George Haines, George Kubach, James Looby, A. Mackay, Jacob Ehrhardt, Hausmann Brothers, R. S. Howell, Daniel Keller, George Kreuger, Samuel Lemmerman, Daniel Lemmer, Patrick Larney, Charles and Henry Nolde, John Stiles, James O. Stiles, L. Silberman, Frederick Smith, John D. Schaffer, Alex. Thompson, David G. Williams, Peter Ernst and Theodore Greogan that they must cease to pollute the waters of the Elizabeth river prior to April 15, 1908, and make such disposition of their sewage and other polluting matter as shall be approved by the State Sewerage Commission.

On motion, the secretary was directed to have notices in writing served in accordance with the foregoing resolution.

At a meeting of the Commission held March 26, 1908, the secretary submitted reports of inspection of sources of pollution of the Elizabeth river.

On motion of Commissioner Capstick, the following resolution was unanimously adopted:

**WHEREAS**, The State Sewerage Commission has found that the waters of Elizabeth river are being polluted to the injury of the inhabitants of this State in their health, comfort and property, therefore, be it

**RESOLVED**, That, in accordance with Chapter 72 of the Laws of 1900, and the supplements and amendments thereto, this Commission hereby gives notice to Henry Ahlers, Elizabeth Collen, Irvington Cemetery Association, Mrs. Eliza Larney, Henry Sonntay, Isador Spelman and L. Smith that they must cease to pollute the waters of the Elizabeth river prior to May 1, 1908, and make such disposition of their sewage and other polluting matter as shall be approved by the State Sewerage Commission.

At a meeting of the Commission held April 2, 1908, a report of pollution of the Elizabeth river by Stewart Headley, at Union, was submitted to the secretary.

On motion of Commissioner Chew the following resolution was unanimously adopted:

**WHEREAS**, The State Sewerage Commission has found that the waters of the Elizabeth river are being polluted to the injury of inhabitants of this State in their health, comfort and property, therefore, be it

**RESOLVED**, That, in accordance with Chapter 72 of the Laws of 1900, and the supplements and amendments thereto, this Commission hereby gives notice to Stewart Headley that he must cease to pollute the waters of the Elizabeth river prior to May 1, 1908, and make such disposition of his sewage and other polluting matter as shall be approved by the State Sewerage Commission.

## IRVINGTON.

An investigation of sewage pollution at Irvington, in response to a complaint made by the Elizabethtown Water Company, was made and resulted in the following information:

The trunk sewer supplying Irvington and Vailsburg and emptying into Bay Way below Elizabeth, is apparently of insufficient size to take care of an extra amount of sewage, especially at times of heavy rains. To remedy this, 2 outlets of 15-inch terra cotta pipe have been attached to the trunk sewer at Irvington, emptying into the Elizabeth river at a point opposite the Irvington Cemetery. One of the above-mentioned outlets is situated beneath Lyle avenue bridge and the other about 400 feet below the first.

Although at time of inspection the exact connection of the above-mentioned drains with the trunk sewers could not be determined, on account of the closure of manholes, it is to be supposed that the connections are made in such a way that when the level of the water in the trunk sewer rises above a certain point, the extra amount will be taken care of by these outlets.

At the same time, a privy-vault was noted situated directly on the bank of the Elizabeth river in Irvington Cemetery. I was informed by Mr. M. S. Drake, who accompanied me, that the Irvington Cemetery had been requested at some previous time to remove the privy by the State Board of Health.

Evidently, this has not been done, and he desired that special attention be called to that fact.

This inspection was made on June 10, 1908.

Notice to cease pollution prior to May 1, 1908, was served on Mr. John H. Van Cleve, Treasurer, on March 30, 1908. Upon inspection it being found that the notice had not been complied with, on June 12, 1908, notice was sent to Mr. Van Cleve that unless the matter was attended to at once the Attorney-General would be instructed to begin injunction proceedings immediately.

## ESSEX FELLS.

The following report was made of an inspection of Essex Fells on July 14, 1908:

Essex Fells is located in Essex county about a mile southwest of Caldwell. It is purely residential in character and has a population of about 300.

A system of separate sewers and sewage disposal was installed about 14 years ago, but in 1905, the disposal plant was remodeled. There are about 1½ miles of sewers consisting of terra cotta pipe from 6 to 10 inches in diameter. Storm water is excluded but ground water enters the system considerably, especially in wet weather.

The disposal plant is located in a valley just north of the settlement and discharges its effluent into a stream tributary to the Passaic river. At present, the plant consists of a septic tank (composed of the old grease-tank and flush-tank), two contact beds and two secondary sand and gravel filters, and a reserve sand and gravel bed used when the contact beds are out of commission, as was the case at the time of this inspection.

The old grease-tank, now part of the digestion tank, is a circular pit 15 feet in diameter and 10 feet deep. Into this the main sewer empties and here most of the heavy sludge is retained. The sewage is blanketed with a thick, soft scum. The old flush-tank, also used for septic purposes, is a rectangular chamber, roofed with flagging. Its inner dimensions are 24x16x5½. The siphon which formerly emptied the tank has not been removed (it is still used when the tank is being cleaned); but a new overflow has been provided, and

through this the sewage flows slowly and continuously. A moderate scum was also present on this tank. The two tanks are used continuously in series. The outlet pipe from the digestion tank leads to a distributing chamber, adjoining the two contact beds. In its course it receives the sewage from a single house. The solids contributed by this connection go straight to the filters without detention; but their bulk is very small. The sewage is fed alternately to the contact beds by automatic air-lock distributors.

Each of the contact beds is a masonry tank 36 feet 8 inches long, 30 feet 6 inches wide and 3 feet 6 inches deep, filled with broken stone. Each bed is fed from the distributor by a six-inch pipe, which empties into a wooden trough 12½ feet long. This spills upon the surface of the filter into two furrows, which run on the lines of the diagonals, and intersect at the centre of the beds. These furrows are lined and banked with ashes. Each bed is underdrained by a diagonal main tile, with laterals six feet apart. At the head of each underdrain lateral, a four-inch pipe is carried vertically to and above the surface for ventilation. In these the rise and fall of the liquid can be measured.

The underdrains of the contact filters deliver to a valve chamber, from which run three outlets, one to each half of the lower gravel filter (the upper one lies too high to be reached by the contact bed effluent), and the other is used as an emergency by-pass and empties directly into the stream.

The lower gravel bed has an area of 6,576 square feet, and is divided into two halves, each half being used alternately. In addition to the feed inlets noted, it has another coming from the high level line feeding the upper gravel bed. Four lines of four-inch underdrains, about 22 feet apart, collect the gravel bed effluent and deliver it, by separate outlets, to a small ditch, from which the flow goes to the brook.

The upper gravel bed has an area of 4,800 square feet. The filling of both the upper and lower beds is mixed gravel, sand and stones, five feet deep.

The upper bed is used as a reserve filter to receive the septic effluent whenever it is necessary to rest and dry out the contact beds, which occurs occasionally. At the time of inspection it was being used in that manner in order to rest the contact beds. When it becomes necessary to empty the septic tank, the sludge is also run out on the upper gravel bed to dry.

The effluent from the underdrains appeared quite clear and with very little odor and very little fungus growth around the outlets.

The beds are surrounded by high grassed slopes. On these the grass is kept cut. The beds are frequently scraped and harrowed and, occasionally, fresh ashes are put on the barriers on the contact beds. Otherwise, the plant needs little attention.

#### FLEMINGTON.

At a meeting of the Commission held November 7, 1907, the secretary was directed to notify the authorities of the Village of Flemington to show cause at a meeting to be held November 21, 1907, why they should not be notified to cease polluting the Raritan river.

At a meeting of the Commission held November 21, 1907, in response to notice to show cause why the village of Flemington should not be notified to cease polluting the Raritan river, John Foran, Village Trustee, and John H. Shrope, Village Clerk of Flemington, appeared before the Commission and consulted with it in relation to the sewage disposal plant at Flemington. Mr. Foran stated that he believed the Village was in favor of placing the disposal plant in the best possible condition, and that the village trustees desired to be advised as to what was necessary to be done to accomplish this, and that the matter would be taken up at the next meeting of the village trustees, after which they would communicate with the Commission in relation to the matter.

At a meeting of the Commission held December 12, 1907, a communication was received from John H. Shrope, Village Clerk of Flemington, saying that he had been directed by the Flemington Village Trustees to request engineer-

ing advice in relation to the betterment of the Flemington sewage disposal plant. The secretary was directed to employ an engineer for the purpose of reporting to the Commission as to what action should be taken for the improvement of the sewage disposal plant at Flemington. George W. Fuller, C. E., was employed for this purpose.

At a meeting of the Commission held March 26, 1908, the following report on the sewage disposal plant at Flemington, was received from George W. Fuller, C. E.:

New York, March 19, 1908.

State Sewerage Commission, Jersey City, N. J.:

DEAR SIRS—In response to the request of the Commission, I have had the sewage disposal plant at Flemington, N. J., inspected by our Mr. A. L. Dabney, assistant engineer, and beg to report upon the same, as follows:

The general statistics of the plant remain about same as given in your report to the Legislature of 1907, page 191, except that the number of houses connected with the sewerage system has been increased to about 430 according to the statement of the manager of the plant, and the present dry weather flow is estimated at about 150,000 gallons daily. This flow is probably doubled in very wet weather, and quadrupled during extremely heavy rains. It is estimated that there are about 4 acres of filter beds. A description of the plant will not be repeated here, as it is given very fully in the report mentioned above.

At the time of this inspection on March 18, 1908, the operation and condition of the plant were as follows:

The shallow settling tank holds about 27,000 gallons as operated and its contents are siphoned onto the filters. It fills and discharges about six times per day in moderately dry weather. The time of discharge is about 45 minutes, after which two hours are required for all the sewage to disappear from the surface of the filter bed. Some of the sludge in the tank is flushed onto the bed.

For several weeks half of the area has been in constant operation because of improvements being made on the other half. There is no visible evidence of deterioration under this plan of operation. Normally, each bed is operated one day and rested three. There is some tendency for the sewage to run to the depressions, caused by slight inequalities of the filter surface.

The material (red shale) when exposed to air soon disintegrates to a pea-size grit which continues to become more and more pulverized. In roads, where subjected to the grinding action of vehicles, this material finally becomes a very fine-grained compact earth. Doubtless in time such a condition will obtain in the filter beds, but as yet there is no evidence there of such fineness and compactness. The surface of the beds everywhere appears loose and porous. The effluent from the underdrains and the water in the creek are both of good physical appearance, with no visible evidence of pollution. The tank had 5 or 6 inches depth of sludge on its bottom.

Mr. John H. Shrope, the manager of the plant, seems to be operating it with reasonable intelligence and care, and is now making some permanent improvements. He has recently built an embankment of red shale along the side of the filter area nearest the creek. This bank is about one foot high and will ordinarily prevent unfiltered sewage from reaching the creek. It is quite likely that it would be wise to make this bank somewhat higher to retain wet weather flow. It is proposed to build embankments or ridges to separate the four units and prevent a flow over the surface from one to the other; to plough and harrow the entire filter area and remove inequalities with a road scraper; and to underdrain about one-third acre of additional area on the south side of the filters. To these immediate improvements might well be added a ditch above the filters, on the north side, to intercept the runoff from several acres of higher ground which now passes over the filter area.

The area of the entire tract controlled by the town for disposal purposes is about 7.5 acres, of which some two acres on the east end are at suitable elevation

to be available for extensions of the filtration area. There is also an area of one acre or more, having a suitable elevation adjoining the area on the west, which belongs to another property.

There is no evidence that the soil on these adjacent areas differs at all from that occupied by the present filters, so that if found to be necessary under continued operation, the area could be increased 60 or 75 %.

The shallow settling basin seems to be due to having encountered rock and it is doubtful if the present tank can be deepened without seriously disturbing the present walls by blasting.

Under these circumstances I advise that a partition wall be built from the inlet end along the middle to near the opposite end. Then omit the siphon and put a weir at the outlet to maintain a constant depth. This would cause the sewage to flow down one side of the tank and back on the other, with an average period of sedimentation of about four hours.

By disposing of the sludge from the settling basin onto adjacent land at fairly frequent intervals, I believe the 4 1-3 acres of available filter area should suffice to effect satisfactory purification of the settled sewage when well distributed over the surface.

Distribution will be greatly improved by the changes now being made and by grading the beds. There still remains to be provided means for applying the sewage to better advantage. I recommend that this be done by putting in a series of wooden troughs some 40 feet apart and extending from the north end of the beds towards the creek. These wooden troughs as used at Brockton should have suitable shape, and at intervals of from 30 to 40 feet the width of the troughs should lessen with openings at each of these places for the sewage to flow on to the filters.

With these improvements provided and with careful management, I should judge that the sewage could be uniformly purified to a satisfactory degree. If experience should prove the contrary, it means that the shale is less suitable for filtration than appears from our inspection and that the filter area should be materially enlarged by developing adjoining areas.

In view of the large filter area now provided in proportion to the population served, I advise that the local authorities be given full opportunity to carry out these improvements; but I am strongly of the opinion that frequent inspection should be made to ascertain definitely the success which is being accomplished.

Very truly yours,

GEORGE W. FULLER.

An inspection of the plant was made on June 22, 1908, and samples taken for analysis.

The plant was found to be in the following condition:

At the time of this inspection the settling tank was out of commission so that a full quick dose could not be watched. One bed is dosed a day with the total flow and then allowed to rest until its turn comes again, thus giving it a rest of three days. It takes the siphon about 45 minutes to empty the tank and it takes the sewage about 1½ hours to disappear from the surface. As soon as a bed dries sufficiently, the clear portion is scraped with rakes and the scrapings are removed, treated with lime and carted off. This clear portion is mainly red shale, while remainder of beds is clay and loam with some red shale mixed in.

There are now 48 underdrains, all of which empty into the creek. They are of 3" tile, placed end to end, with two layers of cheese-cloth over the joints, and are from 4 feet to 6 feet deep. Flow from these drains will continue for about 3 hours after the last dose has soaked in.

Recently, quite a bit of work has been done towards improving the plant.

1st. The beds have been plowed (April and May) where possible, and levelled up, and inequalities have been filled in.

2nd. Ridges have been made, separating the beds.

3rd. The creek has been widened and embankment raised 2 to 6 feet, to prevent storms from washing sewage into the creek.

4th. Area has been increased by 1-3 acre by filling in.

5th. Old creek bed has been filled in and underdrains extended and increased.

6th. Better attention is given to the plant. Pasturing has been discontinued, beds are kept cleaner, weeds and grass kept down and there is not much trouble now from burrowing animals.

The condition of effluent on this day was somewhat milky-looking, owing to soapuds (Monday—washday).

There was considerable growth of green algae (spirogyra) in the stream, but no sewage fungi.

Mr. J. H. Shrope has charge of the plant and has spent this year \$800 on improvements. In fact, he has cheerfully carried out Mr. Fuller's recommendations where possible. He found it was impossible to use the road scraper on the beds, so filled up holes by hauling in dirt (mostly red shale and loam). Some 1,980 loads were hauled in for levelling and increasing embankments. He intends to put in pipe to carry off the drainage from adjoining field to prevent surface water from running on to the filter beds.

He wants to consult with the engineer before building the wall across the settling tank.

He claims it was impossible to build the trough conveyors on the beds for lack of funds.

#### FREEHOLD.

Following is report of inspection made on July 15, 1908:

The Town of Freehold lies in Monmouth county on the crest of the low ridge that separates the watersheds of the Delaware river and the coast. The streams are consequently small and unimportant. In the summer, their beds are almost dry.

In constructing their sewerage system, the town authorities recognized clearly that the condition of the natural water-courses compelled careful and efficient treatment of the sewage. The sewers, built on the separate principle, in 1893, cover all of the town that can be drained by gravity toward the north and east.

The total population of the town is about 4,000, of which there are about 3,000 people in the sewer district. The daily water consumption at present is between 300,000 and 400,000 gallons.

There are about 7 miles of terra cotta sewers, ranging from 6-15 inches in size and having about 500 house connections including dwellings, hotels, churches and one rug factory. From this factory the sewers receive a certain quantity of trade waste mostly dye liquor. About 50 new connections are made with the sewers yearly. The estimated daily dry weather flow of sewage is, perhaps, 200,000 gallons. During wet weather this may be increased 25 % on account of ground water and a few connected cellar-drains.

The sewage is, for the most part, domestic in character, colored variously with dye liquors.

The main sewer leads to the disposal works located just outside the town to the northeast. Here the town purchased 16 acres of land, rather low and wet and flanked by two small streams which unite at the lower end of the tract, pass through Blue Ball Pond and empty into the Manasquan river. Part of the land was peaty, with a surface layer of bog-iron ore. The rest is green marl sand and a mixture—fairly porous—of clay and gravel. The level of the ground water averaged only two feet below the surface. To secure suitable drainage, the bed of the outlet stream was lowered for a distance of a thousand feet beyond the limits of the town purchase, permitting the under-drainage of the land at a depth of four feet.

Of the total area about 2-3 has been prepared for use. One-half of this is used for a year while the other is cultivated in corn. The following year the tracts are reversed. These beds are underdrained with 3"x4" tile laid 25 feet

apart. The part under irrigation is kept bare of vegetation by being plowed and harrowed once a month. This also prevents in a great measure sink holes and animal burrows. At the time of inspection, 3 beds were in use and one was in corn. Of the three in use this year, one is used for a week and then another, and so on in rotation. The sewage is conducted to each bed in open terra cotta channel pipes leading from the flush-tank. This so-called flush-tank is in reality a storage and equalizing reservoir, 50 feet x 50 feet x 4½ feet. The main sewer empties into a small chamber at one corner of the tank in which a 4 foot x 4 foot iron screen is lowered. The sewage flowing through this screen goes directly into the tank. Every Saturday, the screen is hoisted out and about a wheel-barrow load of screenings is removed. Once a week, also, the tank is cleaned, the cleanings removed and composted. The effluent appears very clear and bright and the stream was free of any fungus growth. At one of the effluent pipes in the "new" bed was noticed some color. This was evidently due to a rathole short-circuiting the sewage. The attendant keeps watch for these outbreaks and fills up the holes. It is hoped by frequent plowings to get rid of these animals. They are not so numerous as formerly, but a few remain.

The whole plant was quite presentable, and seems to be well-kept. The grass was cut and the ditches were in good condition.

#### GARWOOD.

It was reported to this division that Garwood was installing a sewerage system, plans for which had not been approved by this Board. An inspection was made and the following report submitted:

On September 14, 1908, Garwood was visited and it was found that the Borough of Garwood is now in the process of putting in a system of sewers as indicated on the accompanying plan.

The mayor and the council of the Borough of Garwood have given out the work to the Atlantic City Construction and Supply Company, the contractors. The acting-mayor at present is Wallace Kaylor. Work was begun (i.e., first ground broken) on August 31, 1908.

The system is connected with the Cranford sewer and at date about 450 feet are already laid. They expect to be able now to lay about 300 feet per day. The engineer is J. L. Bauer, 130 Broad street, Elizabeth, New Jersey.

A private sewer about 6,000 feet long which takes care of the overflow of cesspools exists in the borough. This empties onto a low piece of land which, when there is heavy rain, is overflowed and the water flows off into Foster's brook. The owner of this sewer is Mr. J. R. Maxwell, whose representative is F. W. Morse, agent. Mr. Morse claims that as soon as the borough sewer is finished, the houses on this sewer will be connected with the new one and the old one will be discontinued.

As a result of the inspection, notice was served upon the Borough of Garwood to show cause at a meeting of the Board to be held September 22, 1908.

At the meeting of the Board held September 22, 1908, Paul W. Oliver, attorney for the Borough of Garwood, and Jacob L. Bauer, borough engineer, appeared before the Board in response to a notice to the effect that sewers were being constructed in Garwood without first having plans of the same approved by this Board. Mr. Bauer stated that they were under the impression that the sewer referred to, being an extension of the Cranford sewer, it would not be necessary to obtain approval of the plans for the same; that the Cranford sewer was built before the State Sewerage Commission was created; that the part of Garwood which they now desire to sewer was, at that time, included in Cranford Township and, therefore, they did not think the law applied to the present plans referred to. Mr. Bauer stated that they did not wish to do anything contrary to law, and he presented plans of the extension in question and said he would also forward specifications to the Board for approval. Mr. Herbert asked Mr. Oliver to explain in regard to a private

sewer over the land company's property which discharged into a branch of the Rahway river.

Mr. Oliver stated that they were doing their best to cease polluting the brook, but that this was not really a borough matter.

#### GLEN GARDNER.

On July 31, 1908, an inspection was made at Glen Gardner and the following report submitted:

At Glen Gardner, in Hunterdon county, is located the New Jersey Sanatorium for Tuberculosis Diseases. The institution is pleasantly situated on the southern exposure of a mountain, at an elevation of some 900 feet and overlooking the valley of the North Branch of the Raritan river. The outlook is very delightful.

The sanatorium was opened October 25, 1907, and has a capacity of 104 patients. At present, there are 100 patients and about 30 officers and attendants.

The sewage disposal plant consists of a circular liquefying chamber, 2 circular trickling filters, a settling tank and 3 cinder filter beds. The liquefying tank is 16 feet 10 inches in diameter and 6½ feet deep from the low-line. There are three 6 inch baffle walls extending partly across the tank and the outside wall is 12 inches thick, built of brick and plastered with Portland cement.

The flow from this tank passes into a circular flush-tank 8½ feet in diameter, from which it is emptied intermittently by a siphon. The siphon empties into a dividing chamber and from this the discharge passes into one or the other of the two trickling filters. The trickling filters are circular 20½ feet in diameter and 8 feet deep at the center. The floor slopes 8 inches. The filters are surrounded by a 16 inch dry stone wall in which are several ventilating openings. Distribution is effected by a system of galvanized iron pipes 3 feet 2 inches above the stone. There are 7 outlets in this system from which a falling stream of sewage emerges and strikes a flat sputtering plat under each outlet. The distribution is not as good as it might be, i.e., the surface of the stone is not very evenly wetted. The stone filtering material is crushed rock, one inch macadam, supported by a layer of cobble stones.

The trickling filter effluent runs into a settling basin 15 feet x 7 feet x 3 feet deep. The effluent from the basin is diverted to one of the three cinder beds. These are practically one long bed 83 feet x 21 feet x 4 feet deep. The 4" tile underdrains empty at each of the two lower corners.

These beds need levelling up and need some means of distributing the flow over the surface evenly. At the time of inspection the bed was clogged and the flow was practically going through only in one place.

The liquefying tank seemed to be doing excellent work, but the trickling filters were not up to the standard and the beds were almost out of commission. The final effluent flows out over the surface of the ground down the hill.

#### GLOUCESTER.

At a meeting of the Commission held March 26, 1908, plans and specifications of two proposed extensions of the present sewerage system of the City of Gloucester, were submitted to the Commission by Robert A. Lincoln, Mayor of the City of Gloucester. On motion, the plans submitted by Robert A. Lincoln, Mayor of the City of Gloucester, providing for two extensions of the present sewerage system of that city, were received and filed, and the secretary was directed to acknowledge their receipt.

#### HACKENSACK RIVER.

On September 22, 1908, a letter was received, complaining of pollution of the Hackensack river at New Milford, in response to which an investigation was made, and the report of same is as follows:

New Milford was visited on September 22, 1908, and it was found that two sewers from Oradell unite at a manhole near the bridge over the river just

above the pumping-station, and that the flow from this manhole is discharged into the middle of the Hackensack river in front of the premises of E. A. Leet. There are 45 houses connected with these sewers. One of the committee of the borough gave the information that these sewers were purchased some years ago and left as they were. The new system across the river all discharges through the Delford septic tank.

No doubt at times the presence of this discharge would be objectionable and dangerous to bathers, but at the time of inspection at high water and light sewage no evidence of sewage could be detected by ordinary observation. There was a slight scum on the surface, a compound mostly of leaves and microscopic water organisms. There was just as heavy a scum on the other branch from which the water company gets its supply and which does not receive sewage. A discharge box was found leading from the Leet residence to the river.

## HADDONFIELD.

Haddonfield was visited on June 30, 1908, and the report submitted is as follows:

The Borough of Haddonfield, in Camden county, is situated on a branch of Cooper's creek. The estimated population is 4,000. The borough constructed a system of sewers and a disposal plant which were finished in 1903. In 1905, a new section was added and, on account of the grade, the sewage from this new section has to be pumped and discharged into the main sewer.

At present there are about 12 miles of sewers, constructed of terra cotta pipe 8 to 15 inches in diameter. There are in the borough between 700 and 800 houses, of which between 500 and 600 are connected with the sewers. As building increases, new connections are made which averages about fifty a year.

No storm sewers, down spouts or cellar-drains are connected, but as some of the sewers are laid in water and wet ground, the flow of sewage is increased from about 200,000 gallons per day in dry weather to about 220,000 gallons a day in wet weather. The sewage is all domestic. The daily water consumption is between 200,000 and 300,000 gallons.

The sewage disposal plant consists of a septic tank and 5 filtration beds of sand. It is located on the marshy bank of the south branch of Cooper's creek. The septic tank is of brick 31 by 48 feet in plane and 8 feet deep, covered over with a wooden roof. The tank is divided into 4 compartments, each 12x31 feet. The filter beds cover about one acre and are composed of nearby sand, with 3" tile underdrains. These underdrains empty by three outlets directly into the south branch of Cooper's creek. The beds are cleaned or scraped whenever it is deemed necessary and the thin scrapings are thrown out on the bank and soon dry up and are scattered by the weather. The beds are never plowed for fear of striking the underdrains; but occasionally they are gone over with a cultivator. About 4 years ago, the underdrains of one of the beds got stopped and had to be taken up and relaid.

The sewage is distributed over each bed by means of a long shallow trough with lateral outlets. The stream from the septic tank seems to run continuously to the beds (though there is said to be a siphon, but at the time of the inspection it was impossible to obtain the key to the box). This is regulated by the attendant. He lets it on to one or more beds for about the length of time he thinks necessary, then shifts it over on to other beds. The dose varies according to the flow, and reaches a depth of about 6 or 8 inches. Notwithstanding each bed is supposed to get a three-days rest, such does not seem to be the case. At the time of this inspection all 5 beds were covered quite deep, so that it was impossible to see the condition of the filtering material. It was said that the sewage remained in sight from 24 to 36 hours. Information was given that the beds never become flooded or over-flow, nor does surface wash run onto the beds, a separate drain above the beds being provided. There are, however, two by-passes, one between the sewer outlet and the septic tank and the other, between the septic tank and filter beds. Sometimes

at night, when the sewage is practically clear water, some is by-passed into the stream in order to relieve the beds.

The effluent is white and very clear and only a trace of odor. Some little fungus growth appears around the out-lets. The beds appear to be getting systematic attention, but they seem to be too slow. They stay wet too long for bacterial purification. The system of by-passes is also bad.

## HOBOKEN.

Complaint was made to this Board of the manner in which the City of Hoboken discharged sewage into the Hudson river at a point between the Hamburg-American Steamship pier and the pier of the Delaware & Lackawanna Railroad. An inspection showed that these piers acted as the sides of a basin; that the sewage had a tendency to remain near the end of the pipe until purified and became a nuisance to the neighborhood. Notice was sent to the City of Hoboken, the Hamburg-American Steamship Company and to the Delaware & Lackawanna Railroad Company to appear before the Board and show cause why they should not be notified to cease polluting the Hudson river.

On October 6, 1908, the following letter was received from the railroad company.

New York, Oct. 5, 1908.

*Board of Health of the State of New Jersey, Trenton, N. J.:*

GENTLEMEN—I have had referred to me your notice of October 2, 1908, addressed to the Delaware, Lackawanna & Western R. R. Co., with reference to pollution of the Hudson river by sewage and other polluting matter.

I beg to advise that The Delaware, Lackawanna & Western R. R. Co., does not maintain the sewers extending through its property, and discharging into the waters of the Hudson river. The sewers of the City of Hoboken empty into the canal or long slip just south of the passenger terminal, and three sewers of Jersey City, being the extensions of those of Thirteenth and Fourteenth streets, discharge into the slips at the lower end of our yard, but these cities claim to have certain easements for the maintenance of these sewers across our property, and you are, therefore, respectfully referred to the municipal authorities of these cities in this matter.

Yours very truly,

M. M. STALLMAN,  
Attorney.

A communication was received from the mayor of the City of Hoboken asking to be given more time in which to investigate the matter.

At a meeting of the Board held October 6, 1908, Raymond Dawson and Captain Schuck, representing the Hamburg-American Steamship Company, appeared before the Board in reference to pollution of the Hudson river from sewage. They presented a sketch of their property and explained location of sewers. Captain Schuck presented copies of letters sent to the Board of Health and to the Mayor of Hoboken, complaining of the unsanitary conditions caused by these sewers and stated that no action had been taken to remedy conditions. It was stated that there is a legal question involved as to who shall remedy conditions existing at present.

## JAMESBURG.

Report of inspection made July 16, 1908, is as follows:

The sewage disposal plant at Jamesburg is used for the disposal of the sewage from the State Reform School. It is located in the Township of Monroe, Middlesex county, in the watershed of Metchaponic creek, a tributary of South river, which empties into the Raritan river.

The institution is about three miles from the Town of Jamesburg and has about 600 inmates and attendants. The water consumption is said to be

about 60,000 gallons per day. As most of this water enters the sewers, the dry weather daily flow of the sewage is approximately 60,000 gallons which is probably increased 20% in wet weather.

The sewage is institutional in character with a lot of laundry water every day. Some disinfectants are used in the buildings, the bulk of which is about 100 pounds of chloride of lime per month.

The main 8" sewer leads from the buildings to the disposal plant about  $\frac{1}{4}$  of a mile away. Here it empties into a semi-circular gate chamber, from which the flow is diverted by a swinging iron gate to either one of the two flush-tanks. The stream entering the tanks falls upon a screen which removes the larger solids. These are raked out and thrown on the side to make a mess until sufficient quantity accumulates to make it imperative to clean up.

Each tank is 22 feet x 14 feet with an effective depth of three feet. Each is discharged by an automatic siphon and each is provided with a separate drain pipe for cleaning out. These discharge pipes lead by means of terra cotta channel pipes to the filter beds. One tank is used for several weeks and then the flow is turned into the other one and the sludge is allowed to dry in the first tank. This sludge is then thrown out on the side and later removed. At the time of inspection, a pile of about two cart loads represented one cleaning.

The 12" channel pipes run alongside the southern and western edge of the disposal field and delivers at intervals of about 30 feet through 14 branch channels. Iron stop gates are used to divert the flow.

The filtration field covers about 4 acres and is composed of a sort of sandy clay with some cinders and ashes mixed in. The field contains practically 8 beds or terraces—one higher and one lower set of four each. The higher set is used for about six weeks until thoroughly soaked and then the flow is turned on the lower set for about the same length of time. The dose usually remains on the 1st and 2nd beds of each set so that the other beds are little used. In this way part of the field is overworked while the rest escapes. The whole field is underdrained by 4" horse-shoe drain tiles and discharge by 16 outlets into a ditch. These drains appear to be about 3 feet deep. Recently the beds were seeded with grass to keep down the weeds. This grass is cut about 3 times a year. At present, a thick, heavy stubble covers the beds. Not many flies were noticed, but the water on the beds was alive with mosquito larvae.

The effluent did not look very good and had quite a perceptible odor.

The disposal plant at The State Home for Boys at Jamesburg was again inspected on September 9, 1908, and the following report was submitted:

No improvements have been made and the plant is in as bad, or worse, condition than at the last inspection.

The effluent is bad and part of the field is overworked. The soil is poor and coated with a heavy coating of stubble and humus.

Upon suggestion, the superintendent says he will have the beds plowed and put in order immediately. If proper attention is paid to the plant, it ought to improve, but on account of lack of care, it has gotten into a very bad condition, and purification amounts to nothing.

On September 10, 1908, a letter was sent to the Board of Managers of the State Home for Boys at Jamesburg, to the effect that an inspection of the plant had been made and that it was found that very inferior work was being accomplished; that the only purification obtained by the beds was to strain out the solid matter; that the beds were covered with a thick grass stubble and that the sewage laid in pools on the surface for some length of time, and that it was suggested that the beds be at once plowed lightly and the sod thoroughly broken up; after a few weeks time, replot deeper and continue to work the beds until the mass had been thoroughly loosened up so as to admit of more rapid filtration and allow the air to penetrate, and that they must alternate their beds often, giving them a chance to dry out.

## LAKEHURST.

An inspection was made on October 28, 1908, of which the following is the report submitted:

Lakehurst, a little village formerly called Manchester, in the Township of Manchester, in Ocean county, lies seven miles south of Lakewood, in the heart of New Jersey's pine belt. The ocean formerly covered its site, and the sea-floor of white sand stretches unbroken for miles in all directions. The soil drains very freely, yet the land lies so low that ground-water is close to the surface. Cranberry bogs and cedar swamps abound. The streams traversing the section are deeply dyed with cedar roots.

Some years ago, Pine Tree Inn, the only hotel in Lakehurst, constructed a system of sewers and a sewage disposal plant, primarily for its needs and those of its subsidiary cottages; but the franchise granted by the local government gave to the villagers the right of connecting with the system upon payment of an annual rental of \$10 for each house of moderate size. Only three houses outside of the group of hotel buildings have connected. The sewer main, about 5,400 feet long, is of 10-inch vitrified pipe. Manholes are built at all street intersections, usually 500 or 600 feet apart.

The hotel sewage flows to a brick sludge-pit and flush-tank, located on the hotel grounds practically at the head of the sewer system. The sludge-pit, built inside the flush-tank, is a rectangular chamber  $6\frac{1}{2}$  feet long, 6 feet wide and  $4\frac{3}{4}$  feet deep below its "full" line. The sewage enters it through an untrapped inlet pipe, and passes from it into the flush-chamber through a trapped outlet pipe whose intake is one foot above the bottom of the pit and which overflows when the water is  $2\frac{1}{2}$  feet deep. This pit is cleaned out twice each year—last season in January and again in May.

The flush-tank (including the sludge-pit) is 20 feet square. Its discharging depth is 2 feet 8 inches. It is emptied by a 6-inch siphon delivering into a 10-inch pipe. The roof is of plank though the plans specify stone flagging.

The hotel is open about seven months in each year (October 10th to May 20th). When it is running at full capacity, the flush-tank discharges at intervals of 18 to 20 hours, indicating a maximum daily flow of about 10,000 gallons. The detention of the solids in the sludge-pit and the storage of the liquid in the flush-tank undoubtedly work some septic change; but the connections entering the main below the tank send crude sewage to the disposal beds.

The main sewer delivers by gravity to two filter beds, each 40 feet square lying close to the railroad track and not far from the station. The sewage enters through a carrier-pipe laid in the embankment between the beds. Nine outlets branch from each side of the pipe and deliver the sewage directly to the surface of the filtering material. The beds are filled with sand and gravel, and underdrained, at a depth of 3 feet, by parallel lines of 4-inch tile 8 feet apart. The drains of each bed lead to a single sub-main, and the two sub-mains discharge into a 10-inch outlet pipe leading to and into the Paqua branch, a tributary of Toms river.

At the time of inspection the hotel contained very few guests and volume of sewage was small. The beds need some attention in the way of raking and cleaning and putting in little better order than they are. The effluent was not very satisfactory, but with better attention it ought to improve.

The owners have recently procured a new plot of land for improvements and propose to carry the sewer across the railroad and about 2,000 feet beyond the station and build there, near the junction of the Paqua and the Horicon branch, a real septic tank and new sand filters.

## LAKEWOOD.

At a meeting of the Commission held January 23, 1908, Carrol P. Bassett, Treasurer of the Lakewood Water, Light & Power Company, and Alexander

Potter, C. E., consulted with the Commission in relation to plans for the disposal of the sewage of Lakewood. They informed the Commission that plans for the purification of the sewage by septic tank and sand filtration would be submitted to the Commission in the near future; that plans had already been prepared, but that it was found desirable to acquire a second additional tract for the location of the disposal plant at a point more distant from the residences in Lakewood and in order to keep the disposal plant, if possible, on the south side of the Metedeoek river; that it was the intention of the company to straighten the course of the river and that it was planned to extend the sewerage system of the company.

The Commission advised Mr. C. P. Bassett that it would approve of plans for the treatment of the sewage at Lakewood by septic tank and sand filtration.

At a meeting of the Board held August 11, 1908, the following resolution was adopted:

WHEREAS, The Board of Health of the State of New Jersey has found that the waters of the Metedeoek river and its tributaries are being polluted to the injury of inhabitants of this State in their health, comfort and property, therefore, be it

RESOLVED, That, in accordance with Chapter 72 of the Laws of 1900, and the supplements and amendments thereto, the Board of Health of the State of New Jersey hereby gives notice to the Lakewood Water, Light & Power Company that prior to the first day of December, 1908, they must cease to pollute the waters of the Metedeoek river and its tributaries and make such disposition of their sewage and other polluting matter as shall be approved by the State Board of Health.

At a meeting of the Board held on October 6, 1908, C. P. Bassett, C. E., appeared before the Board, presented plans for a sewage disposal system at Lakewood and explained said plans. Mr. Bassett agreed to submit complete plans to the Board for approval.

At a meeting of the Board held October 27, 1908, plans were submitted for a sewage disposal system at Lakewood and referred to Mr. Herbert.

On October 29, 1908, Lakewood was visited to see whether the instructions of the State Sewerage Commission had been complied with, and for the purpose of investigating the discharge of tar said to come from the Lakewood Gas Works.

At the time of inspection no discharge was apparent and the owners claim that all excess of tar was being burned under their boilers.

#### LAWRENCEVILLE.

Report of July 10, 1908, is: Lawrenceville is a village in the Township of Lawrence, in Mercer county. It is located on a branch of Assanpink creek. The only sewer is located at the Lawrenceville Preparatory School. The school and the houses connected with it are supplied with water from driven wells on the premises. The daily water consumption is about 50,000 gallons.

The sewer consists of a 6-inch cast-iron pipe about 500 yards long, emptying into two systems of underground brick vaults or chambers. Each system has three galleries, so the flow has to extend the entire length of the three in series. The systems are alternated once a month and the sludge is removed once a year. The effluent from the vaults flows into a well about 20 feet in diameter and 9 feet deep. From this well it is pumped to a distance of about ½ of a mile to a large irrigation field. On this field it gradually soaks away, runoff being prevented by cross ditches. The flow is about 35,000 gallons per day during school year, and idle during the summer months.

The conditions are crude but seemingly satisfactory owing to the septic action in the vaults and the large area of available land. No final effluent is visible.

#### LINDEN.

At a meeting of the Commission held February 6, 1908, a communication from Clark McK. Whittemore, attorney for the Borough of Linden and the Township of Linden, enclosing copy of ordinance for a sewerage system for the two municipalities to discharge into Arthur Kill, and also a copy of a resolution of the Borough Council of Linden requesting the approval of the Commission for such a sewerage system, was received and filed. The secretary reported that he had notified Mr. Whittemore that plans of the sewerage system should be submitted to the Commission and suggested that he attend a meeting of the Commission to consult with it in relation to the proposed sewerage system for Linden.

At a meeting of the Commission held February 20, 1908, Jacob L. Bauer, engineer for the Borough and for the Township of Linden, consulted with the Commission in relation to the plans for a joint sewerage system for the Borough and Township of Linden, to discharge into Arthur Kill.

At a meeting of the Commission held March 26, 1908, a communication from Jacob L. Bauer, engineer for the Borough and for the Township of Linden, in relation to the proposed joint sewerage system for the Borough and Township, was received and filed.

Clark McK. Whittemore, attorney for the Borough and for the Township of Linden, consulted with the Commission in relation to the proposed joint sewerage system for the Borough and Township.

On February 1, 1908, an application was made to this Board by Clark McK. Whittemore; action was laid over, pending re-organization.

At a meeting of the Board on May 26, 1908, plans were presented in reference to the construction of a trunk sewer from Linden Borough and Linden Township to Staten Island Sound.

At a meeting of the Board held June 16, 1908, C. McK. Whittemore, of Elizabeth, appeared before the Board and explained plans for a joint trunk sewer from Linden Borough and Linden Township to Staten Island Sound, and stated objections to the installing of a purification plant for the sewage. The plans were laid on the table.

At a meeting of the Board held July 21, 1908, motion was made and carried that the plans submitted by Mr. C. McK. Whittemore, of Elizabeth, for a joint trunk sewer from Linden Borough and Township of Linden to Staten Island Sound, be returned to show plans for a sewage disposal plant.

#### MADISON.

At a meeting of the Board held May 26, 1908, papers in the case of the appeal of the Borough of Madison for the location of a sewage disposal plant in the Borough of Florham Park were presented and, on motion, referred to the Division of Sewerage and Water Supplies for future recommendation.

At a meeting of the Board held June 23, 1908, the secretary presented an application received from Hon. Edward D. Duffield, attorney for Leslie D. Ward, requesting hearing in the case of the location of a sewage disposal plant by the Borough of Madison in the Borough of Florham Park. Motion was made and carried that this petition be received, and that the Attorney-General be requested to advise the Board in regard to the matter.

At a meeting of the Board held June 30, 1908, Colonel Olcott moved that when an opinion is received from the Attorney-General if it is to the effect that this Board can re-open the case of the appeal of the Borough of Madison for the location of a sewage disposal plant in the Borough of Florham Park, that the secretary notify the authorities of the Borough of Madison that the case may be opened for a full hearing. Motion was carried.

At a meeting of the Board held July 21, 1908, the secretary read an opinion from the Assistant Attorney-General in reference to the case of the Madison sewage disposal plant, and also a communication from Charles A. Rathburn, counsel for the Borough of Madison. The matter was laid on the table.



The opinion of the Assistant Attorney-General in brief was, that he could find nothing in the Sewerage Act placing any limitation upon the Board in the matter of review or rehearing; nor, in his judgment, was the present State Board of Health necessarily bound by the action of the former State Sewerage Commission; that in his opinion the Board was empowered to open the matter or not as they saw fit, and that they were under no compulsion to so do.

## MANASQUAN.

Report of inspection made August 19, 1908, is as follows:

The Borough of Manasquan is located in Monmouth county, on the shore of the Atlantic Ocean, just north of Manasquan inlet. Its population is estimated at about 1,800.

The sewerage system was constructed in 1904, and there are about 5 or 6 miles of sewers. There are 120 house connections, 20 of which were added during the past twelve months. Of these house connections, many serve only for roof drains and sink drains, there being few inside water-closets. One so-called factory, ice and cold storage plant, is connected.

The system is flushed from hydrants and the roof drains. It's impossible to get a fair estimate of the daily sewage flow. The outfall main leads to an underground septic tank 50x20 about 1,800 feet from the shore and the effluent from this tank is discharged into the ocean about 200 feet from the shore-line. A few houses are connected between the septic tank and the outlet. Backing up by the tide is prevented by a tidal gate and the tank is baffled and divided into three chambers. No odors or nuisance were manifest and the effluent was in a very good condition.

At the extremity of the discharge pipe is a Lehlbach anchor.

## MIDDLE BROOK.

At a meeting of the Commission held November 21, 1907, a report of inspection of Middle Brook was received from R. L. Reed. The secretary was directed to notify the parties reported to be polluting Middle Brook to show cause at the meeting to be held on December 5, 1907, why they should not be notified to cease pollution.

At a meeting of the Commission held December 5, 1907, communications were received from W. E. Bartle, executor of Alice Bartle, deceased, and John F. Mundy, in response to notices to show cause why they should not be notified to cease polluting Middle Brook. Mr. Bartle stated that he had ordered a cesspool constructed to take care of the wastes now being discharged from his property into Middle Brook.

Mr. Mundy stated that in times of rain it was probable that pollution was washed from his property into Middle Brook, but that he would proceed at once to clean up his premises so as to prevent this.

## MILL CREEK.

At a meeting of the Board on September 8, 1908, Mr. Herbert presented reports of pollution of Mill Creek, in Jersey City. Motion was made and carried that these reports be laid over until the next meeting of the Board.

At a meeting of the Board held September 22, 1908, the following resolution was adopted:

WHEREAS, The Board of Health of the State of New Jersey has found that the waters of Mill Creek are being polluted to the injury of inhabitants of this State in their health, comfort and property, therefore, be it

RESOLVED, That, in accordance with Chapter 72 of the Laws of 1900, and the supplements and amendments thereto, the Board of Health of the State of New Jersey hereby gives notice to Mary E. Murphy, William Nutley, Andrew Scott and Henry Traphagen that prior to the first day of January,

1909, they must cease to pollute the waters of Mill Creek and make such disposition of their sewage and other polluting matter as shall be approved by the said Board of Health.

## MILLTOWN.

At a meeting of the Commission held March 12, 1908, G. Everett Hill, C. E., consulted with the Commission in relation to the disposal of sewage from proposed sewers on the property of the Michelin Tire Company, at Milltown, on Lawrence's Brook, near New Brunswick. The secretary was directed to advise the Michelin Tire Company that the Commission believed the highest degree of purification should be required in cases where the effluent from a sewage disposal plant is discharged into a drinking-water supply; that a plant located near the bank of a drinking-water reservoir would always be under suspicion of causing pollution to the water supply, and that in its case the Commission believed that it would be best to locate its proposed sewage disposal plant as far as possible from Lawrence's Brook.

At a meeting of the Commission held April 9, 1908, G. Everett Hill, C. E., consulted with the Commission in relation to the discharge of sewage from the property of the Michelin Tire Company, at Milltown. The Commission advised Mr. Hill that it would approve of the carrying of the sewage from a proposed system to be installed on the property of the Michelin Tire Company across Lawrence's Brook by means of a force-main properly laid so as to prevent pollution of the brook; and the purification of the sewage by means of sedimentation tanks, rough filters and double sand filters, at such distance from the water of Lawrence's Brook that the overflow would percolate through the ground before reaching it.

At a meeting of the Board held July 21, 1908, Mr. Herbert presented a plan filed at this office by the Michelin Tire Company, of Milltown, for a sewage disposal plant for the treatment of sewage from the works of the said company at Milltown. Dr. Keator moved that this matter be referred to Mr. Herbert to investigate and make such recommendations as he may desire. Motion was carried.

At a meeting of the Board held August 11, 1908, Mr. Herbert presented a communication from the Michelin Tire Company, of Milltown, N. J., relating to the disposal of sewage from the works of said company at said place. Motion was made and carried that the communication be received and referred to Mr. Herbert.

Report having been made that the Jersey Rubber Specialty Company was polluting Lawrence's Brook, at a meeting of the Board held August 11, 1908, the following resolution was adopted:

WHEREAS, The Board of Health of the State of New Jersey has found that the waters of Lawrence Brook are being polluted to the injury of inhabitants of this State in their health, comfort and property, therefore, be it

RESOLVED, That, in accordance with Chapter 72 of the Laws of 1900, and the supplements and amendments thereto, the Board of Health of the State of New Jersey hereby gives notice to the Jersey Rubber Specialty Company that prior to the first day of November, 1908, they must cease to pollute the waters of Lawrence Brook and make such disposition of their sewage and other polluting matter as shall be approved by the State Board of Health.

At a meeting of the Board held August 25, 1908, Mr. Herbert read a letter received from the Public Service Corporation in reference to the pollution of Lawrence Brook. Motion was made and carried that the communication be referred to the Board as a whole.

Hearing was given to Mr. Matlack and Mr. Murray, together with two other gentlemen representing the Michelin Tire Company, of Milltown, in reference to the discharge of waste fluids from the factory of said company into Lawrence Brook. Mr. Murray stated that if the Board would go over the plant they

would see that 90% of the water goes back into the brook in better condition than it comes out of it, and that if Mr. Herbert would come and go over the situation, they would comply with any suggestions which Mr. Herbert had to make. It was stated that the water used for washing rubber passes through three filters before it enters the brook, that water only is used for washing the rubber; that no waste matter of any kind is allowed to enter the brook and that the pipe to be laid across the brook will be tested to see that it is perfectly tight. It was agreed that Mr. Herbert would inform the company in reference to action taken.

On September 1, 1908, the Board visited the plant of the Michelin Tire Company, at Milltown, and inspected the surroundings. The company was advised that a plant designed to conform to the general features of the sketch which had been submitted, would be approved by this Board.

On September 3, 1908, the factory of the Michelin Tire Company was visited and samples taken from their three outlets emptying into the pond beside their factory.

Sample No. 1 was from the outlet discharging the rubber wash water. This proved to be highly putrescible and contained more than 100 B. coli per c.c. Samples No. 2 and No. 3 were from outlets discharging condenser water. These were not putrescible and contained less than 100 B. coli per c.c. It is not proper that these discharges go into Lawrence Brook unpurified. Perhaps if the condenser waters were trapped to absolutely prevent any oil from getting into the brook, they might do no harm. The better plan would be, since the company desire to establish a purification plant, for them to purify all of their waste.

Samples of the water in the pond were also taken. These were analyzed in the water department and the results can be found by consulting the records of the water analyses.

#### MILLVILLE.

At a meeting of the Commission held November 27, 1907, the secretary was directed to request the Attorney-General to take proper legal steps to compel the City of Millville to comply with the requirements made by the State Sewerage Commission that the sewage of that city be purified.

At a meeting of the Commission held December 12, 1907, Louis H. Miller, city counsel, John R. Radcliffe and Dr. C. B. Neal, members of the common council of the City of Millville, appeared before the Commission and stated that they had been notified by the Attorney-General that he had been requested by the Commission to bring suit to enforce its requirements in relation to the disposal of the sewage of the City of Millville; that they desired, on behalf of the City, to request that this action be withheld in order to give time to the City to take the necessary steps to provide for the purification of its sewage without being brought into court; and that the city officials did not desire to oppose the action of the Commission, but desired that they be granted further time in which to comply with its requirements.

The chairman stated that the Commission would request the Attorney-General not to begin suit against the City, provided the city officials took such action as was necessary in order to have a purification plant constructed prior to September 1, 1908, and that, in the opinion of this Commission, this required the immediate employment of an engineer to prepare plans for a sewage disposal plant and the preparation of such plans and their submission to the Commission at the earliest possible date, and that in the meantime the Commission would delay further action in the matter until its meeting to be held December 19, 1907, in order to allow time for proper action on the part of the city officials of Millville.

The chairman further stated that in case proper steps were not taken in due course by the City of Millville, the Commission would be obliged to request the Attorney-General to proceed with the suit against the city.

At a meeting of the Commission held December 26, 1907, a communication was received from L. H. Hogate, city recorder of Millville, enclosing a certified copy of a resolution of the city council of Millville, providing for the employment of an engineer to prepare plans and specifications for the disposal of the sewage of this city, and requesting that the Commission inform the Attorney-General of the action, in order that proceedings should not be brought against the city to compel it to comply with the requirements of the Commission as to the disposal of its sewage.

At a meeting of the Board held August 25, 1908, plans for and the description of a sewage disposal plant for the City of Millville were presented. The plans were laid over until the next meeting. As some new and interesting features are embodied in this plant, it is deemed advisable to give the full text of the description, which is as follows:

Philadelphia, Pa., August 17th, 1908.

MR. H. M. HERBERT,

*Chief of Division of Sewerage and Water Supplies, Board of Health of the State of New Jersey, Trenton, New Jersey.*

DEAR SIR—We respectfully submit for the consideration of your Honorable Board the following description of the sewage disposal plant which we have proposed to recommend to the authorities of the City of Millville, New Jersey—drawings of said proposed plant being likewise submitted herewith—provided that the said described and illustrated disposal plant is approved by your Honorable Board.

Should the Board desire a personal interview before passing upon the subject, we will be glad to learn their wishes in the matter and to meet them at any time and place which they may designate.

#### PROPOSED SEWAGE DISPOSAL PLANT FOR THE CITY OF MILLVILLE, NEW JERSEY.

##### EFFLUENT TO DISCHARGE INTO THE MAURICE RIVER.

The method of operation will consist of three processes:

1. Anaerobic.
2. Aerobic.
3. Disinfection.

1. *The Anaerobic treatment* will take place in the sedimentation tanks which have each a capacity of 41,666 gallons, being about two hours flow of sewage.

By a series of gate valves and stop-planks, as shown on the drawings, these valves are under perfect control—the time of retention, the velocity of flow and the prevention of channelling—being provided for.

These items are of particular importance in the anaerobic stage of the purification, for, if the process is carried too far, putrefactive fermentation will result and offensive odors will arise.

As designed, the anaerobic process can be carried on for two, four, six or eight hours, as may be required.

2. *Aerobic.* The anaerobes, after having performed their function, cannot be too quickly put out of action—and the aerobes, which have been dormant in the sedimentation tanks, cannot be too quickly revived.

The plan of aeration, as shown on the drawings, is a design to take advantage of a law of nature which is, roughly, as follows: When water is exposed to air at atmospheric pressure—in the action of weirs, cascades, etc.—the maximum aeration which can take place, or, in other words, the greatest amount of oxygen which the water can absorb, at average temperature, is seven parts per thousand. If, however, we place the air and water together under pressure, we get,

for each additional atmosphere, another seven parts per thousand; so that, if the sewage is passed down two hundred feet, intermingled with air which is carried down with it, there will be, at the bottom of the column, air and sewage under a pressure of six atmospheres—or about eighty-six pounds per square inch—and the amount of oxygen absorbed will be forty-two parts per thousand.

There will be a further advantage, in the design for aeration as shown, in that a large proportion of the air, which is carried down in the descending circular shaft, rises in very fine bubbles in the ascending annular shaft and is intimately mixed with the sewage in the aeration tank.

From the aeration tank, the effluent passes to the contact beds at the rate of 1.6 million gallons per acre per day.

These beds are controlled by an automatic apparatus which opens and closes the various beds, in rotation, and gives any time desired for the retention and resting period.

3. *Disinfection.* It having been demonstrated, by experiment, that sterilization of the effluent is practically impossible, we resort to the destruction of the pathogenic germs by the introduction of a disinfectant.

It is proposed that this disinfection at Millville be accomplished by the use of copper sulphate in the proportion of two parts of the salt to one million parts of the effluent.

The copper sulphate will be introduced daily into a small tank situated in the automatic apparatus house, as shown on the drawings, and from there the copper solution will go through a frost-proof pipe into the retaining basin—being mixed with the different filter effluents by retention, by means of a submerged weir, as shown on the plan.

The amount of copper sulphate used per day will be about eight pounds, costing about forty cents.

The contact beds empty into a settling basin, capable of holding eight hours flow of the effluent—the outlet being regulated by a flap valve which closes against the entrance of the tide-water when the pressure from without is greater than the pressure from within.

The walls of the whole disposal plant are above the level of the greatest known flood elevation.

The walls will be constructed of reinforced concrete.

The method of cleaning the sedimentation tanks will be as follows: The flow of sewage through the tank to be emptied will be stopped; the gate at the bottom of the said tank will be slowly opened and the contents passed onto the coarse sand filter; the effluent from the filter being pumped back into the main feed channel and the sludge being permitted to dry on the top of the filter, from which place the perfectly inoffensive dry sludge will be removed.

Respectfully submitted,

WILLIAM H. BOARDMAN,

*Engineer,*

426 Walnut street, Philadelphia.

C. C. BEDDOES, C. E.,

*Consulting Engineer.*

At a meeting of the Board held September 8, 1908, C. C. Beddoes and William H. Boardman appeared before the Board and explained plans for a sewage disposal plant at Millville. Motion was made and carried that said plans be approved subject to such conditions of construction, operation and purification as this Board may from time to time require.

At a meeting of the Board held October 27, 1908, T. C. Wheaton of Millville, appeared before the Board and requested that further time be allowed for the installation of a sewage disposal plant for said city. Mr. Wheaton agreed to ask the common council of Millville to pass a resolution asking for an extension of time.

MONMOUTH COUNTY SEASIDE RESORTS.

At a meeting of the Commission held January 2, 1908, a communication was received from Rev. A. E. Ballard, of Ocean Grove, requesting on behalf of the representatives of municipalities bordering on the Atlantic Ocean in Monmouth county, that the Commission receive a delegation and consult with them concerning the procedure in regard to sewage disposal. The secretary reported that he had notified the Rev. A. E. Ballard that the Commission would meet at Jersey City on Thursday, January 9, 1908, and that it would be pleased at that meeting to consult with the representatives of the municipalities, and that if that date was not convenient, arrangements could be made for a conference at some other time.

At a meeting of the Commission held January 9, 1908, a committee consisting of the following representatives of the municipalities in Monmouth county which had received notice from the Commission to cease polluting the Atlantic Ocean, New York Bay and the Shrewsbury river, consulted with the Commission in relation to complying with these notices:

Rev. A. E. Ballard, Vice-President, and E. N. Cole, Secretary, of the Ocean Grove Association; Mayor T. Frank Appleby, of the City of Asbury Park; Mayor P. Hall Packer, of the Borough of Seabright; Mayor H. A. Brown, of the Borough of Highlands; John L. Sweeney, Borough Attorney of the Borough of Atlantic Highlands; W. E. Allen and H. F. Pierce, members of the Council of the Borough of Belmar; Mayor O. H. Brown, and Councilman H. Getsinger, of the Borough of Spring Lake; Mayor A. T. Rogers, and President of Council, D. F. Gant, of the Borough of Bradley Beach, and G. M. Height, member of the Council of the Borough of Spring Lake.

Rev. A. E. Ballard stated that a meeting had been held at Ocean Grove by the representatives of the municipalities which were represented at the present meeting for consultation with the Commission in relation to the notices of the State Sewerage Commission to these municipalities; that as a summer resort it needed the approval of the State Sewerage Commission as to the method of the disposal of its sewage, although he did not believe and was not yet convinced that the present method of disposal of the sewage was polluting the beach, but in common with the other municipalities in Monmouth county, Ocean Grove had found that the time given it by the Commission was short and that it was difficult to determine what action should be taken; that the representatives of all of the municipalities had decided to request the opportunity of consulting with the Commission in order to request more time and the advice of the Commission.

Mayor T. Frank Appleby said that Asbury Park had had plans prepared for the purification of its sewage by a septic tank and that bonds had been issued for this purpose, but that litigation had been threatened by the Cameron Septic Tank Company in case the septic tank designed was installed and that there were local objections to the construction of a septic tank on the shore front; that the bonds designed to pay for the expense of the tank were in the city treasury, and that it was practically impossible at the present time to sell these bonds; that the administration had changed in this municipality as in most of the Monmouth county municipalities on the first of the year, and that action had been delayed by the old officials because they were to go out of office and that the new officials had had no opportunity to give the matter consideration; that a resolution had been adopted by the council directing the city attorneys to appeal from the order of the Commission to the Court of Chancery.

Councilman H. F. Pierce, of Belmar, stated that the authorities of the Borough of Belmar had not taken action because they did not know what action would be proper and because the terms of office of the old officials had ended on the first of January, and that the new borough authorities believed that more time was needed in which to take any action which might be necessary.

Mayor O. H. Brown, of Spring Lake, stated that he had not been mayor of Spring Lake during the past two years, and had only taken office on the first of January, 1908; that he believed the purification of the sewage on the whole shore front would be a good thing for each of the municipalities; that the shore front was polluted not only by sewage, but by garbage dumped at sea by the City of New York, and that he believed that much of the complaint of the pollution of the beach in Monmouth county might be traced to this source; that he believed action should be taken to prevent this pollution as well as the sewage pollution and that if he could accomplish anything toward this end as a member of the Senate of New Jersey, he would be glad to do so.

The chairman stated that the time limits of the notices to the municipalities in Monmouth county had been fixed by agreement with the representatives of the municipalities concerned after conferences with them, held at Asbury Park, on August 1, 1907, and at Jersey City, on August 29, 1907; that these notices all expired on the first days of May, June and July, 1908, in different cases, and were intended to be effective before the summer season at the resorts; that the Commission had recommended in these cases the construction of septic tanks, where possible, on the present lines of the sewers; that engineers could be employed and plans such as had been prepared for Asbury Park, Allenhurst, Loch Arbor and Manasquan could easily be prepared for the other municipalities; that the Commission desired to prevent further pollution at these pleasure resorts before the summer season of 1908, and that this could easily be accomplished by prompt action on the part of the municipalities; that the Commission would consider the request for extension of time and notify those present of its decision; that in relation to the pollution of the bathing beaches by garbage from New York, the Commission had no jurisdiction and that it believed that this could be prevented if suit were brought in the federal courts by the Attorney-General in the name of the State.

On motion, the secretary was directed to notify the representatives of each of the Monmouth county municipalities which was represented before the Commission, that the Commission could see no good reason for extending the time given to these municipalities to cease polluting; that the time had been fixed by agreement with the representatives of the municipalities after consultation; that half of the time allowed had been permitted to pass by, the municipalities now applying for an extension time, without any action or only with action designed to oppose the requirements of the Commission; that the Commission believed that the sewage pollution in the Monmouth county summer resorts should be stopped before the summer season of 1908, and that this could easily be done; that if any of the municipalities were proceeding in good faith to carry out the orders of the Commission and the construction work should not be completed in the time limited, such additional time as might be necessary would be given by the Commission, but that if such action were not taken, the Commission as at present advised, would apply to the Court of Chancery for its aid in enforcing its requirements.

At a meeting of the Commission held February 13, 1908, the chairman reported that he had communicated with the Attorney-General suggesting that, following the precedent of the case of Georgia vs. Tennessee Copper Company, 206 U. S. 230, it might be possible for the State of New Jersey to enjoin the dumping of garbage by the City of New York in the ocean in such manner as to be a nuisance in New Jersey, and that he had received a reply from the Attorney-General saying that he would give the matter consideration.

#### ALLENHURST.

At a meeting of the State Sewerage Commission held December 5, 1907, plans for the purification of the sewage of this borough by means of a septic tank through the existing outlet main discharging 600 feet from the shoreline, were submitted to the Commission on behalf of the Borough of Allen-

hurst by G. Everett Hill, C. E., together with a request from A. M. Hyatt a member of the Sewerage Committee of the Borough of Allenhurst.

On motion, the plans as submitted were approved subject to such conditions of construction, operation and purification as this Commission might from time to time require.

The tank is located under Ocean Road at the corner of Elberon avenue. A vent pipe leads to each curb-line and the manholes are covered with about 6" of gravel. It is a difficult matter to find where this tank is located. Sewage was first turned into the tank on April 22, 1908.

An inspection was made on August 11, 1908, and the outlet pipe was found to be sanded over and the septic effluent discharging from a overflow pipe onto the beach. The attention of the borough authorities was called to this matter and an inspection made on September 17, 1908, showed that the trouble had been remedied.

The effluent from this tank is satisfactory, as shown by the table of analysis.

#### AVON.

At a meeting of the Board held August 11, 1908, a resolution passed by the common council of the Borough of Avon, was presented requesting that an extension of time until June 1, 1909, be allowed to said borough in which to determine and put in operation a plan to cease the discharge of crude sewage from said borough into the Atlantic Ocean, said plan to be submitted to the State Board of Health for approval and work begun during the fall of 1908.

On motion, the extension of time asked for was granted in accordance with, the request contained in said resolution.

#### BELMAR.

At a meeting of the State Sewerage Commission held January 30, 1908, a communication was received from Charles O. Hudnut, borough clerk of Belmar asking that engineering advice be given to the Borough of Belmar in relation to the disposal of its sewage. Commissioner Herbert was appointed a committee for the purpose of consulting with the authorities of the Borough of Belmar in relation to the disposal of its sewage.

At a meeting of the Commission held March 12, 1908, Commissioner Herbert reported that, as a committee of the Commission to advise with the authorities of the Borough of Belmar in regard to the disposal of the sewage of that borough, he had visited the borough on Wednesday, March 11, 1908, and had consulted with Mr. H. F. Pierce, chairman of the Sewer Committee of the borough council, and with Mr. Charles O. Hudnut, borough clerk; that he found that the only record of its sewerage system owned by the Borough of Belmar was a plan of the borough with the lines of the sewers marked thereon, there being no profiles; that there are at present two outlets discharging into the ocean, one at Fifth avenue and one at Eighth avenue; that a connection between these two outlets of fifteen inch vitrified pipe was being laid so that the Fifth avenue outlet might be abandoned and thus do away with the necessity of two purification plants; that this was being done without any plans and without the approval of the Commission; that at the junction of Eighth avenue and Ocean avenue and the outfall pipe there is a brick chamber about 21 feet long, 5 feet wide and 6 or 7 feet deep, built parallel with and on the easterly side of the Ocean avenue roadway; that lateral sewers enter this tank at the southerly end and the outfall leaves it at the northerly end; that at the time of inspection there was about 18 inches of sewage in this tank; that the tank was constructed without screens or valves and that its purpose was not apparent; that the elevation of the invert of pipe in the entrance to the tank was about two feet above high water as nearly as could be ascertained;

that if this measurement proved to be correct, it would be safe to place at this point a septic tank with an automatic valve in the outfall pipe to prevent sea-water from backing in at extremely high tide; that it would probably be necessary to construct a cast-iron outfall larger than the outfall pipe; that he had advised the local authorities to submit to the Commission a plan of the connection between the two outlets and to employ an engineer to prepare plans for a septic tank or some other form of purification, which plans must be approved by this Commission and that he recommended that the secretary be instructed to notify the authorities of the Borough of Belmar to submit to the Commission for its approval at once, plans for the connection between the Fifth avenue and Eighth avenue outlets and to suggest to them that they have prepared and submitted to the Commission at an early date, plans for the purification of the sewage of the borough.

The report made by Commissioner Herbert was received and adopted and the secretary was directed to carry out the recommendations therein.

At a meeting of the Commission held April 2, 1908, plans for the connection of the sewer in Fifth avenue, Belmar with the outlet in Eighth avenue were submitted to the Commission by Charles O. Hudnut, borough clerk, on behalf of the Borough of Belmar. On motion of Commissioner Herbert, the plans submitted by the Borough of Belmar providing for the connection of the Fifth avenue sewer with the outlet in Eighth avenue were approved subject to the notice heretofore given by this Commission to the Borough of Belmar to cease polluting the waters of the Atlantic Ocean prior to May 1, 1908.

At a meeting of the Board held August 11, 1908, Dr. Keator presented a communication from the clerk of the Borough of Belmar, requesting an extension of time in which to install a plant for the treatment of sewage from said borough, together with a reply which had been made to said communication. On motion, the matter was referred to the secretary for further correspondence.

At a meeting of the Board held August 25, 1908, Mr. Herbert presented copy of resolution passed by the borough council of Belmar, requesting an extension of time until June 1, 1909, in which to install a plant for the treatment of crude sewage before it is discharged into the Atlantic Ocean. Motion was made and carried.

#### BRADLEY BEACH.

At a meeting of the Commission held March 12, 1908, Commissioner Herbert reported that, as a committee of the Commission, he had visited the Borough of Bradley Beach on Wednesday, March 11, 1908, for the purpose of consulting with the local authorities in relation to the disposal of the sewage of the borough; that he consulted with A. T. Rogers, the mayor, and with T. F. Gant, borough clerk, and some of the members of the borough council; that he found that at the head of the borough outfall sewer there is a screening chamber four by sixteen feet and six and half feet deep, the inlet pipe being 18 inches above the floor, and the outlet pipe at the floor line; that 5 feet from the outlet is an iron bar screen; that this tank might be used as a grit and screening chamber for a septic tank, that the council had had prepared a plan for a septic tank, composed of two equal units, each 110 by 15 feet and 6 feet deep; that this tank will be ample in size to care for the maximum flow, but that he would suggest that it be divided into two compartments, one of one-third and the other two-thirds of the total capacity, and that he recommended that the secretary be instructed to suggest to the authorities of the borough that they submit to the Commission for its approval, plans for the purification of the sewage of the borough.

The report made by Commissioner Herbert was received and adopted, and the secretary instructed to carry out the recommendations therein.

At a meeting of the Commission held April 16, 1908, plans for the purification of the sewage of the Borough of Bradley Beach by means of a septic tank were submitted to the Commission on behalf of that borough by Joseph L. Yarnall, borough clerk. On motion, the plans submitted on behalf of the

Borough of Bradley Beach providing for the purification of the sewage of that borough, were laid on the table for the purpose of permitting the State Board of Health to take action thereon. The secretary was directed to acknowledge the receipt of the plans providing for the purification of the sewage of the Borough of Bradley Beach, and to notify the authorities of that borough of the action taken by the Commission.

At a meeting held August 11, 1908, Dr. Keator presented a communication from the clerk of the Borough of Bradley Beach, requesting an extension of time in which to install a plant for the treatment of sewage from said borough, together with a reply which had been made to said communication. On motion, the matter was referred to the secretary for further correspondence.

At a meeting held August 25, 1908, Mr. Herbert presented a copy of resolution passed by the borough council of Bradley Beach, requesting an extension of time until June 1, 1909, in which to install a plant for the treatment of crude sewage before it is discharged into the Atlantic Ocean. Motion was made and carried.

#### DEAL.

At a meeting held August 25, 1908, Mr. Herbert presented copy of resolution passed by the borough council of Deal, requesting an extension of time until June 1, 1909, in which to install a plant for the treatment of crude sewage before it is discharged into the Atlantic Ocean. Motion was made and carried.

#### DEAL LAKE.

Complaint having been made of the pollution of Deal Lake, various parties were summoned to appear before the Board to show cause why they should not be notified to cease polluting same.

At a meeting held October 6, 1908, E. B. Gumaer, of West Allenhurst, appeared before the Board, and presented diagram of his property, explaining the same and stating that nothing but waste water from sinks and bath tubs is discharged into the lake from his premises. It was stated to Mr. Gumaer that he should discontinue this pollution, and this he agreed to do.

The following resolution was adopted:

WHEREAS, The Board of Health of the State of New Jersey has found that the waters of Deal Lake are being polluted to the injury of inhabitants of this State in their health, comfort and property, therefore, be it

RESOLVED, That, in accordance with Chapter 72 of the Laws of 1900, and the supplements and amendments thereto, the Board of Health of the State of New Jersey hereby gives notice to George W. Morrow, C. D. Preston and E. Stout that prior to the first day of May, 1909, they must cease to pollute the waters of Deal Lake and make such disposition of their sewage and other polluting matter as shall be approved by the said Board of Health.

At a meeting of the Board held October 13, 1908, in response to notice to appear before the Board sent to several parties, Frank H. Marshall appeared before the Board and stated that he represented Mrs. Marshall, Mrs. Ross and the Ross-Fenton farm, and admitted that waste water from these premises is discharged into Deal Lake. Mr. Marshall explained to the Board several methods which he had in mind to prevent pollution of the lake from these premises, and he agreed to submit plans to the Board in regard to the matter.

Joseph G. Havens stated that he represented the Allenhurst Electric Light Company, and admitted that oil from the plant is discharged into Deal Lake, although he said an effort is made to keep as much oil out of the lake as possible. It was suggested to Mr. Havens that he should put in a tank to intercept the flow of oil, and he agreed to do so.

The following resolution was adopted:

WHEREAS, The Board of Health of the State of New Jersey has found that the waters of Deal Lake are being polluted to the injury of inhabitants of this State in their health, comfort and property, therefore, be it

RESOLVED, That, in accordance with Chapter 72 of the Laws of 1900, and the supplements and amendments thereto, the Board of Health of the State of New Jersey hereby gives notice to the Allenhurst Electric Light Company, the Deal Golf and Country Club, Rufus Casler, William Crammer, Edward Crummell, C. L. Desbard, E. B. Gumaer, William Griffin, A. Hankinson, Mrs. Clara L. Marshall, Rev. Dr. Mason, W. W. Parker, Conrad Pinches, C. J. Ross, Mrs. C. J. Ross, James Ralston, Mr. Sansom, J. H. Weeks, Frank White and J. H. White that prior to the first day of May, 1909, they must cease to pollute the waters of Deal Lake and make such disposition of their sewage and other polluting matter as shall be approved by the said Board of Health.

#### INTERLAKEN.

Following is the report made of inspection on August 11, 1908:

Interlaken is a small village occupying part of the Township of Ocean, in the county of Monmouth, and lying next northwest of Asbury Park. The community is at present quite small, there being only about a dozen houses, and, it was said, only three or four are now connected with the sewers. The sewage is conducted to a tank or well near the Interlaken station. This is an annular septic tank built excentrically around the sump-well. The diameter of both together is about 16 feet and that of the sump-well is about 8 feet. The septic tank varies in width from 30 inches to about 4 feet. The pumping machinery over the pump-well is driven by an electric motor, the switch being operated by a rope attached to a float. When the level of the sewage in the well reaches a certain point, the motor starts and the sewage is pumped through a 6" force-main across Deal Lake and into Loch Arbor sewers. When the level of the sewage falls to a certain point, the motor stops and the well again gradually fills.

Before reaching the ocean, the sewage must pass through the Loch Arbor septic tank along with the Loch Arbor sewage.

#### LOCH ARBOR.

A septic tank was installed at Loch Arbor and sewage turned into it on June 10, 1908.

An inspection was made on August 11, 1908, and the following report submitted:

Loch Arbor is a small summer residential section between Allenhurst and Asbury Park. There are only a few sanitary sewers, in fact, only on two streets. These sewers conduct the sewage to a new septic tank located on the beach close beside the U. S. Life Saving Station. The tank is completely covered with the beach sand. It has been working since June 10, 1908, and seems to be doing very well for the time it has been running.

The effluent is carried out in an iron pipe to a point 702 feet from the tank, or about 550 feet below low water and discharged. At present, however, the surf has washed sand over the end of the pipe stopping the flow. A temporary 5" pipe has been laid from the tank to the low water mark. This is being used until the main pipe can be opened.

The effluent at the time of inspection showed some dark color and suspended solids. The man in charge of repairs thought that the intermittent pumping from the Interlaken sewage reservoir caused the tank to become agitated and affect the character of the effluent. Still, on the whole, the discharge was not bad for a septic effluent.

In response to a letter of complaint, another inspection of the condition of the sewage disposal system at Loch Arbor was made on September 17, 1908. The following persons made complaints in substance, as follows:

P. J. Heilman, objects to the odor near bathing beach and claims it comes from the septic sewage discharged into the surf, also that the odor is, at times blown back to the houses.

Captain Benjamin VanBrunt, of U. S. Life Saving Station No. 6, also complains about the odor and says that whenever the sand washes over the mouth of the temporary outlet pipe, the sewage backs up and out of the closet in the cellar of the Life Saving Station.

F. L. Ferreira makes complaint about odors and backing up of the sewage into his cellar. He thinks the sewage outlet a nuisance to the bathing beach. (This beach is about 50 or 100 feet away).

C. A. Buck, superintendent of the East Jersey Coast Water Company, states that the sanding over of the main pipe has often occurred before, but he has been able to blow the sand out of the pipe with water pressure either immediately or after the next storm which would wash the sand away again. This time, the sand remained so long that it was necessary to put in the extra pipe because he could not dislodge the sand with his water-pressure. Now that the sand has begun to wash up on the beach, he thinks it will soon be thin enough to be dislodged by the water-pressure. If not, then the company will have to lay another pipe or dredge up the old one.

He has been trying to keep the outlet of the small pipe open all the time, but sometimes it stops and when he gives it vent he lets out gas, which the people object to. In other words, the company does not want to expend a lot of money for a new pipe if the old one will unstop itself; so, in the meantime, the people have to contend with the nuisance.

The following work should be done:

1. The main pipe should be put in such a condition that it will not stop up unless some very extraordinary event happens.
2. A second overflow pipe will do no harm if carried sufficiently far out and placed in such a position that it will not be likely to become damaged in case the main pipe is put out of commission.
3. No backing up of sewage should be allowed and every precaution should be taken to absolutely prevent this. If closets and leaky water connections are in places that are too low (as in cellars, etc.), then these should be ordered out immediately and the connections made tight.

The condition of the tank seems fair, although the effluent is rather dark-colored and seems to be somewhat over-septicised. It looks as though the tank is a little too big for the daily flow. There is about 12" of scum and comparatively little sludge in the tank. Occasionally, the sea-water, at a very high tide, backs up through the outlet pipe and fills the tank. This goes out again, but may cause a serious stirring up of the contents. So far as the odors go, the complaints may be perfectly true, but we all know that a great many prized sea-breezes have come from a pile of decaying clams, and, on the other hand, sewage is often blamed for other offenders. At any rate, the company should take steps immediately to remedy the present troubles.

Beside the U. S. Life Saving Station No. 6 is a catch-basin into which leads the pipe from the closets in the bath houses belonging to Dr. Samuel Johnson, of Asbury Park. This catch-basin frequently overflows and creates a very offensive nuisance to the Life Saving Station people and others. At the time of this visit, the whole top was covered with fecal and other matters. This may come under the jurisdiction of the local board, but it should be remedied.

On September 18, 1908, a telephone message was received from Mr. C. A. Buck, to the effect that he had been able to open the pipe as he expected, that everything was clear and that he expected in future that everything would be satisfactory.

#### LONG BRANCH.

At a meeting of the Commission held January 23, 1908, the following report on the disposal of sewage from the sewerage system of the Long Branch Sewer Company, was received from G. Everett Hill, C. E.:

To the Honorable, The State Sewerage Commission of New Jersey:

GENTLEMEN—I submit the following report concerning the sewerage and sewage disposal system serving the City of Long Branch and examined by me on December 5th and 6th, 1907.

The system is owned by the Long Branch Sewer Company, a private corporation, operating under a franchise giving exclusive rights till 1926. The officers are: John W. Slocum, President; Thomas Jolly, Vice-President; William Lewis, Secretary; Charles McFadden (Mayor of Long Branch), Treasurer; William R. Warwick, Superintendent.

The company owns and operates 122,740 feet of vitrified clay pipe, and 5,983 feet of cast iron pipe making in all 128,723 feet of sewers, or about 24  $\frac{1}{2}$  miles.

It is a noteworthy fact that in parts of the system 8-inch pipe is laid with grades as low as 1 to 1,000 and 1 to 1,250, without any general deposit of solids or abnormal numbers of stoppages. No ground-water or storm-water is admitted, save the flow from the rain-leaders of four or five houses, whose owners pay extra for the privilege. House-connections number 1,155—all from cottages and boarding-houses save those serving four hotels, a hospital, a shirt factory and a few minor industries. The drains from the hospital and shirt factory have separate screening chambers to withhold lint, bandages, etc. (Such wastes from the hospital should be burned, on the premises. Discharge into the sewers carries with it grave possibilities of spreading infection). These chambers are raked out two or three times a week. The screenings are taken to the garbage crematory in covered iron-bodied wagons (the company owns two of these) and burned.

The main sewer, of 24-inch pipe laid with a fall of 1 to 1,000, leads to the "disposal works" (to be described later in detail) at the junction of North Broadway, Long Branch avenue and Second avenue; and from these works another 24-inch pipe with a reputed grade of ".015 per 100" (*sic*), carries the strained sewage to a "tidal storage chamber" on North Broadway, between Grant avenue and Ocean avenue—the street on the beach front. This chamber is merely an aneurism of the sewer, 400 feet long, 6 feet wide and 6  $\frac{1}{2}$  feet high, intended to afford storage room while the tide is too high for free discharge; but the superintendent said that the outlet was unprotected by tide-gate or flap-valve, and that sea-water had free access to the chamber. The elevation of normal high-tide is about four feet below the level of the outlet from the disposal works, and average tides cause little or no rise of sewage in the tidal chamber; but exceptional tides flood the chamber and back up the sewage in the tanks of the disposal works two feet or more, drowning the inlet. The gross capacity of the tidal chamber is about 100,000 gallons. What proportion of this lies below the level of the end of the main sewer at the inlet to the disposal works is unknown; but there would seem to be ample capacity for all needed storage of off-season flow (when high tides more frequently recur) if sea-water were excluded by a flap-valve. Indeed it is not unlikely that, if the outlet were thus protected against ocean invasion, there would be no set-back into the town sewers, even at the height of the summer season when the volume of sewage is greatest.

From the eastern end of the tidal chamber run two 14-inch cast-iron outlets. One, normally closed by a drop-gate, formerly a short line and the only outlet, but now diverted, extended and supported and protected by a jetty 190 feet long, ends 200 feet from shore, four feet above the bottom, in water about eight feet deep at low tide. This line was reconstructed in 1906 for use only as an emergency by-pass in case of accident to the main outlet. Such emergency has never arisen. The other outlet, constructed in April, 1906, and in constant use since then, extends to a point 1,000 feet from shore where the water is 22 feet deep. Its end, heavily braced and anchored and upturned about 4  $\frac{1}{2}$  feet, rests on clay bottom. It lies south of the emergency line and is protected (where subject to wave action and the shifting of the beach) by the same jetty. A separate gate-valve, in a man-hole in Ocean avenue, has been provided for control of this main outlet.

The disposal works, located in a brick building erected in 1886, in the heart of the city, consist of two screening-tanks, lime-vat, boiler, engines, 6-inch centrifugal pump and other appliances for pumping and treating sludge.

The screening tanks, each 8 x 24 (approximately), with a total depth of 9 feet and a working depth of 6 feet, lie side by side, their long axis parallel with the direction of the flow; they are fed by separate forks of the main sewer and are intended for alternate use. Close to each inlet two scum-boards dip into the liquid to catch and hold floating solids. Beyond these are two vertical screens of 1  $\frac{1}{4}$  inch mesh and one vertical screen of 1-inch mesh, each with an effective area of 48 square feet (8 x 6). Between these wire screens and the outlet were placed originally two pairs of strainers consisting of wire baskets, each four feet wide and six feet deep with sides one foot apart, filled with coke and held in place by an iron frame. This use of coke has ceased, though the empty baskets are still in place, serving merely as additional wire screens.

When the plant was first operated lime was added to the sewage as a precipitant, and the accumulated sludge was pumped and pressed in the orthodox fashion of the day. But all chemical treatment was abandoned long ago, and the tanks to-day are merely screening chamber. The rakings in summer range from one to two wagon loads a day. In winter weekly cleaning is sufficient. All drained solids are carted (in covered steel wagons) to the garbage crematory and burned.

Pino-Lyptol, a patented disinfectant produced by the action of peroxide of hydrogen on resin oil, and said to be germicidal in five per cent. solution, is used to sprinkle the floors and wash down the walls of the tanks. Some is also thrown into the tanks at intervals—"enough to make them milky," but this is done so infrequently and irregularly that it cannot be counted in any sense as part of the treatment of the sewage. The avowed purpose of using this solution is to "keep the premises sweet and clean," and from this point of view it seems sufficient.

At rare intervals the tanks are emptied and cleaned. On these occasions the entire flow is diverted to one tank and the contents of the other tank are pumped out, all liquid and all "sludge that will run like liquid" going into the outfall main. The heavier solids are then removed with pails, carted to the crematory and burned.

At the time of my visit, the entire plant was clean and free from odor. The flow was very light, the maximum rate observed during the inspection probably not exceeding 200,000 gallons per day. The sewage seemed very dilute, and the day's accumulation by scum-boards and screens was inconsiderable. The effluent contained very little suspended matter and floating particles of noticeable size were rare. The existing conditions, so far as winter flow is concerned, are neither offensive nor dangerous.

Concerning the summer flow, few data are obtainable, and calculations, based upon figures usually considered indicative, vary widely instead of confirming each other. Water consumption records are of no value in this connection; for they cover only *total* use without any details of distribution, and the Tintern Manor Water Company supplies not only the sewered part of Long Branch but districts not reached by the sewers, and, in addition, Elberon, Eatontown and other independent communities.

Based on population served—usually the safest index for a residential community, the volume of sewage may be estimated thus: Winter population is 14,400. House connections number 1,155, reaching about one-third the total number of buildings. Allowing for house-connections idle during the winter, it is fair to say that 3,600 people contribute to the winter flow. Allowing 80 gallons per day per capita makes the winter rate 288,000 gallons per day. As a purely hypothetical study of probable summer flow, I have assumed that the existing connections (1,155) covering private residences, boarding-houses and minor hotels, serve 11,550 people. To this should be added the guests, staffs and servants of the large hotels, say 2,000, making 13,550 people accustomed to lavish use of water. Allowing 125 gallons per

head per day makes the daily volume of sewage 1,694,000 gallons. Another calculation, based upon the bulk of screenings removed daily, the percentage of solids withheld by screens of one-inch mesh and the percentage of total solids in normal domestic sewage, indicates that the summer flow is less than 1,000,000 gallons per day.

It is evident that a available data will not warrant the formulation of definite recommendations at this time. This much is certain:

(a) That the wire screens now in use will permit the passage of fecal matter and other solids in particles large enough to foul the beach and spoil the bathing, the degree of such offence depending on the number of particles discharged and the set of the wind and tide;

(b) That although the escape of such particles could doubtless be prevented by re-establishing the coke-screen service, the effective area of the coke-screens is too small to make this device reliable. If the daily summer flow were only 800,000 gallons, the coke screens would require cleaning three times a day.

In my judgment, the screening chambers should be replaced by a septic tank, of dimensions to be determined after a careful study of summer flow, divided into chambers of unequal size, so that working capacity may be changed with the changing seasons. This tank may be installed without disturbing existing grades.

Ample provision should be made in design for a considerable extension of the sewerage system; for some extensions are under way and others are planned. It may be found wise to supplement the work of this tank with horizontal-flow coke filters of ample sectional area, to intercept the masses of humus and partly digested sludge dislodged by gas formation and escaping occasionally from the best of septic tanks. If clarification alone be required—and I believe this sufficient—the hospital wastes should be carefully guarded and sterilization ensured.

Respectfully submitted,

G. EVERETT HILL.

At a meeting of the Board held August 11, 1908, the following report was submitted:

Long Branch was visited for the purpose of ascertaining the nature of conditions around the outfall sewer main. It was found that the Long Branch Sewer Company has a system by which they effectively screen the sewage and then conduct the screened liquid through a large main out into the ocean.

The outlet is several hundred feet from the shore and, at the time of inspection, no signs of sewage pollution were detected on the beach. No one along the beach seemed to have any complaint to make about the presence of the outlet, nor did they seem to think it caused any nuisance.

The following resolution was adopted:

WHEREAS, The Board of Health of the State of New Jersey has found that the waters of the Atlantic Ocean are being polluted to the injury of inhabitants of this State in their health, comfort and property, therefore, be it

RESOLVED, That, in accordance with Chapter 72 of the Laws of 1900, and the supplements and amendments thereto, the Board of Health of the State of New Jersey hereby gives notice to the Long Branch Sewer Company that prior to the first day of June, 1909, they must cease to pollute the waters of the Atlantic Ocean and make such disposition of their sewage and other polluting matter as shall be approved by the State Board of Health.

Dr. Keator presented a letter from Dr. A. E. Ballard, of Ocean Grove, N. J., requesting an extension of time until June 1, 1909, in which to install a plant for the treatment of crude sewage from said place. Motion was made and carried that the communication be received, and that an extension of time be granted in accordance with said request.

SEABRIGHT.

An inspection was made at Seabright on August 4, 1908, to learn what had been done towards the purification of the sewage of that town.

Mr. Packer, mayor, stated that they had received notification to cease polluting the river, but that nothing had been done beyond appointing a committee who were waiting to see how some of the new plants at some of the other towns were going to work.

The outlets of eight sewers emptying into the river were inspected and found discharging the usual materials found in short sewers at three P. M.

The following resolution was adopted:

WHEREAS, At a meeting of the State Sewerage Commission held on August 29, 1907, it was

RESOLVED, That the Borough be notified to cease to pollute the waters of Shrewsbury river prior to the first day of July, 1909, which notice was served upon John W. Eyles, mayor, on September 6, 1907, and

WHEREAS, The said Borough of Seabright has neglected to comply with said notice, therefore, be it

RESOLVED, That the Attorney-General be requested to at once bring proper legal proceedings under Chapter 72 of the Laws of 1900, and the supplements and amendments thereto, against the Borough of Seabright to enforce said notice.

SPRING LAKE.

At a meeting of the Commission held February 6, 1908 the secretary reported that he had been consulted by Pugh & Hubbard in relation to the construction of three septic tanks to purify the sewage from the three outlet sewers of the Borough of Spring Lake, and that he had recommended that the plans prepared be modified in some of the details and that they be submitted to the Commission, together with an application for their approval by the Borough authorities.

At a meeting held August 25, 1908, of the Board, Mr. Herbert presented a communication from the Borough of Spring Lake, requesting an extension of time in which to install a plant for the treatment of sewage from said borough. On Mr. Herbert's recommendation, motion was made and carried, that an extension of time until June 1, 1909, be granted in which to complete the work.

At a meeting of the Board, September 29, 1908, Mr. Chew moved that an engineer be sent to Spring Lake to confer with the authorities of that place as to the best method of disposing of the sewage of said borough. Motion was carried.

On October 2, 1908, a communication was received from E. V. Patterson, borough clerk, of the Borough of Spring Lake, asking for engineering advice.

WESLEY LAKE.

An inspection of Wesley Lake was made and at a meeting of the Board held October 13, 1908, George W. Garrity, representing Charles Lewis, admitted that polluting matter had been discharged from the premises of Mr. Lewis into Wesley Lake, but stated that the pipe had been disconnected and that no polluting material now reaches the lake from these premises.

The following resolution was adopted:

WHEREAS, The Board of Health of the State of New Jersey has found that the waters of Wesley Lake are being polluted to the injury of inhabitants of this State in their health, comfort and property, therefore, be it

RESOLVED, That, in accordance with Chapter 72 of the Laws of 1900, and the supplements and amendments thereto, the Board of Health of the State



of New Jersey hereby gives notice to W. I. Applegate, Ruffo Bruno, Stephen Bryan, Paul Siciliano, J. William Dean, James D. Fay, Frank Masco, Carmen Progello, David Potter, Joseph Sebell, Ernest Smith and Heiman Sneider that prior to the first day of May, 1909, they must cease to pollute the waters of Wesley Lake and make such disposition of their sewage and other polluting matter as shall be approved by the said Board of Health.

#### MOORESTOWN.

At a meeting of the Board held August 25, 1908, Mr. Herbert presented plans for an extension to the sewers of Moorestown. Motion was made and carried that the plans be approved subject to such conditions of construction, operation and purification as this Board may from time to time require.

Following is a report made of Moorestown:

Moorestown is a village in the Township of Chester, in Burlington county. The population of the sewered district is now estimated to be 3,000, of which 1,800 are patrons of the sewers. According to the report of 1906, the system of sewers was installed in 1901. There are now  $2\frac{1}{2}$  miles of 15" sewer mains and about 8 miles of 8" lateral sewers. The material of the sewers is cast-iron.

There are 400 house connections and about 15 new ones are added yearly. There being no factories, the sewage is purely domestic in character. The only entrance for storm water is one down-spout on a schoolhouse at the beginning of a special line of pipe, which is not provided with a flush-tank; but on account of the vents at the house connections, ground-water enters the system to some extent. The flow in the 15" main is from about  $\frac{1}{2}$  full in dry weather to about 2-3 full in wet.

The daily water consumption is about 400,000 gallons. This water is pumped from a lake fed by springs; but, when necessary, an extra supply is pumped from a stream.

The outlet sewer consists of a 15" main, two miles long, leading to the disposal plant which is located about  $\frac{1}{2}$  mile from Lenola station on the Pennsylvania Railroad, and on the banks of the North Branch of Pensauken creek, six miles above its junction with the Delaware river.

The disposal plant consists of a sedimentation chamber, a septic tank divided into four compartments running in series and four contact beds.

The sedimentation chamber is 10 feet square and 10 feet deep. At the time of inspection, this had a thin scum on the top. This is cleared off every three or four weeks, and the chamber is thoroughly cleaned out once every year.

The septic tank is an uncovered brick chamber 60 feet long by 25 feet wide and is divided into four compartments, so arranged that two, three or four may be used at a time. The sewage passes from one compartment to another over submerged weirs, 16" below the top of the walls. The last compartment is used partly as a dosing tank, the upper four feet being discharged by the siphons on to the contact beds.

A thick scum was found on the first compartment, but the other ones were free. This tank is disturbed as little as possible, the scum being removed, perhaps, twice a year. The materials from this tank, as well as from the sedimentation chamber, are put into a bucket hanging on an overhead track. The bucket is then run to a pen outside the enclosure and dumped. The dumped material is made into a compost and utilized.

The contact beds are four in number, each about 80 feet by 40. In each bed there is a foot of gravel, over which has been placed three feet of slag in three of the beds and three feet of cinders in the other one. The beds are embanked with brick, the bottom being the natural soil grade. The distribution is accomplished by a system of open-jointed sewer-pipe imbedded to its horizontal axis in the filtering material. The discharge is controlled by a valve. Each bed is thoroughly underdrained by a system of open-jointed vitrified sewer pipe in and below the gravel course which forms the lower layer of the beds. The effluent from each bed is led to a chamber 50 feet distant from the contact beds in which chamber are placed the four valves

controlling the flow from the beds. A 15" pipe conducts the effluent from this chamber to the bank of the stream.

The attendant visits the plant twice a day to change the gates and regulate the flow, there being no automatic apparatus. The beds are dosed every other day, thus giving each bed a day's rest between dosing. The flow on to the beds is intermittent, the rate of siphon discharges varying with the sewage flow. The flow through the beds is held back and controlled by the valves in the chamber between the beds and the creek, and the adjustment of these valves is in accordance with the sewage flow.

The condition of the effluent is extremely good, there being no odor, color, sediment, turbidity, or fungus growth visible.

#### MORRIS PLAINS.

A report submitted of inspection made on August 14, 1908, of the New Jersey State Hospital is as follows:

The State institution known as the New Jersey State Hospital at Morris Plains, is located in Morris county about  $1\frac{1}{2}$  miles from the Morris Plains railroad station. This is quite a large asylum for the insane and the buildings are designed for a capacity of 1,500 inmates. At present, there are 1,952 inmates and 453 on the pay roll. These, with the families of the various officers, make a sum total of about 2,450 people on the grounds.

The daily water consumption estimated by the amount pumped is, on the average, about 550,000 gallons. Most of this water finds its way to the sewers together with some storm water. Laundry work goes on every day and the sewage is typical institutional sewage and contains much paper, rags and other debris.

Two sewers, called respectively the north sewer and the south sewer, lead from the wings toward the east and unite near a large circular open flush-tank which has a capacity of about 80,000 gallons.

During the day, the flow from the north sewer, which is somewhat less than half the entire amount, is conducted through a screen tank 7x25 feet and containing wooden slats  $\frac{1}{2}$ " apart. These slats hold back the coarse materials which are drawn off about every 6 weeks into another tank 7x45x5 feet. When dried out, this mass is composted with lime and disposed of. These two tanks are tightly covered and there is no nuisance. The screened sewage flows out in open dirt channels and from them spreads out over a large sloping hillside. Care is taken that new portions of the field are used at intervals so that the sewage does not go far from the trenches on the surface.

At night, the flow from the north sewer unites with that of the south sewer and the combined amount is taken care of by the disposal plant. In the south line there is a circular "catch-trap." From this, screenings and materials "caught" are removed daily and composted. Near the big flush-tank just below the junction of the south and north lines, there are two screen chambers. These are about 12 feet in diameter and 8 feet deep. The flow enters the side and passes out a center pipe over which stands the screen. This is a circular cage of  $\frac{1}{2}$ " mesh wire netting, 6 feet high and 2 $\frac{1}{2}$  feet in diameter. The surface scum of screenings and grease, etc., is skimmed off every day and composted, and the whole chamber is cleaned out twice a year. From the screen chambers the flow passes to the "settling gallery." This consists of three underground tunnels 5 feet wide, 4 feet deep and 100 feet long. The flow enters one, passes through and returns by both the others in parallel. The first gallery has a scum a foot thick, while on the other two, the scum is from 4" to  $\frac{1}{2}$ " thick. Considerable septic action seems to go on in these tunnels. Manholes are placed at regular intervals.

This "gallery" is cleaned out twice a year, by drawing off the sludge into a pit and composting it. About a dozen cartloads are removed.

On leaving the "gallery" the flow passes out through another screen made of fine wire netting and then into a flush-tank. As before mentioned, this is an open circular tank and holds about 80,000 gallons and is emptied by a

siphon from three to five times in 24 hours. The sewage on leaving the tank must pass still another semi-circular screen of wooden slats. It then flows on to a distributing chamber located at the intersection of the boundary divisions of beds 3, 4 and 5.

The beds cover about 4 or 5 acres and are seven (7) in number. Nos. 1 and 2 are underdrained and composed of gravel, soil and ashes, 6 feet deep. Nos. 3 and 4 are natural soil and contain a good deal of clay. They are not used at present. No. 5 contains less clay, more gravel and some cobble-stones and Nos. 6 and 7 contain more gravel and some ashes.

The supply pipe brings the dose upward to an opening in the center of the bed from which it flows out over the ground. Each bed has an embankment around it. The flow from No. 2 bed goes on to No. 1 and it is there held until let out by the attendant the next day. Nos. 2 and 1 are alternated with No. 7 and receive only night sewage. The other beds take care of the day flow in rotation, i.e., Nos. 5 and 7. As the dose soaks away from the beds, except Nos. 2 and 1, through the natural ground, no effluent was visible, except that which the attendant let out from bed No. 1. This effluent was from a night sewage but was almost like spring water. It runs down a little ditch into a pond and finally into the Whippany river. The beds are plowed once or twice a year and harrowed every week or two.

The system is somewhat crude and is pretty heavily loaded, and therefore requires careful management. It seems to be getting good attention, but with more improvements the system could be made less complicated. Care is also necessary to see that the sewage *never* gets away from the north irrigation field into the stream.

#### MORRISTOWN.

At a meeting of the Commission held January 23, 1908, the secretary reported that he had been served with a subpoena duces tecum to produce before a Supreme Court Commissioner in Morristown, in a cause pending in the Supreme Court wherein G. G. Frelinghuysen and others were prosecutors and the Mayor and Board of Aldermen of Morristown and others, defendants, all the records and proceedings of the Commission in relation to the sewerage system and disposal plant of the Town of Morristown.

At a meeting of the Commission held January 30, 1908, the secretary reported that on Friday, January 24, 1908, he had appeared as a witness with the records of the Commission in relation to the Morristown sewerage system and disposal plant in an action brought by G. G. Frelinghuysen and others against the Town of Morristown and others for the purpose of obtaining a writ of certiorari to review the proceedings of the Town of Morristown and the Morristown Board of Sewerage in relation to the new sewerage system and proposed disposal works for Morristown.

On November 2, 1908, a letter was sent to Messrs. Williams, Proctor & Potts, engineers, of New York City, asking for information as to the condition in which the works were. On November 15, 1908, a reply was received saying that the situation was the same as at the time of making the last annual report to the State Sewerage Commission; that the Supreme Court of New Jersey had decided that Morristown might build a sewage disposal plant in the Township of Hanover; that the plaintiffs, the Township of Hanover and Messrs. G. G. Frelinghuysen and others had appealed from the decision of the Supreme Court to the Court of Appeals; that a decision was expected in February; that, in the meantime, the construction of the disposal plant is held in abeyance; that the sewers in the town are completed but are not being used, and will not be used until method of disposal is provided; that the system as constructed provides sewerage facilities for every house within the corporate limits of Morristown, so that when sewage disposal is provided, Morristown will be the most completely sewered town in the State.

#### NEWARK CITY HOME.

The following is a report of inspection made July 23, 1908:  
The Newark City Home for truant boys is located in Essex county,  $\frac{1}{2}$  mile from Overbrook and about the same distance from Verona. The total population is 175.

Last year, a sort of disposal system was attached to their sewer. The main sewer is a 10" pipe flowing in dry weather about 1-10 full. This pipe conducts the sewage down the hill towards the Peckman river about  $\frac{1}{4}$  mile and empties it into a small settling chamber. This chamber also contains a sort of screen, and is cleaned out about two or three times a year. The solids are carted away. From this chamber two pipes extend in opposite directions to a series of other small chambers. On the lower side of each of these chambers is an opening leading into a "blind ditch" filled with gravel extending down across the meadow. There are 20 of these ditches, and hay is cut from the entire meadow. The ground is low and wet and the effluent which finally soaks out through the ground and gravel collects in an open ditch at the foot of the field. This ditch contains much fungus growth and bad-smelling black sediment. The whole soil is unsuitable and probably the greatest purification the effluent receives is dilution with ground water.

The effluent finally empties into the Peckman river, a tributary to the Passaic.

#### NEW BRUNSWICK.

At a meeting of the Board held August 11, 1908, the following resolution was adopted:

**WHEREAS**, The Board of Health of the State of New Jersey has found that the waters of the Raritan river are being polluted to the injury of inhabitants of this State in their health, comfort and property, therefore, be it

**RESOLVED**, That, in accordance with Chapter 72 of the Laws of 1900, and the supplements and amendments thereto, the Board of Health of the State of New Jersey hereby gives notice to the City of New Brunswick that prior to the first day of July, 1911, it must cease to pollute the waters of the Raritan river and its tributaries and make such disposition of its sewage and other polluting matter as shall be approved by the State Board of Health.

At a meeting of the Board held September 22, 1908, plans for an extension to the sewers of New Brunswick were presented and, on recommendation of Mr. Herbert, motion was made and carried that said plans be approved subject to the notice heretofore given to the City of New Brunswick to cease polluting the Raritan river prior to July 1, 1911.

#### NEW JERSEY STATE VILLAGE FOR EPILEPTICS.

At a meeting of the Board held August 11, 1908, the following resolution was adopted:

**WHEREAS**, The Board of Health of the State of New Jersey has found that the waters of the Raritan river and its tributaries are being polluted to the injury of inhabitants of this State in their health, comfort and property, therefore, be it

**RESOLVED**, That, in accordance with Chapter 72 of the Laws of 1900, and the supplements and amendments thereto, the Board of Health of the State of New Jersey hereby gives notice to the Board of Managers of the New Jersey State Village for Epileptics that prior to the first day of June, 1909, they must cease to pollute the waters of the Raritan river and its tributaries and make such disposition of their sewage and other polluting matter as shall be approved by the State Board of Health.

## NEW LISBON.

An inspection was made July 27, 1908, and the following report submitted:  
New Lisbon is a village in Pemberton Township, in Burlington county, located on Rancocas creek, about 20 miles from the Delaware river. The Freeholders of Burlington county maintain two institutions at New Lisbon, a hospital for the insane and an almshouse. Each has its own superintendent and staff. The present population of the hospital is 195, while that of the almshouse is 110. The water consumption is estimated at about 30,000 gallons per day.

At the hospital, the laundry is now connected with the sewer and dry weather flow of sewage is practically about 20,000 gallons per day. This probably is increased 20% in wet weather by some roof and surface water. Practically nothing has been done to the system for years except to connect on the laundry waste.

The sewer is a ten-inch terra cotta pipe about 400 yards long, leading to and emptying into a brick screen chamber five feet square. This chamber is cleaned of screenings about once a week. These are piled on the side and after a while, carted off. From this chamber the flow goes into a circular brick septic tank, 16 feet in diameter and with a working depth of 5½ feet. In this tank there was about 4" of scum and about one foot of sludge. The tank is covered by a flat wooden roof.

Two iron pipes on the same level lead the sewage from the tank to a single bed, 60 feet x 30 feet in an unlined earth excavation, without partitions, filled to a depth of from 3½ to 4 feet with slag of three sizes in horizontal strata, the coarsest at the bottom. Two V-shaped wooden troughs conduct the sewage from the iron pipes out across the bed. The underdrains unite with a single outlet whose valve is open and through which the flow is continuous. The bed is in a horrible condition and is so badly clogged and worked that almost the whole of it goes in. This effluent runs out in an apparently the same condition as it goes in. This effluent runs out in an open ditch, which crosses the field, passes under the road and then parallels it, receiving as it goes, the drainage from the almshouse, and empties into Budd's run, which enters Rancocas creek ½ mile below Pemberton, and above Mount Holly's water intake. Were it not for the great dilution, the effluent receives by ground water in the ditches, this effluent would certainly become a nuisance in addition to its being a pollution.

The whole general appearance out the back-door of the hospital is not what it should be for any institution. In addition to a sewage disposal plant, which shows overwork and utter lack of care, there are two outside surface privies, one which has no back to hide its contents, dirty pig-pens, badly-kept stable surroundings and piles of offensive rubbish.

The almshouse has only four inside closets and bath-tubs. It has also outside surface privies. The 8" sewer runs for a few hundred feet and empties into a circular cesspool 6 feet in diameter and 6 feet deep; from this the flow continues for about 60 feet to another cesspool of the same dimensions. The effluent from this passes out in an open ditch down through the cow-pasture and practically the only purification it receives is dilution with ground water. The cattle have been fenced off from part of this ditch for about a few hundred feet, then they have access to the stream and not having other water supply, are forced to drink this somewhat diluted sewage.

A new hospital for the almshouse to accommodate 40 patients is being built and no provision is being made to take care of its sewage and wastes. There also exists a barnyard surface drain at the back of the almshouse which might in wet weather find its way directly into the stream.

At a meeting of the Board held August 11, 1908, Mr. George F. Harbert, steward of the Burlington County Almshouse, appeared in response to notice to appear and show cause why they should not be notified to cease polluting Rancocas creek, and admitted that the overflow from cesspools at said institution reached the waters of Rancocas creek, but said it flowed sluggishly

through ditches for two or three miles before it reached the creek. He said refuse from the stables flows over the surface of the ground to a meadow, but that very little can reach the ditch referred to, except in times of heavy rain; that this drainage from the stables does not amount to anything as it dries up; that four bath-tubs and four closets are connected with the cesspools. In response to questions, Mr. Hrebert said he did not see how they could put in a disposal plant in connection with the county asylum on account of the lay of the ground.

Mr. Joel Horner, Director of the Board of Freeholders of Burlington county, said they were building a new hospital at the almshouse and would like to have some ideas as to how to dispose of the sewage, but said they did not want to mix in with the asylum. He said they had no real county engineer, but employed an engineer when they needed one. He asked what system of purification was recommended by the Board, and was told that the Board did not recommend systems, but that he should put in one which would secure a high state of purification. Mr. Horner was informed that the matter would be taken up later by the Board, and that he would be notified of action taken.

Mr. Chew moved that Mr. James Owen, C. E., be sent to confer with the Burlington county officials in reference to disposal of sewage from the county institutions. Motion was carried.

At a meeting of the Board held August 25, 1908, report was made that Mr. James Owen had visited the county buildings in Burlington county in response to the request of the Board, and would have a report ready in a few days.

At a meeting of the Board held September 8, 1908, Mr. Owen's report was received and is given in full as follows:

196 Market street, Newark, N. J.,

Sept. 3rd, 1908.

To the State Board of Health:

GENTLEMEN—In compliance with your request I have made an examination of the sewerage disposal plant of the Burlington county Hospital for the Insane at New Lisbon and would suggest the following plan for the permanent improvement of the same.

As cited in the report of Francis E. Daniels, chemist to your Board, dated July 27, 1908, the sewerage amounting to about 20,000 gallons per day, passes through a screening chamber into a circular intercepting tank, then through a bed of slag 60 feet x 30 feet and the effluent then flows in an open ditch, and is far from satisfactory.

The present screening and intercepting chambers can remain, and seem adequate for their work if properly cared for. The slag filter bed is not sufficient and has no period of rest for the flow, instead of being periodically intermittent, is constant with a consequent clogging of the spaces between the particles.

A duplicate stone or slag filter bed of the same size, viz., 60' x 30' should be constructed with earth sides of a proper slope and then filled with broken stone or slag of graduated sizes, the coarser at the bottom and the finer at the top. The pipes from the intercepting chamber should have a switching arrangement so as to deliver the discharge on either of the stone beds as required.

To the north of the slag or stone beds should be constructed two sand filter beds 30'x30' with earthen sides filled with four or five feet of well selected sand.

The connection to these filter beds should be arranged so as to deliver from either of the stone beds to either of the sand filter beds. The effluent from the sand filters can then run into any open channel that may be designed without any detriment or harm. The sand filters will have to be constructed at a sufficient distance from the upper beds so as to discharge from the bottom of the upper ones into the surface of the lower beds. The exact distance will depend upon the natural grade of the ground and the cost of the connecting pipe should be adjusted to the amount of excavation necessary

to get the proper level. I assume for the case, a distance of 150 feet and an excavation of two feet for the pipes. The excavated material can be used to make the banks.

I have consulted with Mr. Thompson, the engineer of Burlington county, assigned for this work and he has cordially assented in the investigation and has expressed approval of results.

With the suggestion of your Board for the improvement as designed, should be coupled an earnest plea for careful maintenance of the plant hereafter. The screening chamber should be cared for daily, and the stone and filter beds should be carefully raked over after they are changed.

It is probable that each bed can be in use for from three to six days without change, but experience as to the nature of the discharge will show which is the better method.

I estimate the cost as follows:

One slag breaking down bed.....	\$1,200
Two sand filter beds @ \$950.....	1,900
Connection, pipes, etc.....	750
	<hr/>
	\$3,850
Engineering and incidentals 10%.....	385
	<hr/>
	\$4,235

In suggesting the work and estimating the cost, the cheapest mode of construction is allowed for. Concrete walls for the beds are much more satisfactory and obviate much care in future maintenance. If earth construction is used, the slope should be carefully trimmed and seeded in first construction, the grass periodically mowed and any breaks promptly repaired.

Yours respectfully,

JAMES OWEN,  
C. E.

Mr. Owen's report of the sewerage system at the almshouse is as follows:

196 Market street, Newark, N. J.,

Sept. 3rd, 1908.

To the State Board of Health:

GENTLEMEN—At your request I have made an examination of the sewerage system now in use at the Burlington County Almshouse at New Lisbon, and would report as follows:

The present system runs from the existing almshouse in an eight (8) inch pipe to two (2) cesspools neither of which are trapped, consequently there is no interception of any solid matter and the crude sewage runs into an open drain and then flows eventually into the brook.

All the closets and sinks discharge from the ground floor level, there being no outlet for any drainage from the cellar level. This supplies the present requirements but if supplementary accommodations should be inserted or required in the basement, the present system is useless.

A new hospital is in course of erection and the plans are designed to discharge the sewage below the cellar floor. No provision has so far been made for the disposal of the hospital discharge.

Topographical conditions practically prevent a joint plan for both the county hospital and the almshouse and it will therefore be more economical to treat the sewage from the almshouse in a separate plant. The present population of the almshouse is from 100 to 110, and it is estimated that the discharge will never exceed 6,000 gallons per day, and it is therefore recommended that the disposal be made by the upward filtration system which can be located on the

garden or meadow in the rear of the almshouse. From such a plant there is no effluent, the sewage being absorbed by the ground and the grass growing in it. The process of constructing such a plant is as follows:

A circular collecting tank about eight (8) feet in diameter and eight (8) feet deep takes the discharge, which is allowed to rest here, when the solid matter rises to the top.

The solid matter should be removed at least once a month. The discharge from the collecting tank then flows into the flushing tank (which will be the same size as the other tank) and the contents of this tank when filled, will be automatically discharged into a series of underground tile pipes which should be filled by the discharge. When the discharge is completed no more flow is allowed until the flushing tank is filled again. During this period of filling, the sewage in the underground pipes is absorbed by the ground and the system then is ready for a new flow. A duplicate system of pipes is necessary to give one set a rest and complete oxidation, the period of use for one system being about one week.

It would be better to lay a new main from the present hospital, starting at a level of one foot below the cellar, and also a main of necessary depth to run from the hospital. These can run into the collecting tank. A study of the levels of the grounds showed that the results would be satisfactory.

I estimate that 3,000 feet of sub-soil pipe will be necessary. These are laid about ten (10) inches below the surface and four (4) feet apart. This 3,000 feet will take up an area of 1-3 of an acre.

The estimated cost will be about as follows:

900 feet of 8 in. pipe @ 50c.....	\$ 450
One collecting basin 8 ft.....	60
One flushing basin 8 ft.....	60
Siphon.....	40
300 ft. 6" pipe and specials @ 40c.....	120
4,000 ft. 2" tile drain @ 30c.....	1,200
Connections, etc.,.....	200
	<hr/>
	\$2,130
Commission 10%.....	200
	<hr/>
Total.....	\$2,330

Yours respectfully,

JAMES OWEN,  
C. E.

At a meeting of the Board held September 8, 1908, Mr. Herbert presented reports (above written) received from James Owen, C. E., in reference to sewage disposal plants for the county institutions of Burlington county. Dr Keator moved that the report be received and copies of the same be sent to the Board of Freeholders of Burlington county.

The following resolution was adopted:

WHEREAS, The Board of Health of the State of New Jersey has found that the waters of Rancocas creek are being polluted to the injury of inhabitants of this State in their health, comfort and property, therefore, be it

RESOLVED, That, in accordance with Chapter 72 of the Laws of 1900, and the supplements and amendments thereto, the Board of Health of the State of New Jersey hereby gives notice to the Board of Freeholders of Burlington county that prior to the first day of May, 1909, they must cease to pollute the waters of Rancocas creek by making such changes in the sewage disposal plant at the asylum as shall be approved by the said Board of Health.

## NEWTON.

Inspection made August 28, 1908, by Francis E. Daniels, Chemist and Bacteriologist of the Division of Sewerage and Water Supplies, is as follows

The Town of Newton is located in the watershed of Paulin's Kill, in Sussex county. Its population, at the present time, is estimated at 4,600.

In 1905 and 1906, the town constructed a sewerage system and two disposal plants. The town is situated on the top of a ridge, draining both ways. One disposal plant was constructed for each of the drainage areas. To connect the two would necessitate the cutting of a ridge forty feet high. The plants are about 6,500 feet apart. They are called respectively, the Clinton street plant and the Sparta street plant.

Seven and one-third miles of sewers are constructed, five twelfths of which drain to the Sparta street plant and seven-twelfths to the Clinton street plant. The sewers are separate and range in size from 15 to 18 inches. At all dead ends of the sewers flush-tanks were constructed. There are at present about 210 house connections and more are rapidly being added. The majority of these are on the Clinton street system and only about 25 are on the Sparta street system.

During the construction of the sewers many storm box drains were uncovered. Some of these showed sewerage connections. Many of these have been removed though some are still in operation. It is hoped that all will be taken out as soon as possible.

The two disposal plants are similar in design and operation but are different in size. Each plant consists of a small sedimentation chamber, a septic tank, a dosing chamber, 5 sand filters and a sludge bed.

At the Clinton street plant, which is designed to receive the sewage flow of 297,000 gallons per day, the septic tank is composed of two equal compartments 83 feet x 20 feet, and the dosing chamber is 40 feet square. The five sand filters are each 200 feet x 80, the distributing trough varying in width 24 inches to 8 inches. The underdrains are 6 and 8 inches in size with 4-inch branches laid 16 feet apart. The outlet pipe is 10 inches in diameter.

At the Sparta street plant, designed to receive a flow of 127,500 gallons per day, the septic tank is 64 feet x 22 x 7 feet 9 inches with a working depth of 5 feet 9 inches. A six-inch drain pipe leads from the tank to the sludge bed 36 feet square. The tank is baffled and designed to retain the sewage eight hours. The flow passes out of the tank over an adjustable weir into the dosing chamber.

The automatic air-locked siphon has been removed from the Clinton street plant and at present the new machinery operated by a large float automatically controlled, and regulates the dose upon the beds in succession. The device is very ingenious though simple. Each bed gets a dose about once in 20 hours, the dosing chamber discharging about once every 4 hours.

The air-lock system is still in the Sparta street plant, but does not seem to give satisfaction and will probably be taken out.

The filtering material is good, clean, sharp sand and the effluents are excellent. The plants receive good attention, beds are put in order frequently, and the attendant takes great pride in the appearance and successful working of the system.

Both plants have by-passes by which the sewage can be turned directly into the stream.

Near the Sparta street plant there empties a 24-inch sewer from the Merriam Shoe Factory and Valentine & Bentley's silk mill. These factories employ about 800 persons and the pollution along the ditch from the outlet of the sewers is very bad. This should be stopped at once.

Since above report was made, the pollution caused by the Merriam Shoe Factory and Valentine & Bentley Silk Company has been abated.

## OAKLYN.

At a meeting of the Board held June 16, 1908, the following report was submitted:

Oaklyn has a sewer line emptying into Newton Lake carrying the wastes from eight houses. This was built by the Collingswood Sewerage Company. Although a moderate amount of sewage comes from this line, it would seem advisable either to purify it by sand filtration or run the pipe across the stream to join the main Collingswood pipe line in order that thorough purification may be obtained.

It is recommended that the Bettelwood Land Company be notified to cease polluting Newton creek prior to the first day of October, 1908.

At a meeting of the Board held June 16, 1908, the following resolution was adopted:

WHEREAS, The Board of Health of the State of New Jersey has found that the waters of Newton creek are being polluted to the injury of inhabitants of this State in their health, comfort and property, therefore be it

RESOLVED, That, in accordance with Chapter 72, of the Laws of 1900, and the supplements and amendments thereto, the Board of Health of the State of New Jersey hereby gives notice to the Bettelwood Land Company that prior to the first day of October, 1908, it must cease to pollute the waters of Newton creek and make such disposition of its sewage and other polluting matter as shall be approved by the said Board of Health.

## OVERBROOK.

At a meeting of the Board held July 21, 1908, Mr. Herbert presented plans for extensions and connections at the Overbrook sewage disposal plant in Essex county, said plans being submitted by the engineer, Mr. James Owen, C. E. Mr. Herbert recommended that the plans be approved. Plans were approved subject to such condition of construction, operation and purification as this Board may from time to time require.

Following report was made of inspection under date of July 23, 1908:

Overbrook is located in Verona Township, in the county of Essex, just south of the Village of Cedar Grove, on Peckman river, a tributary of the Passaic river. The county of Essex maintains at Overbrook a hospital for the insane. The main county hospital for the insane has been maintained at Newark, and the one at Overbrook is merely a branch hospital used for harmless patients. At the present time, the county is constructing additional buildings at Overbrook and upon their completion all of the insane patients will be maintained at this place.

The total population on the day of this inspection was 589. When the other patients are all transferred to Overbrook the population will probably be increased three-fold.

The hospital was built about 1896, and at the same time provision was made for the disposition of the sewage by septic tank and sand filters. The plant was designed by James Owen, county engineer.

The septic tank is 50 feet long, 18 feet wide and 10 feet deep, built of concrete and covered with a concrete roof. This tank is the oldest septic tank in America; is still doing good work, and, so far as could be learned, it has never been cleaned out. At the time of inspection, there was almost no scum on the top and less than a foot of sludge in the bottom.

Just before entering the septic tank, the sewage passes through a small square chamber containing iron screens. These screens hold back rags and other large solids. These are raked out every day, spread on the ground on the side of the chamber, dried and burned next day. These screenings are unsightly and present a disagreeable aspect, because the tank is located right beside the main and only entrance drive to the buildings. While in dry weather these are cleaned up every day, yet there is always a day's supply spread out to dry and in wet weather more must of necessity accumulate.

The flow from the septic tank is now conducted to the new filters (the old beds having been abandoned) located about 1-3 of a mile distant across the creek. These consist of 4 primary contact filters and 4 sand beds.

The primaries are each 100 feet square and 5 feet deep. They are filled about 3½ feet deep with 3" stone with a layer of ¾" stone on top. At the center of the set is the gate chamber. Here the flow is changed from one bed to another. Valves are also located here for controlling the discharges from each bed. Distribution is accomplished by means of lines of sewer pipe, radiating out from the chamber—one on each bed. The beds are used in rotation, one being held full until the second one is full, then while the third is filling the first is being emptied, and so on.

The effluent from the primaries goes to the distributing chamber of the secondaries. The secondaries are of the same size and arrangement as the primaries. The filling, however, of the secondaries is sand and gravel, and on account of its porous nature, these filters are practically still contact beds. The dose disappears immediately. So in order to settle and utilize the whole bed, the effluent valve is held shut until the bed fills which takes about 1½ primary "bed-fuls." Then the valve is opened and the dose is allowed to flow slowly out into the creek. The beds are thus used in rotation for the present at least. The effluent appears excellent. One sand bed is raked every day which keeps them in good order and every bit of grass which appears, is pulled up. This plant was put in operation October 11, 1907. Considerable disinfecting materials are used in the buildings, but they do not seem to have any serious effect on the purification of the sewage.

Ground is now being excavated for a new septic tank 85 feet x 65 feet which will receive the sewage from the new buildings, the old one being kept for the old buildings alone.

In addition to abating the nuisance around the old septic tank above-mentioned, it is *extremely* necessary that something be done *at once* to stop the washing of the clay banks, on the south side of both primary and secondary filters, and to keep this clay off the beds. This clay will soon ruin the filter if allowed to proceed. It is practically the result of an unfinished job. Suggestion is made to raise the walls on that side, sloping back the banks and properly grassing them, and providing proper drains for the surface water.

In the walls at the surface of the stone are two large "notch openings." These would serve practically as by-passes if the two lower filters should overflow, because then the sewage from the top of the primaries would run out these holes directly down into the man-hole chamber and into the secondary beds, and if the secondary lower beds filled, then that flow would go directly by a similar arrangement into the brook. In the first case, the primaries would be by-passed and in the second case, the secondaries would be by-passed. As no good reason can be seen for those openings, it is suggested that they be cemented up. In fact, the attendant had to make a bank of sand around the ones in the sand filter walls in order to be able to fill the beds.

#### PEMBERTON.

Report of inspection made on August 17, 1908, is as follows:

The Borough of Pemberton is situated on a low ridge between Rancocas creek and Budd's run, in Burlington county. It is about 15 miles from the Delaware river. About 60% of its area and 80% of its population lie on the Rancocas water-shed draining to the south. The water supply is pumped from the Rancocas creek. The community is purely residential in character. Its population is estimated at a little under 1,000.

The sewer system was put in operation in 1895, and at present there are about 4,000 feet of sewers from 6 to 8 inches in size. The number of house connections is about 50 with, perhaps, a yearly increase of less than one. Of these connections, most are sink and roof connections only and, probably, not more than 20 or 25 closets empty into the sewers. As the daily water consumption is about 22,000 gallons, the daily sewage flow is probably less than

20,000 gallons, except during very rainy weather. The 10' outfall main leads to a settling basin with an average diameter of about 40 feet, formed by excavation of earth needed for embanking part of the run of the main sewer through the meadow. It is unlined, being simply a pool with gently sloping banks grassed to the water's edge and about 3 feet deep in the center. It looks like a black marsh fog-pond.

The overflow is led out in ditches and from these in lateral ditches, in all about 600 feet of distributing channel. The soil is sandy and the sewage soaks away very rapidly. At the time of inspection, sewage could be found in the ditches only a few feet from the pool. During winter and in wet weather the sewage flows farther along, but it is claimed that there is never any danger of its getting away into the creek.

Part of the tract, which is a little swampy, is underdrained with 2 or 3-inch tile.

The disposal area covers about 5 or 6 acres and was used as a pasture, but this has been discontinued. The whole place looks rather unkempt with its heavy growth of grass and weeds. Care should be taken to keep the sewage up along the higher ridge and allow it to run off into the marshy parts of the field.

Aside from the unpleasant appearance of the place, it seems to be doing good work. Of course, the sewage is weak and of a small volume. Frequent and systematic inspection of the place should be made in order to correct immediately any dangers that may arise.

#### PENN HORN CREEK.

Jersey City not having complied with notice to cease polluting Penn Horn creek prior to May 1, 1908, at a meeting of the Board held August 25, 1908 the following resolution was adopted:

WHEREAS, at a meeting of the State Sewerage Commission held on April 1, 1907, it was

RESOLVED, That the City of Jersey City be notified to cease to pollute the waters of Penn Horn creek prior to May 1, 1908, which notice was served upon Mark A. Fagan, Mayor, on June 3, 1907, and

WHEREAS, The said City of Jersey City has neglected to comply with said notice, therefore, be it

RESOLVED, That the Attorney-General be requested to at once bring proper legal proceedings under Chapter 72 of the Laws of 1900 and the supplements and amendments thereto, against the City of Jersey City to enforce said notice.

West Hoboken not having complied with notice to cease polluting Penn Horn creek prior to May 1, 1908, at a meeting of the Board held August 25, 1908, the following resolution was adopted:

WHEREAS, At a meeting of the State Sewerage Commission held on April 1, 1907, it was

RESOLVED, That the Town of West Hoboken be notified to cease to pollute the waters of Penn Horn creek prior to the first day of May, 1908, which notice was served on Thomas Nolan, Mayor, on June 4, 1907, and

WHEREAS, The said Town of West Hoboken has neglected to comply with said notice, therefore, be it

RESOLVED, That the Attorney-General be requested to at once bring proper legal proceedings under Chapter 72 of the Laws of 1900, and the supplements and amendments thereto, against the Town of West Hoboken to enforce said notice.

## PENN'S GROVE.

At a meeting of the Commission held April 16, 1908, a communication from Asa G. Justice, borough clerk of Penn's Grove, inquiring whether the sewage from a proposed sewerage system for that borough would be permitted to discharge into the Delaware river, and if a disposal plant was required, what would be the approximate cost of it, was received and filed, and the secretary reported that he had replied that this matter must be submitted to the State Board of Health, when it had been re-organized.

At a meeting of the Commission held January 2, 1908, a communication was received from Leo Goldberger, of Perth Amboy, stating that he represented parties owning property on the Raritan river near South First and South Second streets in Perth Amboy, and complaining in their behalf that they were injured by the pollution of the river caused by the sewers at South First and South Second streets, which were not extended a sufficient distance from the shore of the river; and the secretary was directed to acknowledge its receipt, and to notify the authorities of the City of Perth Amboy that the Commission intended to request the Attorney-General to take proper action to compel compliance on the part of the city with the requirements of the Commission that its sewers be extended a sufficient distance from the bulk-head line, and to request that the city authorities notify the Commission at once of any reason why the Commission should not take such action.

At a meeting of the Commission held January 9, 1908, C. C. Hommann, city attorney of Perth Amboy, appeared before the Commission in response to notice that the Commission intended to request the Attorney-General to take proper steps to prevent the pollution of the Raritan river by the sewers in South Second and South Third streets in Perth Amboy. He stated that the city authorities of Perth Amboy would extend the sewers so as to prevent the nuisance complained of along the shore of the Raritan river; that the city council had already passed a resolution directing the city engineer to prepare plans for that purpose, and that these plans would be submitted to the Commission for its approval as soon as they were prepared.

At a meeting of the Commission held March 12, 1908, C. C. Hommann, city attorney of the City of Perth Amboy, consulted with the Commission in relation to proposed sewers in the westerly section of Perth Amboy.

At a meeting of the Commission held March 19, 1908, plans for a sewerage system in the westerly section of Perth Amboy to discharge into the Raritan river at the foot of Sheridan street, were submitted to the Commission on behalf of the City of Perth Amboy by Albert Bollschweiler, Mayor. The secretary was directed to request further information in relation to the plans submitted by the City of Perth Amboy.

At a meeting held March 26, 1908, Charles C. Hommann, City Attorney of the City of Perth Amboy, consulted with the Commission in relation to the proposed Sheridan street sewer in that city.

At a meeting held April 2, 1908, plans for a sewerage system for the westerly section of the City of Perth Amboy, to discharge into the Raritan river at the foot of Sheridan street, were submitted to the Commission on behalf of the City of Perth Amboy by Charles C. Hommann, City Attorney.

On motion of Commissioner Jacobson, the plans submitted by the City of Perth Amboy providing for a system of sewers in the westerly section of the City of Perth Amboy for domestic sewage only, to discharge into the Raritan river at the foot of Sheridan street, were approved subject to such conditions of construction, operation and purification as this Commission may from time to time require, provided, that when in the judgment of the Commission it should become necessary that the sewage from this system should be purified in order to prevent the pollution of the Raritan river, such purification plant for the treatment of the sewage shall then be constructed as this Commission may at that time approve.

## PETTY ISLAND.

At a meeting of the Commission held February 20, 1908, the secretary reported that Blackstaff & Company, proprietors of Petty Island, had consulted with him in relation to proposed sewers to be constructed on the island in connection with a proposed amusement park, the effluent to be discharged into the Delaware river, and that he had suggested that the advisability of constructing septic tanks for the purification of the sewage be considered.

## PHILLIPSBURG.

At a meeting of the Commission held November 14, 1907, Commissioners Herbert and Jacobson reported that they had inspected the sewerage system at Phillipsburg and the Delaware river in that vicinity, November 13, 1907, and found that no action had been taken by the Town of Phillipsburg in relation to the ceasing of the pollution of the Delaware river in accordance with notice given by this Commission, and that they found that the river was being polluted by sewage and other polluting matter from the property of the Pennsylvania Railroad Company, the Central Railroad Company of New Jersey and the Lackawanna Railroad Company. The secretary was directed to notify the three railroad companies to show cause at a meeting of the Commission to be held December 5, 1907, why they should not be notified to cease polluting the Delaware river.

At a meeting held December 5, 1907, a communication was received from W. G. Bealer, Vice-President of the Central Railroad of New Jersey, in reply to a notice to that company to show cause why it should not be notified to cease polluting the Delaware river at Phillipsburg, stating that an investigation of the matter had been made by the officials of the company, and that the company did not discharge any sewage into the drain discharging into the Delaware river along the right of way of the company; that only surface water and such clear water as comes from the roundhouse were discharged into the drain by the company, but that other parties discharged sewage therein, among whom was the Lackawanna Railroad Company, which discharged sewage into the drain from both its freight and passenger stations.

A communication from W. W. Atterbury, General Manager of the Pennsylvania Railroad Company, in response to a notice to show cause why the Pennsylvania Railroad Company should not be notified to cease polluting the Delaware river at Phillipsburg, stating that Mr. F. L. Sheppard, General Superintendent, at Jersey City, would be present or represented at the meeting of the Commission in response to the notice, was received and filed.

M. L. Gardner, engineer of the Pennsylvania Railroad Company, appeared before the Commission on behalf of that company, in relation to the pollution of the Delaware river at Phillipsburg, and stated that the sewage was discharged from the passenger station of the company at Phillipsburg into a drain used by it in common with other parties along the stream; that the company was willing to take proper steps to care for its sewage, but that there was a very small amount of sewage from the station, and that it was not considered that the pollution from this source was serious; that if any general scheme were adopted for the purification of the sewage of Phillipsburg, the company would be glad to join in such plan as was adopted.

At a meeting of the Board held June 9, 1908, motion was made and carried that the matter of Phillipsburg sewerage be referred to the Attorney-General for prosecution.

## PISCATAWAY TOWNSHIP.

At a meeting of the Commission held April 2, 1908, a communication from Reed & Coddington, attorneys for the Township of Piscataway, in relation to pollution of Bound Brook at Lincoln, stating that they were attorneys for the Township of Piscataway; that the question of the pollution of Bound

Brook at Lincoln had been investigated by them; that they had found that sewers at Lincoln had been laid by private parties without permission from the Township authorities; that the Township authorities were not responsible for the pollution at that place and that the same condition existed in relation to pollution at East Bound Brook, was received and filed, and the secretary was directed to acknowledge receipt.

#### PITMAN GROVE.

On August 12, 1908, a letter was received by the Board calling attention to the unsanitary condition of the sewerage at Pitman Grove.

On August 18, 1908, an inspection was made and it was found that all defects had been remedied.

#### PLAINFIELD.

An inspection was made of the Plainfield sewage disposal plant on July 20, 1908, and found to be in the following condition:

The City of Plainfield is located in Union county, on Green Brook, a tributary of the Raritan river. Its population is about 25,000. The sewerage system was installed in 1895, but recently a new pumping-plant has been built for the low-lying district, which pumps about 450 gallons per minute. There are now 43½ miles of sewers, constructed of terra-cotta and some iron pipe. They range from 8" to 24" in diameter. There are 2,936 house connections of which 209 were added last year. The sewage is domestic in character, there being no factory wastes.

The daily dry weather flow of sewage is 1,400,000 gallons which is increased to 1,700,000 gallons in wet weather.

The sewers lead to one main which conducts the flow to the disposal plant located in the valley of Green Brook, a tributary of Bound Brook, which empties into the Raritan river at the Borough of Bound Brook. The old system of sand filtration has been discarded here and the present disposal works consist of a screening chamber, 4 septic tanks, 8 primary contact filters and 8 secondary contact filters. The screen chamber retains rags, paper and some larger solid materials. These are scraped from the screens every hour and piled on the floor of the house over the chamber. Twice or three times a week these are removed. The sewage passes from this structure along a main for a distance of a few hundred feet to the septic tanks.

The septic tanks are 4 in number. Two are 100 x 50 feet, built in 1902, and two are 200 x 50 feet, built in 1905. These tanks are roofed over and have a working depth of 6 feet. They are arranged so that they can be used in parallel or in series, thus varying the time of septic action. Just at present, one of the smaller tanks is out of commission, and the other one and one of the larger tanks are used in parallel. The combined flow then is passed through the remaining large tank, which acts as a settling basin. From this, the clarified liquid passes out over an arating weir to a collecting channel and from thence to the 2 gate-houses, located in the center of each set of primary contact beds.

The tanks seem to be working well and there is not a very heavy scum on the surface. Messrs. Hering & Fuller have a contract to put the plant in perfect-working order and experiments are being carried on with that end in view. The time of septic action is being experimented upon to determine the best length of time for Plainfield sewage. The beds are also being put in order.

There are 8 primary and 8 secondary contact filter beds. These are arranged in sets of 4 each with the gate-house at the center of the set. The grade of the secondaries is about 5½ feet lower than that of the primaries. Each bed is a rectangular tank, walled and floored with concrete, 92x106 feet in area and 5 feet deep. On the floor of each bed, 14 lines of 4-inch horse-shoe drain-tile were laid converging to its own gate-chamber, located one in

the center of each set of filters. Over and between these tiles were placed a 6-inch layer of coarse broken stone for drainage; upon this rested the main body of filtering material (¼ to 1½ inch size) 3½ feet deep; and covering all was a layer one foot thick of coarse broken stone. In the upper foot of filling were laid distributing lines of vitrified pipe 12 to 3 inches in diameter. No automatic distribution of the sewage was attempted. Inlet and outlet gates are controlled by hand. The present secondary beds have a layer of finer material upon them than the stone of the primaries.

During the present process of renovation, the working practice is to fill the beds in rotation as quickly as possible and then allow each to drain so as to give the beds as much air as possible. Later, it is proposed to fill them in rotation changing to the next bed every three hours. Each set of primaries feeds its own set of secondaries and each set of secondaries has its own outlet at the stream. One effluent was decidedly purer than the other, roughly indicating the location of the more serious defects.

It is hoped that the entire plant will soon be in first-class shape. It might be added that while the scum on the septic tanks was not abnormally thick, it was up to the timbers across the tank, which may seriously affect the condition of the wood.

#### POINT PLEASANT BEACH.

At a meeting of the Commission held January 2, 1908, a communication from O. B. VanCamp, secretary of a Citizen's Committee in the Borough of Point Pleasant Beach, stating that this committee was considering the question of a sewerage system, and asking what system would meet with the approval of the Commission, and whether an engineer would be sent by the Commission to the Borough for the purpose of consulting with the committee in relation to the disposal of sewage, was received and filed, and the secretary directed to reply to O. B. VanCamp, informing him that a member of the Commission had already consulted with the officials of the Borough of Point Pleasant Beach and had indicated to them the attitude of the Commission in relation to a sewerage system and sewage disposal plant for that Borough.

At a meeting of the Board held August 25, 1908, plans for a sewer system both sedimentation tank and deep-sea outlet for the Borough of Point Pleasant were presented by Mr. Herbert and he recommended that they be approved. Motion was made and carried that the plans be approved subject to such conditions of construction, operation and purification as this Board may from time to time require.

This system is now being installed and will probably be in operation before the summer season opens.

#### PRINCETON.

A report made by F. E. Daniels, Chemist and Bacteriologist, of an inspection made on July 10, 1908, is as follows:

The Borough of Princeton is located in Mercer county, on Stony Brook, a tributary of the Raritan river. Its population is about 6,000. The Borough owns the sewerage system. Nearly ½ of the total volume of sewage is contributed by university students, staff and attaches. The Borough is sewered on the separate system. The pipes are usually small (5-inch and 6-inch) and automatically flushed. It is interesting to note that the sewers are never gorged and that stoppages are extremely rare.

There are about 600 house connections and 15 to 20 new ones added yearly. The water consumption is about 300,000 gallons daily in summer and about 400,000 gallons daily when the University is in session.

The estimated daily dry weather flow of sewage is about 200,000 gallons which is increased to a considerable extent in wet weather.

The Borough is divided into three sewer districts. One system running east and north, drains the residential and commercial section—that portion



lying north of Nassau street. The south side of Nassau street, including the university buildings, is drained to the south by the "College system." The "West system" covers a small residential section in the northwestern part of the borough. Each system has its own means of disposal.

The sewage of the "Northeast system" contributed by about 2,500 people, is carried by the main sewer for about two miles to the northeast of the town to the "Northeast" field. Here it was formerly disposed of on this field; but now it is emptied directly into a new concrete sedimentation chamber about 70 feet by 15 feet and 7 feet deep, with 4 compartments, and concrete roof. Septic action goes on to some extent, but at the time of inspection there was no sludge in the tank and very little odor and no scum was present except on the first compartment. In fact, the tanks had just been cleaned out a few days before. Four feet of sludge was removed which was run out onto a special sludge-bed 40 feet by 40 feet. This was the first time the tank had been cleaned since starting—nine months ago.

The new beds are 4 in number, in addition to the extra sludge bed which is beside them. They are each 50 feet by 50 feet and 4 feet deep. They are constructed of layers of rock, cinders and sand, and underdrained with 4" terra cotta open-joint drain tile. The beds are separated and bounded by high embankments, although the cross partitions do not extend up as high as the longitudinal or outside embankments. The sewage is distributed by means of a V-shaped wooden trough, made of 1" boards, running diagonally out across each bed. The beds are used in rotation and get a dose (according to the flow of sewage) of from 4 inches to 14 inches depth. This dose remains in sight from 6 to 10 hours and each bed gets a rest of from 4 to 8 days' duration. The effluent empties into a small stream which unites with 4 others and flows into Carnegie Lake.

At the time of inspection, the effluent was fairly clear, but was not sweet, and it showed putrefaction with methylene blue in less than 16 hours. Probably the septic action has not sufficiently begun since cleaning; but, at any rate, it shows insufficient purification which may happen at any time. This effluent on standing a couple of hours precipitated out iron in large amounts.

The old field of 8 acres is still held in reserve, and a by-pass exists by which the entire sewage flow can be turned out on the field. At present, a heavy crop of oats is growing on the field.

The "College" or "South" field, receiving the sewage from about 2,500 people, contains 15 acres of rather sandy soil, high and sloping southeasterly to the edge of the upper part of Carnegie Lake. About  $\frac{1}{2}$  of the area is in actual use and is covered with an immense crop of hay. This grass is cut three times a year and the irrigation ditches are cleaned out twice a year. An 8" sewer main brings the sewage to within 400 feet of the field. The flow is conveyed from this point to the distribution ditches in a new V-shaped wooden trough. The irrigation ditches zigzag over the field and the flow is changed daily by taking a shovelful of earth from the mouth of one ditch and stopping the flow in the other ditch with it—thus turning the course of flow 90°.

This upper portion of the field is underdrained with 4" round clay drain tiles which empty on to the lower portion of the field which is not underdrained. Into this ground the water gradually soaks away. A line of cinders is supposed to protect the lake from any accidental over-wash, but the attendant informed me the sewage has been out of the field once—about two years ago.

The "West" field receiving the sewage from about 200 people, covers 8 acres. The field is high, sloping and rather porous. The sewage is delivered from a flush-tank holding 5,550 gallons which discharge about 4 times a day. There are 4 outlets, each discharging into irrigation ditches. One outlet is used at a time for about a month or two, and then another one is substituted therefor.

The flow in the ditches is changed twice a week. The field is not underdrained and the sewage soaks away on the upper third of the field. There was formerly a bank at the foot of the field along the brook, but this has nearly all disappeared with the widening of the stream. Once about two years ago, sewage escaped from this field also.

At the time of inspection, the grass had been cut and the field was clean.

## RANCOCAS CREEK.

Complaint having been made of the pollution of Rancoocas creek, an inspection was made and the parties summoned to appear before the Board on August 11, 1908. At the meeting of the Board held August 11, 1908, Mr. John Graf, of Philadelphia, appeared in reference to discharge of sewage from the Lake View House, at New Lisbon, N. J., into Rancoocas creek. He said sewage is discharged from bath rooms in the house through a pipe into a pool about 300 feet from the creek; that the house is a summer boarding-house and that 15 or 16 people are there about two months in the year. It was suggested to Mr. Graf that a cesspool be built to retain solid matters and that the overflow from the cesspool be conveyed into 4-inch pipes to be laid 15 inches under the surface of the ground, and that the rain water leaders be disconnected from the cesspool. This, Mr. Graf agreed to do.

The following resolution was adopted:

WHEREAS, The Board of Health of the State of New Jersey has found that the waters of Rancoocas creek are being polluted to the injury of inhabitants of this State in their health, comfort and property, therefore, be it  
RESOLVED, That, in accordance with Chapter 72 of the Laws of 1900, and the supplements and amendments thereto, the Board of Health of the State of New Jersey hereby gives notice to John Graf, Joseph J. White, J. B. Reilly and Anthony Morris that prior to the first day of May, 1909, they must cease to pollute the waters of Rancoocas creek and make such disposition of their sewage and other polluting matter as shall be approved by the State Board of Health.

The following resolution was adopted:

WHEREAS, The Board of Health of the State of New Jersey has found that the waters of Rancoocas creek are being polluted to the injury of inhabitants of this State in their health, comfort and property, therefore, be it  
RESOLVED, That, in accordance with Chapter 72 of the Laws of 1900, and the supplements and amendments thereto, the Board of Health of the State of New Jersey hereby gives notice to the Executor of the H. B. Smith estate that he must cease to pollute the waters of Rancoocas creek immediately (within twenty-four hours of receipt of notice) and make such disposition of his sewage and other polluting matter as shall be approved by the State Board of Health.

## RAHWAY REFORMATORY.

At a meeting of the Commission held April 9, 1908, plans for the purification of the sewage from the State Reformatory at Rahway were submitted to the Commission on behalf of the State Reformatory Commission, by Waring, Chapman & Farquhar. The secretary was directed to notify Waring, Chapman & Farquhar that the plans submitted by them for the purification of the sewage from the State Reformatory at Rahway, were not in such form as to be approved by the Commission.

At a meeting of the Board held June 2, 1908, plans and specifications for a sewage disposal plant at the Rahway Reformatory were submitted by Mr. Farquhar of Waring, Chapman & Farquhar, being accompanied by Captain Joseph W. Martin, the superintendent of the Reformatory.

Mr. Farquhar explained the plans, which consisted of an electric pump, screen and sand filter beds. The matter was referred to the Division of Sewerage and Water Supplies.

At a meeting held June 9, 1908, Mr. Herbert recommended to the Board, that the plans for the disposal plant at the Rahway Reformatory should be amended, as it would be necessary to have installed duplicate pumps, increased thickness of sand beds, better methods of distributing pipes and drain tiles. The plans were ordered to be returned.

At a meeting held July 21, 1908, Mr. Herbert presented revised plans for the sewage disposal plant at the Rahway Reformatory, and recommended

that said plans be approved. Motion was made and carried that the plan be approved, subject to such conditions of construction, operation and purification that this Board may from time to time require.

At a meeting held September 8, 1908, Mr. Herbert reported that he had been interviewed by representatives of the Rahway Reformatory, and they had asked to be allowed to make certain changes in the proposed plant as fully set forth in the following communication:

September 3, 1908.

MR. H. M. HERBERT, C. E., Chief,

*Division of Sewerage and Water Supplies, Board of Health of the State of New Jersey, Trenton, N. J.*

DEAR SIR—On August 26th, proposals were received at the State Reformatory at Rahway for constructing the sewerage and sewage disposal system according to plans submitted to and approved by your Board, and separate proposals were received for the construction of a storm water sewer not included in the plans above referred to.

An appropriation of \$18,300.00 was made for carrying out these works, and from this amount must be deducted the cost of plans, etc., about \$300.00 leaving available for construction the net sum of \$18,000.00

The lowest bids received were:

For Sewerage and Sewage Disposal System.....	\$20,194.00
For Storm Water Sewer (18-inch).....	3,442.00
Total.....	\$23,636.00
Available of Appropriation.....	18,000.00
Deficiency of Appropriation.....	\$ 5,636.00

The cost of the storm water sewer cannot be reduced materially, if at all, by any changes in the plans. We have therefore undertaken to see if changes in the plans for sewerage and sewage disposal can be made which will result in a saving of \$5,636, and at the same time permit the construction of a plant which will meet the present requirements of the institution. We have carefully considered all details and submit the following statement itemized to show the estimated saving which can be effected.

1. Stanford tar and sulphur joints are now specified for the sewers. We propose to make use of these optional with the Contractor and to permit cement joints. Saving \$50.
2. Y-branches are now specified to be 100 feet apart to provide for possible filter connections. We propose to require them 200 feet apart. Saving \$15.
3. Manhole heads and covers are now specified to weigh 450 lbs. per set. We propose to reduce this to 300 lbs. Saving \$25.
4. A flush-tank is now specified at the upper end of the sewer to Hospital No. 2. We propose to substitute a manhole. Saving \$35.
5. The cast iron bar screens and supporting irons are now specified to be galvanized. We propose to permit tar-coating. Sheet iron gutter and basket screen to be galvanized as specified. Saving \$20.
6. All pipe and fittings in pump connections are now specified to be galvanized, with flanged fittings. We propose to permit cast iron water pipe, or black wrought iron pipe, and hub or screwed fittings, tarred (retaining flanged connections necessary to detach pump suction and discharge). Saving \$30.
7. Flooring is specified under concrete bottom of storage tank. We propose to omit this requirement, and leave the method of securing a proper concrete bottom optional with the Contractor. Saving \$40.
8. The concrete walls of the storage tank are specified to be 18" thick. We propose to allow a minimum of 12" thick, the Contractor to adopt buttresses or additional re-inforcing if necessary, and to be responsible for securing sufficient strength to withstand all earth pressure. Saving \$75.

9. On the force main, outside of pump house, two 6"x6"Ys and one 6" gate valve are specified, to facilitate connecting in the future to possible additional filter beds. These can be inserted in the future if required. Saving \$25.

10. The force main is now planned to run 4 feet deep under the filter bed embankment, with rises to supply each distributor. We propose to raise the force main where it runs into the embankment, and lay it near the top of same, supported on saddle piles every 6 feet, so that it will be at the same level as the distributors. This is in fact an improvement as regards protection from freezing, as the pipe will drain out regardless of any filter bed being out of use. The 6" pipe is specified to weigh 400 lbs. per length. It will be used under a head of only a few feet. We propose to make the minimum weight 300 lbs. per length. In all, saving \$100.

11. The distributors are specified to have saddle-flange connections and nipples for discharge every 10 ft. We propose to omit these and provide 2" holes in the pipe every 10 feet. The distribution will still remain adjustable, as the holes can be closed wholly or partially where necessary by using detachable disks, by adjusting the grade of the distributors on the piers, and by controlling at the main gate valves. Saving \$150.

12. Splash plates of moulded concrete are specified every 10 feet under the distributors. We propose to substitute 18"x18" stone flags, 2" thick, every 10 ft. Saving \$40.

13. Piers under distributors are planned to rest on a concrete base. We propose to omit this base, but to make no other change in these piers, which are 3 foot lengths of pipe set hub end down and filled with concrete. Saving \$50.

14. Embankments at filters are specified to be sodded on their inner slopes, tops, and outer slopes for one foot from the top. We propose to provide sodding for inner slopes and for 12" on top next to inner slopes. Saving \$60.

15. A duplicate pump and motor, and duplicate automatic starting-and-stopping device, are specified in the pump house, as precaution against stoppage of the companion apparatus. We propose to omit this duplication, leaving all pipe connections, ready for its installation if it should be found desirable at some later time. The duplicate apparatus would be idle except in case of accident or repairs to the original, which ordinarily could be made during the intervals when the storage tank is filling and no pumping is done. The institution will always have an engineer capable of making ordinary repairs and every facility for keeping simple apparatus of this kind in good operating condition. We propose to provide an emergency overflow pipe to the present old sewer. We consider this necessary in any event, to guard against shutting off the whole sewerage system and the backing up of sewage into the buildings in case the main feed wire from the power house to the pump house should be cut, blown down, or short circuited, or in case of any happening at the power house which would shut off the electric current. The above will result in saving \$660.

16. Referring to the depth of filtering material in the filter beds, you recommend two feet of material above the gravel stones which surround the under-drains. We can provide two feet of filtering material above the level of the top of the underdrains, viz.: 26" over the lower end of the under-drains and 22" over the upper end of the underdrains, giving the interdrains a fall of 4" in 100 feet which should be ample when spaced 12 feet apart. This will reduce the depth shown on plans to the extent of 6" over the whole filter area, and will comply substantially with your recommendations. We propose also to retain the distributors at the level shown on plans, which will permit the addition of 6" of filtering material at any time if it is ever thought desirable. We do not think that the additional material will improve the effluent to any appreciable extent.

This will result in saving.....	\$1,695
Total saving items 1-16 inclusive.....	\$3,070

17. The total net filtering area of the three new filters is  $1\frac{1}{2}$  acres. We propose to reduce this to 1 acre, which, with the old filters which have an area of 11-100 acre and which are to be utilized under our plan, will make a total net filtering area of 1 11-100 acres. We propose to divide the 1 acre of new filtering area into 3 beds, each 200 feet long and 73 feet wide, with underdrains 12 feet apart, and two distributors over each bed spaced 36 feet apart and running lengthwise across the beds. All details to be as proposed in items No. 11 to No. 14 inclusive, with 24" of filtering material as proposed in item No. 16. The above will result in a further saving of \$2,808.

A total saving on all items hereinbefore mentioned amounting to \$5,878. Which is substantially the amount of the deficiency in appropriation, viz., \$5,636.

## ALTERNATIVE.

It is possible to make up the deficiency by accepting modifications stated in items No. 1 to No. 16 inclusive; by omitting two lines of the new sewers, one from Manhole E to Hospital No. 2, and the other from Manhole B to the stables, from which only a small quantity of plumbing wastes will be discharged, leaving these two branch sewers to be constructed at some later time; and by providing  $\frac{1}{4}$  acres of filter beds divided into three beds each 200 ft. long and 91 ft. wide, with underdrains 13 feet apart, two distributors over each bed spaced 45 feet apart, all details as proposed in items No. 11 to No. 14 inclusive, with 24" of filtering material as proposed in item No. 16. A statement of the saving on this basis is as follows:

Items No. 1 to No. 16 inclusive .....	\$3,070
Omitting Sewer to Hospital No. 2 .....	550
"    "    Stables .....	550
" $\frac{1}{4}$ acre of filter area (leaving $1\frac{1}{4}$ ) .....	1,546
<b>Total Saving .....</b>	<b>\$5,716</b>

Which is substantially the amount of deficiency in appropriation, viz., \$5,636.

None of the modifications herein proposed will prevent or interfere in any way with the extension of sewers to future buildings, nor the enlargements of the plant, nor with installing duplicate pumping apparatus, nor with increasing the depth of filtering material, nor with adding additional filters when required, all of which can be done without changing or abandoning any of the work now under consideration.

Respectfully submitted,

(Signed) WARING, CHAPMAN & FARQUHAR.

Mr. Chew moved that the Board meet at the Rahway Reformatory at eleven o'clock, on Tuesday, September 15, 1908, and inspect the site of said plant.

At a meeting of the Board held at the Rahway Reformatory, Mr. Farquhar, of Waring, Chapman & Farquhar, appeared before the Board and explained the changes his firm proposed to make in the plans for the sewage disposal plant for the Reformatory heretofore approved by the State Board of Health, to make the cost of said plant come within the amount of the appropriation.

Captain Martin, the superintendent of the Reformatory, appeared before the Board and in answer to questions, said that after receiving the plans from Waring, Chapman & Farquhar, he, acting under the direction of the Board of Managers of the Reformatory, had advised for proposals for constructing the plant. The advertisements were placed in one paper in Trenton and in two papers in Union county as prescribed by law, and the plans were placed in the office of the Reformatory for the inspection of prospective bidders for a period of three weeks. When the bids were opened, it was found that only one proposal had been received from Waring, Chapman & Farquhar, who agreed to do the work for \$20,194.

Captain Martin also said that the plans for the separate storm water drain were prepared and bids advertised for in the same way as in the case of the disposal plant. Seven bids were received for the storm water drain, the prices ranging from \$3,442 to \$7,000. It was originally intended, he said, to use inmate labor for a portion of the work, but this was found impracticable because of the strong objection offered by the labor unions.

The following resolution was unanimously adopted:

RESOLVED, That the plans offered by Waring, Chapman & Farquhar, for a sewage disposal plant for the New Jersey Rahway Reformatory, at Rahway, which were approved by the State Board of Health, on July 21, 1908, be now rejected in view of the modifications and curtailments suggested in the letter of Waring, Chapman & Farquhar dated September 3, 1908, for the reason that in the judgment of this Board, such plant so curtailed and modified would not be efficient and adequate for the service required of it.

At a meeting held September 22, 1908, Mr. Richard Wilson, member of the Board of Commissioners of the State Reformatory, Rahway, appeared before the Board, stating that he had come at the request of the Secretary of the Board of Commissioners to ask the State Board of Health if they had any plan to offer which would help the Commissioners in establishing a sewage disposal plant for said institution. It was stated that the matter would be taken up by the Board, and information forwarded to the Commissioners in regard to action taken. The matter was taken up by the Board, and Dr. Kerter moved that Mr. E. B. Phelps be employed by the Board to make an investigation and report to the Board in regard to a plan for a sewerage disposal plant at said institution. This motion was carried.

At a meeting held September 29, 1908, Mr. Herbert reported that he had met Mr. E. B. Phelps at the State Reformatory, Rahway, and conferred with him in reference to the installation of a sewage disposal plant for said institution. Mr. Herbert also presented a report received from Professor Phelps in regard to the matter. Motion was made and carried that the Secretary be requested to communicate with the Board of Commissioners of the State Reformatory, Rahway, sending to them a copy of the report of Professor Phelps and stating that the State Board of Health will approve of the sewage system designed in accordance with said report. Motion was carried.

Professor Phelps' report is as follows:

To the Honorable the State Board of Health:

GENTLEMEN—I have been requested by you to submit a report upon the sewage disposal problem at the State Reformatory at Rahway, with special reference to the use of chemical disinfection. I have visited the reformatory in company with Mr. Herbert, and have given careful study to the situation there. As a result I am prepared to recommend a disinfection plant. A brief description of such a plant as I regard necessary accompanies this report. The considerations upon which I base my opinion have a much broader application than to this one case and similar cases are likely to arise with increasing frequency in the future. It has, therefore, seemed to me proper to present for your consideration certain facts which in my opinion should largely determine the type of sewage disposal plant to be recommended at any particular place.

The important characteristics of an ideal sewage effluent are, organic stability, freedom from suspended matter, and low bacterial content. It is not necessary, however, to secure all these at all times and places. Any one, or combinations of any two, may under certain local conditions be sufficient. These conditions are outlined as follows:

Organic stability is required of an effluent discharging into an inland stream. An apparent exception to this general statement is a case of a stream sufficiently large to prevent any possible nuisance. In any such case the discharge of putrescible matter reduces the power of the stream to further purify sewage, and similar discharges by successive towns will eventually result seriously.

Equitable regulations therefore demand that only stable organic matter shall be discharged, or in other words, that no community shall reduce stream's powers of self-purification. Freedom from suspended matter is required of all effluents entering streams which subsequently enter lakes, mill ponds, or over-slack water areas, or which are themselves sufficiently sluggish to permit of sedimentation. Exception may be made in the case of streams in which annual freshets occur which can be relied upon to scour the bottom, and in cases where the stream flow is sufficiently great in comparison with that of the effluent to obviate any possible nuisance from sedimentation. Suspended matter, even though stable, is furthermore undesirable when the water is subsequently to be filtered. In such cases suspended matter increases the cost of filtration.

Bacterial purification to some extent is demanded wherever the water is used subsequently for domestic purposes and wherever it flows to shellfish areas. In the case of drinking water streams, a reasonable purification of from 80 to 90 per cent. is all that ought to be equitably demanded. Further purification should devolve upon the water users. Unfortunately, we have to deal with facts and conditions as they are found. Long usage of waters without purification for domestic purposes has established certain rights in such waters, which rights are well recognized in legislation and by the courts. It therefore becomes necessary in the case of drinking water streams in general, and especially those which are used without filtration, to insist upon high bacterial purification. In the case of streams flowing to shellfish areas, need of bacterial removal is obvious. Organic stability is obtained only by some efficient system of filtration; removal of suspended matter either by sand filters or sedimentation; bacterial removal by sand filters or by chemical disinfection.

In the case of the Rahway Reformatory, the stream is evidently too sluggish to permit the discharge of suspended matter and bacterial purification is highly desirable. The discharge of an effluent into salt water within such a short distance from the bay precludes any undesirable effect from the discharge of small amounts of non-stable organic matter. Therefore, in my opinion, the system recommended, involving chemical disinfection and septic action, will amply suffice.

It is further recommended that the disinfection precede the septic treatment. This arrangement is somewhat novel and requires some discussion.

It is now well established that septic sewage requires about twice as much chlorine for disinfection as is necessary for crude sewage. This is the chief reason for the arrangement suggested. The plan is permissible only because of the well established fact that a septic tank is inimical to the life of pathogenic bacteria. It is therefore obvious that, if the pathogens are removed from the crude sewage the subsequent multiplication of harmless saprophytic bacteria in the tank will have no sanitary significance. On the other hand, the discharge into the stream of septic effluent laden with bacteria capable of further bacterial action upon the organic matter will result in a much more rapid self-purification of the stream than if the same mass of organic matter be discharged practically germ free.

For these reasons I have taken the stand that the preliminary disinfection of the crude sewage, followed by septic treatment, is the most logical method of procedure in cases of this kind. Such a system may be expected to produce an effluent reasonably free from suspended matter and absolutely free from typhoid and other pathogenic bacteria. It will carry a large amount of dissolved, non-stable, organic matter and, with this, large numbers of saprophytic bacteria specially adapted to destroy such organic matter or to reduce it to a stable form. This effluent will not form serious deposits and will not injuriously effect shell-fish in the outer waters.

## SYSTEM RECOMMENDED.

It is recommended that a plant be installed at the Rahway Reformatory substantially as follows:

The present outfall sewer is apparently sufficiently large to provide for the immediate future. Separate storm water drains should be installed. The purification plant recommended consists of two tanks, a disinfecting tank and a septic tank. The disinfecting tank should have a capacity of about one hours flow. It should be sufficiently large in area and shallow in depth to practically prevent sedimentation except of large heavy masses. It should be possible also to prevent the accumulation of such material by occasionally pushing it on into the septic tank. The septic tank will be made in two compartments, each of six hours flow. The first will move the bulk of the suspended matter and reduce any residual chlorine which may come through. The second will settle out any remaining suspended matter and insure a clear effluent. Proper means should be provided for pumping the sludge from each tank and sludge beds will be necessary for its disposal. For that reason also the entire tank should be divided longitudinally so that one-half may be cut off and cleaned without interfering with the system. Suitable tanks for mixing the bleaching powder will be provided. They may be housed in the present pump house together with the pump and electric motors. The present septic tank is of no value in this plan. The expense of putting it in shape would be greater than the cost of a new tank. I have not prepared details of this system, but in my opinion it can be built for \$300 or less.

It is not possible to state just how much bleaching powder would be required. The entire cost of operation would not exceed one dollar a day.

Respectfully submitted,

(Signed) EARLE B. PHELPS.

At a meeting held October 13, 1908, Mr. Herbert read a communication from the Commissioners of the State Reformatory of Rahway in regard to the size of the storm sewers, which the Commissioners intended to install, and asking that the present pipes as laid, were sufficient to take care of the house sewage. That he had replied, and in his opinion the present 10-inch main would be ample to care for all the house sewage for a great many years to come, and recommend that for storm sewer, not less than an 18-inch pipe be used. In all probability a larger size would prove more satisfactory.

## RAHWAY RIVER.

At a meeting of the Commission held April 9, 1908, a communication from A. C. Benedict, Inspector of the Board of Health of the village of South Orange, stating that pollution of the Rahway River from property in South Orange had been stopped; that he had been unable to discover any pollution of the Rahway river from dye for two months past, and thanking the Commission for its work in regard to the pollution of the Rahway river, was received and filed, and the secretary directed to acknowledge its receipt.

As the result of an inspection, the following resolution was adopted at a meeting held September 8, 1908.

WHEREAS, The Board of Health of the State of New Jersey has found that the waters of the Rahway river and its tributaries are being polluted to the injury of inhabitants of this State in their health, comfort and property, therefore be it

RESOLVED, That in accordance with Chapter 72 of the Laws of 1900, and the supplements and amendments thereto, The Board of Health of the State of New Jersey hereby gives notice to Lewis H. Pierson, James W. Ferguson,

Isaac Williams, Jacob Keller, Charles Foye, J. Galbraith, Benjamin F. Ham, Mrs. A. L. Henderson, Executors of the Lighthipe Estate, Mrs. Mary Rhatican, Mrs. Katherine Shanley, P. J. Smith, Josephine Miller, J. E. Post, John Schutz, George Redinger and M. H. High, that prior to the first day of December, 1903, they must cease to pollute the waters of the Rahway river and its tributaries, and make such disposition of their sewage and other polluting matter as shall be approved by the said Board of Health.

At a meeting held September 22, 1908, B. S. H. Baker, of Summit, appeared in response to a notice sent to W. H. Bryant of that place, in regard to pollution of a tributary of the Rahway river from hog pens on Mr. Baker's premises. Mr. Baker stated that the City of Summit had no scavenger and that he collected the garbage from the city and fed it to the hogs kept in the pens referred to; that he kept the pens in as good condition as possible and used disinfectants freely, but admitted that the pens were located near the stream and that drainage from them would reach the stream probably by percolation. He said the health officer of Summit visited the place from time to time and he was authorized to state that said health officer had found no cause for complaint. It was suggested to Mr. Baker that he move the pens further from the stream, and he expressed a willingness to do what he could to prevent pollution of said stream.

The following resolution was adopted:

WHEREAS, the Board of Health of the State of New Jersey has found that the waters of the Rahway river and its tributaries are being polluted to the injury of the inhabitants of this State in their health, comfort and property, therefore, be it

RESOLVED, That in accordance with Chapter 72 of the Laws of 1900, and the supplements and amendments thereto, the Board of Health of the State of New Jersey hereby gives notice to E. K. Adams, Fred Marohn, Frank W. Morse, agent, Edward Morgan, G. Neuman, B. J. O'Donnell, William Reeder, J. Skillman, A. Will, William Anger, The Peter Breidt Brewing Company, Paul Britz, F. Gritzner, The Hall Signal Company, Conrad Kein, Mrs. Amelia Becker, I. Lorenze, William H. Bryant, and the Mayor and Council of Garwood, be notified to cease to pollute the waters of the Rahway river and its tributaries prior to the first day of December, 1908, and make such disposition of their sewage and other polluting matter as shall be approved by the said Board of Health.

At a meeting held September 9, 1908, the following resolution was adopted:

WHEREAS, the Board of Health of the State of New Jersey has found that the waters of the Rahway river and its tributaries are being polluted to the injury of inhabitants of this State in their health, comfort and property, therefore, be it

RESOLVED, That in accordance with Chapter 72, of the Laws of 1900, and the supplements and amendments thereto, the Board of Health of the State of New Jersey hereby gives notice to the American Felt Mills and Mrs. Henry Pett, that prior to the first day of December, 1908, they must cease to pollute the waters of the Rahway river and its tributaries and make such disposition of their sewage and other polluting matter as shall be approved by the said Board of Health.

#### RARITAN RIVER

At a meeting of the Commission held November 14, 1908, plans for the disposal of the sewage of the North Branch Railroad Station of the Central Railroad of New Jersey, providing for the disposal of the sewage from its station at North Branch by means of a double cesspool, were approved, subject to such conditions of construction, operation and purification as this Commission may from time to time require.

At a meeting of the Commission held November 27, 1907, the following resolution was unanimously adopted:

WHEREAS, the State Sewerage Commission has found that the waters of the Raritan River and its branches are being polluted to the injury of inhabitants of this State in their health, comfort and property, therefore, be it

RESOLVED, that in accordance with Chapter 72 of the Laws of 1900, and the supplements and amendments thereto, the State Sewerage Commission hereby gives notice to W. D. Vanderbeek, Benjamin Harrison, L. A. Appar, William Rockefeller, Flemington National Bank, Stewart Kitchen, Theodore Statts, Burnt Mills Public School District, Thomas Moore, Pottersville Public School District, L. S. Bache, Dr. Hugh Bache, A. Lowande, A. C. Zvolanek, Edward Mauer, Durlack Brothers, Augustine Ramsey, Peter Delrick, Benjamin F. Houston, Asa Applegate, Henry Schlothane, W. H. Arkenburg, William LaRue, B. Myer, Seeley Paper Mill Company, S. E. Garretson, Maud Rehill, executrix of Rehill estate; G. A. Van Doren, Theodore Ammerman, Mathias Buchanan, Mrs. Cornelia Kinney, Theodore Servis, Charles Connet, executor of Peter Huff, Mrs. D. Bartow, Mrs. Chas. H. Wood, Mrs. L. Force, John Murdock, John S. Gano, Benjamin Gano, Milton Shives, William Weidenmeyer, Louis Streeter, Mrs. S. K. Angle, Stephen Appar, Miss L. W. Anderson, Miss A. A. Shafer, Mrs. C. M. Hunt, Harry Hunt, Patrick Murray, Robert Miller, William Mowery, George T. Swackhamer, Mrs. Theodore J. Hoffman, William Maxwell, C. A. Speer, I. L. Appar, Reuben Able, Martin J. O'Brien, Bridgewater Township Committee and David Buiist, that prior to the first day of February, nineteen hundred and eight, they must cease to pollute the waters of the Raritan river and its branches, and make such other disposition of their sewage and other polluting matter as shall be approved by this Commission.

On motion, the secretary was directed to have notices in writing served in accordance with the foregoing resolution.

At a meeting of the Commission held February 6, 1908, a communication was received from Ralph L. Reed, stating that it had not been possible for him to serve all the notices to cease polluting the Raritan River directed by the Commission to be served in accordance with the resolution adopted November 7, 1907, which notices had been given to him for service, because of bad weather, his own illness and the large amount of territory over which the notices were scattered.

On motion of Commissioner Herbert, the following resolution was unanimously adopted:

RESOLVED, that the Secretary be directed to inform all parties notified to cease polluting the Raritan river prior to February 1, 1908, in accordance with a resolution adopted November 27, 1907, that the Commission would take no action for the enforcement of this notice until May 1, 1908, in order to allow sufficient time for compliance therewith.

On motion of Commissioner Herbert, the following resolution was unanimously adopted:

WHEREAS, certain parties hereinafter named who were notified to cease polluting the Raritan river prior to February 1, 1908, in accordance with a resolution adopted November 27, 1907, were not served with notice in writing in accordance with this resolution within the time limited, and

WHEREAS, the State Sewerage Commission has found that these parties are polluting the Raritan river and its tributaries to the injury of inhabitants of this State in their health, comfort and property, therefore, be it

RESOLVED, that in accordance with the provisions of Chapter 72 of the Laws of 1900, and the supplements and amendments thereto, the State Sewerage Commission hereby notifies L. S. Bache, Dr. Hugh Bache, A. Lowande, William LaRue, John Murdock, A. C. Zvolanek, Augustus Ramsey, Peter Delrick, Benjamin F. Houston, Asa Applegate, Henry Schlothane, Mrs. C. M. Hunt, Harry Hunt, Robert Miller, William Mowery, Mrs. Theodore J. Hoffman, William Maxwell, and I. L. Appar, to cease polluting the Raritan river and its tributaries prior to May 1, 1908, and to make such disposition of their sewage and other polluting matter as shall be approved by this Commission.

The Secretary was directed to have notices in writing served in accordance with the foregoing resolution.

At a meeting held July 21, 1908, the following parties appeared before the Board in response to a notice to appear and show cause why they should not be notified to cease to pollute the waters of the Raritan river:

Fred Weigle, Esq., appeared to represent William J. McCurdy, of New Brunswick. He stated that Mr. McCurdy has a large cesspool on his premises, but has a drain which conveys wash water from a sink and stationary wash tubs into the canal. Mr. Weigle stated that this drain would be at once disconnected.

Colonel J. A. Kunkel, of Pennington, stated that he lives 29 miles from the Raritan river; that he has a cesspool on his premises into which he discharges not only household sewage but also rain water from leaders on his house; that the contents of the cesspool only overflow in times of freshet, and that at such times the matter flows from a small ditch, 2,200 feet to Stony Brook. Mr. Kunkel stated that sewage from the town of Pennington flows down the same ditch through his property in times of freshet. Mr. S. B. Ketcham, of Pennington, stated that he had examined the ditch on July 10, 1908, and that for a distance of 125 feet it was absolutely dry. He said that he thought if Mr. Kunkel would disconnect his rain water leaders from the cesspool it would remedy the trouble. This Mr. Kunkel agreed to do upon being assured that such action would be satisfactory to the Board. He also stated that he desired the Board to take action to prevent the discharge of sewage over his premises from the Borough of Pennington.

Mr. Thomas M. Cashel represented the Pennington Canning Company. He said the cannery is in operation two months in the year; that they have a large cesspool located under the building which receives the solids, and another large cesspool outside of the building, about 150 feet from the stream, into which liquids are discharged; that liquids from the cesspool under building overflow into the cesspool outside, and that in times of very heavy freshet the outside cesspool overflows into the stream. Upon the suggestion of Mr. Herbert, Mr. Cashel agreed to submit a diagram of the cesspool, buildings, etc.

George Atwood, of Pennington, stated that at the time of the visit of the Inspector he butchered hogs on his premises; that offal was thrown out to the hogs in the yard, and that sewage from this yard reached the stream, but that at the present time no such pollution existed as he did not slaughter hogs on his premises. In response to questions, Mr. Atwood admitted that he had a drain carrying waste water from a bath and sink into Lewis Brook, and he was advised that this drain should be disconnected.

Mr. Charles Opie, who resides between Rocky Hill and Harrington, stated that the pipe which had been laid from his dwelling to the stream had not been used but had been taken up, and sewage is discharged into a cesspool.

Mr. Henry J. Garretson, of South Bound Brook, stated that sewage from his dwelling conveyed through a pipe under the road and discharged on the bank of the canal about 100 feet from the canal; that the amount of sewage is very small, and that no odor is noticeable at the point of discharge. Mr. Herbert agreed to inspect this premises.

Mr. Kent White, of the Pentecostal Mission, located near Bound Brook, represented Mr. Aaron Yoder, and stated that at the time the mission took possession of this farm, they learned that sewage was being discharged into the river from towns of Somerville and Raritan, and therefore laid a four-inch pipe to convey sewage from the dwelling on their premises into the Millstone river. Mr. Kent expressed a willingness to take whatever action the Board advised, in order to cease polluting the waters of the river, and upon the suggestion of Colonel Olcott, he agreed to furnish a sketch to the board showing the locations of the buildings, drains, etc., for the purpose of having the Board advise him in regard to a plan for disposal.

Dr. Keator read a communication from the Lehigh Valley Railroad Company in reference to the pollution of the Raritan river. Colonel Olcott moved

that the communication be received, and that the secretary be requested to notify said company that they may present their case for consideration by the Board on August 11, 1908, at 1:30 P.M. This motion was carried.

Colonel Olcott moved that notice be served upon all parties who have been notified to appear before the board, and have failed to do so, that they must cease to pollute the waters of the Raritan river prior to January 1, 1909.

WHEREAS, The Board of Health of the State of New Jersey has found that the waters of the Raritan river and its tributaries are being polluted to the injury of inhabitants of this State in their health, comfort and property, therefore, be it

RESOLVED, That the authority conferred upon it by section 5 of Chapter 72 of the Laws of 1900, and the supplements and amendments thereto, the Board of Health of the State of New Jersey hereby gives notice that, prior to the first day of January, 1909, George Atwood, Thomas L. Brophy, Abraham Cortelyou, George Campbell, Charles V. Cray, D. F. Feild, W. M. Funkhouser, Mrs. Edward Gillman, Henry J. Garretson, William C. Hendrickson, Mrs. Wesley Horner, E. S. Hicks, R. M. Hoe, R. S. Kuhl, John Kunkel, Dr. E. W. Lawrence, Henry Lehnerman, J. Maitland, William J. McCurdy, C. E. Milborn, Dr. A. B. Mosher, Phillip G. Mitze, Charles Opie, Pennington Canning Company, C. G. Rogers, Willis E. Stryker, William B. Smith, C. E. Sherin and John Waldron must cease to pollute the waters of the Raritan and its tributaries and make such disposition of their sewage and other polluting matter as shall be approved by the Board of Health of the State of New Jersey.

At a meeting of the Board of Health held August 11, 1908, Mr. E. C. Clifton, representing the Lehigh Valley R. R. appeared in response to a notice to the Company to cease discharging sewage from the Station of South Plainfield into the Branch of the Raritan river. He said the station is used by only a few passengers and that the pollution from the station is slight; that their engineer is now working on a plan to fix up matters; that his idea is to construct some sort of a cesspool and have it maintained in a sanitary condition. He said they would take the matter up with the chief engineer and submit plans to the Board for approval. It was agreed to give the company a reasonable time in which to do this.

The following resolution was adopted:

WHEREAS, The Board of Health of the State of New Jersey has found that the waters of the Raritan river and its tributaries are being polluted to injury of inhabitants of this State in their health, comfort and property, therefore, be it

RESOLVED, That in accordance with Chapter 72 of the Laws of 1900, and the supplements and amendments thereto, the Board of Health of the State of New Jersey hereby gives notice to the Lehigh Valley Railroad Company that prior to the first day of May, 1909, it must cease to pollute the waters of the Raritan river and its tributaries and make such disposition of its sewage and other polluting matter as shall be approved by the State Board of Health.

#### RARITAN RIVER TRUNK SEWER.

At a meeting held September 8, 1908, Mr. Herbert reported that he had, by invitation attended a joint meeting of the citizens of Plainfield, North Plainfield, Dunellen and Bound Brook, which was held at Bound Brook on September 2, for the purpose of discussing the feasibility of a joint trunk sewer to be laid through part of the Raritan Valley for the purpose of providing for the care of the sewage of the above mentioned towns and probably in addition thereto, Fanwood, Lincoln, New Bound Brook, Somerville, Raritan, New Brunswick and Highland Park.

The Committee wished to know what would be the attitude of the State Board of Health regarding such a proposition. Mr. Herbert stated that he believed that the Board would approve of such a plan provided the effluent was sufficiently purified before being discharged into the stream. The nature of purification would be governed by the location of the point of discharge. That the matter was worthy of thorough investigation and the cost compared with the cost of individual plants.

Information has since been received that Messrs. Hering and Fuller, civil engineers have been engaged to make a preliminary report and estimate of cost of construction.

At a meeting held September 29, 1908, the following resolution was adopted:

WHEREAS, The Board of Health of the State of New Jersey has found that the waters of the Raritan river and its tributaries are being polluted to the injury of inhabitants of this State in their health, comfort and property, therefore, be it

RESOLVED, That in accordance with Chapter 72 of the Laws of 1900, and the supplements and amendments thereto, the Board of Health of the State of New Jersey hereby gives notice to J. W. Welch that prior to the first day of December, 1908, he must cease to pollute the waters of the Raritan river and its tributaries, and make such disposition of his sewage and other polluting matter as shall be approved by the said Board of Health.

#### RED BANK.

The Town of Red Bank is located in Monmouth county, on the Navesink or North Shrewsbury river. The flow of the river is principally tidal, it being part of the Shrewsbury basin. It is over half a mile wide at Red Bank, and very shallow, the greater part of the river being only a few feet deep at low tide. Above Red Bank there are a few small fresh water streams running into the river. The population is about 7,000.

In 1902, the town constructed a sewerage system and disposal plant. The daily discharge is estimated at about 250,000 gallons to 300,000 gallons.

Considerable ground water enters the system and while all storm water is supposedly excluded, such is not the case. During the night the flow is practically the clearest ground water. In the morning the flow becomes greater and the sewage becomes very strong. There is much variation on different days of the week.

After a shower the flow immediately increases and after a hard shower, the whole plant sometimes becomes flooded with sewage.

This is due to some roof-drains being connected and to bad surface grading which causes storm water to pond in some streets and run into the sanitary sewers through manhole covers.

The disposal plant consists of two grit-chambers, a septic tank and two circular tanks which were originally upward stone filters.

The grit-chambers receive the sewage directly from the main and are each 5 ft. x 8 ft. x 3½ ft. deep. They serve to detain sand, paper and fecal matter. They are cleaned out about once or twice a year.

The septic tank is circular, and about 43 ft. in diameter, the depth ranging from 9 ft. 10 inches at its edge to 5 ft. 9 in. at the center. It has a capacity of about 95,000 gallons. It was constructed from an old gas tank well.

The old filter tanks are each 12 ft. in diameter and 10 ft. deep. After the removal of the stone filtering material, baffle boards were put across each and they served as disinfecting chambers during the disinfecting experiments of 1906 and 1907.

They were then used in series. Now they receive the flow from its septic tank in parallel and serve only to settle out some suspended solids from the septic sewage. The effluent from these tanks unites in a manhole outside from which it is conducted through a 15" outfall out into the river about 300 feet from the shore.

Four-inch drain pipes, controlled by valves, run from the septic tank and from each of the filter tanks to a drainage manhole, and a four-inch vitrified drain leads from this manhole to the river bank, and empties through the bulk-head.

The grit-chambers are covered by a neat wooden house, the septic tank by a conical shingle roof, and the two filter tanks by another wooden house. The grit-chambers when in need of cleaning, give off considerable odor at times when the flow is low and the solids are exposed. The septic tank is well protected by a heavy screen and has never been cleaned out. Sometimes there is some odor from the septic sewage as it passes, exposed through the filter tanks. During the disinfection experiments, the only odor there was, came from the grit-chambers.

Some complaints come from the Italian settlement, which is located beside the plant, but they claimed that in the summer of 1907, there was no annoyance at all.

The sewage is typical domestic sewage, greatly diluted at times.

The effluent is a good product for a septic tank, but in view of the shellfish industry, should be further purified. But before such a plant is put in operation, some measures must be taken to absolutely exclude sudden inrushes of storm water and to keep the sewage flow under proper control. As it is with a chain with a weak link, so a sudden shower coming at the right time under present sewer conditions, might cause just as big an epidemic as though no disinfection or purification system had ever been installed.

The system of by-passes by which the raw sewage or flow from any part of the disposal system may be turned directly into the river is also bad.

#### RIDGEWOOD.

The town of Ridgewood is situated in Bergen county, on the Saddle river, about five miles northeast of Paterson.

Its estimated population is about 5,000 and its character is purely residential. The area covered lies on two watersheds, the eastern draining to the Hohokus creek and Saddle river and the western to a small stream which empties into the Passaic river near Paterson. The works constructed serve only the eastern side. A movement is now on foot to sewer the western side, pump the sewage over the ridge, and connect on to the eastern system. Storm water and ground water are prevented as much as possible from entering the system. Drains under the sewer lines and cast iron pipe in the wet localities exist.

The size of the sewers ranges from 8 inches to 36 inches. The daily sewage flow is not known but the sewer side of the town uses about 150,000 gallons of water per day.

During the summer of 1907, several improvements to the disposal system were made. A new septic tank was built near the filter-beds. The bottoms of the primary beds were repaired and made water-tight with concrete, new underdrains were laid and the secondary beds were reduced to a single layer of coarse crushed stone. The disposal plant as it now exists comprises a septic tank, four primary contact filters and four secondary stone wave beds. It was supposed that high freshets would compel the use of pumps and two pumps were installed to pump the effluent in times of high water, but these have never been used.

The old septic tank has been abandoned, and the new one was started October, 1907. This new tank is 35 feet x 25 feet x 9 feet and is divided into three compartments; at present the flow passes through one compartment and then into the two others in parallel. A heavy scum exists and the tank seems to be working well. The tank is ventilated by several manholes.

Two of the primary contact beds are 60x120 feet and two are 52x120 feet. They have concrete floors and brick walls. They are filled to a depth of 21 inches with 1<sup>7</sup>/<sub>2</sub>" coke and have a layer of 2" stone on top. The under-drains are horseshoe agricultural tile, laid 18" apart.

The beds are controlled by an automatic air-lock feed system. The sewage is distributed by diagonal troughs with concrete bottoms and wooden sides. It takes about one hour and forty minutes to fill a bed and about one-half hour to empty it. The next bed is then used and so on in rotation, almost no attention being required at all.

Each primary empties into its own secondary wave bed, consisting of a single layer of coarse stone, on a tight sloping, concrete floor 50x60 feet and surrounded by a high wall. These beds were designed to facilitate the rapid absorption of oxygen by the effluent rather than to effect immediate purification. Just outside of the wall, back of the secondaries, is a tide gate to be closed if necessary to exclude freshet water.

Nothing has been done to the plant since October, except to pull up a few weeds which had grown on the primary beds. The primary beds seem to be working well and show no evidence of being clogged at all. The secondaries seem to be doing little good. They are clogged a little, and considerable sewage flows over the stone in an unbroken sheet. Some green algae are visible, but considerable sewage fungi are also present in the outlet drain. There is also some odor to the final effluent.

A pretty complete system of by-passes exists for both septic tank and filters.

## RIVERTON.

On October 2, 1908, Riverton was visited for the purpose of looking over the sewerage system in a general way. It was found that the town has about 1,500 inhabitants practically all sewered. The exact number of house connections could not be ascertained. Nearly all of the houses are connected with the sewers except those along the water front from which houses about 15 private drains ran into the river.

The town system has two outfalls emptying into the Delaware river. The Main street outfall is 10" sewer and the Linden avenue outfall is a 12" sewer. At the time of inspection 10 A. M., the two mains together were discharging into the river at a rate of about 150,000 gallons per 24 hours.

The superintendent stated that the sewers had been laid on such a grade that they could be extended into the neighboring town of Palmyra and there could be one system of disposal installed which would take care of the sewage of both places.

At a meeting of the Board held October 6, 1908, the motion was made and carried that the Borough of Riverton be notified to show cause at a meeting of this Board to be held October 13, 1903, why said borough should not cease to pollute the waters of the Delaware river.

## ROEBLING.

At a meeting held August 11, 1903, plans were presented for a part of a purification plant for the Town of Roebling and, the following resolution was adopted:

RESOLVED, That the plans submitted by John A. Roebling's Sons Company for the arrangement of air-lock sluice-ways for sewage control at Roebling, N. J., be approved subject to such conditions of construction and operation as this Board may from time to time require. It being understood that these plans are to form a part of the purification plant to be installed at said Town of Roebling.

## ROCKAWAY.

At a meeting of the Commission held February 27, 1908, the secretary reported that H. Otto Wittpenn, Mayor of Jersey City, had consulted with him in relation to pollution of the Rockaway river above the intake of the Jersey City Water Works, and had stated that there was considerable pollution of the Jersey City Water Supply. The secretary was directed to have an inspection made of the sources of pollution of the Rockaway river.

At a meeting of the Commission held March 5, 1908, a communication was received from H. Otto Wittpenn, Mayor of Jersey City making complaint of pollution in the Rockaway river, above the intake of the Jersey City water supply.

At a meeting of the Commission held March 12, 1908, a report of inspection was received from Fred B. Worman of sources of pollution of the Rockaway river.

On motion of Commissioner Capstick, the following resolution was unanimously adopted:

WHEREAS, the State Sewerage Commission has found that the waters of Rockaway river are being polluted to the injury of inhabitants of this State in their health, comfort and property, therefore, be it

RESOLVED, That in accordance with the provisions of Chapter 72 of the Laws of 1900, and the supplements and amendments thereto, this Commission hereby gives notice to Melvin S. Condit and Newton S. Kitchel, executors of the estate of Theodore Ringlieb, to cease polluting the waters of Rockaway river prior to April 15, 1908, and to make such other disposition of their sewage and other polluting matter as shall be approved by this Commission. The secretary was directed to have notices in writing served in accordance with the foregoing resolution.

At a meeting of the Commission held April 2, 1908, Commissioner Capstick reported that he had been consulted by the executors of the estate of Theodore Ringlieb, in relation to the notice given to them by the Commission to cease polluting the Rockaway river at Boonton; that he had informed them that the discharge of sewage from their property through an overflow pipe must be stopped.

At a meeting of the Commission held April 9, 1908, a communication was received from Newton S. Kitchel, of Boonton, in relation to pollution of Rockaway river from the estate of Theodore Ringlieb, deceased, requesting that some representative of the Commission visit the property in order to give an opportunity to the executors of the estate to show that the action of the Commission was unjust. The secretary was directed to acknowledge its receipt and investigate the matter.

A further inspection of the Rockaway river was made, and at a meeting of the Board held on September 8, 1908, the following resolution was adopted:

WHEREAS, The Board of Health of the State of New Jersey has found that the waters of the Rockaway river and its tributaries are being polluted to the injury of the inhabitants of this State in their health, comfort and property, therefore, be it



RESOLVED, That in accordance with Chapter 72 of the Laws of 1900, and the supplements and amendments thereto, the Board of Health of the State of New Jersey hereby gives notice to Carl Bergt, Mrs. Albert Hedden, William Hunkel, John Miller, and Loewenthal & Sons that prior to the first day of November, 1908, they must cease to pollute the waters of the Rockaway river and its tributaries and make such disposition of their sewage and other polluting matter as shall be approved by the said Board of Health.

Mr. Herbert made verbal report in regard to inspection of works of the Liondale Bleach, Dye and Print Company, and of result of analysis of effluent discharged from said works. On motion, it was ordered that this matter be laid on the table.

Report of the Liondale Bleach, Dye and Print Works, made by Arthur G. Fowler, September 10, 1908, is as follows:

The Liondale Bleach, Dye and Print Works is a factory erected for the purpose of making such cloths as cretonnes, sleeve-linings and shirting material.

The question of pollution arises from the fact that usually the Rockaway river below this mill is discolored for some distance and the color of the stream is objectionable to the people living near the banks of the river. An inspection of the premises of the factory revealed the following facts:

The dyes used by this company are all alizarian dyes, and being very soluble, a small amount of the compound getting into the water will cause great discoloration. The process of mixing the dyes consists of adding the necessary quantity of water in a small wooden tub. This is called the stock solution. When this is used up, the tub is carefully scraped, the scrapings burned or buried and then the remainder washed out. In this way a small quantity of stock dye gets into the stream which flows directly underneath the plant. Another way in which the dye gets into the Rockaway river is due to the fact that three vats are kept in the dye-room, into which the print rolls, as soon as they have become clogged with the starch dye paste, are placed and allowed to soak until the surface has been cleansed. These vats are emptied into the stream not more than twice a day. Although the water seems to be highly colored, in reality there is very little of the dye in the solution.

The other materials which this plant allows to flow into the Rockaway river are the wash waters derived from basins into which the cloth, after being bleached in a weak solution of chloride of lime, is allowed to soak, in order to remove as much of the lime as possible, and also the waters which come from the vats, in which the cloth is soaked after the small quantities of lime which may remain after bleaching, are neutralized by a solution of sulphuric acid of about one-tenth of one per cent. of strength.

The total amount of waste waters coming from the bleaching plant is between 1,500,000 gallons and 2,000,000 gallons per twenty-four hours. Every particle of this is treated with two grains to the gallon of aluminum sulphate, which is added to the water as it flows from the mill, by means of an iron pipe two inches in diameter filled with small holes and extending over the raceway. This scheme for partial sedimentation and purification of waste, was evolved by Dr. Leal, of Paterson Board of Health, and Mr. Weldon D. Griffin, Bacteriologist, of Jersey City, has made repeated tests of effluent and has certified that ninety per cent. purification is obtained. A sample of the waste water coming from the raceway of the company was obtained and analysis made. The effluent was neutral, contained no chloride and had a slight excess of chlorine. A second sample of the Rockaway river below the point where the effluent from the dye works enters, was collected and the analysis is practically the same as the first sample.

Experiments were carried on to determine whether a small sand filter would not remove the color which seems to appear to be the only objectionable feature in the effluent. No satisfactory results were obtained either in the effluent as it comes from the plant or by making the effluent acid or alkaline; this may be due to the fact that the dye is so very soluble. In regard to other polluting material coming from the factory, there is none.

The toilet and water-closets are connected to a large cesspool which is apparently in good condition and from which it will be impossible for any effluent to escape into the river.

At a meeting of the board held September 22, 1908, the following resolution was adopted:

WHEREAS, The Board of Health of the State of New Jersey has found that the waters of the Rockaway river and its tributaries are being polluted to the injury of inhabitants of this State in their health, comfort and property, therefore, be it

RESOLVED, That in accordance with Chapter 72 of the Laws of 1900, and the supplements and amendments thereto, the Board of Health of the State of New Jersey hereby gives notice to Lewis Deona, Dover Electric Light Company, Dover Rockaway and Port Oram Gas Company, Mrs. William Hand, W. W. Seering, and J. E. Williams, that prior to the first day of November, 1908, they must cease to pollute the waters of the Rockaway river and its tributaries and make such disposition of their sewage and other polluting matter as shall be approved by the said Board of Health.

#### SALEM CREEK.

At a meeting of the Commission held April 2, 1908, Commissioner Chew reported that Wallace Roberts, Manager of the canning plant owned by Curtice Brothers, at Woodstown, had consulted with him in relation to the proper method of complying with a notice to cease polluting the waters of Salem creek. The secretary was directed to notify Curtice Brothers that the Commission would advise them in relation to the proper method of caring for the wastes from their canning factory at Woodstown, and that it would be satisfactory to the Commission if no steps were taken to cease polluting Salem creek by them until the Commission had advised them as to the proper method of disposing of their wastes.

#### SEA GIRT.

At a meeting of the Commission held November 21, 1907, a communication was received from Quartermaster-General C. Edward Murray, in relation to the disposal of sewage from the State Camp at Sea Girt, suggesting that the Commission have an engineer inspect the camp and advise him in regard to the matter. The secretary was directed to employ an engineer to report to the Commission as to the proper disposal of the sewage from the State Camp at Sea Girt. James Owen, C. E., of Newark, was employed for this purpose.

At a meeting of the Commission held February 6, 1908, the following report as to the proper disposal of the sewage from the State Camp at Sea Girt and estimate of cost, was submitted to the Commission by James Owen, C. E.

196 Market street, Newark, N. J.,

February 6th, 1908.

To the State Sewerage Commission:

GENTLEMEN—In compliance with your request I have made an investigation of the sewerage discharge at the State Encampment at Sea Girt, and present to you plans for the proper treatment of the effluents.

I found on examination that there are at present nine points of discharge of the present buildings into a small lake on the south side of the encampment. This lake has indirectly a small tidal flow and is connected with the Manasquan river by a tortuous channel. The average tide is about eighteen inches so that all the discharge first runs into the lake and has a slow movement to the river and thence eventually into the ocean. Recognizing the principles laid down by your Commission that no sewage should be discharged into creeks, lakes and rivers, without complete purification the first question arose as to which proposition would be the most advisable.

On examination, the following is the basis for estimating the volume of discharge. As is readily understood, the use of the camp is only for a small portion of the year, yet it is imperative that as complete provision must be made for this discharge as if it lasted throughout the entire twelve months. The greatest population at any one time is about 2,000 and the amount of water used at present is about 100,000 gallons per day. Allowing for the future, 150,000 gallons per day cannot be considered excessive and this is the basis of the suggested plan.

To completely purify the discharge, septic tanks and filter beds will be necessary with a proper fall and necessary available ground for their location and installation.

Examination of the territory adjacent to the lake does not show any available area for a proper disposal plant near to the present discharge pipes and it will be necessary, therefore, to carry the sewage some distance to the southeast to find suitable territory.

It must also be remembered that the present discharges are at about level with high water and consequently under any circumstances pumping would be necessary. Therefore, these alternates present themselves, of pumping plant, septic tank and filter beds, or pumping plant, septic tank and discharge into the ocean. As to first cost, and also as to maintenance the direct discharge into the ocean is the most economical and plans to that end are submitted.

There being no records or data in existence of the layout of the grounds or location of the discharges, complete surveys had to be had for that purpose, and they were accordingly made.

The construction as outlined can be described as follows:

An intercepting eight-inch sewer will start at the most westerly discharge. This sewer will run along the south side of the present drive as far as the Club House, it will then turn to the south, intercept the remainder of the effluents and run into a septic tank east of the pistol butts. A Shone ejector will lift the discharge into the septic tank about seven feet, and it will then flow by gravity into the ocean as shown on the map.

The grade of the sewer is laid out with a minimum fall consistent with proper flow, and at the upper end is one foot below the first discharge so as to secure complete interception, consequently the lift at the pumping plant as designed is imperative. An overflow is arranged for in the upper side of the tank in case of emergency and provision is made for emptying the tank if at any time it should be required. The Shone ejector is suggested because it is automatic and it is worked by compressed air, so the present air plant now installed can be made available with but small outlay.

The discharge into the ocean will be by an eight-inch cast-iron pipe extending out from the shore line for a distance of five hundred feet laid on the ocean-bed with the end turned up to prevent sand from entering.

The plumbing of the Magazine building will have to be re-arranged making the discharge to the north instead of the south as at present.

One controlling influence in this design is the problem of constructing the sewer and tanks in a porous and gravelly soil close to the lake with prospect of having to care for a large volume of water in the trenches and tank pit, and also the absolute necessity of having a water-tight main to the septic tank.

To obviate unnecessary pumping the suggestion is therefore made that the main to the tank be laid with cast-iron pipe. These can be put together in sections on the bank and lowered to grade in the trench. Such construction, while costing more than the earthen pipe eliminates the larger number of joints that exist in earthen sewers and practically water-tight construction can be secured.

The construction of the septic tank is also a matter of concern, the bottom of the tank being six feet below high water in a bed of gravel, and it is questionable whether a sufficient pumping plant can be installed without very large expense. It is proposed, therefore, to construct the tank in a wooden box

or caisson and lower it into place with water jets. This process will result in a complete water-tight construction also absolutely essential. The main from the septic tank to the ocean can be of ordinary tile in a shallow trench.

The plans as submitted will be complete for the busy season in the summer. In the winter, however, when there is practically no discharge except from two houses and the office, the handling is a matter of consideration whether to keep the tank and lift in commission or to let the effluent run into the lake as at present. So little pollution will ensue at that period and the possibility of nuisance is so slight that provision is made in the plan for either alternative.

This plan does not contemplate any change in the pipes between the main and the buildings and some of the present cesspools can be kept or abandoned as it is finally thought desirable.

The following is the estimate of the cost of the plant and in drawing the plans and estimates and I have consulted with contractors who are familiar with the work, the locality and the material to be used.

## ESTIMATE OF COST.

## SEPTIC TANK.

Concrete, 220 yards @ .....	\$15.00	\$3,300.00
Expanded metal .....		130.00
House .....		75.00
Lights .....		30.00
Man-hole covers, 2 @ .....	5.00	10.00
Basins, 2 @ .....	4.00	8.00
Double ejector, Shone pattern .....		2,000.00
Small ejector for seepage in Pump chamber .....		50.00
		<hr/>
		\$5,603.00

## SEWER.

Iron pipe, 2,350' 8" @ .....	\$1.25	\$2,937.00
Vitrified pipe, 1,770' 8" @ .....	.70	1,239.00
Vitrified pipe, 100' 6" @ .....	.25	25.00
Man-hole, 13 .....	30.00	390.00
Compressed air-line, 1,000' @ .....	.30	300.00
Outlet, 500' @ .....	2.50	1,250.00
		<hr/>
		\$6,141.00

		<hr/>
Incidental expenses for connection, etc. ....		500.00

		<hr/>
Contingencies and Engineering 10% .....		\$12,244.00
		1,242.40

Feb. 6th, 1908.

(Signed) JAMES OWEN,

Civil Engineer,

Newark, N. J.

A communication from Quartermaster-General C. Edward Murray requesting that a copy of the report of Jas. Owen, C. E., on the disposal of sewage from the State Camp at Sea Girt and estimates of the cost be furnished to him in order that his department could request the proper appropriation for this work, was received and filed, and the secretary directed to furnish Quarter-

master-General C. Edward Murray with a copy of the report, estimates and plans for the disposal of the sewage from the State Camp at Sea Girt made by James Owen, C. E.

At a meeting of the Board held June 9, 1908, a resolution to serve notice on C. Edward Murray, Quartermaster-General and Custodian of the State Camp grounds at Sea Girt, that prior to the tenth day of July, 1908, they must cease to pollute the waters of the Manasquan river and its tributaries, etc., was passed.

At a meeting held June 16, 1908, the secretary read a letter received from the Quartermaster-General in regard to installing a sewer system for the State Camp at Sea Girt. Motion was made and carried that this communication be received, and that the request of the Quartermaster-General to the effect that the time for installing the system be extended from July 10, 1908, to July 10, 1909, be granted.

#### SEPTIC TANK PATENTS.

At a meeting of the Commission held February 6, 1908, a communication was received from F. Herbert Snow, stating that it was intended to apply for a rehearing in the case of the Cameron Septic Tank Company vs. Saratoga in which a decision had been rendered sustaining in part the Cameron patents; and that for this purpose it was desired that other public bodies interested in the use of the tank contribute to a fund to be used for the defense of this case.

At a meeting of the Commission held February 10, 1908, the Commission consulted with the Governor in relation to the propriety of action by the Commission to assist the Village of Saratoga Springs, in the State of New York, in defending a suit brought against it by the Cameron Septic Tank Company to restrain an alleged infringement on certain patents by the construction of a septic tank. The secretary was directed to prepare a communication to the Attorney-General, stating the position of the Commission in relation to the suit of the Cameron Septic Tank Company vs. Saratoga Springs, and asking his advice as to what action the Commission could take in the matter.

At a meeting of the Commission held February 13, 1908, the secretary submitted the following communication requesting advice from the Attorney-General in relation to the suit of the Cameron Septic Tank Company vs. Saratoga Springs, prepared by direction of the Commission:

February 13, 1908.

HON. ROBERT H. McCARTER, *Attorney-General*,  
Trenton, New Jersey.

DEAR SIR—I am directed by the State Sewerage Commission to ask your advice and counsel as to certain questions hereinafter set forth in view of the following state of facts.

One of the accepted methods of treating sewage has been the use of a septic tank, this term indicating an enlargement of a sewer in tank form whereby the current of the sewage is so retarded as to permit the solid matter of the sewage to either settle as sludge in the bottom of the tank or to rise and form a scum at its top. The clarified liquid is drawn from a point between these two layers. The solid matter is subsequently decomposed by the action of bacteria. Oxygen being excluded in this arrangement, the bacteria are termed anaerobic to distinguish them from bacteria thriving in the presence of oxygen, which are called aerobic. Every particle of vegetable or animal matter which had existed from the beginning of the world to date has been decomposed by the action of the bacteria included in these two classes, excepting that matter which is still in existence, most of which is being decomposed in this manner. These bacteria are responsible for all putrefaction and decay. Included in the animal and the vegetable matter referred to, is all of the solid matter of sewage, which has always been decomposed by these bacteria. Since the history of man, it has been the practice to dispose of sewage by cesspools. A

cesspool is a tank in which the velocity of the sewage is checked so that a deposit of solids is permitted with the result that these bacteria breed and decompose the solids, in other words, the terms septic tank and cesspool are almost interchangeable excepting that septic tanks are used for the handling of larger quantities of sewage and permit more readily the egress of the liquid. Cesspools usually are limited in capacity to the permeability of the surrounding soil.

In 1897, Donald Cameron and others, applied for patents in this country on a septic tank. Both process and apparatus claims were allowed in the patents. These patents have been assigned to the Cameron Septic Tank Company, of Chicago.

A couple of years ago, the Cameron Septic Tank Company brought suit against the Village of Saratoga Springs, N. Y., for an injunction to prevent an infringement of these patents, the Village of Saratoga Springs having installed a septic tank. This case is a test case on this subject matter, and five or six other municipalities in other States which have in use septic tanks contributed to assist the Village of Saratoga Springs in the defense. The case was tried in the U. S. Circuit Court for the Northern District of New York, which dismissed the bill. The opinion is found in 151 Fed. Rep. 242. The case was carried to the U. S. Circuit Court of Appeals, Second Circuit, which rendered a decision a couple of weeks ago reversing the decree and allowing some of the process claims but none of the apparatus claims. Application has been made for a rehearing and arrangements are being made to take the case to the U. S. Supreme Court.

In the defense of this suit, which has been very expensive, the Village of Saratoga Springs has used up all of the money available and the amount contributed heretofore for its assistance has only been \$5,000. All of the places making this contribution are small and poor and have been obliged to withdraw from further financial support.

The engineering profession at large in this country is somewhat astounded at the decision of the court. To any one familiar with the septic tank process, the decision on its face is erroneous both in fact and law, and could only have been rendered under a surprising misconception of the whole matter. If this decision is sustained, the Cameron Septic Tank Company can levy tribute on practically every municipality in this country which has installed a modern sewage disposal plant. There are approximately two dozen such municipalities in the State of New Jersey. Eight or ten more have already prepared plans and, in some cases, let contracts for the construction of such tanks and at least a dozen other communities have now under consideration, plans for the use of this process. In addition to these, the State of New Jersey owns one septic tank in operation, also one which has not been placed in operation and has had plans prepared for another one. The counties of Essex, Burlington and Camden also own septic tanks which are in operation.

In the case of the County of Essex, the septic tank owned by it at Overbrook was constructed in 1896. The application for the septic tank patents was made in 1897. This Overbrook tank is the oldest tank in America, but it was not the first. Some months before, a septic tank was constructed at Champlain, Illinois, but it was experimental and constructed of wood and was not in operation for a very long period.

In practically every case where its advice has been asked as to proper methods for the disposal of sewage, this Commission has recommended as septic tank for the removal of solid matter in the sewage as a preliminary to any other treatment. This being the natural process to accomplish this result and there being no other practical way to do it, the matter thus becomes a vital proposition in the sanitary progress of this State and, in fact, of each of the States.

The Village of Saratoga Springs is requesting that financial support be given it for the further defense of this suit. A number of municipalities in other States have already indicated that the matter is of sufficient importance to them in this cause. The State Health Department of Pennsylvania has taken the matter up and has requested each of the municipalities under its

jurisdiction using a septic tank to contribute \$100 for this purpose. The State Board of Health of Ohio has taken the matter up and requested the Attorney-General of Ohio to lend his support and assistance in the defense of this suit as he may find it possible. I am informed that this department will contribute financially to assist in defending this suit.

The State Sewerage Commission desires to assist in the defense of the Cameron suit for the purpose of protecting the municipalities of New Jersey which have or desire to have septic tanks, and also for the purpose of avoiding the effect of such a decision as has been rendered in preventing further progress in the sanitary disposal of sewage in this State. For this purpose it is willing to contribute financial support to some extent from the appropriation made for its expenses or, if it be proper, to call upon your department for assistance in this matter; in the latter case, it believes that it would be less expensive and less difficult for your department to assist in retaining the patent lawyers who have conducted this litigation for several years as the case is very complicated and volumes of testimony have been taken.

In view of these facts, the Commission desires to be advised by you:

1. Has this Commission power to expend money from its appropriation for expenses of the Commission for the assistance of the Village of Saratoga Spring in the defense of this suit?

2. Is the Commission so limited by the act making you its legal adviser that it cannot use its funds for this purpose?

3. Is it within your power as Attorney-General on behalf of the State Sewerage Commission to intervene in such a suit as this so vitally affecting the work of this Commission?

4. If it is impossible for this Commission to directly contribute to the defense of this suit, would it be practicable for your department, in case it is proper for it to intervene in this suit, to do so by retaining counsel already employed in the case as associate counsel for the State, the payment for such services to be limited in amount to a specified sum?

5. In case none of these suggestions are practicable in your opinion, what method, if any, can this Commission follow to render the assistance it desires to give in this matter?

It may be of importance in this regard, to state that the Cameron Septic Tank Company instituted suit on the same grounds against the city of Plainfield in this State four or five years ago. At that time, this Commission desired to make the test fight on that case but was unable to do so. The Attorney for the City of Plainfield, Mr. Craig Marsh, consulted with Mr. Livingston Gifford, a patent expert, in this matter, and their conclusion was that while the patents were void and a defense to the suit should be effective, yet the cost of defending the suit would be much greater than the cost of compromising with the Cameron Septic Tank Company, and the City of Plainfield paid the sum of money to the Cameron Septic Tank Company, I think \$3,000, for the discontinuance of this suit. Plainfield is the largest and wealthiest community in this State, which has a septic tank. It is evident that the smaller and poorer communities will not be able to defend suits against them and will have to compromise with the Cameron Septic Tank Company in case the recent decision is not reversed. The matter affects so many communities in the State, as well as several of the counties and the State itself, that the Commission feels that the importance of the matter justifies action by the State, if it be possible. Immediately upon the filing of the decision, the Cameron Septic Tank Company announced its intention of beginning suit against every infringer of the claims allowed by the Circuit Court of Appeals

Respectfully yours,

BOYD MACLEAN,

Secretary.

On motion of Commissioner Chew, the foregoing communication was approved by the Commission and ordered spread in full on the minutes, and the secretary was directed to send same to the Attorney-General.

At a meeting of the Commission held February 27, 1908, a communication was received from Robert H. McCarter, Attorney-General, advising the Commission that it had no power to contribute for or assist in the defense of the suit of the Cameron Septic Tank Company vs. the Village of Saratoga Springs; that he did not consider that his department should take action in the matter, and that it would be proper for the municipalities concerned, or which might be threatened with similar litigation, to take steps to defend themselves.

A communication was received from F. Herbert Snow, C. E., in relation to the Cameron Septic Tank Company litigation.

The following communication was received from Chas. McMillan, C. E., of Princeton:

Princeton, N. J.,

February 19th, 1908.

Secretary State Sewerage Commission of New Jersey.

DEAR SIR—I have the honor to acknowledge the receipt of your favor of the 14th inst., asking in behalf of the State Sewerage Commission that I communicate to it such knowledge as I may have as to the use of septic tanks, especially before the date of the Cameron patents. I take pleasure in responding to the wishes of the Commission; but regret that I must plead as excuse for the delay in this communication the fact that I have been fighting an old man's battle with the gripe.

Speaking literally, the "septic tank" was not known by that name previous to 1896. I believe that Mr. Cameron introduced the word "septic" into the art. But the processes which lie at the foundation of his claims, and which naturally and spontaneously take place in partially or completely stagnant sewage, previously designated rather indiscriminately by the terms, rotting, macerating, decomposing, putrefying, were known and used long before the issue of his patents. Mr. Cameron's studies, for which he deserves great credit, suggested—though not always correctly—the scientific reason why these processes operated. He called renewed attention to these processes, and by his enthusiasm gave them directive force; but he did not discover them. His process claims are coupled with conditions which are, in my estimation, incidental and non-essential, such as absence of light and air which may have made it appear that he discovered a new process. The actual process, however, namely, the natural and spontaneous putrefaction of stagnating sewage, especially of the organic solids which are contained in the sewage, with accompanying liquefaction and gasification, and therefore also, disappearance of those solids, was known at least as far back as 1889.

In 1882, a patent now expired was issued to Amasa S. Glover, of Brockton, Mass., for "Apparatus for the Disposal of Sewage," covering, according to my interpretation two forms of apparatus, the first, for the treatment, apparently, of domestic sewage, and the second, apparently, for the treatment of municipal sewage in which street-wash might appear. The apparatus of the first form (lines 8 to 26) which appears to me to be the basic form, is designed to accomplish in effect substantially what the present septic tank accomplished. The invention seems to have been based upon Glover's discovery that if the liquid from a cesspool which has become plugged up by use were decanted over into a second (new) cesspool, leaving the solids in the first cesspool, there would be no necessity for cleaning either cesspool for a long time. I think the evidence was to the effect that those particular cesspools have been under observation for five years without any accumulation of solids being noticeable.

I did not know of the above patent until about a couple of years ago, when I found that it had appeared as contributory evidence in a suit for infringement of another patent, brought by the American Sewage Disposal Co., of Boston, against the City of Pawtucket. I have personal knowledge, however,

that, in 1881, a fellow townsman, Mr. George Goldie, Director of the Gymnasium of Princeton University—then styled, College of New Jersey—availed himself of the self-same process which Mr. Glover had discovered in his cesspools for the relief of the sewage-disposal of his dwelling. This case came to my notice at its very inception. In those days, sanitary engineers were very much opposed to any form of what was styled "the storing up of filth," and I endeavored to dissuade Mr. Goldie from carrying out his plans of decanting the liquid from his old and comparatively water-tight cesspool into a new one adjoining. This arrangement, however, was carried out, and proved a success from the beginning, working satisfactorily, and requiring no cleaning of either cesspool for 12 or 13 years, at the expiration of which time the arrangement was abandoned upon the requirement of our borough authorities that the house be connected with our sewer system newly installed.

The late Col. Geo. E. Waring, in endeavoring to perfect the system of sewage-disposal known as the sub-surface irrigation system, which he brought over from England to this country, introduced into the system and claimed to have patented a tank between the dwelling and his flush-tank, which he sometimes styled "maerating" tank, and sometimes "settling" tank. I am inclined to think that in the use of this tank it was difficult to establish priority of claims, because the difficulty of operating a sub-irrigation system without some such guard against the intrusion of coarse solids into the small pipes which spread the liquid under the ground was at once apparent; at least, I never heard of Mr. Waring suing anybody for infringement. This preliminary or intermediate tank was at once adopted as a *sine qua non* and appeared during the "eighties" as part of almost every installation of a sub-surface irrigation system of sewage-disposal. It must be added that, whatever these preliminary tanks may have been called, a very important part of their action was the putrefaction of the retained organic solids. Mr. E. S. Philbrick, of Boston, who made a special study of this system of sewage-disposal, evidently recognized the importance of the last-named function of the preliminary tank, and, in an illustrated article published in *The Sanitary Engineer* (now *Engineering Record*) of May 17, 1883, p. 554, gives sketches of a combination of flush-tank and settling basin and flushing manhole in which the capacity of the so-called settling basin is practically the same as that of the flush-tank. When the form of inlet and outlet is considered, the design is evidently a very efficient kind of putrefaction tank, in other words, septic tank.

I was mistaken in saying to President Fuller of your Commission that I had built the first septic tank in the State. That distinction belonged to the late J. J. R. Croes, Past President of the American Society of Civil Engineers, who designed and constructed the double septic tank on the grounds of the Lawrenceville School at Lawrenceville, N. J. It was completed, I think, in 1885, while mine at Morris Plains were not finished until 1886. Each half of Mr. Croes' tank, including its proportion of the collecting well, had a capacity of about 24 hours' flow, at 20,000 to 25,000 gallons per day. My septic tank was only a seven-hour tank for a flow of about 150,000 gallons daily, which flow, it was then thought, would not be soon surpassed, after the curtailment of wastes, through closets mainly, which was then under consideration, had been effected. The daily flow of sewage from the Asylum, as gauged by me about six years ago, was between 400,000 and 420,000 gallons. The septic quality of the effluent from this septic tank is very appreciably weaker than it was when only about 150,000 gallons were passing through it daily in 1887.

Neither Mr. Croes' tank at Lawrenceville nor mine at Morris Plains Asylum was installed under the name of septic tank. The name was unknown to me. But an examination of Mr. Croes' plans or works at Lawrenceville can scarcely lead to any other conclusion than that he had been determined to separate as much of the solids from the liquid sewage as was possible, though at very considerable cost, to retain it in the tanks, and profit by its dissolution (liquefaction); and this is the essence of the present septic process, with a few trifling changes in the influent pipe to accord with the great increase of the flow. The Lawrenceville authorities find it necessary to clean the tank but once a

year. I have not examined the tank for about ten years, but at the time of my last examination, a chemical determination was not at all necessary to determine the character of the effluent.

In the case of the Morris Plains tank, I made as large a tank as I could without overrunning my appropriation. I had reason to believe that by the exclusion of roof water entirely from the sewers, most of which was accomplished while I was still at work there, and by curtailing what seemed to be unnecessary and ineffective waste of water within the building, to which I have already alluded, 150,000 gallons per day for a population of 1,000 should be sufficient for some years in the future. The tank consisted of three parallel waterways, each of a liquid cross section of about 20 sq. ft. and about 100 ft. long. The head wall of this triple tank was channelled and connected at one end (easterly end) with the sewer, and at the other end with the effluent pipe leading to the flush-tank. Ordinarily, the sewage would enter the most easterly waterway, which when filled would cause the sewage to overflow, at the tail-wall, into the second and third waterways, through which the liquid would slowly return to the effluent end of the head-wall. There was provision for control in the form scum-boards at the passages at the tail-end of the tank from one waterway to another. Screens were also provided, but not used, as they were inefficient. This tank was, in my estimation, necessary to protect the 120,000 feet of absorption tile, which I had laid 10 inches below the surface of the slope below the tanks, from the intrusion of all but the finest solids. From previous experience, I knew that putrefaction would be speedily developed in the contents of the tank, but I coveted it rather than otherwise, because it promised less frequent removal by hand of solids from the tank, and because the principal feature of the plan of disposal which I executed, viz., the sub-surface irrigation system, being underground, could not give offense through the putridity of the liquid injected into it. Yet, there was also installed an auxiliary system of three intermittent filter-beds covering a little less than 1½ acres of the valley below the slope above referred to, which beds were to relieve areas for sewage disposal whenever the sub-surface system might be in need of rest, and at other times could serve as the places of final disposal for the water from the sub-soil drains underlying them are occupied by the sub-surface irrigation system. These filter-beds were in the open, and quite accessible to strollers, and I was well contented, therefore, in the end at not having made my tanks larger at the beginning of operations; and as an additional precaution, left positive orders, which I think were scrupulously obeyed, not to charge the beds from the tanks by flushing, but by continuous flow through a by-pass which I had provided. The charging of beds by flushing had been demonstrated to be offensive because of what would now be styled the septic character of the liquid.

The neighbors of the Asylum were at that time rather excited about previous operations of the Asylum in the way of sewage-disposal, and the Managers of the Institution had been threatened with indictment for maintaining a nuisance; and it was only after careful consideration that the Managers resolved to allay all apprehension and complaint by putting the sewage of the Institution underground. That system was, after an interval of between twelve and thirteen years, definitely abandoned owing to the enormous increase in the flow of sewage.

Very respectfully,

(Signed) CHAS. McMILLAN.

The secretary was directed to forward to F. Herbert Snow, C. E., for his information, copies of the letters received by the Commission from Robert H. McCarter, Attorney-General, and from Charles McMillan, C. E., in relation to septic tank patents.

At a meeting of the Board held July 21, 1908, Dr. Keator read a communication from the Assistant Attorney-General in reference to the infringement of

patents of the Cameron Septic Tank Company at Glen Gardner. Colonel Ocott moved that the matter be referred to the Chief of the Division of Sewerage and Water Supplies. Motion was carried.

At a meeting held September 8, 1908, Mr. Herbert reported as to meeting with representatives of the Cameron Septic Tank Company, at Glen Gardner, and of a conference had by him with the Attorney-General in reference to the same.

At a meeting held September 29, 1908, Dr. Keator presented a letter received from the Assistant Attorney-General in reference to the payment of royalties on patents to the Cameron Septic Tank Company. Mr. Herbert moved that the secretary be instructed to inform the Assistant Attorney-General that this Board does not approve of paying the Cameron Septic Tank Company any royalties on the use of sedimentation and septic tanks, unless legally compelled to do so. Motion was carried.

#### SHREWSBURY RIVER.

On the evening of August 18th, 1908, Messrs. Marnell and Herbert met with the Shrewsbury River Improvement Association. Complaints were made of various pollutions and the State Board of Health requested to abate same as soon as possible. They were told that the Board would have a thorough inspection made and all parties found polluting the stream would be ordered to cease prior to the opening of the following season.

An inspection was immediately commenced and is still in progress.

On August 27, 1908, Mr. Herbert visited the works of the Consolidated Gas Company of New Jersey, located at Long Branch and found that although no pipes were discharging tar into the adjacent creek, yet the bank of the creek was impregnated with tar and it was oozing out and finding its way into the water. There was also visible evidence that one of the tar retention tanks had recently overflowed and run into the creek.

At a meeting held September 8, 1908, the following resolution was adopted:

WHEREAS, the Board of Health of the State of New Jersey has found that the waters of the Shrewsbury river and its tributaries are being polluted to the injury of inhabitants of this State in their health, comfort and property, therefore, be it

RESOLVED, That in accordance with Chapter 72 of the Laws of 1900, and the supplements and amendments thereto, the Board of Health of the State of New Jersey hereby gives notice to the Atlantic Coast Sanitary Company, W. Brehm, Thomas W. Cooper, Garrett Hennessy, A. O. Johnson, Mellon Kettle, Wolf Liebesman, N. Cohen, J. Pearsall, Mrs. Slocum, and Mrs. Zengel that prior to the first day of December, 1908, they must cease to pollute the waters of the Shrewsbury river and its tributaries and make such disposition of their sewage and other polluting matter as shall be approved by the said Board of Health.

At a meeting held September 22, 1908, Mr. Thomas P. Fay and Mr. E. E. Eysenbach, of Long Branch, appeared before the Board in reference to the discharge of tar and waste materials from the works of the Consolidated Gas Company of said city into a tributary of the Shrewsbury.

Mr. Fay stated that before tar had acquired a commercial value, it was dumped out into a swamp, and about a year ago this marsh was filled in; that one or two springs were located in this swamp and that water oozing out from said springs carried tar with it into the brook; that tar is not discharged into the brook direct from the works themselves; that the amount of tar coming from the swamp must diminish as the water continues to carry it off; that an effort has been made to remedy the trouble by digging a trench along the swamp to catch the tar, and that the pipes carrying this matter out to the swamp were relaid about a year ago, but were originally laid a number of years ago. It was stated that the Board would take the matter up, and that the interested parties would be notified in regard to action taken.

At a meeting held September 22, 1908, the following resolution was adopted:

WHEREAS, The Board of Health of the State of New Jersey has found that the waters of the Shrewsbury river and its tributaries are being polluted to the injury of inhabitants of this State in their health, comfort and property, therefore, be it,

RESOLVED, That in accordance with Chapter 72 of the Laws of 1900, and the supplements and amendments thereto, the Board of Health of the State of New Jersey hereby gives notice to the Consolidated Gas Company of New Jersey, Charles Cooper, Edwards Lumber & Coal Company, Frank Englefried, New York & Long Branch Steamboat Company, Mr. Pontin, Port-au-peck Realty Company, W. L. Rathburn, Mrs. Harry Foster, John Coffin, Peter Schlicher, Walter Patten, W. R. & T. Patten, Thomas Patten and Mr. Demarest be notified to cease to pollute the waters of the Shrewsbury river and its tributaries prior to the first day of May, 1909, and make such disposition of their sewage and other polluting matter as shall be approved by the said Board of Health.

A letter was received calling the Board's attention to the dumping of garbage and refuse in the river by several parties from the Borough of Highlands. An inspection was made, and at a meeting of the Board held September 22, 1908, a resolution was adopted ordering John Riker, Martin Gerlach, James Leonard, Michael Rowland, Samuel Strauss, and William Sandlass to at once cease polluting the waters of the Shrewsbury river.

At a meeting held September 29, 1908, the following resolution was adopted:

WHEREAS, The Board of Health of the State of New Jersey has found that the waters of the Shrewsbury river and its tributaries are being polluted to the injury of inhabitants of this State in their health, comfort and property, therefore, be it

RESOLVED, That in accordance with Chapter 72 of the Laws of 1900, and the supplements and amendments thereto, the Board of Health of the State of New Jersey hereby gives notice to Leon Dalton, F. C. Fiedler, J. J. Gibbons, W. H. Walsh, Thomas Riddle, and Fred Worthley, that prior to the first day of May, 1909, that they must cease to pollute the waters of the Shrewsbury river and its tributaries and make such disposition of their sewage and other polluting matter as shall be approved by the said Board of Health.

At a meeting held October 13, 1908, the following resolution was adopted:

WHEREAS, The Board of Health of the State of New Jersey has found that the waters of the Shrewsbury river and its tributaries are being polluted to the injury of inhabitants of this State in their health, comfort and property, therefore, be it

RESOLVED, That in accordance with Chapter 72 of the Laws of 1900, and the supplements and amendments thereto, the Board of Health of the State of New Jersey hereby gives notice to W. H. Beadleston, John Beet, Charles L. Bowley, J. W. Cook, W. H. Hamilton, J. A. Haskell, P. Kellogg, Kettle & Johnson, N. Lockwood, Mayor of Long Branch, Robert Stratton, John McWood, Jr.; S. A. Riker, Jr.; James Srymser, A. Symington, H. L. Thornell, B. A. VanBrunt and Mrs. W. H. Whitney, that prior to the first day of May, 1909, they must cease to pollute the waters of the Shrewsbury river and its tributaries and make such disposition of their sewage and other polluting matter as shall be approved by the said Board of Health.

At a meeting held October 27, 1908, a representative of the United States Government appeared before the Board in reference to pollution of the Shrewsbury river from the sink drain at life saving station at Galilee. It was suggested that a cesspool be constructed, which would not necessarily have to be tight if built some distance from the stream, and it was agreed to allow time until May 1, 1909, in which to construct said cesspool.

## SOHO.

The Essex County Isolation Hospital located in Belleville Township near Soho Park Station, was visited August 13, 1908.

The institution was erected in 1905, but has never been opened. The managers are now getting the place in order to receive patients and expect to formally open about the 1st of September, 1908.

As there are only 10 persons living at the hospital and as the institution is expected to open soon, report on the sewage disposal will be deferred until after an inspection under full-working conditions is made.

## SOUTH RIVER.

At a meeting of the Commission held February 27, 1908, the secretary was directed to notify all parties previously reported to be polluting South River to show cause at a meeting of the Commission to be held Thursday, March 12, 1908, why they should not be notified to cease such pollution.

At a meeting of the Commission held March 12, 1908, in response to notices to show cause why they should not be notified to cease polluting South River, communications from the following parties were received and filed:

John J. Quaid, A. T. Applegate, M. D., Fred Nodoker, Mrs. L. Henkel, Walter B. Helme, Clayton Palmer, Patrick Allen, Bernhard Mark, Sophia M. Van Artadalen, Mrs. E. T. Ried, Appleby Sand and Clay Company, Stephen Long, George Dickely, Sayre & Fisher, William F. Gildersleeve, C. M. Davison, Adam Kullmar, William T. Emmons, W. C. Crosby, Mr. John Monahan, J. Conover Bowne, Conrad Mark, Mrs. Pauline Klausner, Benjamin Mark, George Allgair, M. F. Quaid, G. D. Soden, D. V. Perrine, American Enameled Brick & Tile Company, W. S. Roth, and A. C. Dennett, pastor of the Methodist Church at Englishtown.

In response to notices to show cause why they should not be notified to cease polluting South River, the following parties appeared before the Commission:

C. C. Hommann, City Attorney for the City of Perth Amboy, John P. Kirkpatrick, of Jamesburg, representing M. E. Kirkpatrick of the First National Bank of Jamesburg, and Mrs. I. L. Buckelew, Stephen Long of Englishtown, for D. V. Perrine; F. L. Fullam, Superintendent of the International Smokeless Powder & Chemical Company, C. W. Bumsted, Manager, and C. O. Ericson, Chief Engineer of the American Snuff Company, and H. Herrmann, of Herrmann, Aukam & Company.

John P. Kirkpatrick stated that the people he represented did not believe that the small amount of pollution caused by them was doing any damage to any of the inhabitants of this State in their health, comfort and property, and he submitted affidavits from parties in that neighborhood to the effect that the pollution caused by these parties did not cause injury, or threaten injury, to any of the inhabitants of this State.

Stephen Long stated that the report received by the Commission as to the pollution coming from the property of D. V. Perrine was correct and that privies complained of would be moved further from the bank of the stream, and efforts would be made to prevent farm yard drainage from reaching the stream.

F. L. Fullam stated that he was the Superintendent of the International Smokeless Powder & Chemical Company at Parlin; that the company had eight or nine buildings and employed about one hundred and thirty men; that the sewage from the buildings and houses of the men, and the waste water from the factory, amounting in all to about 250,000 gallons a day, discharges through a sewer which had been constructed about 1905, by the company; that this sewer had been constructed in ignorance of the need of the submission of plans to this Commission for its approval; that there was a very small amount of acids discharged in the wastes of the factory of the company, but that he did not believe that there was sufficient escaped in this manner to be found on a test, and that he did not believe that the pollution

from this source was an injury to any person in this State in either health, comfort or property.

C. W. Bumsted stated that he was the manager of the American Snuff Company at Helmetta; that the company had prepared a map of its property at Helmetta, and also had prepared a report of analyses of samples of water taken in the vicinity of its works, copies of which he submitted to the Commission; that he did not believe that the discharge of sewage from the property of the company was sufficient to cause any injury, and that this opinion was borne out by the report of the analyses made for the company.

H. Herrmann stated that his company employed about eight hundred hands; that the waste waters and sewage from the plant was being discharged into South River as was reported to the Commission, and that he would be glad to have any advice from the Commission as to what they wished to be done by this company.

## SOUTH RIVER BOROUGH.

At a meeting of the Commission held March 12, 1908, Josiah Tice, of New Brunswick, Engineer of the Borough of South River, consulted with the Commission in relation to proposed sewerage system and purification works for that Borough.

## STONE HARBOR.

At a meeting held June 9, 1908, Mr. Goff asked permission to build a sewer at Stone Harbor to discharge into Great Channel. On motion it was left with Mr. Herbert to take the matter up with Mr. Goff and report to the Board.

At a meeting held September 22, 1908, R. L. Goff and H. S. Risley appeared before the Board and requested permission to change the outlet of the sewer at Stone Harbor. They were informed that if plans were presented showing this change, they would undoubtedly be approved. Mr. Goff said they also wished to have the approval of the Board to a second outlet for sewers, and stated in response to questions, that he did not think that any oysters and clams would be polluted from this second outlet. Mr. Risley asked if they could put in a tank at the end of the sewers to treat the sewage. He was informed that he could do this, and it was agreed that Mr. Herbert would give him information in regard to this matter. Motion was made and carried that approval of the plans of said sewers be laid over until the next meeting of the Board.

At a meeting held September 29, 1908, plans for sewers at Stone Harbor were presented by Mr. Herbert, and motion was made and carried that said plans be approved subject to such conditions of construction, operation and purification as this Board may from time to time require, and with the understanding that before the sewer pipes are laid plans for a sewage disposal plant will be presented to this Board for approval.

## SUMMIT.

The City of Summit, in Union county, lies on the crest of the ridge that divides the watersheds of the Passaic and Rahway rivers. The population is now estimated to be about 8,000.

The whole town is seweraged with the ordinary terra cotta sewers ranging from 6 to 24 inches in size. About one-half of the sewage flows off by gravity, while the other half has to be collected in a concrete tank holding about 250,000 gallons, and pumped over the ridge and emptied into the outfall sewer. The amount pumped varies from 200,000 gallons to 325,000 gallons per day.

The old disposal plant and beds have now been entirely discarded and all of the sewage is delivered to the so-called Alexander Potter Trunk Sewer.

This sewer empties into the Staten Island Sound below Elizabeth and causes considerable nuisance and pollution in that body of water.

## SWEDESBORO.

At a meeting of the Commission held December 19, 1907, J. Boyd Avis, Counsel for the Swedesboro Sewer Company, consulted with the Commission in relation to the disposal of sewage from the system of that company.

## TRENTON.

At a meeting of the Commission held January 16, 1908, plans for an extension of the sewerage system of the City of Trenton in Stuyvesant avenue, Trenton, were submitted to the Commission for approval by A. C. Gregory, City Engineer of Sewers, on behalf of the city. On motion of Commissioner Capstick, the plans submitted by the City of Trenton, providing for the extension of the Trenton City sewerage system in Stuyvesant avenue, were approved subject to the notice heretofore given to the City of Trenton, to cease polluting the Delaware river prior to January 1, 1911.

At a meeting of the Commission held February 27, 1908, plans for a lateral extension of the sewerage system of the City of Trenton by the construction of an eight-inch sewer in Pennington avenue, Prospect, High and Short streets, Trenton, were submitted to the Commission for approval on behalf of the city of Trenton by A. C. Gregory, City Engineer of sewers. On motion of Commissioner Herbert, the plans submitted by the City of Trenton providing for the construction of a lateral extension of the sewerage system at Pennington avenue, Prospect, High and Short streets, Trenton, were approved subject to the notice heretofore given to the City of Trenton to cease polluting the Delaware river prior to January 1, 1911.

At a meeting of the Commission held March 26, 1908, plans for the construction of four lateral sewers in Cleveland avenue, Cherry street, Olden avenue and Woodland street, in the City of Trenton, were submitted on behalf of that City by Alfred C. Gregory, City Engineer of Sewers. On motion of Commissioner Chew, the plans submitted on behalf of the City of Trenton by Alfred C. Gregory, City Engineer of Sewers, providing for the construction of four lateral extensions of the present sewerage system of the City of Trenton, in Cleveland avenue, Cherry street, Olden avenue, and Woodland street, were approved subject to the notice heretofore given by this Commission to the City of Trenton to cease polluting the Delaware river prior to January 1, 1911.

At a meeting of the Board held June 16, 1908, plans submitted on behalf of the City of Trenton by A. C. Gregory, Engineer of Sewers, for extensions Nos. 398 and 408, on Princeton avenue and Hills alley, were approved subject to the notice heretofore given by the State Sewerage Commission to the City of Trenton to cease polluting the Delaware river prior to January 1, 1911.

At a meeting of the Board held July 21, 1908, Mr. Herbert presented plans submitted by A. C. Gregory, Engineer of Sewers for the City of Trenton, for extensions Nos. 329, 415, and 416, to the sewers of the City of Trenton, and recommended that said plans be approved. Motion was made and carried that said plans be approved subject to the notice heretofore given by the State Sewerage Commission to the City of Trenton, to cease polluting the Delaware river prior to January 1, 1911.

At a meeting of the Board held August 25, 1908, plans for extensions Nos. 396, 420 and 421 to the sewers of Trenton were presented by Mr. Herbert, and he recommended that they be approved. Motion was made and carried that the said plans be approved subject to the notice heretofore given by the State Sewerage Commission to the City of Trenton to cease polluting the Delaware river prior to January 1, 1911.

## STATE HOSPITAL AT TRENTON.

At a meeting of the Board held October 13, 1908, Mr. Herbert presented the following report of inspection of sewers at the State Hospital, Trenton, showing that they are in a sanitary condition, but that the flush-tank at the

end of the city sewer in the Asylum road was not in operation and apparently had not been for some time and, as a consequence, rags and other refuse had collected in some of the manholes and there is danger of a stoppage occurring and thus polluting the feeder. Motion was made and carried that the secretary be requested to communicate with the Board of Health of the City of Trenton in regard to the matter.

The following is the report of a special investigation, by Francis E. Daniels:

On September 23, 1908, I visited the New Jersey State Hospital for the insane at Trenton, N. J., and made an examination of the new toilets and other sanitary arrangements in the buildings and found the work of repairing and remodeling progressing, although much remains to be done, because the repairs intended cover a large amount of work. I believe the new arrangements will be satisfactory and will tend toward better sanitary conditions.

The outside condition of the sewers seemed to be good. They all were clean and running freely. New sewers are in the process of being laid to the bakery, meathouse and other buildings which will add greatly to the general sewerage system. Three new wells are being driven to increase the water supply and at present no indications are apparent that the water supply should become contaminated.

One thing still exists which might prove serious. The old sewer line from the catch-basins near the road is still intact and plugged. Should an emergency occur no doubt this plug would be removed and the sewage fill up the basin near the canal and overflow into the canal and from thence into the Delaware river. One might say that should the manhole overflow, the sewage would run down the road and into the canal by way of the big ditch. Should the latter occur it would be the sooner remedied and prevented.

Further examinations of the city sewer along the road showed that the sewer is running freely but slight deposits of rags and debris are beginning to collect in some of the manholes and that the flushing apparatus at the head of the sewer is out of order. The apparatus should be put in order and so modified that it will stay in order; and regular inspections should be made on the sewer to empty sand buckets and remove obstructions.

## VINELAND.

Vineland is a borough about one mile square, situated in the northern part of Cumberland county on the Tarklin branch of the Maurice river. Its population is said to be about 5,000 people. A system of sewers and sand filters were installed in 1901.

There are about 9 miles of sewers constructed of terra cotta pipe. There are 950 house connections, including dwelling-houses, stores, and three or four factories (shoe and grape juice). About 10-20 new connections are made each year as building increases.

The estimated flow of sewage is about 400,000 to 500,000 gallons per day in dry weather. No storm drains are connected with the sewers and ground water is supposed to be absolutely kept out; but, as is often the case under these conditions, the flow in wet weather is probably greatly increased. The sewage is domestic in character.

The disposal area covers about 6 acres and is divided into 11 beds, although two sand beds are really sub-divided making a sum total of 15.

These beds are all underdrained, except the first 3, 2 of which are used as settling tanks and 1 for a reservoir. This reservoir was drying at the time of inspection. The first tank had considerable scum of an offensive character on it. This was being fished off and removed.

The sewage received through an 18" main, is first let into one of the settling basins, and after 5 to 14 hours it is let into the other one where it remains for about the same length of time. The depth of the liquid is about 15".

From the second basin, the sewage is let onto the other beds in series, ending up on the "sand filters." The underdrains run continuously owing to both



slow sewage filtration and to considerable ground water, and all empty directly into the Tarklin branch through seven separate openings.

The beds are dosed once in 72 hours, and receive whatever has accumulated in that time. It requires from 1 to 15 hours for a dose to soak in, depending on the quantity and some of the beds would require 60 hours to soak away the same amount.

Whenever necessary, which depends on conditions, say about once a week, the beds are cleaned and the green algæ (of which there is considerable) and dried mud-layer is removed to be carted off to the farm.

Mr. F. B. L. Turner is now in charge, while Dr. Elsmore Stites is the bacteriologist.

Contrary to the Report of 1906, Mr. Turner asserts there is no clay in the soil. At any rate, the filters seem to be clogged and very slow acting.

The effluents vary somewhat in character, from a very slow-running clear effluent to a faster and greenish one. Considerable green algæ and some sewage fungi are present. There have been no complaints since the plant has been under the new management, and the scum from the settling basins has been kept from collecting.

The copper-sulphate work is being continued. 25 lbs. are hung in a sack in the flow from the settling basin to the beds, each day.

Mr. Turner states that considerable work has been done in the way of improvements. Better and more systematic cleaning is done on the beds. The beds are plowed whenever necessary. New beds have been constructed and old ones renovated as fast as possible.

Mr. Turner says \$2,000 was spent in 1907, and \$1,000 in 1908, on the plant in addition to the ordinary maintenance.

#### WASHINGTON.

At a meeting of the Board held August 11, 1908, Mr. Herbert presented a letter from the Mayor of Washington, N. J., requesting an extension of time until April 1, 1909, in which to install a plant for the treatment of sewage from said borough. Motion was made and carried that the communication be received and filed.

A letter was received on October 8, 1908, from the Mayor asking advice regarding the best sewerage system for that Borough.

#### WATER WITCH.

At a meeting of the Commission held January 30, 1908, Commissioner Herbert reported that he had been consulted by representatives from the Water Witch Club in relation to disposal of sewage from their property at Water Witch; that they desired to construct a septic tank and either sand filters or a dosing chamber for the use of chlorine; that it was found that the expense of extending an outlet a sufficient distance from the shore line would be greater than the construction of sand filters, provided, that the Commission would approve of the discharge of the effluent from the sand filters into the canal at a point between the railroad depot and the shore. On motion, the secretary was directed to inform the representatives of the Water Witch Club that the Commission could see no objection to the location of the proposed sand filters alongside of the canal at a point between the railroad station at Water Witch and the shore and the discharge of the effluent of the sand filters into the canal.

At a meeting of the Commission held April 2, 1908 the secretary was directed to communicate with the Water Witch Club in relation to the plans for the disposal of the sewage from its property at Water Witch, calling attention to the necessity of having plans approved before any sewage disposal plant should be installed.

At a meeting of the Commission held April 9, 1908, a communication from Lyman A. Ford, of New York, stating that plans for the disposal of the sewage from the property at the Water Witch Club at Water Witch, would be submitted to the Commission before work was started, was received and filed.

Plans for the purification of the sewage from property of the Water Witch Club at Water Witch were submitted to the Commission for its approval by the Bacterial Sewage Purification Company on behalf of the Water Witch Club, and the secretary was directed to notify the Bacterial Sewage Purification Company that the plans submitted by them for the purification of the sewage at Water Witch were not in such form as to be approved by the Commission.

The following is a report of a special investigation made by Francis E. Daniels:

"In accordance with instructions, on August 4, 1908, I visited the residence community of Water Witch to ascertain what had been done toward installing a sewage disposal system.

I found that a septic tank had just been put in operation, August 3rd, and that the effluent from the tank emptied into a sort of tidal ditch below the railroad station at the location of the old sewer outlet. There also exists a by-pass for use in time of cleaning by which the flow can be turned directly into the outlet.

On August 19, 1908, I again visited the place and found the outlet running. The tide was up and the flow was barely distinguishable by its slight milky color against the tidal water.

At the time of inspection, no nuisance was apparent although it might be advisable to carry the outlet pipe farther out, if necessary."

At a meeting of the Board held September 8, 1908, motion was made and carried that the Water Witch Club be notified to appear before the Board on September 22, 1908, to show cause why they should not be restrained from installing a sewage disposal plant without having plans for the same approved by this Board.

At a meeting held September 29, 1908, on recommendation of Mr. Herbert, motion was made and carried that the case of the Water Witch Club, of Atlantic Highlands, be referred to the Attorney-General, said club having proceeded to install a sewage disposal system without having plans for the same approved by this Board.

#### WESTFIELD.

The following is a report of a special inspection by Arthur G. Fowler:

In response to a complaint made by Robert B. Cross against the Westfield Sewerage Works, I visited Westfield on June 3, 1908, and obtained the following information:

Mr. Cross states that at times the odors arising from the sewage disposal plant, situated three-quarters of a mile from his house are so obnoxious that it is impossible to remain out of doors, or even remain in the house with windows open. He is substantiated in his complaint by William J. Hutchinson, W. R. Hutchins and William Wilson, who live nearby. The conditions as above stated have been brought to the attention of the Mayor of Westfield on several occasions.

An inspection of the sewage disposal plant showed that the plant is operating in the same manner as given in the report of the State Sewerage Commission for 1906. A screening tank, five sand beds, and three small sand beds for treatment of the solid material from the screening tank, are in operation.

The sand filters are each apparently made of such material that filtration is not wholly effective. They are cleaned about three times a year and harrowed. At the time of inspection there was a slight odor rising from the two beds then in use. The chief cause for complaint arises, I think from the sludge beds. These are nasty and give off strong odors which, at the time of cleaning, are undoubtedly much worse. I was informed that the material accumulating on the beds was cleaned off every three weeks, or after each bed had served for one week, applications of the sludge being made to each bed three times per week. The surface was cracked and, although the sludge layer was not thick, still it gave rise to very foul odors and served as a good feeding ground for countless number of flies.

The surface of the beds upon removal is at once carried by a farmer to his land, a couple of miles away, there to be used as fertilizer. No evidence of storage of this material at the plant was detected.

It would seem advisable to suggest the installation of a septic tank at this plant, or to provide some method of covering the sludge beds.

The septic tank would, I believe, eliminate all odor, and result in cheaper and more efficient purification.

The following is a report of Francis E. Daniels, made July 20, 1908:

Westfield, a town of about 6,000 inhabitants, is situated in Union county, in the Rahway river watershed. In 1895, the city constructed its system of sewers and disposal works. The present sewerage system consists of about 15 miles of sewers ranging from 8 to 24" in size and constructed of terra cotta pipe in the dry, and cast-iron pipe in the wet places. Storm water is not supposed to enter the system at all, but at times considerable ground water increases the flow of sewage very much—probably about 50%. The daily dry weather flow is roughly estimated at about 400,000 gallons. The sewage is domestic in character, there being no factory wastes. There are at present 974 house connections, and about 80 or 90 are added yearly.

The outfall sewer leads to the disposal farm, situated about 2 miles south of the town. This tract contains 108 acres of which about 12 acres are available for sewage disposal. The soil is a sort of sandy loam with some gravel and some parts are nearly all sand.

The plant consists of a double screening chamber, 3 sludge beds, 5 filter beds and 4 irrigation tracts. The screening chamber is used in parallel except during the cleaning process when one alone takes care of the flow. Each compartment is 5x8 feet in plan. The sewage entering near the bottom rises through screens of 5-8" rods spaced 1 inch in the clear, and overflows through an 18" pipe to the filters. An 8-inch pipe controlled by valves, taps both chambers at the bottom and carries the screenings to the sludge-beds. Of these, there are three, each 47x30 filled with gravel. The screen chamber is drained out three times a week. The conditions at the sludge-beds are about as reported in 1906. The layer of sludge and screenings on the beds gives out a strong offensive odor while drying out. The materials are taken away without expense to the town and therefore, not as frequently as might be. There are no houses near, but the conditions might well be improved because of the bad impressions they convey, if for no other reason.

Of the filter beds, four are about  $\frac{3}{4}$  of an acre in size, made of sand and sandy loam with some gravel mixed in and provided with underdrains, and one of 1 acre in size without underdrains. The depth of the beds is from 4 to 5 ft. and the underdrains are 4" circular agricultural tile leading to an 8" side drain.

These beds seem now to be receiving better attention than the former reports would indicate. They receive a deep plowing in spring and fall and are gone over with a spring-tooth harrow every 6 weeks. The beds are used in rotation, giving each a day's flow at a time. When this subsides and the surface dries, the top layer is raked off, and as soon as a few dosings make it necessary, the harrow is put on. In this way the bed is kept porous and free from weeds and grass.

The irrigation area is divided into 4 tracts and one small 3-cornered piece.

These tracts are not in good condition. They are plowed and harrowed twice a year, but at present, they have a heavy growth of grass and weeds. These are cut with a machine occasionally, but the whole condition is bad. They have too much grade and should be leveled or terraced. The superintendent proposes to skim off the upper soil to the sand and gravel and virtually convert them into filters. If this were done the surface could be kept in better condition, and, at the same time, unsuitable filtering material would be removed.

The effluent seems mixed. That is, some of it seems to have been well purified while there seems to be a portion (perhaps from the irrigation tracts) which is not purified. The effluent runs into a small stream which is caught

by a large iron main and conducted about two miles and emptied below the intake of the Rahway water-works.

No doubt a good septic tank would get rid of much of the solids and lessen the work of the beds.

#### WEST COLLINGSWOOD.

An inspection was made of the West Collingswood Sewer on June 12, 1908, and the following conditions were found to exist:

A pipe to which 100 houses in West Collingswood are connected discharges into Newton creek about 500 feet below the outlet of the Collingswood Purification Plant. At the time of inspection a fairly large volume of crude sewage was pouring from the pipe into a small ditch, partially overgrown with weeds, which extends for about 100 feet before it connects with the main stream. The place immediately surrounding the outlet was filthy in the extreme. The banks were lined with paper, wastes of various kinds, fecal matter and accumulations of grease such as can come only from crude sewage. The odors arising were obnoxious in the extreme.

Your inspector was informed that a franchise to lay sewers in West Collingswood had been granted to the Collingswood Sewage Company and that in this way the nuisance arising from the West Collingswood sewage would be abated, since the new additions would be connected to the Collingswood trunk line and passed to the purification works.

At a meeting held August 11, 1908, Mr. John S. Smith and Mr. W. T. Dunning, appeared representing citizens of West Collingswood. Mr. Smith said that the people of West Collingswood had no desire to do anything contrary to law; that they were using sewers which had been put in by the Collingswood Land Company some ten years ago; that 125 or 140 houses were connected with the sewer running directly into Newton creek; that they had no other means of disposal at the present time; that the Collingswood Sewerage Company made an effort to lay a sewer but were held up by an injunction from residents of West Collingswood; that there was a movement on the part of the residents of West Collingswood to build a plant of their own to take care of sewage; that the land company had made an effort to sell the piping in the streets to the Sewerage Company, but there was some trouble about it and the whole matter was in a state of litigation. Mr. Smith said they were ready to do anything at the suggestion of this Board which is reasonable, and asked that as liberal a time as possible be granted to them in which to take action. He was informed that he would receive notice in regard to the time granted.

Mr. Dunning said he had nothing further to add to what Mr. Smith had said. He said the Collingswood Land Company put the piping in the streets, but whether the pipes were reserved when the streets were deeded to the borough he could not say as there was a legal point involved there. The following resolution was adopted:

WHEREAS, The Board of Health of the State of New Jersey, has found that the waters of Newton creek are being polluted to the injury of inhabitants of this State in their health, comfort and property, therefore, be it

RESOLVED, That, in accordance with Chapter 72 of the Laws of 1900, and the supplements and amendments thereto, the Board of Health of the State of New Jersey hereby gives notice to Ephraim Arrants, Abbie L. Alexander, Henry Ankener, Sarah Albeston, Reginald Adams, Alfred Brewin, Baptist Parsonage, Frank Bloomer, Harry Bancroft, Maria Biezel, Mary C. Barklow, Viola Boggs, Victoria Bourquin, D. W. Bayne, George Boggs, Henry Bauer, John Cahaley, Andrew Calberg, John Casner, George M. Carr, Alice Carson, Alfred Clark, Wm. F. Cherry, Sadie Davis, Katherine Dunning, George Deal, Joseph Fleming, E.S. Frost, Harry Farren, Mary A. Felch, Daniel Garrison, George R. Gibson, Albert Gaus, J. L. Greenwood, Frederick Griger, L. K. Geary, A. J. Hoehlin, Mary E. Harris, Francis W. Hencke, Ada W. Hartman, Frederick Hall, Robert W. Hillegas, Benjamin A. Johnson, William Kraft, P. B. Kinsley, Elwood B. Kern, Walter King, Winfield Latch,

James Leslie, Annie Lippincott, Agnes Macrea, Wm. McCully, Frederick Mettatal, James Macouch, O. H. McCurdy, Mrs. Minnie Nichols, Katherine Health, Matthew Phifer, Dr. T. H. Peacock, Public School No. 2, Florence Parker, Sarah P. Pyle, John G. Peterson, F. M. Phillips, Sarah S. Porter, Louis Rice, Mr. Rungie, Wm. M. Raynor, Mary Robinson, Wilbur Randall, C. Robinson, A. B. Ross, Alex. Robertson. Wm. B. Smith, Eugene Smith, Fred W. Smith, Phillip S. Smith, C. H. Stockwell, Alonzo M. Steelman, Margaretha Stevenson, Louisa Seemuller, Samuel Smith, Chas. Sutterlin, Rebecca Smith, Eva Steel, George Snell, George Selby, H. R. Saylor, Walter Stevens, Sarah Smith, Phoebe L. Turner, Mary A. Tyre, Chas. Whitman, Herman Ware, A. E. Usilton, Gustav L. Usilton, Margaret E. Wolf, Chas. A. Wolverton, Geo. F. Weiland, Jacob Wells, George West, Jr.; Walter Ward, that prior to the first day of September, 1909, they must cease to pollute the waters of Newton creek, and make such disposition of their sewage and other polluting matter as shall be approved by the State Board of Health.

## WESTWOOD.

At a meeting of the Commission held March 26, 1908, the secretary reported that William E. Good and A. B. Bogert, a committee of the council of the Borough of Westwood, had consulted with him on Wednesday, March 25, 1908, in relation to a proposed sewerage system and disposal plant for that borough.

## WOODBURY.

At a meeting of the Commission held February 6, 1908, a communication from Thomas D. Clark, plumbing inspector of the City of Woodbury, requesting an interview with Joseph P. MacLean, C. E., in relation to the alteration recommended in the sewage tank of the City of Woodbury, was received and filed, and the secretary directed to reply.

## WOODLYNNE.

The Borough of Woodlynnne installed a sewerage system without the approval of the State Sewerage Commission.

On January 7, 1907, the Commission passed a resolution notifying the borough to submit plans providing for the purification of its sewage to the Commission at once.

The Borough not having complied with the above resolution, the Secretary of the Commission was, at a meeting held June 27, 1907, directed to request the Attorney-General to take such legal steps as might be necessary to secure compliance with section 6 of Chapter 72 of the Laws of 1900. This suit is still pending.

## WOODSTOWN.

The Borough of Woodstown lies on both sides of Salem creek, in Salem county. The population of the village is about 1,500. A local corporation, the Woodstown Sewer Company, owns the sewers and runs the disposal plant.

The sewers are about 2 miles in length and vary in size from 6" to 8". They are of the usual terra cotta pipe. Formerly a great amount of roof water entered all the lines, but lately, a good deal has been excluded although there still remains enough to cause an immense increase in the sewage flow during wet weather. There are about 100 house connections with a yearly increase of 3 or 4.

The outfall 10" main leads to the disposal plant located on a tributary of Salem creek. This plant consists of a septic tank, holding 12,600 gallons, a flush-tank with a capacity of 1,750 gallons and two filter beds each having an area of 3,400 square feet. The septic tank is covered with a concrete roof and has a scum about 2 feet thick on the surface of the liquid. The tank has never had to be cleaned out. The flush-tank is discharged by a siphon and the flow

goes to one of the beds by means of two lines of terra cotta channel pipes. The beds are composed of sand and gravel, 4 feet deep and underdrained by 4-inch drain tiles 15 feet apart. The dose is changed from one bed to the other twice a week and each bed is harrowed every 2 or 3 weeks.

The first bed seems to be clogged to some extent, although the previous dose of the flush-tank had quickly disappeared save in a few places.

Some odor was noticeable near the plant. It is probable that the sewage receives too much detention in the septic tank in dry weather. The fluctuations due to storm water, upset calculations for a good regulation. The underdrains empty directly into the creek and the effluent was quite clear and colorless. There was a slight odor, however, but no sewage fungi or other signs of pollution were visible around the outlets.

The company wish to do everything they can to make the plant a benefit to all concerned, and they want to build new filters as soon as possible, to rest the old ones and take care of a larger amount of sewage.

This town greatly needs a general cleaning up. There are many signs of wanton pollution. There are some of the foulest drains imaginable leading from private houses, stables, privies, so-called surface or storm water sewers which are worse than cesspool overflows and creameries. All this filth together with a large volume of rain water which washes down filth from other privies and other sources, goes directly into the stream.

It is stated that the sources of pollution mentioned in the previous report (1906) still exist.

Following is the analysis of the sewage and effluents taken from the several plants throughout the State:

TABLE OF ANALYSES OF SAMPLE SEWAGE.

LOCATION OF PLANT AND DATE OF SAMPLE.	SOURCE OF SAMPLE.	Odor.	Turbidity.	Sediment.	Total solids.	Fixed solids.	Volatile solids.	Solids in solution.	Fixed solids in sol.	Vol solids in sol.	Solids in suspension.	Fixed solids in susp.	Vol solids in susp.	Chlorine.
Asyn—July 2.	Raw sewage.		140	0	203	100	103	208	103	175	25	7	15	
Burlington—July 8.	Raw sewage.	Septic.	140	50	872	454	218	85	640	201	22	5	17	403
Oct. 8.	Effluent.	Septic.	10	0	306	218	88	306	218	88	0	0	0	108
Essex Falls—July 14.	Raw sewage.		400	310	386	224	162	554	216	138	32	8	24	0
	Effluent.	slight	0	222	103	103	222	326	152	160	0	0	0	0
	Effluent.		215	0	305	215	0	305	215	0	0	0	0	0
Flemington—June 22.	Raw sewage.		250	0	227	162	65	227	162	65	0	0	0	0
	Effluent.	Septic.	250	0	784	240	94	520	200	264	141	10	10	0
	Effluent.	Septic.	600	500	580	248	302	418	200	218	132	10	10	163
Oct. 7.	Raw sewage.		600	500	580	248	302	418	200	218	132	10	10	163
Freehold—July 16.	Raw sewage.	slight	0	311	183	696	497	1,083	690	403	100	0	0	0
	Effluent.		30	5	460	305	315	830	295	46	0	0	0	228
	Effluent.	Septic.	80	50	480	390	81	480	390	81	0	0	0	78
Oct. 13.	Effluent.	Septic.	50	0	210	142	68	210	142	68	0	0	0	68
Glen Gardner—July 31.	Raw sewage.		270	200	244	74	170	241	72	120	48	2	41	23
	Effluent.	Septic.	700	560	419	165	254	842	342	180	77	2	7	43
	Effluent.	Septic.	120	70	275	140	165	245	100	142	34	0	0	33
Haddonfield—June 30.	Raw sewage.		230	0	278	145	133	278	145	133	0	0	0	124
	Effluent.	Septic.	1,000	700	496	187	309	445	181	264	51	6	45	68
	Effluent.	Septic.	50	0	210	142	68	210	142	68	0	0	0	68
Oct. 12.	Raw sewage.		1,500	1,000	337	200	238	337	200	238	0	0	0	78
Jamesburg—July 16.	Raw sewage.	Septic.	1,500	1,240	731	146	585	605	130	128	0	0	0	78
Lakehurst—Oct. 28.	Raw sewage.	Septic.	1,500	1,240	731	146	585	605	130	128	0	0	0	78
Loch Arbor—Aug. 11.	Raw sewage.		1,000	50	454	255	199	448	253	195	60	12	4	53
	Effluent.	Septic.	1,000	280	682	277	408	494	250	240	10	22	104	73
	Effluent.	Septic.	1,200	150	5,310	4,060	4,377	4,047	330	633	913	20	1	2,008
Moorestown—July 6.	Raw sewage.		180	45	284	128	168	240	99	241	54	27	27	33
Oct. 15.	Effluent.		0	0	104	52	231	274	44	133	30	0	102	33
	Effluent.		80	70	160	85	65	150	85	65	0	0	0	48
	Effluent.		0	0	160	85	65	150	85	65	0	0	0	48

Total (Kjel)	Total (Kj)	Pre ammonia.	Nitrogen as		Oxygen consumed	Oxygen cons. in sol.	Oxygen dissolved.	Bacteria per cc. 20°	Bacteria per cc. 37°	Red Colonies per cc. 37°	B. Coll per cc.	Purposibility, days.	REMARKS.
			Organic (diff.)	Organic (diff.) in sol.									
11	12	4.5	3.5	7.5	51	11					10,000	15	Catch sample.
12	10	8	11	2	15	20					10,000	14	Catch sample.
13	10	9	11	6	43	20					10,000	14	Catch sample.
14	10	14	6	6	64	14	370,000	120,000	10,000		10,000	14	Catch sample.
15	10	14	5	5	16	2	4,000				10,000	14	Catch sample.
16	10	7.5	0.5	7.5	0	59					100,000	4	Catch sample.
17	10	6	5	5	20	20					100,000	20	Catch sample.
18	10	12	3	3	42	11					100,000	15	Catch sample.
19	10	11	12	4	49	41					10,000	15	Catch sample.
20	10	2	5	5	15	15	800,000	90,000	60,000		10,000	14	Catch sample.
21	10	2	5	5	15	15	20,000	7,000	7,000		10,000	20	Catch sample.
22	10	3	9	7	0	0	1,250,000	100,000	60,000		10,000	3	Catch sample.
23	10	5	16.5	5.5	114	89	1,000,000	15,000	10,000		10,000	3	Catch sample.
24	23	16	8	7	0	0					100,000	5	Catch sample.
25	23	16	8	7	0	0					100,000	5	Catch sample.
26	23	16	8	7	0	0					100,000	5	Catch sample.
27	27	18	10	9	0	0	1,400,000	700,000	600,000		10	7	Catch sample.
28	27	18	10	9	0	0	1,400,000	80,000	40,000		10,000	5	Catch sample.
29	23	23	10	14	0	27					10,000	6	Catch sample.
30	22	13	9	0	42	42	5,000,000	1,750,000	1,000,000		10,000	1	Catch sample.
31	60	60	11	48	39	0	450,000	60,000	30,000		100,000	1	Catch sample.
32	26	20	19	7	0	7					100,000	1	Catch sample.
33	40	34	20	20	14	0					100,000	1	Catch sample.
34	18	16	15.5	2.5	0	58					100,000	1	Catch sample.
35	18	9	16	9	0	37					1,000	14	Catch sample, see water
36	22	13	10	6	0	22					10,100	14	Catch sample.
37	23	22	13	6	0	86					10,100	14	Catch sample.
38	22	13	10	6	0	24					10,100	14	Catch sample.

TABLE OF ANALYSES OF SAMPLES OF SEWAGE.—Continued.

LOCATION OF PLANT AND DATE OF SAMPLE.	SOURCE OF SAMPLE.	Odor.	Turbidity.	Sediment.	Total solids.	Fixed solids.	Volatile solids.	Solids in solution.	Fixed solids in sol.	Vol. solids in sol.	Solids in suspension.	Fixed solids in susp.	Vol. solids in susp.	Chlorine
Morris Plains—Asylum—Aug. 14.	Raw sewage.	0	1,000	850	373	110	254	276	100	167	97	10	87	23
Effluent.	0	0	0	0	124	84	40	124	84	40	0	0	0	33
New Lisbon—Almshouse—July 24.	Raw sewage.	0	500	1,275	159	84	134	124	146	260	49	3	46	43
Effluent.	0	0	0	0	200	150	150	150	150	150	0	0	0	0
Newton—Clinton St.—Aug. 28.	Raw sewage.	0	1,500	200	217	119	98	208	173	90	6	7	2	21
Effluent.	0	0	0	0	30	898	635	822	607	215	76	8	48	388
Sparta St.—Aug. 28.	Raw sewage.	0	60	0	174	360	114	474	360	114	0	0	0	113
Effluent.	0	0	0	0	165	97	66	165	97	66	0	0	0	113
Overbrook—July 23.	Raw sewage.	0	160	60	354	117	237	298	111	187	56	6	50	23
Effluent.	0	0	0	0	189	122	67	189	122	62	0	0	0	38
Oct. 20.	Raw sewage.	0	800	760	273	130	157	130	115	130	13	17	28	58
Effluent.	0	0	0	0	363	263	300	458	264	320	180	42	138	73
Plainfield—July 20.	Raw sewage.	Septic.	500	350	764	300	458	584	264	320	180	42	138	73
Effluent.	0	0	0	0	900	424	572	915	389	526	387	35	346	183
Princeton—N. E. Field—July 10.	Raw sewage.	Septic.	500	1,300	1,300	1,300	1,300	1,300	1,300	1,300	1,300	1,300	1,300	1,300
Effluent.	0	0	0	0	1,300	1,300	1,300	1,300	1,300	1,300	1,300	1,300	1,300	1,300
Oct. 22.	Raw sewage.	Septic.	2,000	1,850	365	615	655	1,190	600	800	68	3	17	228
Effluent.	0	0	0	0	1,850	1,850	1,850	1,850	1,850	1,850	1,850	1,850	1,850	1,850
Red Bank—Aug. 11.	Septic effluent.	Septic.	1,000	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500
Oct. 20.	Raw sewage.	Septic.	1,000	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500
Effluent.	0	0	0	0	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500
Ridgewood—Aug. 7.	Raw sewage.	Septic.	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000
Effluent.	0	0	0	0	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000
Vineland—June 26.	Raw sewage.	Septic.	200	60	556	128	228	290	87	203	68	41	25	98
Effluent.	0	0	0	0	556	147	242	308	158	172	77	7	10	78
Oct. 5.	Raw sewage.	Septic.	1,000	850	383	147	242	308	158	172	77	7	10	78
Effluent.	0	0	0	0	383	147	242	308	158	172	77	7	10	78
Westfield—July 20.	Raw sewage.	Septic.	0	25	143	80	54	143	80	54	0	0	0	58
Effluent.	0	0	0	0	143	80	54	143	80	54	0	0	0	58
Oct. 21.	Raw sewage.	Septic.	1,500	1,400	402	218	265	400	167	213	110	28	82	23
Effluent.	0	0	0	0	402	218	265	400	167	213	110	28	82	23
Woodtown—Aug. 20.	Raw sewage.	Septic.	600	490	500	359	221	565	237	228	25	22	3	123
Effluent.	0	0	0	0	478	355	121	478	351	121	0	0	0	123

Total (Kj.) in sol.	Free ammonia.	Organic (diff.) in sol.	Organic (diff.) in sol.	Nitrates.	Oxygen consumed.	Oxygen cons. in sol.	Oxygen dissolved.	Bacteria per cc. 20°.	Bacteria per cc. 37°.	Red colonies per cc. 37°.	B. Coll per cc.	Putrescibility, days.	REMARKS.
11.5	6	5.5	5.5	0	108	70	0	0	0	0	0	0	Catch sample.
10	13	2	2	0.5	69	88	0	0	0	0	0	0	Catch sample.
21	11.5	0.5	1.5	0	24	23	0	0	0	100,000	100,000	6	Catch sample.
11	6.5	4.5	3.5	0	85	74	0	0	0	100	100	30+	Catch sample.
8	4	4	4	0	7	4	0	0	0	10	10	21+	Catch sample.
4	2.5	2.5	2.5	3	1	1	0	0	0	10,000	10,000	14+	Catch sample.
4	2.5	2.5	2.5	3	1	1	0	0	0	10,000	10,000	10+	Catch sample.
16	13	10.5	7.5	0	95	90	0	0	0	10,000	10,000	6	Catch sample.
7	3	4	4	0	29	29	0	0	0	100,000	100,000	1.5	Catch sample.
12	15	10	13	0	60	47	1.3	0	0	100,000	100,000	0	Catch sample.
21	19	11.5	9.5	0	126	108	8.3	0	0	1,000,000	1,000,000	0	Catch sample.
10	10	4	7.5	1	17	17	0	0	0	100,000	100,000	2	Catch sample.
10	9	3	10	0	212	142	0	0	0	100,000	100,000	0	Catch sample.
30	26	35	10	0	294	224	0	0	0	100,000	100,000	0	Catch sample.
30	26	35	10	0	57	47	1.3	0	0	100,000	100,000	0	Catch sample.
36	35	27	19	8	86	77	0	0	0	1,000,000	1,000,000	0	Catch sample.
23	10	14	9	0	111	72	0	0	0	100,000	100,000	0	Catch sample.
30	28	15	23	13	0	0	0	0	0	100,000	100,000	0	Catch sample.
28	24	14	14	10	0	0	0	0	0	100,000	100,000	0	Catch sample.
16	16	11	4	4	0	15	15	0	0	100,000	100,000	0	Catch sample.
32	30	18	15	0	98	52	0	0	0	100,000	100,000	0	Catch sample.
27	26	20	13	0.4	123	77	0	0	0	100,000	100,000	0	Catch sample.
24	20	18	13	0	30	30	0	0	0	100,000	100,000	0	Catch sample.
17	17	11	6	0	22	22	4.5	0	0	260,000	260,000	0	Catch sample.
10	6	10	6	0	132	106	0	0	0	150,000	150,000	0	Catch sample.
10	6	10	6	0	132	106	0	0	0	1,000	1,000	0	Catch sample.
37	34	25	13	0.5	119	78	0	0	0	100,000	100,000	0	Catch sample.
38	36	30	16	0	84	65	0	0	0	250,000	250,000	0	Catch sample.
6	6	6	6	0	16	16	0	0	0	1,000	1,000	0	Catch sample.
6	6	6	6	0	84	65	0	0	0	1,000	1,000	0	Catch sample.
6	6	6	6	0	16	16	0	0	0	1,000	1,000	0	Catch sample.

Respectfully submitted,

H. M. HERBERT,

*Am. Soc. C. E.,*

Chief Division of Sewerage and Water Supplies.



## Dedication of Atlantic City's New Municipal Hospital.

Atlantic City's new municipal hospital, erected at a cost of over one hundred thousand dollars, a cut of which is shown above, was formally dedicated on October 21, 1908, in the presence of a large and enthusiastic audience. Health officers of many cities, sanitarians of national prominence, members of the State Board of Health, city officials and many prominent citizens were present.

### REMARKS BY DR. BRUCE S. KEATOR.

Among the speeches delivered on the occasion was one by Dr. Bruce S. Keator, Secretary of the State Board of Health, in the course of which he said:

"I believe your City Council was the first in the State of New Jersey to adopt an anti-smoke ordinance which has stood the test of the courts. I recently saw in the public press that the Supreme Court of New Jersey had sustained you in enforcing that ordinance, and I propose to make mention of this fact in the annual report of the State Board of Health. I want those who read that report to know that you are alive and progressive in Atlantic City in public health matters. If there should be any doubt about this fact we have as proof but to look at this splendid new municipal hospital, for the

dedication of which we have met here today. I understand this property has cost \$100,000.00. If I had been told that it cost \$150,000.00 I should not have been surprised. It is a magnificent property in point of architecture, construction, plan and appointments generally. This building is all that you could wish for or desire. It will meet the requirements of your city for many years to come. It is a credit to your building committee; to your board of health; to your city; and to the State of New Jersey. It is a splendid monument to the efforts of the public spirited citizens of Atlantic City in the line of her public health achievements."

## Excerpts from the Annual Report of Local Boards of Health.

The following excerpts from the Annual Reports of Local Boards of Health for the year ending October 31, 1908, are given as illustrations of reports such as the State Board of Health desires shall be made by other local boards of health, especially those who contrary to law made no report whatever for the year 1908.

Asbury Park:—The health officer, Mr. B. H. Obert, writes in part as follows:

The personnel of the Board was changed January 1, 1908, Mr. William C. Weeden, having been elected to Common Council, resigned as a member of the Board of Health, and Mr. George Turner was appointed to fill his unexpired term.

The total number of deaths in Asbury Park for the year ending October 1, 1908, was one hundred and fifty-two, one hundred and seven among the resident and forty-five among the non-resident population. The resident population estimated at 9,744, would give a resident death-rate of 10.98 per 1,000.

In the annexed district (annexed to Asbury Park May 15, 1906) which district contains about four hundred and fifty acres, about three-fourths of which was in a primitive sanitary state until April 1, 1908, when a sewer system for said district was completed, and since which time about six hundred and seventy properties have been connected thereto, and which contains a resident population of approximately five thousand, sixty-eight deaths occurred. In the old district of Asbury Park, but thirty-four deaths occurred among the resident population, which is one more than for the preceding year, and about normal for several years past.

TABLE SHOWING THE NUMBER OF DEATHS OCCURRING IN ASBURY PARK AMONG THE RESIDENT AND NON-RESIDENT POPULATION EACH YEAR, 1881 EXCEPTED, FOR THE PAST TWENTY-NINE YEARS.

YEAR.	Resident population†.	DEATHS.			Resident death-rate per 1,000 population.
		Resident.	Non-resident.	Total.	
1880.....	1,640	19	13	32	11.58
1882.....	1,784	30	18	48	16.81
1883.....	1,856	18	12	30	9.69
1884.....	1,928	24	15	39	12.44
1885.....	2,000	20	14	34	10.00
1886.....	2,125	21	23	44	9.88
1887.....	2,250	20	29	49	8.88
1888.....	2,375	16	18	34	6.73
1889.....	2,500	28	28	56	11.20
1890.....	2,625	32	39	71	12.19
1891.....	2,750	34	28	62	13.36
1892.....	2,875	35	24	59	12.17
1893.....	3,000	30	19	49	10.00
1894.....	3,380	40	21	61	11.86
1895.....	3,761	39	17	56	10.36
1896.....	3,838	34	25	59	8.85
1897.....	3,916	43	19	62	10.98
1898.....	3,993	28	13	41	7.01
1899.....	4,071	37	22	59	9.08
1900.....	4,148	36	22	58	8.67
1901.....	4,223	37	21	58	8.76
1902.....	4,298	32	19	51	7.44
1903.....	4,374	36	13	49	8.22
1904.....	4,450	47	12	59	10.55
1905.....	4,526	26	25	51	5.75
1906.....	*4,602	*46	*25	*71	*10.00
1907.....	9,604	114	27	141	11.87
1908.....	9,744	107	45	152	10.98

†Resident population estimated except for years 1880, 1895, 1900, 1905 and 1907.

\*Does not include district annexed May 15, 1906.

Fifty-seven cases of infectious diseases have been reported to the Board of Health during the year as follows:

Diphtheria.....	5
Scarlet fever.....	23
Typhoid fever.....	12
Measles.....	14
Tuberculosis.....	3

## DIPHTHERIA.

Five cases of diphtheria occurred in four different families, in three of which the infection was from outside of Asbury Park, the fourth was contracted from one of the patients before the nature of the disease was recognized. The Board furnished diphtheria antitoxin free of charge to two of these families who are poor, for all persons affected and also for well persons coming in contact with the patients for immunizing them against the disease. The Board later voted to, in the future, furnish diphtheria antitoxin free of charge to any indigent person when needed.

## SCARLET FEVER.

The twenty-three cases of scarlet fever reported is considerably greater than the average and occurred between Oct. 28, 1907, and May 31, 1908. In four of the cases the infection was undoubtedly from outside the city; in five from other members of the family, and in the remaining fourteen cases the sources of infection could not be traced. It would seem that cases of scarlet fever in a mild and unrecognized form existed in the city from Feb. 1st to April 15th. The cases appeared in different schools and no link could be found connecting one with the other. It was thought that the public schools might be the place where the disease was contracted, as the schools were greatly crowded, due to the great increase in the number of pupils from the recently annexed district and the inadequate facilities pending the construction of the new school buildings, but the cases were in different classes, different grades and in different buildings. The Sunday-schools did not seem to be responsible, as no two cases occurred among children attending the same school. But one case of scarlet fever proved fatal and the majority of the cases were of an exceedingly mild form.

## TYPHOID FEVER.

The twelve cases of typhoid fever were scattered through the year, seven of which were infected outside of Asbury Park. In one case five members of the family were subsequently infected by contact. Three of the cases proved fatal.

## MEASLES.

Fourteen cases of measles were scattered through the year, all of which were contracted outside of Asbury Park.

## TUBERCULOSIS.

The Board sent out communications to physicians of the city calling their attention to an ordinance of the Board requiring that cases of tuberculosis be reported to the Board, resulting in three cases having been reported. This no doubt is a very small percentage of the existing cases in this city. It is the intention of the Board in the future to enforce the reporting of this disease by physicians, and to instruct infected persons in preventative measures against the spread of the disease.

One hundred and five specimens of diseased tissues were sent during the year through this Department to the State Laboratory for examination.



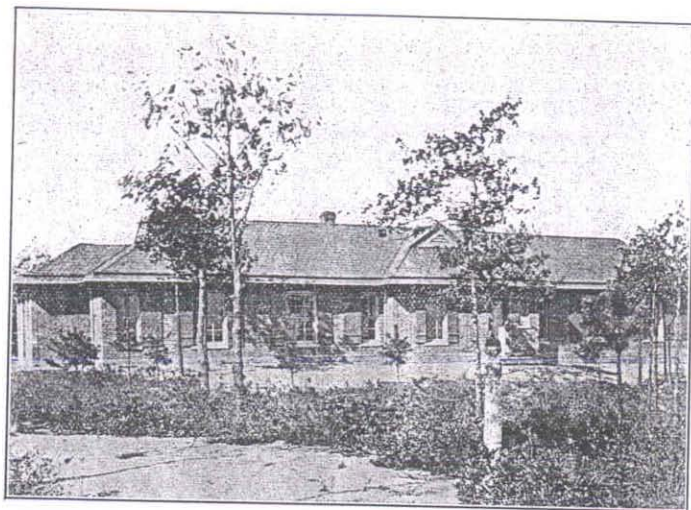
TABLE SHOWING THE NUMBER OF REPORTED CASES OF INFECTIOUS DISEASES IN ASBURY PARK, AND DEATHS OCCURRING THEREFROM, DURING THE PAST TWENTY-FOUR YEARS.

YEARS.	Resident population (estimated except for census years).	NUMBER OF CASES REPORTED.					DEATHS.						
		Measles	Scarlet fever	Diphtheria	Typhoid fever	Consumption	Smallpox	Measles	Scarlet fever	Diphtheria	Typhoid fever	Consumption	Smallpox
1885.	3,000	14	3	1				2	1			2	
1886.	3,125	4	9									5	
1887.	3,250	82	7	1					4			2	
1888.	3,375		20	1								3	
1889.	3,500	10	3									4	
1890.	3,625		16	6				1	3			4	
1891.	3,750	1	6									5	
1892.	3,875	36	4	1				1	3	1		3	
1893.	4,000		7	2					1			2	
1894.	4,125		7	1					1	5		1	
1895.	4,250		6	5					3	1		2	
1896.	4,375	39	3						1				
1897.	4,500	5	14	15				1		1		1	
1898.	4,625	5	3									3	
1899.	4,750	4	6	2								4	
1900.	4,875	20	4	4					1			5	
1901.	5,000	6	29	12					1	1		7	
1902.	5,125	17	2	3					1			4	
1903.	5,250	30	1	5								2	
1904.	5,375	120	3	1								8	
1905.	5,500	9	10	7					1			1	
1906.	5,625	31	6	16					1	2		10	
1907.	5,750	3	7	4					1			10	
1908.	5,875	14	23	5					1	1		3	
Totals.		463	187	109	59	8	11	1	10	29	10	107	1

It was not found necessary to remove any of the cases of infectious diseases to the Municipal Hospital during the year, satisfactory quarantine being maintained in the homes of the patients.

A new hospital pavilion for scarlet fever has been constructed during the year at a cost of \$6,000.00. It is of brick construction, containing two wards, for six beds each, six rooms for one bed each, bath room and kitchen. The plumbing and heating are now being installed and the ladies of the Present Day Club intend to provide the furnishings at an early date. This Club furnished \$2,000.00 toward the construction of this building, the city furnishing the balance. The city now owns two hospital buildings, one for diphtheria and one for scarlet fever, located about one thousand feet apart, making it unnecessary to quarantine persons affected by one of the diseases with a person affected by the other and removing any possibility of patients affected by either diphtheria or scarlet fever contracting the other diseases by reason of the Board removing such a person to the hospital.

The ladies of the Present Day Club of Asbury Park in addition to furnishing \$2,000.00 of the money needed for the new hospital pavilion supplied all the funds for the erection of the diphtheria pavilion, including furnishings, and the caretaker's cottage.



DIPHtheria PAVILION.



NEW SCARLET FEVER PAVILION.

## WELLS.

Seventy-four wells on private premises have been closed during the year. The connecting of premises with the new sewer system has been responsible for the closing of many of the wells, and the Board has required all wells found to have visible sources of pollution, or which upon analysis of its water was found to be polluted, to be closed.

## ICE.

The Board again had considerable trouble in excluding ice harvested from Alberta Lake located in Neptune Township. The Ice Company was persistent in selling this ice claiming the Board could not exclude it under the existing laws, but when the Board notified them to appear before the Board and show cause why it should not be declared to be dangerous to health, and after some publicity, the Company stopped the sale of said ice in Asbury Park.

## WATER SUPPLY.

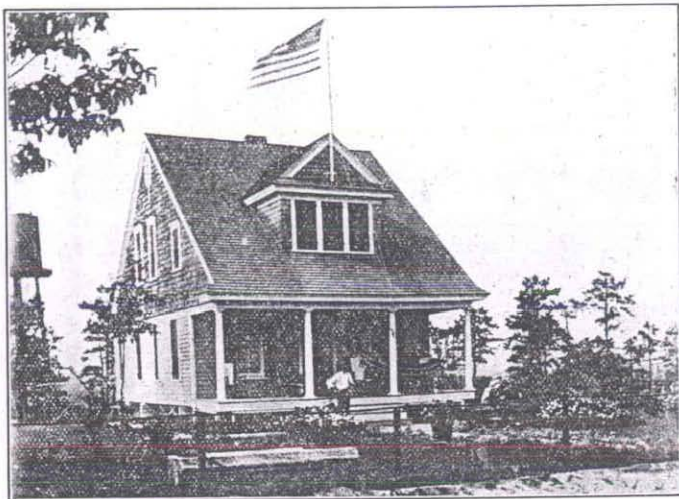
No change has been made during the year in the water supply of Asbury Park. The entire eastern half and the northwestern section of the city is supplied with water from deep artesian wells owned and operated by the city. The balance of the city is supplied with water by the East Jersey Coast Water Co. This Company during the year drove a well five hundred and eighty-eight feet deep, six inches diameter at the bottom, which is a flowing well. They estimate the amount of water obtained from this well to be about twenty-five per cent, and that obtained from Kisners' Pond at seventy-five per cent. The Company obtained its entire supply of water from said well and pond excepting about six weeks in the summer season when its supply was supplemented by water from artesian wells located at another plant owned by them.

## PRIVY VAULTS.

Three hundred and six privy vaults have been removed during the year. The new sewer system was completed in the annexed district about April 1st, since which time six hundred and seventy-three properties have been connected thereto. The Board voted to notify every owner of a property along the lines of the sewer system to connect their property to said sewer system within thirty days, with the result that more than one-half of the number of properties in said annexed district have been connected to said sewer system. The Board is determined that all properties in the city not connected with the sewer system shall be connected thereto at an early date. The inspecting and testing of plumbing work has formed a very important part of the work of the Board during the part of the year since April 1st, and it necessitated the appointment of an additional inspector. It being a recognized fact among sanitarians that plumbing has no direct part in the dissemination of diseases nor direct bearing upon health it would seem that it should be taken out of the hands of health departments and be placed under building departments, thus giving health officials more time for work more deserving of their time and attention.

## GARBAGE AND RUBBISH.

A new contract for the collection, removal and disposal of garbage, dead animals, rubbish and ashes was awarded and went into effect June 15, 1908. The same contractor who did the work during the period from 1898 to 1905 was the successful bidder. He has performed his work in an excellent manner and the efficiency of the service has been greatly increased over that of any former year. A change was made in the collection of rubbish, it now being removed from the rear of premises by the contractor, instead of from the street curb, and, the garbage being removed from the rear of premises,



CARETAKER'S COTTAGE.



Of the five hundred and ninety-five citizens' complaints received, not including those against the garbage service, just cause was found to exist in four hundred and eighty-seven. Of this number of two hundred and twelve were for the removal of dead animals which are in reality but reports. By eliminating these it would leave but two hundred and seventy-five just complaints received from citizens during the year. Of the three hundred and ninety-five complaints against the garbage service just cause was found to exist in all but sixty-eight.

TABLE SHOWING THE NUMBER OF WRITTEN PERMITS ISSUED DURING THE YEAR, BY MONTHS.

Months	Certificate of approval of plumbing plans	Subsurface drainage	Constructing stable manure receptacles	To scavengers	For collecting butcher's offal and fat	Burial and transit	Transit, local	For collecting garbage from private premises	To return to public school after infectious diseases	Totals
1907										
October	17			32		17				68
November	12	1	3	23		14				56
December	14			11		6				33
1908										
January	24	1		30		11	2		2	70
February	22	1		12		13	1	1		50
March	35	3		19		4				74
April	101	32	2	33		10	4			186
May	92	27		48		10	4		5	244
June	111	39		76	1	8		3		260
July	100	63		73		14		2		246
August	129	41	3	43		23				246
September	104	35		45		22				209
Totals	781	248	6	445	1	152	47	5	14	1,682

OFFICE AND INSPECTION WORK.

	1907	1908
Number of violations of health ordinances reported by inspectors during the year	2,093	2,371
Number of reinspections of premises after notice to abate nuisance had been sent	1,229	1,243
Number of citizens' complaints investigated	1,083	991
Number of written orders sent to abate nuisances	935	1,713
Number of cases in which notice to abate nuisances were known to have been complied with without further action	331	535
Number of cases referred to the Board with request for instruction	60	101
Number of written communications sent from office	1,431	2,228
Number of inspections made of plumbing work under construction	732	2,802
Number of air pressure tests applied to plumbing work under construction	200	765
Number of smoke tests applied to plumbing work	131	297
Number of notices for minor alterations and repairs in plumbing work, filed by plumbers, and inspections made	84	68
Number of plumbing plans approved	214	760

Number of special inspections of plumbing fixtures in dwellings and records made of same	338	532
Number of sanitary records and diagrams of properties made	484	487
Number of specimens sent to State Bacteriological Laboratory and replies received through this office	123	105
Number of disinfections performed in dwellings	15	26

Our Attorney writes as follows:

"Board of Health of the City of Asbury Park.

GENTLEMEN—I beg to briefly present for your consideration some of the matters which have come under my supervision from your Board during the past year.

The necessity for adequate legislation regarding the control of the sale and delivery of ice by Health Boards was recognized by your body last winter, and acting under your instructions I prepared a suitable bill for enactment by the Legislature. This bill authorized Health Boards to enact an ordinance requiring persons selling or delivering ice in cities, to obtain a permit from such Boards, and empowering the Boards to impose severe penalties for the violation of said ordinance. The Legislature did not see fit to enact a law of this character last winter. The reason of this failure has not been disclosed. There certainly can be no merit in withholding suitable legislation of the above character from Health Boards. I suggest that the effort to obtain the enactment of such a law be renewed the coming winter when the Legislature convenes.

There is already legislation in this State giving certain powers to Health Boards on this subject, but they are inadequate and the law covering same is questionable as to its legality.

Last summer drastic measures were instituted by your Board for the prevention of ice of a doubtful quality being sold and delivered in this city, and results were obtained that were quite satisfactory. From the proceedings taken I am confident that impure ice was excluded from this city the past season.

In each instance where suit has been brought by your Board for a violation of its ordinances the past year, judgments have been rendered in favor of the Board, excepting in one case, that of the Board of Health against the New York and Long Branch Railroad for a violation of the plumbing ordinance, in which it was decided by the Court of Common Pleas in this county, that suits for a violation of the ordinances of your Board must be brought in the name of the City of Asbury Park. This ruling, which was quite unexpected and novel was in my judgment erroneous and I have carried this case to the Supreme Court for a final decision on this point.

There has been no adverse decision, however, against your Board in any case brought where the merits were involved. The action of your Inspectors has been invariably sustained by the Courts, and I desire to place on record my appreciation of their efforts and of the assistance they have rendered in the prosecution and trial of your suits.

It is my opinion from actual experience in prosecuting your suits that there has been much less disregard on the part of the public regarding the enforcement of your ordinances this past year than any other year. This is due undoubtedly to a growing belief on the part of the public that any violation of your Health ordinances in this city will meet with prompt and strenuous prosecution.

Yours very truly,

SAMUEL A. PATTERSON."



Orange—The Secretary, Mr. Selskar M. Gunn, writes in part as follows:

As I find the enclosed blank is not sufficiently large to fill in a record, I am writing this supplementary letter.

With regard to question 6 dealing with house to house inspection, we have done but very little of this. However, I expect to have appointed another Sanitary Inspector in the course of a few weeks, who will devote a considerable amount of his time to house to house inspection. A card index will be used, and a separate card filed for each inspection. I will send you a copy later.

With regard to tuberculosis, we are planning a strong campaign this fall and winter, and have passed ordinances requiring fumigation after death or removal of all cases, and prohibiting expectoration on pavements and public places. We are making arrangements with the Hatters Union and Hat Manufacturers Association to be given hearings before their bodies in order to point out to them the extreme prevalence of this disease among the hatters, and indicate simple methods of prevention. I hope that the house to house inspection that is to be started will also tend to alleviate insanitary condition in the home. I am distributing free of charge to all who desire them, sanitary sputum cups, for both street and house use. The doctors are reporting cases of tuberculosis quite satisfactorily. It is the constant aim of this Board to establish good relations with the physicians. I enclose a circular letter (a) sent to the doctors, the main part of it re. tuberculosis will give you an idea as to what we do with cases of this disease when reported.

Circulars on this disease which will be distributed throughout the city, and printed in both English and Italian, are at present being prepared. A special circular is being prepared for distribution to the hatters. The Board of Health is going to co-operate very heartily with the Anti-Tuberculosis Committee of the Oranges, and we anticipate making some kind of a showing as a result of our labor.

Circulars on flies and mosquitoes were distributed throughout the city during the summer, and apparently were of value. It is proposed, however, to have a special inspection made during the winter, of all stables, and see that all persons obey the Sanitary and Plumbing Code with regard to the care of manure, so that at the next fly season we may be adequately protected.

The mosquitoes have not been very bad, although they have been worse than they were during the past few years, this seems to be general all over this section of the State. I am inclined to believe, however, that most of our mosquitoes are local, I saw very few salt marsh mosquitoes and no anopheles. Again we anticipate house to house inspection of being of value in the eradication of this insect pest.

A start has been made to inspect all the farms and dairies which supply Orange with milk. Each dairy is scored, but a sufficient amount of work has not yet been done to give a very good idea of our milk supply. However, from the analytical point of view both chemical and bacteriological, our supply seems to be quite good, and our infant mortality not excessive. The enclosed letter marked (b) was sent to all milkmen earlier in the season.

I have been very anxious to introduce the use of paper milk bottles in houses where certain contagious diseases are prevalent. Unfortunately, however, I have been unable to obtain the bottles in anything like sufficient quantities, but from the small experience that I have had, I am fully determined as to the value of these bottles.

With regard to the schools, as yet no medical inspection has been established. The Board of Education, however, employ two nurses who devote their entire time to the schools, and they serve a very useful purpose. Of course, a more thorough medical inspection is to be desired, and I think that we will get it in the future.

Our death-rate was 19.08 for 1907, a decrease of over 1 from 1906. It must be remembered, however, that the crude death-rate in Orange includes the deaths of a considerable number of non-residents, who are brought into our hospitals.

Card catalogues of all nuisances and complaints, milk inspections, contagious diseases, etc., have been introduced. A house register which shows every case of tuberculosis in the city for the past 10 years has been completed, and is of considerable use in permitting us to study the various foci in the city.

A complete inspection of our water-shed was made, and certain recommendations suggested. Mr. Fowler, of the Division of Sewage and Water Supplies, of the State Board of Health, also made an inspection with me, and I understand that certain parties who were polluting the water-shed have been ordered to cease. However, I think surface water such as we use nothing short of proper scientific filtration will adequately safe guard the city, and agitation along this line is being started by me.

Considerable use is made of the press to disseminate sanitary knowledge, and I believe that the general public is more cognizant of our work now than they have ever been in the past, and we hope that with the improvement of our milk supply, house conditions and efforts against tuberculosis, that the future of the city from the health point of view will be better than it has been in the past.

Yours respectfully,

SELSKAR M. GUNN,  
Health Officer.

Oct. 5, 1908.

DEAR DOCTOR—At the request of the Board of Education we are going to put measles on the list of reportable diseases in Orange. The real purpose of this is so that we can notify the Board of Education of cases, so that they can exclude the other pupils who live in the same house from school.

I enclose a copy of some new supplements to the Sanitary and Plumbing Code. I would particularly draw your attention to section No. 1, requiring disinfection after the removal of tuberculous patients. If you know of any house or rooms in houses where disinfection should be carried out, if you will telephone to this office it will have our immediate attention, and notifications of removal of patients will also be considered a favor. Every house in which a death from tuberculosis takes place will be fumigated by this Board in the future.

You may not be aware that this Board is willing to distribute free of charge sputum cups for both house and street use, to tuberculous patients who are unable to pay for the same; all that is necessary is for the physician to write a note to this Board, requesting that the patient be supplied, and it will be attended to.

The Board of Health is also willing to distribute circulars and supply a visiting nurse wherever the physician considers it of value.

The reporting of all cases of tuberculosis as required by law, is one of the essential things, and of course is treated confidentially, and nothing will be done in the way of visiting the patient and supplying literature, information, etc., if the physician signifies that it is unnecessary or inadvisable, and assures us that all precautions to prevent the spread of the disease are being taken.

We hope to make a strenuous campaign against tuberculosis this fall, and we realize that without the co-operation and assistance of the medical profession in the Oranges we can expect but little success.

If you are in need of any cards to report cases of contagious diseases, will you either write or telephone, and I will see that you are supplied at once.

Thanking you for your past co-operation, and hoping that it will be continued, believe me,

Yours very truly,

SELSKAR M. GUNN,  
Health Officer.

DEAR SIR—With the advent of hot weather the importance of a clean milk supply becomes very prominent. It is a well recognized fact that clean milk goes hand in hand with a low infant death-rate, and not only are there less deaths among children, but also less sickness.

We are sending this circular letter to impress this point, so that you can take every precaution in the production and handling of milk, that you sell in the city of Orange.

A few words with regard to the significance of bacteria of milk may be of value. Ordinary cow's milk as it flows from the udder contains a very few organisms, but unless scrupulous care is taken keep to the barn clean, the animals free from manure, the utensils used in collecting the milk thoroughly cleaned out with hot water, and the same process used for the bottles, and the milk kept at a low temperature (at least 50 degrees Fahrenheit or less), it is impossible to produce a milk with a low bacteriological content, that is *Clean Milk*.

Will you not assist the Board of Health in an effort to save the lives of some of our children? The Board of Health is always anxious and willing to help the producers and handlers of milk by making suggestions which will improve the quality of this important article of food, and if you wish any advice you may be sure that the Board of Health will give it to you, to the best of their ability, if you ask for it.

We propose visiting the farms some time during the summer months, but as it is impossible at the present time to do this and see you personally, we take this opportunity of writing to you, and feel certain that you will do all in your power to produce and keep clean, pure, wholesome milk.

Yours respectfully,

SELSKAR M. GUNN,  
Health Officer.

Montclair—Health Officer, Mr. C. H. Wells, reports work of the board during the year as follows:

The year ending Sept. 30, 1908, has been noteworthy on account of the small number of deaths from communicable diseases. There were no deaths from scarlet fever, diphtheria or whooping cough, and there was but one death each from typhoid fever and measles. This is the second successive year during which there has not been a death from diphtheria.

Compared with the two previous years the deaths from communicable diseases were as follows (year ending Sept. 30):

	1906	1907	1908
Tuberculosis of lungs.....	27	24	15
Pneumonia.....	23	20	31
Scarlet fever.....	5	1	0
Whooping cough.....	4	6	0
Diphtheria.....	3	0	0
Typhoid fever.....	2	1	1
Measles.....	2	1	1
Erysipelas.....	1	2	2

The number of cases of the more important communicable diseases were as follows (year ending Sept. 30):

	1906	1907	1908
Scarlet fever.....	113	38	34
Diphtheria.....	51	32	14
Typhoid fever.....	18	22	22
Tuberculosis.....	14	34	27
Smallpox.....	2	0	0

One of the cases of diphtheria and four of the cases of scarlet fever were cared for at the expense of the town. Diphtheria antitoxin has been furnished free to all patients who would otherwise be without this treatment. It has also been furnished free in immunizing doses.

There were 258 deaths during the year. This corresponds with a death-rate of 14.58 per 1,000 inhabitants, based upon an estimated mid-year population of 17,700. If the deaths of 49 non-residents at the hospitals be deducted the corrected death-rate is 11.81. The number of resident deaths under 5 years of age was 52, or 24.9 per cent. of the total. This corresponds with a rate of 294 per 100,000 of population. The infant mortality rate, or the number of deaths under one year of age per 1,000 births during the year was 97. There were but six deaths from enteritis in children under two years of age.

It may be of interest to note that we have a case pending before the State Supreme Court to determine our power to require the tuberculin test of all dairy cows that supply the town with milk.

The routine work of the Board is outlined in detail in our annual reports.

TUBERCULOSIS BLANK.

Street..... Date.....

Name..... Reported by.....

How long in Montclair..... Sick before coming to M.....

Age..... Occupation..... Where employed.....

How many persons in family..... Ages of children.....

Is case advanced..... How long sick.....

What is done with expectation.....

Does patient know he has tuberculosis.....

Are other persons sleeping in same room with patient.....

Are public library books used by patient.....

Does physician request this Board not to visit the case.....

If so, does physician certify that all precautions are being observed.....

Are there other cases in family.....

Remarks.....

Englewood—Secretary, Mr. Alfred Hopkins, reports as follows:

*Report on Tuberculosis Class*—During the early spring of this year a class was formed under the direction of the Emergency Committee of the Stony Wold Auxiliary to aid and instruct patients. This was organized by Miss Steen, a professional nurse employed in town as District Nurse by the institutional work of the Nurses' Committee of the local Presbyterian church. Quarters were secured. Dr. Edwin Holmes, and in his absence, Dr. J. Finley Bell, meet with the patients once a week to examine and advise. Usually there were seven or nine attending the class. This fall the committee hope to reorganize as a branch of the N. J. Society for the Prevention of Tuberculosis, and hope to secure sufficient support to have a daily class to provide diet and also medicine.

## REPORT OF MEDICAL INSPECTION IN ENGLEWOOD PUBLIC SCHOOLS, 1907-08.

DR. E. C. HEUF, M. D., MEDICAL INSPECTOR.

	Number of pupils examined	Number of pupils sent home.	Cases of contagious diseases.	Visits by Medical Inspector.
October.....	19	4	10	25
November..	15	2	10	24
December ..	9	2	15	22
January.....	10	1	27	24
February..	75	0	25	27
March.....	100	2	3	23
April.....	12	1	1	20
May.....	20	0	31	24
June.....	50	3	4	23
	310	15	†126	††212

†Measles, scarlet fever, diphtheria, whooping-cough, mumps and chicken-pox.  
 ††Five schools.

There was an epidemic of measles in Highwood school during January and February, and in Franklin school during May.

Beginning with February the Medical Inspectors made a physical examination of about 200 pupils who were reported by their teachers as probably having some physical defect. When such was found the parents were so notified.

## Legal Decisions and Opinions.

## ADULTERATED MILK MAY STILL BE CONFISCATED.

Although certain sections of the vice and immorality act have been declared unconstitutional, it is interesting to know that the State Board of Health still has the power under this act to confiscate adulterated milk and cream.

Justice Alfred Reed filed an opinion in the Supreme Court of New Jersey on July 17, 1908, declaring that three sections of the vice and immorality act are unconstitutional. The decision was given in the case of Joseph Berry and Thomas E. Ackley, of Salem County, against R. T. Demaris, constable of that county. As a constable Demaris confiscated a large quantity of ice cream, candies and other commodities to Berry and Ackley on the ground that they operated a booth illegally within three miles of the Pitman Grove camp meeting. After the confiscation the accused brought suit against the constable, charging that he acted illegally and without authority. The case was in reality a test, and the decision is of interest in all parts of New Jersey. In his opinion Justice Reed says that the three sections of the act mentioned, under which Demaris acted, are not in accordance with the constitution. The Justice does not believe the Legislature has the power of permitting the confiscation of goods without judicial action. The Court believes the constable should be authorized to confiscate goods by a judicial body of some kind. In this case the justice believes the property seized should have been advertised for a reasonable length of time before disposition of it had been made.

The secretary called the Attorney-General's attention to this case, and received the following communication from the Assistant Attorney-General:

*Dr. Bruce S. Keator, Sec. State Board of Health, Trenton, N. J.*

DEAR SIR—I have your letter of the 28th, requesting advice upon the opinion of Justice Reed in the case of Berry, *et al.*, vs. Demaris, in which sections 10, 11 and 12 of the vice and immorality act are declared unconstitutional, with particular reference to the operation of this opinion upon section 25 of chapter 217 of the laws of 1907, authorizing your Inspectors to condemn milk and cream and pour the same out upon the ground.

I have obtained a copy of the opinion, and reading the same carefully, conclude that there is nothing in this opinion or decision which interferes in any way with the section of your health laws referred to. The opinion distinguishes between the police power of the State, which is sufficient to destroy any property which is per se a nuisance, and the necessity for hearing and judicial forfeiture of property which, not per se a nuisance, may become so by reason of its use, and in the opinion Mr. Justice Reed distinctly distinguishes the power of the Board of Health to seize and destroy, without judicial determination, milk found to be below the determined standard.

I return your memorandum herewith.

Very truly yours,

NELSON B. GASKILL,

Assistant Attorney-General."

## CITIES MAY STOP SMOKE NUISANCES.

The right of cities to pass anti-smoke ordinances to abate smoke nuisances has been upheld in an opinion handed down by the Court of Errors and Appeals in the case of Atlantic City against Adam W. France. France, who was manager of an ice company, was convicted of maintaining a smoke nuisance, the conviction having been obtained under the Atlantic City smoke ordinance. France appealed and now the conviction has been sustained by the Court of last resort. The opinion which is by Justice Bergen says:

The plaintiff in error was convicted under an ordinance of Atlantic City, of being "the manager of an ice plant within the limits of Atlantic City, to which was attached a smoke-stack connected with a furnace, which smoke-stack, on the day and days aforesaid, emitted dense smoke, which contained soot in sufficient quantity to permit the deposit of such soot on a surface within the limits of Atlantic City, as set forth in the complaint." The proceedings and conviction were removed to the Supreme Court by certiorari, where the judgment was affirmed, and the judgment of the Supreme Court is now here for review.

The reasons filed in the Court below to which the attention of this Court was directed are as follows:

First. That the city was without power to pass such an ordinance. We think that section 15 (P. L. 1902, p. 296), which empowers a City Council to adopt such ordinances "as they may deem necessary and proper for the good government, order, protection of persons and property, and for the preservation of the public health and prosperity of such city and its inhabitants," is sufficiently broad and comprehensive to sustain an ordinance directed to the suppression of such use of a smokestack as causes to be emitted therefrom smoke containing soot in sufficient quantities to create a nuisance when deposited within the limits of Atlantic City. It would be impossible to define in an ordinance the density of the smoke, the quantity of soot to be deposited or the precise effect required in each case, to constitute a nuisance; but we think that the creation and emission of dense smoke, containing soot in sufficient quantities to fall upon the surface of the city to the injury of persons, property, and the public health, is a wrong which the powers granted to the city authorizes it to suppress, if such a condition would be a nuisance at common law. We are also of opinion that, while the ordinance is somewhat broad in its terms, its application must be limited to smoke of such character as invades the rights of persons and property, or affects injuriously the public health of the inhabitants of the city, that being the extent of the powers granted, and that before a conviction under it can be lawfully had, such invasion and injury must be shown; for whether in a given case the quantity of dense smoke emitted, soot deposited, and the result therefrom, is an invasion of rights and property, or injurious to health, can only be conclusively determined by a Court having jurisdiction over such matters. *Huttonos Camden*, 39 N. J. Law, 122-130, 23 Am. Rep. 203. The present case shows that the property of the complainant was injured by the dense smoke and soot emitted from defendant's smokestack.

Second. That the city has no power to adjudge, as a nuisance, the emission of smoke, and therefore the ordinance was unreasonable and void. The emission of smoke alone is not what the ordinance is aimed at, but of smoke containing soot, or other substances, in sufficient quantities to permit of their being deposited on the surface of the city, and which, when deposited on the property of a citizen in sufficient quantity to damage and annoy him, thereby becomes intrinsically such a nuisance as the Common Council has a right to prevent and suppress under its general powers. "The authority to preserve the health and safety of the inhabitants and their property, as well as the authority to prevent and abate nuisances, is a sufficient foundation for ordinances to suppress and prohibit whatever is intrinsically and inevitably a nuisance." 1 Dill. Mun. Corp. N. 379.

Third. That the ordinance is unconstitutional, because it deprives the defendant of his property without due process of law. Laws and ordinances, relating to the comfort, health, and good government of the inhabitants of a city, are ordinarily described as "police regulations," and, though they may disturb the full enjoyment of a personal right, are constitutional, notwithstanding they do not provide compensation therefor; for they do not appropriate private property for public use, but merely regulate its enjoyment by the owner, who is supposed to be compensated by sharing in the benefits which such regulations are intended to secure. He holds his property subject to the restriction that he must so use it as not to injure another, and an ordinance which so controls his use of it that it shall not prove injurious to his neighbor, or the inhabitants generally of the municipality, is not a taking of his property without compensation.

Fourth. That the complaint does not show that the prosecutor had any control over the plant or building. The ordinance is directed against the owner, agent, manager, lessee, or occupant of any building, etc. The complaint charges that the prosecutor was the owner and manager of the building. This we think is sufficient to charge that he had the control of the building. An allegation of ownership and management clearly implies control.

Fifth. That the conviction does not show that the prosecutor had any control over the building, and that there was no finding of fact that the soot was deposited on any surface within the limits of Atlantic City. The finding is that the prosecutor was the manager. This is sufficient to bring him within the class described in the ordinance, and the judgment further declares that the smokestack emitted dense smoke containing soot in sufficient quantities to permit the deposit thereof within the limits of Atlantic City. This finding is all that the ordinance requires, and the evidence shown was based upon proof of injury to property. This disposed of all the reasons assigned which were argued.

The judgment of the Supreme Court will be affirmed.

## APPOINTMENTS OF MEMBERS OF LOCAL BOARDS OF HEALTH.

Inquiries as to the proper methods of appointments of members of local Boards of Health are frequently made of the State Board of Health. As an illustration, and for the benefit of those who are not familiar with the law, the following opinion of Assistant Attorney-General, Nelson B. Gaskill, in the case is given:

TRENTON, N. J., June 8, 1908.

*Dr. Bruce S. Keator, Sec. State Board of Health, Trenton, N. J.*

DEAR SIR—Your letter of the 4th, enclosing communication from Robert Biddle, of Riverton, New Jersey, requesting information in regard to the appointment of members of local Boards of Health, has been duly received, and in reply thereto I beg to advise that the appointment of members of the local Boards of Health should be made in the following manner:

The second section of the act of 1887, constituting the State and local Boards of Health, beginning with paragraph 9, has been repealed in part by the revised borough law of 1897 (P. L. 1897, p. 285), in particular with reference to the manner of choosing the officers of such local Boards. The health law provides in section nine that the local Board of Health shall be composed of not less than five nor more than seven members, to be appointed and to hold their respective offices for such terms, not exceeding four years, as the Common Council or other governing body may, by ordinance, provide. The borough law provides—

"and so many other officers as may be deemed necessary by the said Council, who shall perform such duties as are or may be provided for by law, or ordinance of said Council, not in conflict with law. All of said officers, except



the Borough Attorney and Borough Engineer, shall be residents of the borough, and said officers shall hold office during the pleasure of the Council, provided that no officer shall be removed without giving him opportunity to be heard. Unless sooner removed, however, they shall hold office for one year and until their successors shall have qualified \* \* \*. The Mayor shall nominate, and with the advice and consent of the Council, shall appoint, all officers in this act directed to be appointed."

It results from this that the local Council or governing body must, by ordinance, provide for the appointment of a certain number, not less than five, nor more than seven members, residents of the borough, to compose the local Board of Health, to hold office for one year and until their successors shall have qualified. Following the passage of such ordinance, the Mayor nominates, and with the advice and consent of the Council, appoints such nominees as members of the Board of Health of his municipality. This does not affect Boards of Health in townships nor in cities, applying only to boroughs. The powers of the Board of Health after appointment, are then those prescribed by the act of 1887, and such other powers, not in conflict therewith, as may be delegated to it by the local Council, which has power, under the 28th section of the borough law, "to provide for the maintenance of the health of the borough."

It appears from this, therefore, that the present ordinance of the Borough of Riverton, regarding a three-quarter vote of such Council to elect members of the Board of Health, is in conflict with the borough law, and the Board of Health should be properly constituted as herein set out.

As you request I return Mr. Biddle's letter herewith.

Very truly yours,

NELSON B. GASKILL,

*Assistant Attorney-General.*

#### HOW TO SUPPRESS NUISANCES.

Frequently requests come to the State Board of Health from different parts of the State, asking the Board to suppress various kinds of nuisances. It is only, however, where it can be proven that the nuisance complained of affects the public health, or causes sickness, that the State Board can satisfactorily take action. As an illustration resolutions, relative to an alleged smoke nuisance caused by the burning of soft coal by the Erie Railroad Company, adopted at a meeting of a thousand citizens of Jersey City, were forwarded to the Board.

These resolutions, together with a similar set of resolutions, relative to the Pennsylvania Railroad Company, were sent to the Attorney General, asking his advice in the matter, and the following reply was received:

TRENTON, N. J., June 8, 1908.

*Dr. Bruce S. Keator, Sec. State Board of Health, Trenton, N. J.*

DEAR SIR—I have your letter of June 5, with communication forwarded to you by Charles P. Olwell, of Jersey City, in reference to the nuisance caused by the use of soft coal by the Erie Railroad of that city, and you ask to be advised as to the power, if any, of the State Board of Health to abate this nuisance or nuisances of similar character.

I am referred also to a communication, dated June 24, 1897, addressed to Dr. Henry Mitchell, Secretary of the State Board of Health, containing an opinion of Charles L. Corbin upon a similar question, which is, in my judgment, a correct and accurate statement of the powers of your Board in cases similar to that now stated. He says:

"Anyone whose property is injured by the nuisance can bring suit at law for damages and can renew such suit from time to time and recover such damages as he can show he has sustained. He may also, on establishing that the nuisance does injury to his property, procure an injunction from

the Court of Chancery. Those who are not injured in their property, but who are annoyed by the nuisance, have no personal action, but their remedy is to apply to the Grand Jury for an indictment. If a number of persons annoyed by the nuisance would join and collect proof and bring it to the attention of the Grand Jury, and thereby procure an indictment and conviction, it would abate the nuisance more quickly than any other remedy. Complaints could be renewed from time to time and indictment after indictment found, and the acquittal of the parties on one indictment would not prevent their conviction on another, for a continuing nuisance. There remains the remedy through the action of the State Board of Health. This is a narrower remedy than those referred to, for the reason that it is not enough to show that there is a nuisance, and that there are noisome smells. The Board of Health has no jurisdiction unless it can be shown that the nuisance is to a substantial extent injurious to public health. Should the parties complaining of this nuisance be able to collect and bring to the Board satisfactory evidence that in a number of specified cases it can be established that the health of individuals named has suffered from the nuisance, and that it is likely to continue to cause injury to health, it would then be competent for the State Board to take action by bill for injunction, on default of the local Board. But it ought not to be overlooked that the proof in the enforcement of this remedy will be more difficult than that required for the other remedies referred to. A serious nuisance might be shown by reason of offensive odors, and this would be sufficient proof to warrant an indictment or a suit at law or in equity by a citizen especially injured. The State Board must further prove danger to public health."

This is such a clear and succinct statement of your power that I shall not attempt to improve upon it. I see nothing in the resolutions enclosed to me to warrant the inference that the public health has been affected, or that the petitioners are suffering anything further than mere inconvenience, or those particular classes of nuisances which are only to be abated by the action of individual citizens. Unless it can be shown by satisfactory evidence that in a number of specified cases the health of individuals has suffered by the existence of this nuisance, your Board is, in my judgment, without power, and this applies as well to the local Board of Health.

I return the communications to you herewith.

Very truly yours,

NELSON B. GASKILL,

*Assistant Attorney-General.*

REPORT

OF THE

Bureau of Vital Statistics

OF THE

STATE OF NEW JERSEY

FOR THE

Year Ending December 31st, 1907

## INTRODUCTION

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The first definite effort for the collection of Vital Statistics in New Jersey began in 1848, and from that time until 1878 the records of births, marriages and deaths were reported by local officers to the Secretary of State.

Since 1878 the chief effort of the State Board of Health has been to secure accuracy and uniformity of these reports, until today New Jersey is in the front rank of registration States. It is a recognized fact that the intelligent health officer relies upon vital statistics for an understanding of his field.

One writer has said: "A police bureau cannot protect society unless it knows the character and haunts of the degenerates; a health officer cannot execute the laws for the protection of society's health unless he knows the haunts and habits of disease. For this he must look to vital statistics, and a careful study of these vital facts enables the sanitarian to work upon definite lines for the promotion of the public health."

The statesman and legislator to-day recognizes that whatever is done to promote the strength and vigor of the people also tends to raise the standard morally, socially and politically of the state and nation.

In referring to the tables in the reports of the State Board of Health showing the decrease in deaths from preventable diseases in New Jersey, we find that in 1879 the death-rate per 10,000 inhabitants from consumption was 27.32 while in 1907 it was only 16.67; from diphtheria 10.86 in 1879 and 2.81 in 1907; from typhoid fever 7.43 in 1882 and 2.06 in 1907; from scarlet fever 10.09 in 1882 and 1.27 in 1907; therefore it is readily proven that the accurate collection and tabulation of certificates of death has enabled the health authorities of the state to properly locate and remedy the causes of preventable disease.

In speaking of the importance of vital statistics, Marshall Langton Price, M.D., says:

"Vital statistics is the most important of statistical studies. This is true from the merely economic standpoint. All property other than real, having intrinsic value, derives its value from the population. Considering the subject from the hygienic standpoint, we can truthfully say, that all permanent hygienic advancement is founded upon data derived from the study of vital statistics. The fundamental data upon which vital statistics are founded are, the birth-rate, the death-rate and the duration of life. The whole purpose of public hygiene is to increase the birth-rate, decrease the death-rate and increase the duration of life. In vital statistics we find not only the measure of our efficiency, but the means by which we can obtain these ends.

Knowledge is the power through which we walk, unscathed, among the powers of darkness, and Statistics is the Supreme Court of Knowledge; and if statistics is the supreme court of all knowledge, vital statistics is the court of last resort for all knowledge of public hygiene."

In viewing vital statistics from the standpoint of the geneologist, the pension attorney, the lawyer, and many others who daily request certified copies of certain records of births, marriages and deaths, we find the further necessity of complete and accurate reports of all vital facts.

During the calendar year 1907, 108,248 certificates were received, classified, tabulated and filed in the Bureau of Vital Statistics. These certificates were divided as follows:

44,651 . . . . .	Births
23,649 . . . . .	Marriages
37,408 . . . . .	Deaths
2,540 . . . . .	Still Births

About 457 local registrars of vital statistics representing as many cities, boroughs, towns and townships transmit to this department the certificates from their respective sanitary districts on or before the fifteenth day of each calendar month.

The certificates are credited to each registrar and orders on the local disbursing officer are regularly transmitted as required by section 12, chapter 39, laws of 1888.

Upon the receipt of the certificates in this office they are carefully examined and if found incomplete additional information is requested on printed forms provided for that purpose.

The department made about 2,250 searches of the records during the year 1907 and furnished certified copies of all certificates found on file for which searches were made.

Reference to the marriage rates of Camden, N. J., and certain cities in the northern part of this State, shows that New Jersey is again becoming the Gretna Green for couples from Pennsylvania and New York who desire to evade the marriage license laws of those States, and there is urgent need of a more stringent marriage law in New Jersey requiring all persons contemplating marriage to secure a license.

To further improve the registration laws of New Jersey several amendments to the present act are necessary; the more important are as follows:

1. Marriage license for all couples contemplating matrimony.
2. Allow professional attendants at births 5 days (instead of 30 days) to report the same.
3. Require all persons solemnizing marriages to report the same to local registrars within 5 days of date of event.
4. Local registrars to transmit all certificates on or before the tenth day of each calendar month.
5. Allow local registrars 20 cents (instead of 10 cents) for each certificate of birth, marriage and death transmitted to the State Bureau of Vital Statistics.
6. No fee to local registrars for delinquent certificates.

In addition to the changes in the present law as suggested above, there should be some further provision made for indexing the old records on file in this department, these records consist of valuable data in reference to births, marriages and deaths in New Jersey from 1848 to 1878 and were formerly in the office of the Secretary of State.

Table 1—Births, Marriages and Deaths, by Counties, Cities, Boroughs and Townships and Totals for the State, for the Year Ending December 31st, 1907, and Showing Increase and Decrease from Previous Year.

ATLANTIC COUNTY.

NAME OF PLACE.	BIRTHS.			MARRIAGES.			DEATHS.		
	Number in 1907.	Variation from 1906.		Number in 1907.	Variation from 1906.		Number in 1907.	Variation from 1906.	
		Increase.	Decrease.		Increase.	Decrease.		Increase.	Decrease.
Abecon.....	5		10	2		5	8		6
**Atlantic City.....	797	213		442		60	699		11
Buena Vista.....	66		7	22		2	29		12
Brigantine.....	1						2		
Egg Harbor City.....	63	8		23	3		43	19	
Egg Harbor Twp.....	14		9	12	6		26	8	
Folsom Borough.....	5	5		3	3				2
Galloway.....	21	11		4		4	22	1	
Hamilton Twp.....	26		6	14			23		
Hammononton.....	113	2		45		4	64		2
Linwood.....			3			1	4		4
Longport Borough.....							3	2	
Mullica.....	12	1		3			11	5	
Northfield City.....	11	2					27		
Pleasantville.....	83	18		6			37		
Port Republic City.....	3			2	4		5	3	
Somers Point.....	9	2				5	11	3	
South Atlantic City.....			2	2			1		1
Ventnor.....	1						4		
Weymouth.....	11	1					3		
	1,243	263	38	608	22	83	1,037	51	47

\*Marriage certificate received from County Clerk in which the place where the marriage was performed is not stated.  
 \*\*The death-rate in summer resorts is calculated on the basis of the resident population, whereas the actual population is often several times larger, and on account of this floating population and the large number of invalids included in it, the death-rate is not a criterion of health conditions.

BERGEN COUNTY.

NAME OF PLACE.	BIRTHS.			MARRIAGES.			DEATHS.		
	Number in 1907.	Variation from 1906.		Number in 1907.	Variation from 1906.		Number in 1907.	Variation from 1906.	
		Increase.	Decrease.		Increase.	Decrease.		Increase.	Decrease.
Allendale.....	9						8		39
Alpine Borough.....	6	4		6	6		7		
Bergenfield.....	33	4		11	5		14		4
Bogota.....	26	7		5	3		21	11	
Carlstadt.....	79	5		24	2	2	43		
Cliffside Park.....	73	5		13	2		23		5
Closter Borough.....	20		3	6		1	11	1	
Cresskill.....	14		2	2			11	5	
Delford.....	13		2	2		1	14	5	
Demarest Borough.....	3		2	2	3		6	6	
Dumont.....	29		1	6	2		17	4	
East Rutherford.....	41	14		15		2	52	6	
Edgewater.....	14			10		2	37	16	
Englewood City.....	166	29		59	5		143	16	
Englewood Cliffs.....	2		2	1		2	4		
Etats.....	17			2		3	10	10	
Fairview.....	56	2		7		3	25	2	
Fort Lee.....	18		26	14		3	45		2
Franklin.....	24		4	9		1	23	4	
Garfield.....	165	28		49	7		91	15	7
Glen Rock.....	10		2	2			3		7
Hackensack City.....	343	53		122		30	218	25	4
Harrington.....	12	4		1		3	9		1
Harrington Park Borough.....	5		3	3		2	3		
Hasbrouck Heights.....	22		6	10			12		
Haworth Borough.....	10		3	3		1	2		1
Hilledale.....	10			3			3		
Hohokus.....	43	1		14		2	34	3	7
Leonia.....	2		5				1		10
Little Ferry.....	68	35		1		6	25	2	
Lodi Borough.....	61	15		31	13		44	12	
Lodi Township.....	15		6	1			10	5	
Maywood.....	23	4		2		2	6		3
Midland.....	16		5	9	4		15	17	
Midland Park.....	46		8	7		2	54		10
Montvale.....	6		6	1			6		
North Arlington.....	6		1			2	6	3	
Northvale.....	2		2			1	1		6
Norwood Borough.....	16		4	2			8	3	
Oakland.....	2	3		2		1	6		2
Old Tappan.....	4					1	3		
Orvil Borough.....	11			1			4		3
Orvil Township.....	15		6	7			6		1
Overpeck.....	95	45		10		6	35	10	
Palisade.....	25	3		4		3	23	6	
Palisade Park.....	36	13		6			15	1	
Park Ridge.....	23		6	2	4		18	4	
Ridgefield Borough.....	4		4	2		3	9	6	
Ridgefield Township.....	10	6		1	1		1		4
Ridgewood.....	55		13	22	6		49	1	
Riverside.....	12		7			7	5		1
Rivervale Township.....	12	4					4	3	
Rutherford.....	85		2	39	6		52		10
Saddle River Borough.....	3		3	5		1	4		4
Saddle River Township.....	43		19	5		1	31		12
Tenafly.....	28	13		3			10		1
Tenafly.....	43	1		5			23		
Union.....	63	21		8		1	53	16	
Upper Saddle River Boro.....	4	3					4	3	
Wallington.....	1						3		
Washington.....	2		4				2		3
Westwood.....	31	5		7		3	21	6	
Woodcliffs.....	12	5		2	2		7		3
Wood Ridge.....	35	18		4			8		1
	2,245	351	186	591	70	119	1,471	218	105

## BURLINGTON COUNTY.

NAME OF PLACE.	BIRTHS.		MARRIAGES.		DEATHS.	
	Number in 1907.	Variation from 1906.	Number in 1907.	Variation from 1906.	Number in 1907.	Variation from 1906.
		Increase.		Decrease.		Increase.
Bass River.....	2		3		7	6
Beverly City.....	46	16	23	5	53	6
Beverly Township.....	26	4	16	6	41	19
Bordentown City.....	65	5	38		63	14
Bordentown Township.....	4				9	3
Burlington City.....	129	12	100	44	155	9
Burlington Township.....	5	3	2	2	15	3
Chester.....	125	19	36		68	9
Chesterfield.....	11	9	5		9	20
Cinnaminson.....	12		8	5	10	
Delran.....	11	13	7	4	14	2
Eastampton.....	6		2	1	16	3
Evesham.....	27	7	4	1	2	2
Fieldsboro.....	3	1	7	5	13	3
Florence.....	94	44	11	5	43	12
Lamberton.....	15		4		19	10
Mansfield.....	7	4	4		18	
Medford.....	20	6	13	3	59	26
Mount Laurel.....	36	6	22	2	18	5
New Hanover.....	8		3		21	9
Northampton.....	113	31	77	7	120	13
North Hanover Township.....	2		9	5	8	1
Palmyra.....	55	10	33	2	37	7
Pemberton Borough.....	10		11		13	1
Pemberton Township.....	5		6	3	40	6
Riverside.....	67	23	33	9	67	19
Riverton Borough.....	34	9	8	3	20	2
Shamong.....	1		6	6	7	3
Southampton.....	10	5	7	4	17	4
Springfield.....	9		2		17	6
Tabernacle.....	7	3	1	1	9	2
Washington.....	13	4	3	3	7	3
Westhampton.....	6		1		1	
Willingboro.....	7		1		8	1
Woodland.....	12	5			2	2
	1,012	211	69	496	121	41
					1,024	143
						83

## CAMDEN COUNTY.

NAME OF PLACE.	BIRTHS.		MARRIAGES.		DEATHS.	
	Number in 1907.	Variation from 1906.	Number in 1907.	Variation from 1906.	Number in 1907.	Variation from 1906.
		Increase.		Decrease.		Increase.
Audubon Borough.....	11	7			7	4
Camden City.....	1,643	15	2,919	88	1,506	59
Centre.....	56	4	14	3	51	11
Chesilhurst.....	7				3	1
Clementon.....	47	1	10		51	11
Collingswood.....	63	37	24		53	25
Delaware.....	29	5	11		15	1
Gloucester City.....	181	5	87	7	167	14
Gloucester Township.....	48	5	20	7	101	16
Haddon.....	24	8	12	7	15	18
Haddonfield.....	56	10	25	5	49	3
Haddon Heights Borough.....	16		8	2	7	5
Merchantville Borough.....	29	5	36	3	16	8
Oaklyn Borough.....	5		1		7	1
Pensauken.....	37	8	11	3	51	5
Voorhees.....	24	8	7	7	14	3
Waterford.....	68	13	18	6	34	8
Winslow.....	34	9	14	4	38	5
Wood Lynne Borough.....	11	5	3	1	3	1
	2,389	117	44	3,216	120	31
					2,169	108
						81

\*Marriage certificates received from County Clerk in which the places where the marriages were performed are not stated.

CAPE MAY COUNTY.

NAME OF PLACE.	BIRTHS.			MARRIAGES.			DEATHS.		
	Number in 1907.	Variation from 1906.		Number in 1907.	Variation from 1906.		Number in 1907.	Variation from 1906.	
		Increase.	Decrease.		Increase.	Decrease.		Increase.	Decrease.
Anglesea Borough.....	9	1		1		2	5		12
Avalon.....	33	2		5		9	50		9
**Cape May City.....	37	1		30		1	22		2
Cape May Point.....	20		4	9		3	22		5
Dennis.....	33	3		9		2	17		5
Holly Beach Borough.....	16		11	10			33		14
Lower.....	42	16		24		7	28		4
Middle.....	25		9	5		4	23		1
Ocean City.....	3		3	3		5	6		1
Sea Isle City.....	23	7		11		3	9		1
Upper.....	15		15	1		3	6		3
West Cape May.....	8		16	16		3	11		4
Wildwood.....	15								
Woodbine.....	8								
<b>Total</b>	<b>309</b>	<b>45</b>	<b>48</b>	<b>143</b>	<b>26</b>	<b>12</b>	<b>216</b>	<b>16</b>	<b>36</b>

\*Marriage certificates received from County Clerk in which the places where the marriages were performed are not stated.  
 \*\*The death-rate in summer resorts is calculated on the basis of the resident population, whereas the actual population is often several times larger, and on account of this floating population and the large number of invalids included in it, the death-rate is not a criterion of health conditions.

CUMBERLAND COUNTY.

NAME OF PLACE.	BIRTHS.			MARRIAGES.			DEATHS.		
	Number in 1907.	Variation from 1906.		Number in 1907.	Variation from 1906.		Number in 1907.	Variation from 1906.	
		Increase.	Decrease.		Increase.	Decrease.		Increase.	Decrease.
Bridgeton.....	213	10		116		2	239	41	
Commercial.....	52	16		24		7	34	9	
Deerfield.....	50		32	12		5	27		
Downe.....	30	19		12		2	19		7
Fairfield.....	29	9		10		2	15		5
Greenwich.....	28	9		4		7	13		2
Hopewell.....	12	9		7			27		21
Landis.....	60		31	10		5	69		25
Lawrence.....	18		11	7			24		9
Maurice River.....	16	9		7		4	31		19
Millville City.....	291	10		129		24	174		8
Stow Creek.....	8		6	3		3	9		1
Vineland.....	145	41		79		2	77		6
<b>Total</b>	<b>952</b>	<b>125</b>	<b>80</b>	<b>423</b>	<b>45</b>	<b>31</b>	<b>759</b>	<b>121</b>	<b>32</b>

\*Marriage certificate received from County Clerk in which the place where the marriage was performed is not stated.

ESSEX COUNTY.

NAME OF PLACE.	BIRTHS.			MARRIAGES.			DEATHS.		
	Number in 1907.	Variation from 1906.		Number in 1907.	Variation from 1906.		Number in 1907.	Variation from 1906.	
		Increase.	Decrease.		Increase.	Decrease.		Increase.	Decrease.
Belleville.....	141	10		46		13	133	16	
Bloomfield City.....	221		5	58		13	145		23
Caldwell Borough.....	21		5	12		1	28		4
Caldwell Township.....	4		1	3			10		3
East Orange City.....	490	1		166		17	297	23	
Essex Falls.....	2			2		1	1		4
Glen Ridge.....	21		14	9		1	25		1
Irvington.....	136		79	38		1	114		13
Livingston.....	23	4		6		2	16		2
Millburn.....	61			11		1	36		1
Montclair City.....	410	41		133		7	291	30	
Newark City.....	8,105	276		3,660		278	5,736	139	
North Caldwell Borough.....	74	21		28		3	51		7
Nutley Borough.....	813	2		243		53	513		28
Orange City.....	79		13	56		28	65		20
South Orange Borough.....	23		7	14		4	24		3
South Orange Township.....	22		4	9			49		9
Verona Borough.....	4			4			7		
Verona Township.....	190	12		20		30	95		9
West Caldwell Borough.....			4						
West Orange City.....									
<b>Total</b>	<b>10,840</b>	<b>378</b>	<b>128</b>	<b>4,517</b>	<b>378</b>	<b>75</b>	<b>7,638</b>	<b>328</b>	<b>65</b>

GLOUCESTER COUNTY.

NAME OF PLACE.	BIRTHS.			MARRIAGES.			DEATHS.		
	Number in 1907.	Variation from 1906.		Number in 1907.	Variation from 1906.		Number in 1907.	Variation from 1906.	
		Increase.	Decrease.		Increase.	Decrease.		Increase.	Decrease.
Clayton.....	38	5		7	2		30	2	
Deptford.....	25		4	10	1		33	3	
East Greenwich.....	19		6	11	4		27		4
Elk.....	9		3	1	12		13	2	
Franklin.....	46	1		9	4		27	3	
Glassboro.....	49		16	35	9		14		24
Greenwich.....	12		6	1	11		11		
Harrison.....	21		11	7	7		25	9	
Logan.....	29	5		7	3		14		
Mantua.....	22	3		11	19		10	6	
Monroe.....	24	4		7	15		32		3
National Park Borough.....	5		1	1	4		22		5
Paulsboro.....	40		11	3	7		16	2	
Pitman Grove Borough.....	19	10		13			4		
South Harrison.....	5		1	1	3		26		3
Swedesboro.....	15		1	15	4		19	3	
Washington.....	2	3		1	2		40	16	
Wenonah.....	5	3		4	2		4		
West Deptford.....	32		7	14	1		79		9
Woodbury.....	65	26		68	20		8		
Woolwich.....	23	6		2	2		2		
	530	66	67	257	72	42	456	48	55

HUDSON COUNTY.

NAME OF PLACE.	BIRTHS.			MARRIAGES.			DEATHS.		
	Number in 1907.	Variation from 1906.		Number in 1907.	Variation from 1906.		Number in 1907.	Variation from 1906.	
		Increase.	Decrease.		Increase.	Decrease.		Increase.	Decrease.
Bayonne.....	1,668	18		432	88		763	4	
East Newark.....	29			10	7		42	6	
Guttenburg.....	164		8	20	6		65	31	
Harrison.....	224		48	123	5		284	125	
Hoboken.....	1,737	78		1,136	245		1,556	116	
Jersey City.....	4,794	356		2,371	206		4,723	35	
Kearney.....	326	65		103	29		213	20	
North Bergen.....	347	4		63	7		135	33	
Secaucus.....	49	11		7	10		291	4	
Town of Union.....	496			50	29		141	11	
West Hackensack.....	146	3		357	77		371	11	
West Hoboken.....	751	36		116	21		136	32	
West New York.....	254								
	11,045	638	56	5,010	728	10	8,964	390	49

HUNTERDON COUNTY.

NAME OF PLACE.	BIRTHS.			MARRIAGES.			DEATHS.		
	Number in 1907.	Variation from 1906.		Number in 1907.	Variation from 1906.		Number in 1907.	Variation from 1906.	
		Increase.	Decrease.		Increase.	Decrease.		Increase.	Decrease.
Alexandria.....	15	8		2	2		14		4
Bethlehem.....	14	6		3	2		23	8	
Bloomsbury Borough.....							30	6	
Clinton Borough.....			3	6			19		
Clinton Township.....	35	13		9	33		30		5
Delaware.....	21	2		5	2		26	7	
East Amwell.....	11	4		8	6		18	6	
Franklin.....	15		1	4	6		20		
Frenchtown.....	11	5		13	7		25	12	
High Bridge.....	27		4	11			32		
Holland.....	17	6		10	4		15		7
Junction.....	10	2		5			22	14	
Kingwood.....			12				22	12	
Lambertville.....	126	17		33	6		78		4
Lebanon.....	23	4		15	1		36	9	
Marlton.....	31		5	20	6		52		3
Readington.....	40	12		20	9		41	5	
Stockton.....	14	1		4	1		8		5
Tewksbury.....	17		15	13	2		28	5	
Union.....	12		4	3	1		13	6	
West Amwell.....	13				1		5		8
				*2					
	470	80	44	197	36	37	530	92	45

\*Marriage certificates received from County Clerk in which the places where the marriages were performed are not stated.



MERCER COUNTY.

MONMOUTH COUNTY.

NAME OF PLACE.	BIRTHS.		MARRIAGES.		DEATHS.	
	Number in 1907.	Variation from 1906.	Number in 1907.	Variation from 1906.	Number in 1907.	Variation from 1906.
		Increase.		Decrease.		Increase.
East Windsor.....	22	5	1	1	18	8
Edison.....	22	11	5	1	16	10
Hamilton.....	43	6	30	4	44	18
Hightstown.....	19	21	19	2	25	5
Hopewell Borough.....	34	10	14	9	32	1
Hopewell Township.....	17	14	10	4	28	8
Lawrence.....	3	4	9	4	6	2
Pennington Borough.....	88	10	49	6	6	3
Princeton Borough.....	185	9	984	30	1,599	106
Princeton Township.....	14	5	4	1	16	4
Trenton.....	1,088	62	2	3	12	1
Washington.....	25	16	2	3	12	1
West Windsor.....	1,378	60	113	54	21	143
			2	21	1,587	76

\*Marriage certificates received from County Clerk in which the places where the marriages were performed are not stated.

MIDDLESEX COUNTY.

NAME OF PLACE.	BIRTHS.		MARRIAGES.		DEATHS.	
	Number in 1907.	Variation from 1906.	Number in 1907.	Variation from 1906.	Number in 1907.	Variation from 1906.
		Increase.		Decrease.		Increase.
Cranbury.....	23	7	7	1	23	3
Dunellen.....	29	8	9	1	14	1
East Brunswick.....	17	16	13	3	30	4
Helmetta.....	10	8	5	3	19	3
Highland Park Borough.....	11	5	14	3	5	2
Jamesburg.....	12	16	14	2	9	2
Madison.....	18	13	13	5	28	6
Metuchen.....	31	2	14	2	17	2
Milltown.....	19	4	13	6	13	2
Monroe.....	16	1	12	4	13	2
New Brunswick.....	375	76	382	53	468	46
North Brunswick.....	12	7	8	2	13	10
Perth Amboy.....	447	101	492	73	399	46
Piscataway.....	52	23	10	4	46	2
Raritan.....	6	37	8	4	46	2
Rooseville Borough.....	115	86	19	18	72	63
Screeville.....	166	21	23	2	65	13
South Amboy.....	52	2	55	40	105	8
South Brunswick.....	39	13	59	2	69	7
South River.....	89	2	53	2	109	14
Woodbridge.....	27	4	30	7	109	14
	1,620	360	117	207	59	215
			1,153	59	1,585	67

NAME OF PLACE.	BIRTHS.		MARRIAGES.		DEATHS.	
	Number in 1907.	Variation from 1906.	Number in 1907.	Variation from 1906.	Number in 1907.	Variation from 1906.
		Increase.		Decrease.		Increase.
Allenhurst.....	11	9	3	3	9	5
Allentown.....	1	5	5	1	7	3
Asbury Park.....	166	76	128	41	140	9
Atlantic.....	4	13	1	5	13	3
Atlantic Highlands.....	16	13	20	3	21	7
Avon.....	20	11	25	10	20	6
Belmar.....	4	7	1	5	13	1
Bradley Beach Borough.....	2	4	4	3	5	1
Deal.....	32	9	20	3	24	18
Eatonville.....	9	3	11	4	1	1
Englishtown.....	9	3	11	4	10	1
Farmingdale.....	63	41	136	89	64	8
Freehold Borough.....	12	7	7	2	25	3
Freehold Township.....	11	6	7	2	25	3
Highlands Borough.....	8	15	4	1	16	3
Holmdel.....	20	12	15	2	35	14
Howell.....	180	24	121	14	288	55
**Long Branch.....	14	11	11	2	8	1
Manalapan.....	11	10	20	5	25	3
Manasquan.....	3	6	5	6	19	4
Marlboro.....	15	12	16	9	18	10
Matawan Borough.....	6	2	2	9	26	13
Matawan Township.....	54	12	30	1	77	26
Middletown.....	8	8	1	1	13	6
Millstone.....	6	6	1	1	10	7
Monmouth Beach Boro.....	72	43	41	28	99	7
Neptune City Borough.....	5	2	1	1	7	4
Ocean.....	76	14	3	8	8	1
Raritan.....	76	44	7	11	99	32
Red Bank City.....	111	13	69	11	91	1
Rumson Borough.....	17	2	2	2	11	1
Seabright.....	24	9	1	4	42	6
Shrewsbury.....	38	23	6	7	26	1
Spring Lake Borough.....	19	2	2	2	26	1
Upper Freehold.....	27	9	12	8	30	3
Wall.....	39	1	21	4	42	4
	1,132	135	283	237	58	1,370
			723	237	199	79

\*Marriage certificates received from County Clerk in which the places where the marriages were performed are not stated.

\*\*The death-rate in summer resorts is calculated on the basis of the resident population, whereas the actual population is often several times larger, and on account of this floating population and the large number of invalids included in it, the death-rate is not a criterion of health conditions.

MORRIS COUNTY.

NAME OF PLACE.	BIRTHS.		MARRIAGES.			DEATHS.			
	Number in 1907.	Variation from 1906.		Number in 1907.	Variation from 1906.		Number in 1907.	Variation from 1906.	
		Increase.	Decrease.		Increase.	Decrease.		Increase.	Decrease.
Boonton City.	52		3	39	10	77	9	1	
Boonton Township.	2	1		14		18		9	
Butler.	53	5		17		17		2	
Chatham Borough.	25		14	14	5	6	4		
Chatham Township.	11	7		6		104	4		
Chester.	9		8	6	4	18			
Dover City.	125		29	60	2	4	2		
Florham Park Borough.	7		1	1		221	13		
Hanover.	38	7		20	4	15		9	
Jefferson.	8	1		7		74		11	
Madison.	76	1	38	34	2	15			
Mendham Borough.	26			11	8				
Mendham Township.	14		1	2		25	11		
Montville.	18	6		16		16		2	
Morris Township.	211	43		100	20	281	21		
Morristown City.	12		1	1		7			
Mount Arlington.	8			2		13	4		
Mount Olive.	40	17	4	15	5	31	8	5	
Netcong.	24	4		5	4	21	4		
Passaic.	44		6	15		36			
Pequannock.	7			4		24	12		
Randolph.	57	5		10	3	96	45		
Rockaway Borough.	17			30	15	28	6		
Rockaway Township.	20	15		13		29	11		
Roxbury.	16		2	25	13	34		8	
Washington.	34	21							
Wharton Borough.									
<b>Total</b>	<b>937</b>	<b>133</b>	<b>108</b>	<b>434</b>	<b>90</b>	<b>2,218</b>	<b>186</b>	<b>47</b>	

OCEAN COUNTY.

NAME OF PLACE.	BIRTHS.		MARRIAGES.			DEATHS.			
	Number in 1907.	Variation from 1906.		Number in 1907.	Variation from 1906.		Number in 1907.	Variation from 1906.	
		Increase.	Decrease.		Increase.	Decrease.		Increase.	Decrease.
Barnegat City.	7	4		15	15	1		1	
Bay Head.	10	9		1		1		1	
Beach Haven.	5		1	6	4	6			
Berkeley.				1		1			
Brick.	25		6	16	6	30		9	
Dover.	20		6	12	6	4	32	2	
Eaglewood.	2		1	1		8	1		
Island Heights.				1		4	5	4	
Jackson.	27	13		5	4	2		3	
Lacey.	6			1		1		10	
Lakewood.	66			47	6	82	22		
Lavallette.			3	1		1			
Little Egg Harbor.				1		2			
Long Beach.				2		3	20	2	
Manchester.	13	1	8				10		
Ocean.	6	1		1		2			
Plumstead.	13		7	13	6	1	20	2	
Point Pleasant Beach Bor.	3			13		8			
Sea Side Park Borough.	1	1		9	1		10	1	
Stafford.	10	1	3	10		8			
Tuckerton.	14	1		5	1	2	1	5	
Union.	10	5		5	1	20			
<b>Total</b>	<b>238</b>	<b>34</b>	<b>43</b>	<b>165</b>	<b>44</b>	<b>25</b>	<b>264</b>	<b>49</b>	<b>51</b>

\*Marriage certificate received from County Clerk in which the place where the marriage was performed is not stated.

PASSAIC COUNTY.

NAME OF PLACE.	BIRTHS.		MARRIAGES.			DEATHS.			
	Number in 1907.	Variation from 1906.		Number in 1907.	Variation from 1906.		Number in 1907.	Variation from 1906.	
		Increase.	Decrease.		Increase.	Decrease.		Increase.	Decrease.
Acquackanonk.	202	71		15	12	71		12	
Hawthorne.	29		4	6	2	22		4	
Little Falls.	33		11	14		42		8	
Manchester.	20			9	3	26		1	
North Haledon.	4	3				3		2	
Passaic City.	1,273		253	1,063	134	808	155		
Paterson.	2,481	465		1,233	240	1,839		153	
Pompton.	65		8	25		7			
Pompton Lakes Borough.	7		14	8	9	48	16		
Prospect Park Borough.	15	5		4	1	16			
Totowa.	6			11		5		4	
Wayne.	8			17	3	17		9	
West Milford.	22			18		29			
<b>Total</b>	<b>4,177</b>	<b>565</b>	<b>310</b>	<b>2,410</b>	<b>385</b>	<b>2,933</b>	<b>183</b>	<b>193</b>	

SALEM COUNTY.

NAME OF PLACE.	BIRTHS.			MARRIAGES.			DEATHS.		
	Number in 1907.	Variation from 1906.		Number in 1907.	Variation from 1906.		Number in 1907.	Variation from 1906.	
		Increase.	Decrease.		Increase.	Decrease.		Increase.	Decrease.
Alloway.....	27	2	.....	7	4	.....	13	.....	1
Elmer Borough.....	12	10	.....	15	1	.....	3	.....	1
Elsinboro.....	7	.....	.....	1	.....	.....	.....	.....	.....
Lower Alloways Creek.....	27	4	.....	11	.....	23	12	.....	.....
Lower Penns Neck.....	19	6	.....	6	.....	17	.....	3	.....
Mannington.....	22	.....	.....	5	.....	28	.....	5	.....
Oldmans.....	15	.....	.....	10	.....	25	.....	.....	.....
Penns Grove Borough.....	25	16	.....	28	13	.....	25	.....	.....
Pittsgrove.....	37	9	.....	10	6	.....	20	.....	11
Pittsgrove.....	35	.....	.....	3	.....	9	.....	.....	.....
Quinton.....	11	.....	.....	4	.....	1	.....	3	.....
Salem City.....	76	14	.....	59	.....	14	109	.....	2
Upper Penns Neck.....	18	.....	.....	11	.....	3	14	.....	11
Upper Pittsgrove.....	19	.....	.....	14	.....	15	37	19	.....
Woodstown.....	21	.....	.....	.....	.....	.....	17	.....	.....
	376	43	48	179	26	64	343	44	50

\*Marriage certificates received from County Clerk in which the places where the marriages were performed are not stated.

SOMERSET COUNTY.

NAME OF PLACE.	BIRTHS.			MARRIAGES.			DEATHS.		
	Number in 1907.	Variation from 1906.		Number in 1907.	Variation from 1906.		Number in 1907.	Variation from 1906.	
		Increase.	Decrease.		Increase.	Decrease.		Increase.	Decrease.
Bedminster.....	34	.....	6	13	2	.....	27	6	8
Bernards.....	57	27	.....	35	.....	6	33	.....	10
Bound Brook Borough.....	13	.....	.....	7	.....	.....	6	.....	4
Branchburg.....	23	4	.....	7	3	.....	17	.....	1
Bridgewater.....	33	4	.....	16	.....	4	21	.....	8
Franklin.....	38	18	.....	10	.....	1	3	.....	2
Hillsborough.....	1	.....	.....	1	.....	.....	2	.....	.....
Millstone.....	14	.....	.....	9	.....	2	25	8	.....
Montgomery.....	4	.....	.....	26	.....	.....	87	32	.....
North Plainfield City.....	19	.....	.....	13	.....	.....	7	.....	6
North Plainfield Township.....	45	.....	.....	1	.....	.....	5	.....	10
Raritan.....	76	15	.....	48	7	.....	16	20	.....
Rocky Hill.....	10	.....	.....	2	.....	.....	16	.....	.....
Somerville.....	7	.....	.....	.....	.....	.....	10	.....	3
South Bound Brook.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Warren.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
	545	28	64	226	14	22	489	66	56

SUSSEX COUNTY.

NAME OF PLACE.	BIRTHS.			MARRIAGES.			DEATHS.		
	Number in 1907.	Variation from 1906.		Number in 1907.	Variation from 1906.		Number in 1907.	Variation from 1906.	
		Increase.	Decrease.		Increase.	Decrease.		Increase.	Decrease.
Andover Borough.....	13	2	.....	9	3	.....	6	6	.....
Andover Township.....	2	.....	.....	1	.....	.....	5	.....	.....
Branchville.....	9	4	.....	6	1	.....	13	1	.....
Byram.....	9	.....	.....	.....	.....	.....	.....	.....	.....
Frankford.....	6	.....	.....	.....	.....	.....	10	.....	.....
Fredon.....	10	3	.....	9	7	.....	6	4	.....
Green.....	10	1	.....	4	6	.....	5	3	.....
Hampton.....	6	.....	.....	7	.....	.....	8	.....	.....
Hardyston.....	40	.....	.....	29	.....	.....	7	.....	.....
Hopatcong.....	19	.....	.....	.....	.....	.....	7	.....	.....
Lafayette.....	3	6	.....	11	5	.....	9	1	.....
Montague.....	5	.....	.....	5	.....	.....	27	17	.....
Newton.....	74	14	.....	47	19	.....	43	4	.....
Sandyston.....	16	.....	.....	9	.....	.....	11	.....	.....
Sparta.....	18	7	.....	13	5	.....	22	.....	.....
Stanhope Borough.....	8	.....	.....	3	.....	.....	13	.....	.....
Sullwater.....	14	.....	.....	7	.....	.....	1	.....	.....
Sussex Borough.....	11	14	.....	10	.....	.....	11	.....	.....
Vernon.....	13	8	.....	5	.....	.....	5	.....	.....
Walpack.....	.....	.....	.....	.....	.....	.....	1	.....	.....
Wantage.....	13	.....	.....	3	.....	.....	2	.....	.....
	296	53	45	186	65	24	340	56	34

UNION COUNTY.

NAME OF PLACE.	BIRTHS.			MARRIAGES.			DEATHS.		
	Number in 1907.	Variation from 1906.		Number in 1907.	Variation from 1906.		Number in 1907.	Variation from 1906.	
		Increase.	Decrease.		Increase.	Decrease.		Increase.	Decrease.
Clark.....	77	.....	1	1	.....	.....	6	.....	.....
Cranford.....	.....	.....	.....	25	.....	.....	4	.....	.....
Elizabeth.....	1,267	42	.....	679	177	.....	1,194	97	.....
Fanwood Borough.....	.....	.....	.....	1	.....	.....	.....	.....	.....
Fanwood Township.....	23	3	.....	4	.....	.....	17	.....	.....
Garwood Borough.....	21	6	.....	3	.....	.....	.....	.....	.....
Kemilworth Borough.....	7	.....	.....	.....	.....	.....	.....	.....	.....
Linden Borough.....	.....	.....	.....	1	.....	.....	.....	.....	.....
Linden Township.....	19	11	.....	3	.....	.....	15	.....	.....
Mountainside.....	2	.....	.....	.....	.....	.....	.....	.....	.....
New Providence Borough.....	12	5	.....	5	.....	.....	1	.....	.....
New Providence Township.....	13	11	.....	8	.....	.....	9	.....	.....
Plainfield.....	430	11	.....	20	.....	.....	358	54	.....
Rahway.....	118	75	.....	53	25	.....	125	15	.....
Roselle Borough.....	25	7	.....	9	.....	.....	46	38	.....
Roselle Park.....	16	.....	.....	3	.....	.....	16	.....	.....
Springfield.....	35	9	.....	12	.....	.....	18	.....	.....
Summit City.....	133	.....	.....	52	.....	.....	82	.....	.....
Union.....	17	.....	.....	6	.....	.....	35	.....	.....
Westfield.....	111	2	.....	39	15	.....	71	19	.....
	2,323	179	27	1,095	230	56	2,064	257	49

WARREN COUNTY.

NAME OF PLACE.	BIRTHS.			MARRIAGES.			DEATHS.		
	Number in 1907.	Variation from 1906.		Number in 1907.	Variation from 1906.		Number in 1907.	Variation from 1906.	
		Increase.	Decrease.		Increase.	Decrease.		Increase.	Decrease.
Allamuchy.....	8			1			3		
Belvidere.....	16			28			13		
Hairtown.....	26			11			34		7
Franklin.....	9			3			15		
Frelighuysen.....	17			11			4		14
Greenwich.....	49	12		28			12		
Hackettstown.....	17			3			59		
Hardwick.....	10			3			6		
Hamony.....	12			3			4		
Hope.....	21			13			9		7
Independence.....	4			6			16		
Knowlton.....	8			2			20		15
Lopatcong.....	4			6			41		15
Manfield.....	61			23			10		
Oxford.....	3			2			4		
Pahaquarry.....	186	55		219			220	59	
Phillipsburg.....	38			81			47		
Polatcong.....	67			38			66		
Washington Borough.....	23			11			13		
Washington Township.....	23			11			19		
<b>Total</b> .....	<b>594</b>	<b>138</b>	<b>54</b>	<b>499</b>	<b>19</b>	<b>21</b>	<b>642</b>	<b>134</b>	<b>52</b>

\*Marriage certificates received from County Clerk in which the places where the marriages were performed are not stated.

SUMMARY.

NAME OF PLACE.	BIRTHS.			MARRIAGES.			DEATHS.		
	Number in 1907.	Variation from 1906.		Number in 1907.	Variation from 1906.		Number in 1907.	Variation from 1906.	
		Increase.	Decrease.		Increase.	Decrease.		Increase.	Decrease.
Atlantic County.....	1,243	225		606			1,037		4
Bergen County.....	2,245	165		591		94	1,470		122
Burlington County.....	2,125	98		486		75	1,024		60
Camden County.....	2,389	73		3,216	90		2,169	25	
Cape May County.....	309		3	143	15		216		20
Cumberland County.....	952	25		423	312		759	86	
Essex County.....	10,840	234		4,517	44		456		7
Gloucester County.....	530			257			8,964	341	
Hudson County.....	11,045	582		5,010	700		5,300	87	
Hunterdon County.....	470	38		197		1	1,837		
Mercer County.....	1,378	53		1,133	33		1,595	145	
Middlesex County.....	1,620	243		1,133	148		1,370	143	
Monmouth County.....	1,132		132	723	85		1,213	111	
Morris County.....	937		5	434	68		1,111		
Ocean County.....	238		11	165	18		2,633		10
Passaic County.....	4,177	255		2,410	360	36	343		6
Salem County.....	376			179		8	498		
Somerset County.....	545	6		226			240		
Sussex County.....	296		2	186	41		2,064	214	
Union County.....	2,323	159		1,093	174		642	102	
Warren County.....	594	84		499	43				
<b>Total</b> .....	<b>44,651</b>	<b>1,218</b>	<b>158</b>	<b>23,649</b>	<b>2,221</b>	<b>152</b>	<b>37,408</b>	<b>1,738</b>	<b>44</b>

TABLE 2.—SHOWING NUMBER OF DEATHS IN NEW JERSEY FROM EACH OF THE CLASSIFIED CAUSES, BY COUNTIES, FOR THE YEAR ENDING DECEMBER 31, 1907.

Cause of Death	Counties											Total									
	Atlantic	Bergen	Burlington	Camden	Cape May	Cumberland	Essex	Gloucester	Hudson	Hunterdon	Mercer		Middlesex	Monmouth	Morris	Ocean	Passaic	Salem	Somerset	Sussex	Union
Typhoid fever.....	1	15	14	28	37	5	12	86	5	75	20	18	7	3	22	4	1	3	17	6	464
Typhus.....	2			1				1											1		20
Dysentery.....	3			1				10													1
Smallpox.....	4			8				52											5		144
Measles.....	6			1				10											2		21
Scarlet fever.....	6			1				52											5		122
Diphtheria.....	7			1				146											2		268
Diphtheria (Group).....	8			1				103											1		162
Influenza.....	8			13				110											6		332
Military fever.....	10			8				45											4		318
Amatic Cholera.....	10			25				53											4		116
Cholera Nostris.....	13			1				5													1
Other Epidemic Diseases.....	13			1				4													5
Measles.....	13			5				15											4		55
Presencia and Spontaneous.....	14			3				3													1
Glanders and Erysipelas.....	15			5				1													1
Anthrax.....	16			2				1													1
Rabies.....	16			1				1													1
Intermittent Fever.....	17			4				7													20
Intermittent Fever.....	19			1				1													1
Malaria.....	20			1				2													1
Malaria (Group).....	21			2				24													3
Pellagra.....	21			0				2													109
Of the Lungs.....	22	76	100	98	223	23	85	600	30	36	188	116	7	101	24	200	17	24	188	55	3,710
Of the Peritoneum.....	22	4	13	7	1	0	13	11	1	2	2	2	2	2	2	2	3	1	2	1	88
Of the Skin.....	22	5	3	6	1	1	3	2	1	4	6	3	3	3	4	4	2	3	3	3	109
Of Other Organs.....	22	3	2	0	0	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	72
General.....	22	3	2	0	0	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	41
Of the Mouth.....	23	2	1	3	4			17													62
Of the Stomach and Liver.....	23	4	3	2	4			1													62
Of the Brain.....	23	16	31	23	4			103													214
Of the Female Genital Orgs.....	23	10	12	4	10			57													184
Of the Breast.....	23	8	6	7	0			34													154
Of the Skin.....	23	6	7	0	4			3													74
Of Others.....	23	5	4	4	4			17													177
Scrophulous.....	24			1				1													57
Syphilis.....	24	16	31	23	4			103													214
Of the Stomach and Liver.....	24	10	12	4	10			57													184
Cancer.....	25	8	6	7	0			34													154
Of the Skin.....	25	6	7	0	4			3													74
Of Others.....	25	5	4	4	4			17													177
Rheumatism.....	26			1				1													57

Cont.

TABLE 2—SHOWING NUMBER OF DEATHS IN NEW JERSEY FROM EACH OF THE CLASSIFIED CAUSES, BY COUNTIES, FOR THE YEAR ENDING DECEMBER 31, 1907—(Continued).

Table with 14 columns (Atlantic, Bergen, Burlington, Camden, Cape May, Cumberland, Essex, Gloucester, Hudson, Hunterdon, Mercer, Middlesex, Monmouth, Morris, Ocean, Passaic, Salem, Somerset, Sussex, Union, Warren, Total) and rows listing causes such as Diabetes, Exophthalmic Goitre, Addison's Disease, Leucemia, etc.

TABLE 2—SHOWING NUMBER OF DEATHS IN NEW JERSEY FROM EACH OF THE CLASSIFIED CAUSES, BY COUNTIES, FOR THE YEAR ENDING DECEMBER 31, 1907—(Continued).

Table with 14 columns (Atlantic, Bergen, Burlington, Camden, Cape May, Cumberland, Essex, Gloucester, Hudson, Hunterdon, Mercer, Middlesex, Monmouth, Morris, Ocean, Passaic, Salem, Somerset, Sussex, Union, Warren, Total) and rows listing causes such as Diseases of the Nasal Passes, Acute Bronchitis, Chronic Bronchitis, etc.













TABLE 4—SHOWING OCCUPATIONS OF DECEDENTS IN NEW JERSEY, BY COUNTIES, EXCLUSIVE OF CITIES OF OVER 5,000 INHABITANTS, FOR THE YEAR ENDING DECEMBER 31, 1907—(Continued).

COUNTIES.	CITIES.																					
	Atlantic	Bergen	Camden	Cape May	Cumberland	Essex	Hudson	Hunterdon	Mercer	Middlesex	Morris	Ocean	Passaic	Somerset	Sussex	Union	Warren	Atlantic City	Burlington	Camden		
Mustelans.																						
Nurses.																						
Painters.																						
Paperhangers.																						
Photographers.																						
Physicians.																						
Plumbers.																						
Porters, etc.																						
Porters.																						
Printers.																						
Railroad employes.																						
Real estate and in-																						
structors.																						
Rubberworkers.																						
Sailors.																						
Salesmen.																						
Shoemakers.																						
Silkworkers.																						
Stonemasons.																						
Tailors.																						
Tanners.																						
Teachers.																						
Telegraphers.																						
Thimblemakers.																						
Undertakers.																						
Photographers.																						
Waiters.																						
Weavers.																						
Wheelwrights.																						
Winegrowers.																						
Winepressers.																						
All other professions.																						
All other occupations.																						

TABLE 5—SHOWING NUMBER OF DEATHS FROM BRIGHT'S DISEASE IN NEW JERSEY, IN COUNTIES, EXCLUSIVE OF CITIES, AND IN CITIES OF OVER 5,000 INHABITANTS, FOR EIGHT YEARS.

NAMES OF COUNTIES AND CITIES.	DEATHS FROM BRIGHT'S DISEASE.							
	1900	1901	1902	1903	1904	1905	1906	1907
Atlantic County	17	13	14	15	21	25	21	26
Atlantic City	28	36	32	34	38	60	66	66
Bergen County	27	25	22	31	47	36	61	49
Englewood	5	2	5	7	5	7	5	7
Garfield								2
Hackensack	11	8	3	8	8	16	12	9
Burlington County	25	40	28	39	47	48	46	44
Bordentown								3
Burlington	10	9	10	12	10	12	10	14
Camden County	13	12	17	29	20	27	25	31
Camden	99	64	87	84	106	113	113	131
Glocester City	3	2	5	11	6	6	7	6
Cape May County	8	2	7	10	12	11	22	18
Cumberland County	13	15	16	22	27	19	23	21
Bridgeton	16	11	22	24	24	13	15	19
Millville	6	7	5	3	8	12	8	9
Essex County	48	17	15	19	23	21	26	26
Bloomfield	5	6	5	1	5	7	9	11
East Orange	14	11	20	20	20	15	12	25
Irvington		1	4	8	6	2	11	7
Montclair	10	11	5	5	9	13	11	19
Newark	280	249	255	308	287	279	359	403
Orange	35	18	20	38	20	18	34	36
West Orange			7	7	5	7	7	7
Glocester County	20	17	12	32	23	28	38	32
Hudson County	69	39	13	22	29	36	27	49
Bayonne	28	16	21	25	23	29	31	38
Harrison	3	2	7	8	9	12	12	12
Hoboken	55	41	57	78	80	73	112	111
Jersey City	188	140	155	179	194	236	279	293
Kearny				7	10	6	10	8
Town of Union	11	14	12	19	15	14	16	24
West Hoboken			21	14	12	29	23	27
West New York			4	9	5	8	8	5
Hunterdon County	17	17	12	22	26	28	43	42
Lambertville								3
Mercer County	15	6	13	9	9	8	24	18
Princeton								3
Trenton	73	3	54	60	71	74	87	103
Middlesex County	20	22	18	20	18	25	25	41
New Brunswick	23	18	19	26	19	29	13	23
Ferri Amboy	18	11	9	5	5	17	23	22
South Amboy		2	5	3	4	4	4	4
Monmouth County	48	42	50	55	57	43	62	56
Asbury Park								11
Long Branch	11	13	10	13	8	13	23	28
Red Bank			2	2	3	4	4	4
Morris County	34	30	26	44	35	36	35	47
Dover	3	4	4	6	7	7	4	13
Morristown	14	8	12	8	13	10	10	13
Ocean County	17	11	12	14	13	16	16	23
Passaic County	17	7	6	11	9	17	14	24
Passaic City	10	11	12	21	20	31	31	35
Paterson	94	64	60	75	70	84	123	168
Salem County	7	14	11	16	14	9	13	16
Salem City	7	7	4	5	7	9	5	7
Somerset County	31	17	22	17	17	19	26	21
North Plainfield		3		4	4	4	3	12
Sussex County	10	6	8	13	9	12	14	16
Union County	10	10	9	15	11	17	17	16
Elizabeth	50	48	28	45	50	51	73	67
Plainfield	11	14	15	9	13	22	29	29
Rahway	14	9	14	12	6	9	7	12
Summit		1	4	7	5	2	2	3
Westfield								4
Warren County	13	14	16	17	24	21	19	37
Phillipsburg	6	5	4	4	8	5	14	13
Total	1,620	1,246	1,371	1,686	1,722	1,840	2,238	2,518

TABLE 6—SHOWING AGES AT DEATH AND OCCUPATIONS OF DECEDENTS IN DECEMBER

	Consumption.											Cancer.											Suicide.											Disease of the nervous system or organs of sense.											Disease of the circulatory system.																												
	10 to 15.	15 to 20.	20 to 30.	30 to 40.	40 to 50.	50 to 60.	60 to 70.	70 to 80.	80 to 90.	Over 90.	10 to 15.	15 to 20.	20 to 30.	30 to 40.	40 to 50.	50 to 60.	60 to 70.	70 to 80.	80 to 90.	Over 90.	10 to 15.	15 to 20.	20 to 30.	30 to 40.	40 to 50.	50 to 60.	60 to 70.	70 to 80.	80 to 90.	Over 90.	10 to 15.	15 to 20.	20 to 30.	30 to 40.	40 to 50.	50 to 60.	60 to 70.	70 to 80.	80 to 90.	Over 90.	10 to 15.	15 to 20.	20 to 30.	30 to 40.	40 to 50.	50 to 60.	60 to 70.	70 to 80.	80 to 90.	Over 90.																							
Totals.	3	1	8	10	8	24	15	30	5	22	37	23	4	9	2	147	14	3		2	31	4	6	1	4	2	2	10	5	1	2	12	1	6	1	1	5	1	2	16	1	2	3	4	5	3	5	2	12	6	4	3	3	9	6	5	18	13	17	22	5	11	15	15	1	3	1	3	5	9	42	6	4

NEW JERSEY FROM CERTAIN SELECTED DISEASES FOR THE YEAR ENDING 31, 1907.

	Constables and policemen.		Contractors, carpenters and builders.		Dressmakers and seamstresses.		Dentists.		Drivers, boaters and teamsters.		Druggists.		Dyers.		Engineers.		Electricians.		Expressmen.		FACTORY EMPLOYEES.		Farmers.		Fishermen.		Florists and gardeners.		Foundrymen and moulders.		Glassblowers.		Grinders and polishers.		Grocers.		Hatters.		Hotelkeepers, restaurateurs and stewards.		
	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.			
Totals.	3	76	10	2	91	5	4	18	3	13	3	20	30	41	13	2	10	14	4	11	20	4	29	7	2	31	4	6	1	4	2	2	51	1	2	5	4	2	8	5	3



TABLE 6—SHOWING AGES AT DEATH AND OCCUPATIONS OF DECEDENTS IN DECEMBER

Diseases of the respiratory system (Consumption excepted)	Occupations																							
	Architects.	Artists.	Bakers.	Bankers and brokers.	Barbers.	Bar-tenders, brewers and saloon keepers.	Blacksmiths.	Boatmen.	Boiler makers.	Bookkeepers.	Brass and iron-workers.	Brickmakers.	Butchers.	Automakers.	Chemists.	Civil engineers.	Cigar-makers.	Clergymen.	Clerks.	Cooks.	Coopers.			
10 to 15																								
15 to 20																								
20 to 30																								
30 to 40																								
40 to 50																								
50 to 60																								
60 to 70																								
70 to 80																								
80 to 90																								
Over 90																								
Totals	2	2	2	2	2	2	5	6	4	4	4	3	3	1	1	2	3	3	4	1	1			

NEW JERSEY FROM CERTAIN SELECTED DISEASES FOR THE YEAR ENDING 31, 1907—(Continued).

Diseases of the digestive system.	Occupations																									
	Constables and policemen.	Contractors, carpenters and builders.	Dressmakers and seamstresses.	Dentists.	Drivers, hostlers and teamsters.	Druggists.	Dyers.	Engineers.	Enginers.	Electricians.	Expressmen.	FACTORY EMPLOYEES.	Farmers.	Fishermen.	Florists and gardeners.	Foundrymen and moulders.	Glassblowers.	Grinders and polishers.	Grocers.	Hatters.	Hotelkeepers, restaurateurs and stewards.					
10 to 15																										
15 to 20																										
20 to 30																										
30 to 40																										
40 to 50																										
50 to 60																										
60 to 70																										
70 to 80																										
80 to 90																										
Over 90																										
Totals	1	15	1	12	1	3	7	3	7	3	2	40	2	2	7	2	2	2	2	1	1					

Diseases of the genito-urinary system and adnexa.	Occupations																									
	Constables and policemen.	Contractors, carpenters and builders.	Dressmakers and seamstresses.	Dentists.	Drivers, hostlers and teamsters.	Druggists.	Dyers.	Engineers.	Enginers.	Electricians.	Expressmen.	FACTORY EMPLOYEES.	Farmers.	Fishermen.	Florists and gardeners.	Foundrymen and moulders.	Glassblowers.	Grinders and polishers.	Grocers.	Hatters.	Hotelkeepers, restaurateurs and stewards.					
10 to 15																										
15 to 20																										
20 to 30																										
30 to 40																										
40 to 50																										
50 to 60																										
60 to 70																										
70 to 80																										
80 to 90																										
Over 90																										
Totals	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2

Pneumonia.	Occupations																									
	Constables and policemen.	Contractors, carpenters and builders.	Dressmakers and seamstresses.	Dentists.	Drivers, hostlers and teamsters.	Druggists.	Dyers.	Engineers.	Enginers.	Electricians.	Expressmen.	FACTORY EMPLOYEES.	Farmers.	Fishermen.	Florists and gardeners.	Foundrymen and moulders.	Glassblowers.	Grinders and polishers.	Grocers.	Hatters.	Hotelkeepers, restaurateurs and stewards.					
10 to 15																										
15 to 20																										
20 to 30																										
30 to 40																										
40 to 50																										
50 to 60																										
60 to 70																										
70 to 80																										
80 to 90																										
Over 90																										
Totals	2	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5

All others.	Occupations																								
	1	15	1	12	1	3	7	3	7	3	2	40	2	2	7	2	2	2	2	1	1				



TABLE 7.—TABULATION OF DEATHS FROM THE CLASSIFIED DISEASES,  
THE YEAR ENDING

DEATHS IN ASBURY PARK.

	AGE PERIODS.										
	Under one month.	One to five.	Five to ten.	Ten to fifteen.	Fifteen to twenty.	Twenty to twenty-five.	Twenty-five to thirty.	Thirty to thirty-five.	Forty to forty-five.	Forty-five to fifty.	Fifty to fifty-five.
Typhoid Fever.....	1					1					
Whooping Cough.....	7	4	1								
Diphtheria and Croup.....	8										
Influenza.....	9										
Tuberculosis. { Of the Lungs.....	22	C									
{ Of the Peritoneum.....											
Syphilis.....	24				1						
Cancer. { Of the Breast.....	25	E									
{ Others.....											
Cerebral Hemorrhage and Congestion.....	42					1					
General Paralysis.....	45										
Other Diseases of the Nervous System.....	52										
Endocarditis.....	56	1					1		1	1	
Organic Diseases of the Heart.....	57		1								1
Angina Pectoris.....	58					1					
Diseases of Arteries, Atheroma, Aneurism, etc.....	59					1					
Embolism.....	60										1
Hemorrhage.....	65	1									
Diseases of the Larynx and Thyroid Body.....	68										1
Broncho-Pneumonia.....	71		1								
Pneumonia.....	72	3	2		2						
Asthma.....	76						1		1		
Other Diseases of the Respiratory System.....	77	B									
Other Diseases of Stomach (Cancer excepted).....	81		2								1
Infantile Diarrhea, Athrepsia.....	82	1	4	1							
Diarrhea and Enteritis.....	83										1
Cirrhosis of the Liver.....	90										1
Other Diseases of the Liver.....	92							1			1
Acute Nephritis.....	96										
Bright's Disease.....	97			1							
Phlegmon, Acute Abscess.....	128						2				
Malformations.....	137	1									
Congenital Debility, Icterus and Sclerema.....	138										
Senile Debility.....	141	7	4	2							
Suicide or Attempt at Suicide, By Firearms.....	142	D									
Other Accidental Injuries.....	145										
Burns by Fire.....	146	A									
Sunstroke and Freezing.....	147										
Other External Violence.....	152										
Unknown or Not Specified Diseases.....	160										
Cerebro-spinal Meningitis.....	161		1	2							

Total deaths, 140. Death-rate, 14.58.

IN THE STATISTICAL DIVISIONS OF THE STATE OF NEW JERSEY, FOR  
DECEMBER 31, 1907.

AGE PERIODS.	SEX.	COLOR.	NATIVITY.											SOCIAL CONDITION.								
			United States.	England.	France.	Germany.	Ireland.	Italy.	Scotland.	Hungary.	Sweden.	Other foreign.	Not stated.	Married.	Single.	Widowed.	Not stated.					
Fifty-five to sixty.	1	2	1																1	5		
Sixty to seventy.	1	1	3																	6		
Seventy to eighty.	1	4	5																	1		
Eighty to ninety.	1	1	1																	1		
Over ninety.	1	1	1																	1		
Not stated.																						
Male.	2	4	4																	1	1	
Female.	1	1	1																	1	4	
Color of decedent white unless designated by mark.																						
United States.	1	5	10																	4	4	2
England.		1	1																	4	4	4
France.		1																		5	5	4
Germany.																				1	1	3
Ireland.																						
Italy.																						
Scotland.																						
Hungary.																						
Sweden.																						
Other foreign.																				1	1	1
Not stated.																				4	4	4
Married.																				1	1	1
Single.																				1	7	1
Widowed.																				1	1	1
Not stated.																				3	1	1







TABLE 9.—TABULATION OF DEATHS FROM THE CLASSIFIED DISEASES, THE YEAR ENDING

IN THE STATISTICAL DIVISIONS OF THE STATE OF NEW JERSEY, FOR DECEMBER 31, 1907.

DEATHS IN BAYONNE.

	AGE PERIODS.												
	Under one month.	Under one year.	One to five.	Five to ten.	Ten to fifteen.	Fifteen to twenty.	Twenty to twenty-five.	Twenty-five to thirty.	Thirty to thirty-five.	Thirty-five to forty.	Forty to forty-five.	Forty-five to fifty.	Fifty to fifty-five.
Typhoid fever	1	1	1	1	1	1	1	1	1	1	1	1	1
Measles	2	7	1	1	1	1	1	1	1	1	1	1	1
Scarlet Fever	1	11	1	1	1	1	1	1	1	1	1	1	1
Whooping Cough	4	5	1	1	1	1	1	1	1	1	1	1	1
Diphtheria and Croup	8	4	1	1	1	1	1	1	1	1	1	1	1
Tuberculosis. { Of the Lungs. 22	6	11	4	1	1	1	1	1	1	1	1	1	1
{ Of the Meninges. 22	1	1	1	1	1	1	1	1	1	1	1	1	1
{ Of Other Organs. 22	1	1	1	1	1	1	1	1	1	1	1	1	1
{ Of the Stomach and Liver. 22	1	1	1	1	1	1	1	1	1	1	1	1	1
{ Of the Female Genital Organs. 22	1	1	1	1	1	1	1	1	1	1	1	1	1
Cancer. { Of the Breast. 25	1	1	1	1	1	1	1	1	1	1	1	1	1
{ Of the Skin. 25	1	1	1	1	1	1	1	1	1	1	1	1	1
{ Others. 25	1	1	1	1	1	1	1	1	1	1	1	1	1
Rheumatism	1	1	1	1	1	1	1	1	1	1	1	1	1
Diabetes	1	1	1	1	1	1	1	1	1	1	1	1	1
Addison's Disease	1	1	1	1	1	1	1	1	1	1	1	1	1
Leukemia	1	1	1	1	1	1	1	1	1	1	1	1	1
Othemia Chlorosis	1	1	1	1	1	1	1	1	1	1	1	1	1
Alcoholism (Acute or Chronic)	1	1	1	1	1	1	1	1	1	1	1	1	1
Simple Meningitis	2	5	1	1	1	1	1	1	1	1	1	1	1
Progressive Locomotor Ataxia	4	1	1	1	1	1	1	1	1	1	1	1	1
Cerebral Hemorrhage and Congestion	4	2	1	1	1	1	1	1	1	1	1	1	1
General Paralysis	4	1	1	1	1	1	1	1	1	1	1	1	1
Other Forms of Insanity	4	1	1	1	1	1	1	1	1	1	1	1	1
Convulsions of Infants	4	1	1	1	1	1	1	1	1	1	1	1	1
Other Diseases of the Nervous System	49	7	5	2	1	1	1	1	1	1	1	1	1
Pericarditis	52	1	1	1	1	1	1	1	1	1	1	1	1
Endocarditis	55	1	1	1	1	1	1	1	1	1	1	1	1
Organic Diseases of the Heart	56	1	1	1	1	1	1	1	1	1	1	1	1
Angina Pectoris	57	1	1	1	1	1	1	1	1	1	1	1	1
Diseases of Arteries, Atheroma, Aneurism, etc.	58	1	1	1	1	1	1	1	1	1	1	1	1
Other Diseases of the Circulatory System	59	1	1	1	1	1	1	1	1	1	1	1	1
Diseases of the Larynx and Thyroid Body	66	1	1	1	1	1	1	1	1	1	1	1	1
Acute Bronchitis	68	1	1	1	1	1	1	1	1	1	1	1	1
Chronic Bronchitis	69	1	1	1	1	1	1	1	1	1	1	1	1
Broncho-Pneumonia	70	1	1	1	1	1	1	1	1	1	1	1	1
Pneumonia	71	5	10	15	1	1	1	1	1	1	1	1	1
Fluency	72	1	3	15	1	1	1	1	1	1	1	1	1
Congestion and Apoplexy of Lungs	73	1	1	1	1	1	1	1	1	1	1	1	1
Gangrene of Lungs	74	4	1	1	1	1	1	1	1	1	1	1	1
Asthma	75	1	1	1	1	1	1	1	1	1	1	1	1
Pulmonary Emphysema	76	1	1	1	1	1	1	1	1	1	1	1	1
Other Diseases of the Respiratory System	77	1	1	1	1	1	1	1	1	1	1	1	1
Diseases of the Pharynx	79	1	1	1	1	1	1	1	1	1	1	1	1
Ulcer of Stomach	80	1	1	1	1	1	1	1	1	1	1	1	1
Other Diseases of Stomach (Cancer excepted)	81	1	1	1	1	1	1	1	1	1	1	1	1
Infantile Diarrhea, Athrepsia	82	1	1	1	1	1	1	1	1	1	1	1	1
Diarrhea and Enteritis	83	2	2	1	1	1	1	1	1	1	1	1	1
Dysentery	84	2	1	1	1	1	1	1	1	1	1	1	1
Hernia and Intestinal Obstructions	86	2	1	1	1	1	1	1	1	1	1	1	1
Cirrhosis of the Liver	90	1	1	1	1	1	1	1	1	1	1	1	1
Other Diseases of the Liver	92	2	2	1	1	1	1	1	1	1	1	1	1
Inflammatory Peritonitis (Non-Puerperal)	93	1	1	1	1	1	1	1	1	1	1	1	1
Appendicitis	95	1	1	1	1	1	1	1	1	1	1	1	1
Acute Nephritis	96	1	1	1	1	1	1	1	1	1	1	1	1
Bright's Disease	97	1	1	1	1	1	1	1	1	1	1	1	1
Other Diseases of the Kidneys and Adnexa	100	1	1	1	1	1	1	1	1	1	1	1	1
Disease of the Bladder	102	1	1	1	1	1	1	1	1	1	1	1	1
Other Diseases of the Uterus	112	1	1	1	1	1	1	1	1	1	1	1	1

AGE PERIODS.	SEX.	COLOR.	NATIVITY.												SOCIAL CONDITION.												
			Fifty-five to sixty.	Sixty to seventy.	Seventy to eighty.	Eighty to ninety.	Over ninety.	Not stated.	Male.		White unless designated by mark.	United States.												Married.	Single.	Widowed.	Not stated.
									United States.	Female.		England.	France.	Germany.	Ireland.	Italy.	Scotland.	Hungary.	Sweden.	Other foreign.	Not stated.						
Fifty-five to sixty.	Male.	Female.	United States.	England.	France.	Germany.	Ireland.	Italy.	Scotland.	Hungary.	Sweden.	Other foreign.	Not stated.	Married.	Single.	Widowed.	Not stated.										
Fifty-five to sixty.	Female.	Male.	United States.	England.	France.	Germany.	Ireland.	Italy.	Scotland.	Hungary.	Sweden.	Other foreign.	Not stated.	Married.	Single.	Widowed.	Not stated.										
White unless designated by mark.	United States.	England.	France.	Germany.	Ireland.	Italy.	Scotland.	Hungary.	Sweden.	Other foreign.	Not stated.	Married.	Single.	Widowed.	Not stated.												
Married.	Single.	Widowed.	Not stated.	United States.	England.	France.	Germany.	Ireland.	Italy.	Scotland.	Hungary.	Sweden.	Other foreign.	Not stated.	Married.	Single.	Widowed.	Not stated.									





































TABLE 23.—TABULATION OF DEATHS FROM THE CLASSIFIED DISEASES, THE YEAR ENDING

DEATHS IN HOBOKEN.	AGE PERIODS.												
	Under one month.	Under one year.	One to five.	Five to ten.	Ten to fifteen.	Fifteen to twenty.	Twenty to twenty-five.	Twenty-five to thirty.	Thirty to thirty-five.	Thirty-five to forty.	Forty to forty-five.	Forty-five to fifty.	Fifty to fifty-five.
Typhoid Fever.....	1												
Scurvy.....	3	1											
Masles.....	5	25	1	1									
Scarlet Fever.....	6	1	28	17	1								
Whooping Cough.....	7	1	6	2	1								
Diphtheria and Croup.....	8	1	16	4	1								
Influenza.....	8	1	1	1									
Pneumonia and Septicæmia.....	14	1											
Intermittent Fever.....	19												
Tuberculosis.....	22	3	2	1		11	11	20	28	30	18	16	14
Of the Lungs.....	A	3	2			11	11	20	28	30	18	16	14
Of the Meninges.....	B	3	2			11	11	20	28	30	18	16	14
Of the Peritoneum.....	C	1	1										
Of Other Organs.....	D												
General.....	E												
Syphilis.....	24	1											
Of the Mouth.....	A												
Of the Stomach and Liver.....	B												
Of the Intestines and Rectum.....	C												
Cancer.....	25												
Of the Female Genital Organs.....	D												
Of the Breast.....	E												
Others.....	C												
Rheumatism.....	26												
Diabetes.....	28												
Exophthalmic Goitre.....	29												
Leukæmia.....	31												
Anæmia Chlorosis.....	32												
Alcoholism (Acute or Chronic).....	34												
Encephalitis.....	38												
Simple Meningitis.....	39	7	7	3	1	2	5	1	1	1	1	1	1
Progressive Locomotor Ataxia.....	40												
Progressive Muscular Atrophy.....	41	1											
Cerebral Hemorrhage and Congestion.....	42	2	5										
Paralysis Without Indicated Cause.....	44												
General Paralysis.....	45												
Epilepsy.....	47												
Convulsions of Infants.....	49	7	8	5	1								
Tetanus.....	50												
Other Diseases of the Nervous System.....	52	1	2										
Pericarditis.....	55												
Endocarditis.....	56												
Organic Diseases of the Heart.....	57	4	1	1	1	5	4	5	6	3	3	5	13
Angina Pectoris.....	58												
Diseases of Arteries, Atheroma, Aneurism, etc.....	61												
Diseases of the Larynx and Thyroid Body.....	68												
Acute Bronchitis.....	69	1	12	3	1								
Chronic Bronchitis.....	70												
Broncho-Pneumonia.....	71	2	1	13	1								
Pneumonia.....	72	2	21	31	2	3	3	10	5	12	7	12	8
Pleurisy.....	73												
Congestion and Apoplexy of Lungs.....	74												
Asthma.....	76												
Other Diseases of the Respiratory System.....	77	1											
Ulcer of Stomach.....	80												
Other Diseases of Stomach (Cancer excepted).....	81	2	2	2									
Infantile Diarrhoea, Atresia.....	82	1	6	21									
Diarrhoea and Enteritis.....	83	3											

IN THE STATISTICAL DIVISIONS OF THE STATE OF NEW JERSEY, FOR DECEMBER 31, 1907.

AGE PERIODS.	SEX.	COLOR.	NATIVITY.										SOCIAL CONDITION.					
			United States.	England.	France.	Germany.	Ireland.	Italy.	Scotland.	Hungary.	Sweden.	Other foreign.	Not stated.	Married.	Single.	Widowed.	Not stated.	
Fifty-five to sixty.	15	3	11			1									6	11		1
Sixty to seventy.	16	21	21			5									1	36		
Seventy to eighty.	28	23	23			5									5	51		
Eighty to ninety.	16	11	17			1									2	20		
Over ninety.	3	1	1												2	7		
Not stated.	107	57	90			2									1	1		2
Male.	12	6	7			29									69	78		17
Female.	1	1	1			1									1	1		1
Color of decedent white unless designated by mark.	2	2	2			1									2	2		2
United States.	16	11	1			1									1	1		2
England.	1	1	1			1									1	1		1
France.	1	1	1			1									1	1		1
Germany.	1	1	1			1									1	1		1
Ireland.	1	1	1			1									1	1		1
Italy.	1	1	1			1									1	1		1
Scotland.	1	1	1			1									1	1		1
Hungary.	1	1	1			1									1	1		1
Sweden.	1	1	1			1									1	1		1
Other foreign.	1	1	1			1									1	1		1
Not stated.	1	1	1			1									1	1		1
Married.	69	78	1			1									1	1		2
Single.	1	1	1			1									1	1		1
Widowed.	2	2	2			2									2	2		2
Not stated.	1	1	1			1									1	1		1



















TABLE 29.—TABULATION OF DEATHS FROM THE CLASSIFIED DISEASES, THE YEAR ENDING

IN THE STATISTICAL DIVISIONS OF THE STATE OF NEW JERSEY, FOR DECEMBER 31, 1907.

DEATHS IN MONTCLAIR.	AGE PERIODS.											
	Under one month.	Under one year.	One to five.	Five to ten.	Ten to fifteen.	Fifteen to twenty.	Twenty to twenty-five.	Twenty-five to thirty.	Thirty to thirty-five.	Thirty-five to forty.	Forty to forty-five.	Fifty to fifty-five.
Typhoid Fever.....	1											
Scurvy.....	3											
Measles.....	5											
Scarlet Fever.....	6											
Whooping Cough.....	7											
Influenza.....	9											
Tuberculosis.....	22											
{ Of the Lungs.....	A											
{ Of the Meninges.....	B											
{ Of the Peritoneum.....	C											
Cancer.....	25											
{ Of the Stomach and Liver.....	B											
{ Of the Intestines and Rectum.....	C											
{ Of the Female Genital Organs.....	D											
{ Of the Breast.....	E											
{ Of the Skin.....	F											
Diabetes.....	28											
Leukemia.....	28											
Anemia Chlorosis.....	31											
Alcoholism (Acute or Chronic).....	32											
Simple Meningitis.....	34											
Progressive Locomotor Ataxia.....	39											
Progressive Muscular Atrophy.....	40											
Cerebral Hemorrhage and Congestion.....	41											
Paralysis Without Indicated Cause.....	44											
General Paralysis.....	45											
Epilepsy.....	47											
Other Diseases of the Nervous System.....	52											
Endocarditis.....	56											
Organic Diseases of the Heart.....	67											
Angina Pectoris.....	58											
Diseases of Arteries, Atheroma, Aneurism, etc.....	59											
Acute Bronchitis.....	59											
Chronic Bronchitis.....	70											
Broncho-Pneumonia.....	71											
Pneumonia.....	72											
Fluorid.....	73											
Other Diseases of the Respiratory System.....	77											
Ulcer of Stomach.....	80											
Other Diseases of Stomach (Cancer excepted).....	81											
Infantile Diarrhoea, Athrepsia.....	82											
Diarrhoea and Enteritis.....	83											
Dysentery.....	84											
Hernia and Intestinal Obstructions.....	86											
Other Diseases of the Liver.....	92											
Inflammatory Peritonitis (Non-Puerperal).....	93											
Acute Nephritis.....	96											
Bright's Disease.....	97											
Other Diseases of the Kidneys and Adnexa.....	100											
Vesical Calculi.....	101											
Diseases of the Bladder.....	102											
Accidents of Pregnancy.....	116											
Puerperal Septicemia.....	119											
Puerperal Albuminuria and Eclampsia.....	121											
Erysipelas.....	125											
Other Diseases of Skin and Adnexa (Cancer ex.).....	129											
Other Diseases of Bones.....	132											
Congenital Deblity, Icterus and Sclerema.....	135											
Senile Deblity.....	141											
Suicide.....	141											
{ By Poison.....	A											
{ By Asphyxia.....	B											
{ By Firearms.....	D											
Other Accidental Injuries.....	145											
Burns by Fire.....	146											
Other Accidental Poisoning.....	151											
Exhaustion-Cachexia.....	153											
Cerebro-spinal Meningitis.....	161											

To tal deaths, 291. Death-rate, 16.79.

AGE PERIODS.	COLOR.	SEX.	NATIVITY.	SOCIAL CONDITION.			
				Married.	Single.	Widowed.	Not stated.
Fifty-five to sixty.			United States.				
Sixty to seventy.			England.				
Seventy to eighty.			France.				
Eighty to ninety.			Germany.				
Over ninety.			Ireland.				
Not stated.			Italy.				
Male.			Scotland.				
Female.			Hungary.				
Color of decedent white unless designated by mark.			Sweden.				
			Other foreign.				
			Not stated.				
			Married.				
			Single.				
			Widowed.				
			Not stated.				

TABLE 30.—TABULATION OF DEATHS FROM THE CLASSIFIED DISEASES, THE YEAR ENDING

DEATHS IN MORRISTOWN.	AGE PERIODS.												
	Under one month.	Under one year.	One to five.	Five to ten.	Ten to fifteen.	Fifteen to twenty.	Twenty to twenty-five.	Twenty-five to thirty.	Thirty to thirty-five.	Thirty-five to forty.	Forty to forty-five.	Forty-five to fifty.	Fifty to fifty-five.
Typhoid Fever.....	1												
Scoury.....	1												
Scarlet Fever.....	6												
Diphtheria and Croup.....	8												
Influenza.....	9												
Tuberculosis.....	A												
(Of the Lungs.....)	C												
(Of the Peritoneum.....)	E												
(Of Other Organs.....)	E	22											
(General.....)	F												
(Of the Mouth.....)	A												
Cancer.....	A												
(Of the Stomach and Liver.....)	C												
(Of the Intestines and Rectum.....)	C	25											
(Of the Female Genital Organs.....)	D												
Diabetes.....	23												
Exophthalmic Goitre.....	29												
Anemia Chlorosis.....	35												
Alcoholism (Acute or Chronic).....	34												
Lead Poisoning.....	35												
Simple Meningitis.....	39												
Cerebral Hemorrhage and Congestion.....	42												
Paralysis Without Indicated Cause.....	44												
General Paralysis.....	45												
Convulsions of Infants.....	49												
Tetanus.....	50												
Other Diseases of the Nervous System.....	52												
Endocarditis.....	56												
Organic Diseases of the Heart.....	57												
Diseases of Arteries, Atheroma, Aneurism, etc.....	59												
Hemorrhage.....	65												
Diseases of the Larynx and Thyroid Body.....	68												
Acute Bronchitis.....	69												
Chronic Bronchitis.....	70												
Broncho-Pneumonia.....	71												
Pneumonia.....	72												
Pleurisy.....	73												
Congestion and Apoplexy of Lungs.....	74												
Asthma.....	76												
Other Diseases of the Respiratory System.....	77												
Ulcer of Stomach.....	80												
Other Diseases of Stomach (Cancer excepted).....	81												
Infantile Diarrhoea, Athrepsia.....	82												
Diarrhoea and Enteritis.....	83												
Dysentery.....	84												
Hernia and Intestinal Obstructions.....	86												
Cirrhosis of the Liver.....	90												
Inflammatory Peritonitis (Non-Puerperal).....	93												
Appendicitis.....	95												
Acute Nephritis.....	96												
Bright's Disease.....	97												
Vesical Calculi.....	101												
Diseases of the Bladder.....	102												
Uterine Tumors (Non-Cancerous).....	111												
Puerperal Septicæmia.....	119												
Erysipelas.....	125												
Gangrene.....	126												
Malformations.....	137												
Congenital Debility, Icterus and Sclerema.....	138												
Infantile Inanition, Want of Care.....	139												
Senile Debility.....	141												
Suicide or Attempt at Suicide, By Firearms.....	142												
Other Accidental Injuries.....	143												
Burns by Fire.....	146												
Other Accidental Poisoning.....	151												
Other External Violence.....	152												
Inflammatory Fever.....	154												
Cerebro-spinal Meningitis.....	161												
Total deaths, 281. Death-rate, 22.49.													

IN THE STATISTICAL DIVISIONS OF THE STATE OF NEW JERSEY, FOR DECEMBER 31, 1907.

AGE PERIODS.	SEX.	COLOR.	NATIVITY.	SOCIAL CONDITION.			
				Married.	Single.	Widowed.	Not stated.
Fifty-five to sixty.							
Sixty to seventy.							
Seventy to eighty.							
Eighty to ninety.							
Over ninety.							
Not stated.							
Male.							
Female.							
Color of decedent which is not designated by mark.							
United States.							
England.							
France.							
Germany.							
Ireland.							
Ireland.							
Ireland.							
Ireland.							
Ireland.							
Scotland.							
Scotland.							
Hungary.							
Sweden.							
Sweden.							
Other foreign.							
Not stated.							
Married.							
Single.							
Widowed.							
Not stated.							

IN THE STATISTICAL DIVISIONS OF THE STATE OF NEW JERSEY, FOR  
DECEMBER 31, 1907.

TABLE 31.—TABULATION OF DEATHS FROM THE CLASSIFIED DISEASES,  
THE YEAR ENDING

DEATHS IN NEWARK.

DISEASES.	AGE PERIODS.												
	Under one month.	Under one year.	One to five.	Five to ten.	Ten to fifteen.	Fifteen to twenty.	Twenty to twenty-five.	Twenty-five to thirty.	Thirty to thirty-five.	Thirty-five to forty.	Forty to forty-five.	Forty-five to fifty.	Fifty to fifty-five.
Typhoid Fever.	1												
Scurvy.	3	1											
Measles.	5	11	11	10	10	10	9	16	10				
Scarlet Fever.	7	17	17	3	3	3	3	7	7				
Whooping Cough.	9	28	33	33	5	3	3	5	3				
Diphtheria and Croup.	8	6	6	2	4	4	4	4	4				
Influenza.	9	1	1	1	1	1	1	1	1				
Other Epidemic Diseases.	13	1	1	1	1	1	1	1	1				
Diseases (Other).	14	1	1	1	1	1	1	1	1				
Pneumonia and Septicæmia.	19	1	1	1	1	1	1	1	1				
Intermittent Fever.	20	1	1	1	1	1	1	1	1				
Malarial Cachexia.	20	4	4	2	2	7	36	89	73	97	103	84	68
Tuberculosis.	22	23	29	6	6	2	2	4	4	2	2	1	1
Of the Lungs.	A	23	29	6	6	2	2	4	4	2	2	1	1
Of the Meninges.	B	1	1	1	1	1	1	1	1	1	1	1	1
Of the Peritoneum.	C	4	4	2	2	2	2	2	2	2	2	2	2
Of Other Organs.	E	1	1	1	1	1	1	1	1	1	1	1	1
General.	F	2	10	1	1	1	1	1	1	1	1	1	1
Syphilis.	24	2	10	1	1	1	1	1	1	1	1	1	1
Of the Mouth.	A	1	1	1	1	1	1	1	1	1	1	1	1
Of the Stomach and Liver.	B	1	1	1	1	1	1	1	1	1	1	1	1
Of Intestines and Rectum.	C	1	1	1	1	1	1	1	1	1	1	1	1
Of Female Genital Organs.	D	1	1	1	1	1	1	1	1	1	1	1	1
Of the Breast.	E	1	1	1	1	1	1	1	1	1	1	1	1
Of the Skin.	F	1	1	1	1	1	1	1	1	1	1	1	1
Others.	G	1	1	1	1	1	1	1	1	1	1	1	1
Cancer.	25	1	1	1	1	1	1	1	1	1	1	1	1
Rheumatism.	26												
Diabetes.	26												
Leukemia.	31	1	1	1	1	1	1	1	1	1	1	1	1
Anemia Chlorosis.	32												
Other General Diseases.	33												
Alcoholism (Acute or Chronic).	34												
Other Chronic Poisonings.	37												
Encephalitis.	38												
Simple Meningitis.	39	4	22	43	6	4	2	2	2	2	2	2	2
Progressive Locomotor Ataxia.	40	1	1	1	1	1	1	1	1	1	1	1	1
Cerebral Hemorrhage and Congestion.	43	4	3	1	2	1	1	1	1	1	1	1	1
Softening of the Brain.	43	1	1	1	1	1	1	1	1	1	1	1	1
Paralysis Without Indicated Cause.	44												
General Paralysis.	45	1	1	1	1	1	1	1	1	1	1	1	1
Other Forms of Insanity.	46	1	1	1	1	1	1	1	1	1	1	1	1
Epilepsy.	47												
Convulsions of Infants.	49	31	20	14									
Chorea.	51												
Other Diseases of the Nervous System.	52	1	1	2	2	1	1	1	1	1	1	1	1
Diseases of the Eyes.	53												
Diseases of the Ears.	54												
Pericarditis.	55												
Endocarditis.	56	3	2	3	6	4	6	8	11	12	12	15	16
Organic Diseases of the Heart.	57	8	2	3	6	4	6	8	11	12	12	15	16
Angina Pectoris.	58												
Diseases of Arteries. Atheroma, Aneurism, etc.	59	1	1	1	1	1	1	1	1	1	1	1	1
Phlebitis and Other Diseases of the Veins.	62												
Other Diseases of the Lymphatic System.	64												
Hemorrhage.	66												
Other Diseases of the Circulatory System.	66												
Diseases of the Nasal Fossæ.	67	1	1	1	1	1	1	1	1	1	1	1	1
Diseases of the Larynx and Thyroid Body.	68	1	1	1	1	1	1	1	1	1	1	1	1
Acute Bronchitis.	69	12	27	12	2	1	1	1	1	2	2	4	4
Chronic Bronchitis.	70	5	10	5	5	5	5	5	5	5	5	5	5
Broncho-Pneumonia.	71	5	35	59	8	4	7	19	21	16	33	23	33
Pneumonia.	72	57	65	8	4	7	19	21	16	33	23	33	22
Pleurisy.	73	1	1	1	1	1	1	1	1	1	1	1	1
Congestion and Apoplexy of Lungs.	74	1	1	1	1	1	1	1	1	1	1	1	1
Gangrene of Lungs.	75	1	1	1	1	1	1	1	1	1	1	1	1
Asthma.	76	1	1	1	1	1	1	1	1	1	1	1	1
Pulmonary Emphysema.	77	1	1	1	1	1	1	1	1	1	1	1	1
Other Diseases of Respiratory System.	B	1	1	1	1	1	1	1	1	1	1	1	1

AGE PERIODS.	SEX.	COLOR.	NATIVITY.	SOCIAL CONDITION.			
				Married.	Single.	Widowed.	Not stated.
Fifty-five to sixty.	43	30					
Sixty to seventy.	37	31					
Seventy to eighty.	37	31					
Eighty to ninety.	47	235					
Over ninety.	1	1					
Not stated.	43	30					
Male.	471	235					
Female.	43	36					
Color of decedent white unless designated by mark.	2	4					
United States.	45	3					
England.	3	1					
France.	1	1					
Germany.	3	5					
Ireland.	1	1					
Italy.	1	1					
Scotland.	1	1					
Hungary.	1	1					
Sweden.	1	1					
Other foreign.	1	1					
Not stated.	1	1					
Married.	38	38					
Single.	1	1					
Widowed.	1	1					
Not stated.	1	1					

TABLE 31.—TABULATION OF DEATHS FROM THE CLASSIFIED DISEASES, THE YEAR ENDING

Table with columns for 'AGE PERIODS' (Under one month to Fifty to fifty-five) and rows for various diseases and conditions. Total deaths: 5,736. Death-rate: 19.11.

IN THE STATISTICAL DIVISIONS OF THE STATE OF NEW JERSEY, FOR DECEMBER 31, 1907—(Continued).

Table with columns for 'AGE PERIODS', 'SEX', 'COLOR', 'NATIVITY', and 'SOCIAL CONDITION'. Rows include various age groups and categories like 'United States', 'England', 'France', etc.















TABLE 35.—TABULATION OF DEATHS FROM THE CLASSIFIED DISEASES,  
THE YEAR ENDING

DEATHS IN PASSAIC CITY.	AGE PERIODS.												
	Under one month.	Under one year.	One to five.	Five to ten.	Ten to fifteen.	Fifteen to twenty.	Twenty to twenty-five.	Twenty-five to thirty.	Thirty to thirty-five.	Thirty-five to forty.	Forty to forty-five.	Forty-five to fifty.	Fifty to fifty-five.
Abscess of the Pelvis.....													
Ovarian Cysts and Other Ovarian Tumors.....													
Accidents of Pregnancy.....													
Other Accidents of Labor.....													
Puerperal Septicæmia.....	119	A											
Erysipelas.....	125												
Gangrene.....	126												
Phlegmon, Acute Abscess.....	129												
Other Diseases of Skin and Adnexa (Cancer ex.).....	129	F											
Congenital Debility, Icterus and Sclerema.....	138	F											
Infantile Inanition, Want of Care.....	139	F											
Scælic Debility.....	141												
Suicide or Attempt at Suicide.....	142	A											
		B											
		D											
		F											
Fractures.....	143												
Other Accidental Injuries.....	146												
Burns by Fire.....	146	A											
Accidental Drowning.....	148												
Other External Violence.....	152												
Cerebro-spinal Meningitis.....	161												
Total deaths, 808	Death-rate, 19.30.												

BY THE STATISTICAL DIVISIONS OF THE STATE OF NEW JERSEY, FOR  
DECEMBER 31, 1907—(Continued)

AGE PERIODS.	SEX.	COLOR.	NATIVITY.	SOCIAL CONDITION.			
				Married.	Single.	Widowed.	Not stated.
Fifty-five to sixty.			Unite <sup>1</sup> States.				
Sixty to seventy.			England.				
Seventy to eighty.			France.				
Eighty to ninety.			Germany.				
Over ninety.			Ireland.				
Not stated.			Italy.				
Male.			Scotland.				
Female.			Hungary.				
Color of decedent white unless design- ated by mark.			Sweden.				
			Other foreign.				
			Not stated.				
				Married.			
				Single.			
				Widowed.			
				Not stated.			

TABLE 36—TABULATION OF DEATHS FROM THE CLASSIFIED DISEASES, THE YEAR ENDING

DEATHS IN PATERSON.	AGE PERIODS.											
	Under one month.	Under one year.	One to five.	Five to ten.	Ten to fifteen.	Fifteen to twenty.	Twenty to twenty-five.	Twenty-five to thirty.	Thirty to thirty-five.	Thirty-five to forty.	Forty to forty-five.	Fifty to fifty-five.
Typhoid Fever.....	1											
Scurvy.....												
Measles.....	3	1	1	2	1	2						
Scarlet Fever.....	5	1	1	2	1	2						
Whooping Cough.....	6	1	1	2	1	2						
Diphtheria and Croup.....	7	1	1	2	1	2						
Influenza.....	8	1	1	2	1	2						
Pyæmia and Septicæmia.....	9	1	1	2	1	2						
Tuberculosis.....	14	1	1	1	1	1	1	1	1	1	1	1
Of the Lungs.....	A											
Of the Meninges.....	B											
Of the Peritoneum.....	C											
Of Other Organs.....	D											
General.....	E											
Syphilis.....	F											
Cancer.....	G											
Of the Mouth.....	A											
Of the Stomach and Liver.....	B											
Of the Intestines and Rectum.....	C											
Of the Female Genital Organs.....	D											
Of the Breast.....	E											
Of the Skin.....	F											
Others.....	G											
Rheumatism.....	24											
Diabetes.....	26											
Leukæmia.....	28											
Anæmia Chlorosis.....	31											
Other General Diseases.....	32											
Alcoholism (Acute or Chronic).....	33											
Simple Meningitis.....	34											
Progressive Locomotor Ataxia.....	39	4	7	9	7							
Progressive Muscular Atrophy.....	40											
Cerebral Hemorrhage and Congestion.....	41											
Softening of the Brain.....	44	1	1	1	1	1	1	1	1	1	1	1
Paralysis Without Indicated Cause.....	43											
General Paralysis.....	44	1	1	1	1	1	1	1	1	1	1	1
Other Forms of Insanity.....	45											
Convulsions of Infants.....	46											
Tetanus.....	49	13	12	3	1	1	1	1	1	1	1	1
Other Diseases of the Nervous System.....	50											
Endocarditis.....	52	C										
Organic Diseases of the Heart.....	56											
Angina Pectoris.....	57	6	1	2	3	3	4	5	5	6	6	12
Diseases of Arteries, Atheroma, Aneurism, etc.....	58											
Hemorrhage.....	59											
Diseases of the Nasal Fossæ.....	65											
Diseases of the Larynx and Thyroid Body.....	67											
Acute Bronchitis.....	68											
Chronic Bronchitis.....	69	2	3	2	1	1	1	1	1	1	1	1
Broncho-Pneumonia.....	70											
Pneumonia.....	71	26	19	2	1	1	1	2	2	2	1	1
Pleurisy.....	72	3	16	15	3	2	1	2	2	2	1	1
Congestion and Apoplexy of Lungs.....	73	1	1	1	1	1	1	1	1	1	1	1
Gangrene of Lungs.....	74											
Asthma.....	75											
Pulmonary Emphysema.....	76											
Other Diseases of the Respiratory System.....	77	A										
Diseases of the Esophagus.....	79	B										
Ulcer of Stomach.....	80											
Other Diseases of Stomach (Cancer excepted).....	81	2	2	1	1	1	1	1	1	1	1	1

IN THE STATISTICAL DIVISIONS OF THE STATE OF NEW JERSEY, FOR DECEMBER 31, 1907.

AGE PERIODS.	SEX.	COLOR.	NATIVITY.	SOCIAL CONDITION.			
				Married.	Single.	Widowed.	Not stated.
Fifty-five to sixty.	1	7	1	7	0	1	0
Sixty to seventy.	1	3	1	1	1	0	0
Seventy to eighty.	1	4	1	1	1	0	0
Eighty to ninety.	1	4	1	1	1	0	0
Over ninety.	1	5	1	1	1	0	0
Not stated.	1	19	1	1	1	0	0
Male.	108	69	118	10	8	14	6
Female.	101	32	84	10	6	5	5
Color of hair and eyes unless designated by mark.	1	1	1	1	1	1	1
United States.	1	1	1	1	1	1	1
England.	1	1	1	1	1	1	1
France.	1	1	1	1	1	1	1
Germany.	1	1	1	1	1	1	1
Ireland.	1	1	1	1	1	1	1
Italy.	1	1	1	1	1	1	1
Scotland.	1	1	1	1	1	1	1
Hungary.	1	1	1	1	1	1	1
Sweden.	1	1	1	1	1	1	1
Other foreign.	1	1	1	1	1	1	1
Not stated.	1	1	1	1	1	1	1
Married.	86	28	28	28	28	28	28
Single.	72	28	28	28	28	28	28
Widowed.	19	1	1	1	1	1	1
Not stated.	1	1	1	1	1	1	1













TABLE 40—TABULATION OF DEATHS FROM THE CLASSIFIED DISEASES, THE YEAR ENDING

DEATHS IN RAHWAY.	AGE PERIODS.											
	Under one month.	Under one year.	One to five.	Five to ten.	Ten to fifteen.	Fifteen to twenty.	Twenty to twenty-five.	Twenty-five to thirty.	Thirty to thirty-five.	Thirty-five to forty.	Forty to forty-five.	Fifty to fifty-five.
Typhoid Fever.....	1											
Scarlet Fever.....	6											
Diphtheria and Croup.....	3	1										
Influenza.....	9				1							
Tuberculosis—Of the Lungs.....	22	A					1	2	2			
Syphilis.....	24		1									
Cancer. {Of the Female Genital Organs.....}	25											
{Others.....}	D											
Diabetes.....	28									1		
Other General Diseases.....	33		1									
Simple Meningitis.....	39		1									
Progressive Locomotor Ataxia.....	40											
Cerebral Hemorrhage and Congestion.....	42									1	2	2
Paralysis Without Indicated Cause.....	44											
General Paralysis.....	45			1								
Convulsions of Infants.....	49		2									
Other Diseases of the Nervous System.....	53	C					1					
Endocarditis.....	56											1
Organic Diseases of the Heart.....	57				1					3		
Diseases of Arteries, Atheroma, Aneurism, etc.....	59											
Acute Bronchitis.....	69											
Broncho-Pneumonia.....	71		1									
Pneumonia.....	72		4		1							
Other Diseases of the Respiratory System.....	77	E					1	1				
Other Diseases of Stomach (Cancer excepted).....	81											
Infantile Diarrhoea, Athrepsia.....	82		2									
Cirrhosis of the Liver.....	86											
Acute Nephritis.....	86											
Bright's Disease.....	97		1	1		1	1	1		1	1	
Puerperal Septicæmia.....	119	A					1		1			
Erysipelas.....	125											
Gangrene.....	126											
Anthrax Carbuncle.....	127				1							
Congenital Debility, Icterus and Sclerema.....	138		4	3								
Senile Debility.....	141											
Suicide or Attempt at Suicide—By Asphyxia.....	142	B								2	1	2
Other Accidental Injuries.....	145				1	1	1	1				
Burns by Fire.....	146	A		1								
Accidental Drowning.....	148			1								

Total deaths, 125. Death-rate, 13.99.

IN THE STATISTICAL DIVISIONS OF THE STATE OF NEW JERSEY, FOR DECEMBER 31, 1907.

AGE PERIODS.	SEX.	COLOR.	NATIVITY.	SOCIAL CONDITION.			
				Married.	Single.	Widowed.	Not stated.
Fifty-five to sixty.			United States.				
Sixty to seventy.			England.				
Seventy to eighty.			France.				
Eighty to ninety.			Germany.				
Over ninety.			Ireland.				
Not stated.			Italy.				
Male.			Scotland.				
Female.			Hungary.				
Color of decedent white unless designated by mark.			Sweden.				
			(Other foreign.)				
			Not stated.				
			Married.				
			Single.				
			Widowed.				
			Not stated.				



TABLE 42.—TABULATION OF DEATHS FROM THE CLASSIFIED DISEASES,  
THE YEAR ENDING

**DEATHS IN SALEM CITY.**

	AGE PERIODS.												
	Under one month.	Under one year.	One to five.	Five to ten.	Ten to fifteen.	Fifteen to twenty.	Twenty to twenty-five.	Twenty-five to thirty.	Thirty to thirty-five.	Thirty-five to forty.	Forty to forty-five.	Forty-five to fifty.	Fifty to fifty-five.
Typhoid Fever.....	1												
Whooping Cough.....	7												
Influenza.....	9	1											
Tuberculosis. { Of the Lungs.....	A					1		1	3		1	3	3
{ Of Other Organs.....	B												
{ Of the Stomach and Liver.....	C												
{ Of the Female Genital Organs.....	D								2				
{ Of the Breast.....	E												
Cancer.....	F									1			
{ Others.....	G												
Anemia Chlorosis.....	39												
Simple Meningitis.....	39			1									
Progressive Locomotor Ataxia.....	40												
Cerebral Hemorrhage and Congestion.....	42			1									
Paralysis Without Indicated Cause.....	44												
General Paralysis.....	44										1		
Other Forms of Insanity.....	46												
Endocarditis.....	56												
Organic Diseases of the Heart.....	57	1										1	
Angina Pectoris.....	58												
Acute Bronchitis.....	59												
Pneumonia.....	72	2	1				1				1		1
Asthma.....	76												
Infantile Diarrhoea, Athrepsia.....	82	1	4	1									
Diarrhoea and Enteritis.....	83												
Hernia and Intestinal Obstructions.....	86												
Cirrhosis of the Liver.....	90											1	
Other Diseases of the Liver.....	92	1											
Inflammatory Peritonitis (Non-Puerperal).....	93											1	
Acute Nephritis.....	86												
Bright's Disease.....	97												
Diseases of the Bladder.....	102											1	1
Other Accidents of Labor.....	118					1							
Anthrax Carbuncle.....	127												
Congenital Debility, Icterus and Sclerema.....	139	4	3										
Infantile Inanition, Want of Care.....	139	1											
Senile Debility.....	141												
Other Accidental Injuries.....	145						1						
Other Tumors.....	159												
Cerebro-spinal Meningitis.....	161	1											

Total deaths 109. Death-rate, 16.28.

IN THE STATISTICAL DIVISIONS OF THE STATE OF NEW JERSEY, FOR  
DECEMBER 31, 1907.

AGE PERIODS.	SEX.	COLOR.	NATIVITY.	SOCIAL CONDITION.			
				Married.	Sing. b.	Widowed.	Not stated.
Fifty-five to sixty.			United States.				
Sixty to seventy.			England.				
Seventy to eighty.			France.				
Eighty to ninety.			Germany.				
Over ninety.			Ireland.				
Not stated.			Italy.				
Male.			Scotland.				
Female.			Hungary.				
Color of decedent white unless designated by mark.			Sweden.				
United States.			Other foreign.				
England.			Not stated.				
France.			Married.				
Germany.			Sing. b.				
Ireland.			Widowed.				
Italy.			Not stated.				
Scotland.							
Hungary.							
Sweden.							
Other foreign.							
Not stated.							
Married.							
Sing. b.							
Widowed.							
Not stated.							

















TABLE 49.—TABULATION OF DEATHS FROM THE CLASSIFIED DISEASES,  
THE YEAR ENDING

DEATHS IN WEST ORANGE.	AGE PERIODS.												
	Under one month.	Under one year.	One to five.	Five to ten.	Ten to fifteen.	Fifteen to twenty.	Twenty to twenty-five.	Twenty-five to thirty.	Thirty to thirty-five.	Thirty-five to forty.	Forty to forty-five.	Forty-five to fifty.	Fifty to fifty-five.
Scarlet Fever.....	6												
Diphtheria and Croup.....	8												
Influenza.....	9	1	2	2	1								
Tuberculosis. {	22												
Of the Lungs.....	A												
Of the Stomach and Liver.....	E	2	1			1	3	4	2				
Cancer. {	25												
Of the Breast.....	E												
Others.....	C					1						1	
Rheumatism.....	26												
Exophthalmic Goiter.....	29												
Simple Meningitis.....	39												
Cerebral Hemorrhage and Congestion.....	42	1											
General Paralysis.....	45								1				
Diseases of the Ears.....	54	1											
Endocarditis.....	56												
Organic Diseases of the Heart.....	57												
Diseases of Arteries, Atheroma, Aneurism, etc.....	59												
Broncho-Pneumonia.....	71	2	3	1									
Pneumonia.....	72												
Other Diseases of the Respiratory System.....	77												
Other Diseases of Stomach (Cancer excepted).....	81												
Infantile Diarrhoea, Athropsia.....	82												
Eright's Disease.....	83	2	2	1									
Puerperal Septicæmia, Peritis and Sclerema.....	119												
Senile Debility.....	138	2											
Suicide or Attempt at Suicide—By Poison.....	143												
Accidental Drowning.....	148												
Cerebro-spinal Meningitis.....	161	1	1	2									
Total deaths, 95. Death-rate, 11.49.													

IN THE STATISTICAL DIVISIONS OF THE STATE OF NEW JERSEY, FOR  
DECEMBER 31, 1907.

AGE PERIODS.	SEX.	COLOR.	NATIVITY.	SOCIAL CONDITION.		
				Married.	Single.	Widowed.
				Not stated.	Not stated.	Not stated.
Fifty-five to sixty.						
Sixty to seventy.						
Seventy to eighty.						
Eighty to ninety.						
Over ninety.						
Not stated.						
Male.						
Female.						
Color of decedent white unless designated by mark.						
United States.						
England.						
France.						
Germany.						
Ireland.						
Italy.						
Scotland.						
Hungary.						
Sweden.						
Other foreign.						
Not stated.						
Married.						
Single.						
Widowed.						
Not stated.						



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# INDEX.

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(635)

# INDEX.

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Absecon, board of health of . . . . .	110
Acquackanonk township, board of health of . . . . .	111
Alexandria township, board of health of . . . . .	111
Allamuchy township, board of health of . . . . .	111
Allendale, board of health of . . . . .	101
Allenhurst, board of health of . . . . .	101
Allentown, board of health of . . . . .	101
Alloway township, board of health of . . . . .	111
Alpine, board of health of . . . . .	101
Andover, board of health of . . . . .	102
Andover township, board of health of . . . . .	111
Anglesea, board of health of . . . . .	102
Animals, infectious diseases of . . . . .	92
Animals, report of infectious diseases of . . . . .	171
Asbury Park, board of health of . . . . .	99
Asbury Park, report of health officer . . . . .	455
Atlantic City, board of health of . . . . .	99
Atlantic City Hospital, dedication of . . . . .	453
Atlantic Highlands, board of health of . . . . .	102
Atlantic township, board of health of . . . . .	111
Audubon, board of health of . . . . .	102
Avalon, board of health of . . . . .	102
Avon, board of health of . . . . .	102
Barnegat City, board of health of . . . . .	102
Bass River township, board of health of . . . . .	111
Bay Head, board of health of . . . . .	102
Bayonne, board of health of . . . . .	99
Beach Haven, board of health of . . . . .	102
Bedminster township, board of health of . . . . .	111
Belleville township, board of health of . . . . .	111
Belmar, board of health of . . . . .	102
Belvidere, board of health of . . . . .	99
Bergenfield, board of health of . . . . .	102
Berkeley township, board of health of . . . . .	112
Bernards township, board of health of . . . . .	112
Bethlehem township, board of health of . . . . .	112
Beverly City, board of health of . . . . .	99

Beverly township, board of health of . . . . .	112
Births . . . . .	19
Blairstown township, board of health of . . . . .	112
Bloomfield, board of health of . . . . .	110
Board, report of . . . . .	3-9
Bogota, board of health of . . . . .	102
Boonton, board of health of . . . . .	110
Boonton township, board of health of . . . . .	112
Bordentown, board of health of . . . . .	99
Bordentown township, board of health of . . . . .	112
Bound Brook, board of health of . . . . .	102
Bradley Beach, board of health of . . . . .	102
Branchburg township, board of health of . . . . .	112
Branchville, board of health of . . . . .	102
Brick township, board of health of . . . . .	112
Bridgeton, board of health of . . . . .	99
Bridgewater township, board of health of . . . . .	112
Brigantine, board of health of . . . . .	102
Buena Vista township, board of health of . . . . .	112
Bureau of Vital Statistics . . . . .	87
Burlington City, board of health of . . . . .	99
Burlington township, board of health of . . . . .	112
Butler, board of health of . . . . .	102
Byram township, board of health of . . . . .	112
Caldwell, board of health of . . . . .	102
Caldwell township, board of health of . . . . .	112
Camden City, board of health of . . . . .	99
Cancer . . . . .	59
Cape May, board of health of . . . . .	99
Cape May Point, board of health of . . . . .	102
Carlstadt, board of health of . . . . .	102
Cedar Grove township, board of health of . . . . .	112
Cemeteries . . . . .	89
Centre township, board of health of . . . . .	113
Chatham, board of health of . . . . .	102
Chatham township, board of health of . . . . .	113
Chesilhurst, board of health of . . . . .	102
Chesterfield township, board of health of . . . . .	113
Chester township (Burlington county), board of health of . . . . .	113
Chester township (Morris county), board of health of . . . . .	113
Cinnaminson township, board of health of . . . . .	113
Clark township, board of health of . . . . .	113
Clayton, board of health of . . . . .	103
Clean milk . . . . .	200
Clementon township, board of health of . . . . .	113
Cliffside Park, board of health of . . . . .	103

Clinton, board of health of . . . . .	103
Clinton township, board of health of . . . . .	113
Closter, board of health of . . . . .	103
Collingswood, board of health of . . . . .	103
Commercial township, board of health of . . . . .	113
Communicable diseases . . . . .	140
Conference of State and local boards of health . . . . .	93
Consumption . . . . .	32
Coroners of New Jersey, list of . . . . .	135
County physicians, list of . . . . .	137
Cranbury township, board of health of . . . . .	113
Cranford township, board of health of . . . . .	113
Creameries . . . . .	175
Creameries, list of . . . . .	183
Creameries and dairies, division of . . . . .	82
Creameries and dairies, report of chief of division of . . . . .	175
Cresskill, board of health of . . . . .	103
Dairies . . . . .	83-137
Dairy premises, inspections of . . . . .	199
Deal, board of health of . . . . .	103
Deaths . . . . .	23
Deaths among children . . . . .	37
Deerfield township, board of health of . . . . .	113
Delaware township (Camden county), board of health of . . . . .	113
Delaware township (Hunterdon county), board of health of . . . . .	113
Delford, board of health of . . . . .	103
Delran township, board of health of . . . . .	113
Demarest, board of health of . . . . .	103
Dennis township, board of health of . . . . .	114
Deptford township, board of health of . . . . .	114
Diphtheria . . . . .	46
Diphtheria, history of cases . . . . .	151
Division of creameries and dairies . . . . .	82
Division of food and drugs . . . . .	74
Division of medical and sanitary inspection . . . . .	70
Division of sewerage and water supplies . . . . .	85
Dover, board of health of . . . . .	99
Dover township, board of health of . . . . .	114
Downe township, board of health of . . . . .	114
Dumont, board of health of . . . . .	103
Dunellen, board of health of . . . . .	103
Duties of state board of health . . . . .	15
Eagleswood township, board of health of . . . . .	114
Eastampton township, board of health of . . . . .	114
East Amwell township, board of health of . . . . .	114

East Brunswick township, board of health of . . . . .	114
East Greenwich township, board of health of . . . . .	114
East Newark, board of health of . . . . .	103
East Orange, board of health of . . . . .	99
East Rutherford, board of health of . . . . .	103
East Windsor township, board of health of . . . . .	114
Eatontown township, board of health of . . . . .	114
Edgewater, board of health of . . . . .	103
Egg Harbor, board of health of . . . . .	100
Egg Harbor township, board of health of . . . . .	114
Elizabeth, board of health of . . . . .	100
Elk township, board of health of . . . . .	114
Elmer, board of health of . . . . .	103
Elsinboro township, board of health of . . . . .	114
Englewood, board of health of . . . . .	100
Englewood, report of secretary of board of health . . . . .	469
Englewood Cliffs, board of health of . . . . .	103
Englishtown, board of health of . . . . .	103
Essex Fells, board of health of . . . . .	103
Etna, board of health of . . . . .	103
Evesham township, board of health of . . . . .	114
Ewing township, board of health of . . . . .	114
Excerpts from reports of local boards of health . . . . .	455
Fairfield township, board of health of . . . . .	114
Fairview, board of health of . . . . .	103
Fanwood, board of health of . . . . .	104
Fanwood township, board of health of . . . . .	115
Farmingdale, board of health of . . . . .	104
Fieldsboro, board of health of . . . . .	104
Florence township, board of health of . . . . .	115
Florham Park, board of health of . . . . .	104
Folsom, board of health of . . . . .	104
Food and drug suits . . . . .	76
Food and drugs, division of . . . . .	74
Food and drugs, report of chief of division of . . . . .	203
Fort Lee, board of health of . . . . .	104
Frankford township, board of health of . . . . .	115
Franklin township (Bergen county), board of health of . . . . .	115
Franklin township (Gloucester county), board of health of . . . . .	115
Franklin township (Hunterdon county), board of health of . . . . .	115
Franklin township (Somerset county), board of health of . . . . .	115
Franklin township (Warren county), board of health of . . . . .	115
Fredon township, board of health of . . . . .	115
Freehold, board of health of . . . . .	110
Freehold township, board of health of . . . . .	115
Frelinghuysen township, board of health of . . . . .	115
Frenchtown, board of health of . . . . .	104

Galloway township, board of health of . . . . .	115
Garfield, board of health of . . . . .	104
Garwood, board of health of . . . . .	104
Glassboro township, board of health of . . . . .	115
Glen Ridge, board of health of . . . . .	104
Glen Rock, board of health of . . . . .	104
Gloucester City, board of health of . . . . .	100
Gloucester township, board of health of . . . . .	115
Green township, board of health of . . . . .	115
Greenwich township (Cumberland county), board of health of . . . . .	115
Greenwich township (Gloucester county) board of health of . . . . .	115
Greenwich township (Warren county), board of health of . . . . .	115
Guttenberg, board of health of . . . . .	110
Hackensack, board of health of . . . . .	100
Hackettstown, board of health of . . . . .	110
Haddon township, board of health of . . . . .	116
Haddonfield, board of health of . . . . .	104
Haddon Heights, board of health of . . . . .	104
Haledon, board of health of . . . . .	104
Hamilton township (Atlantic county), board of health of . . . . .	116
Hamilton township (Mercer county), board of health of . . . . .	116
Hammonton, board of health of . . . . .	110
Hampton township, board of health of . . . . .	116
Hanover township, board of health of . . . . .	116
Hardwick township, board of health of . . . . .	116
Hardyston township, board of health of . . . . .	116
Harmony township, board of health of . . . . .	116
Harrington Park, board of health of . . . . .	104
Harrington township, board of health of . . . . .	116
Harrison, board of health of . . . . .	110
Harrison township, board of health of . . . . .	116
Hasbrouck Heights, board of health of . . . . .	104
Haworth, board of health of . . . . .	104
Hawthorne, board of health of . . . . .	104
Health officers and sanitary inspectors . . . . .	72
Health officers and sanitary inspectors, licensed . . . . .	167
Helmetta, board of health of . . . . .	104
High Bridge, board of health of . . . . .	104
Highland Park, board of health of . . . . .	104
Highlands, board of health of . . . . .	105
Hightstown, board of health of . . . . .	105
Hillsboro township, board of health of . . . . .	116
Hillsdale township, board of health of . . . . .	116
Hoboken, board of health of . . . . .	100
Hohokus township, board of health of . . . . .	116
Holland township, board of health of . . . . .	116

Holly Beach, board of health of . . . . .	105
Holmdel township, board of health of . . . . .	116
Hopatcong, board of health of . . . . .	105
Hope township, board of health of . . . . .	116
Hopewell, board of health of . . . . .	105
Hopewell township (Cumberland county), board of health of . . . . .	117
Hopewell township (Mercer county), board of health of . . . . .	117
Howell township, board of health of . . . . .	117
Hudson county, board of health of . . . . .	117
Independence township, board of health of . . . . .	117
Infant mortality . . . . .	37
Infectious diseases of animals . . . . .	92
Infectious diseases of animals, report on . . . . .	171
Institutions, inspection of . . . . .	163
Irvington, board of health of . . . . .	110
Island Heights, board of health of . . . . .	105
Jackson township, board of health of . . . . .	117
Jamesburg, board of health of . . . . .	105
Jefferson township, board of health of . . . . .	117
Jersey City, board of health of . . . . .	100
Junction, board of health of . . . . .	105
Kearney, board of health of . . . . .	110
Kenilworth, board of health of . . . . .	105
Keyport, board of health of . . . . .	110
Kingwood township, board of health of . . . . .	117
Knowlton township, board of health of . . . . .	117
Laboratory of hygiene, report of director of . . . . .	235
Lacey township, board of health of . . . . .	117
Lafayette township, board of health of . . . . .	117
Lakewood township, board of health of . . . . .	117
Lambertville, board of health of . . . . .	100
Landis township, board of health of . . . . .	117
Lavalette, board of health of . . . . .	105
Law—abolishing old board . . . . .	10
Law—creating new board . . . . .	11
Law—terminating State sewerage commission . . . . .	11
Law—transferring to board duties of State sewerage commission . . . . .	11
Lawrence township (Cumberland county), board of health of . . . . .	117
Lawrence township (Mercer county), board of health of . . . . .	117
Lebanon township, board of health of . . . . .	117
Legal decisions and opinions . . . . .	471
Leonia, board of health of . . . . .	105
Leprosy . . . . .	157

Licensed health officers and sanitary inspectors, list of . . . . .	167
Linden, board of health of . . . . .	105
Linden township, board of health of . . . . .	117
Linwood, board of health of . . . . .	105
List of sanitary districts . . . . .	99
Little Egg Harbor township, board of health of . . . . .	118
Little Falls township, board of health of . . . . .	118
Little Ferry, board of health of . . . . .	105
Livingston township, board of health of . . . . .	118
Lodi, board of health of . . . . .	105
Lodi township, board of health of . . . . .	118
Logan township, board of health of . . . . .	118
Long Beach township, board of health of . . . . .	118
Long Branch, board of health of . . . . .	100
Longport, board of health of . . . . .	105
Lopatcong township, board of health of . . . . .	118
Lower township, board of health of . . . . .	118
Lower Alloways Creek township, board of health of . . . . .	118
Lower Penns Neck township, board of health of . . . . .	118
Lumberton township, board of health of . . . . .	118
Madison, board of health of . . . . .	105
Madison township, board of health of . . . . .	118
Malarial diseases . . . . .	57
Manalapan township, board of health of . . . . .	118
Manasquan, board of health of . . . . .	105
Manchester township (Ocean county), board of health of . . . . .	118
Manchester township (Passaic county) board of health of . . . . .	118
Mannington township, board of health of . . . . .	118
Mansfield township (Burlington county), board of health of . . . . .	118
Mansfield township (Warren county), board of health of . . . . .	118
Mantua township, board of health of . . . . .	118
Marlboro township, board of health of . . . . .	119
Marriages . . . . .	22
Matawan, board of health of . . . . .	105
Matawan township, board of health of . . . . .	119
Maurice River township, board of health of . . . . .	119
Maywood, board of health of . . . . .	105
Measles . . . . .	56
Medford township, board of health of . . . . .	119
Medical and sanitary inspection, division of . . . . .	70
Medical and sanitary inspection, report of chief of division of . . . . .	139
Mendham township, board of health of . . . . .	119
Merchantville, board of health of . . . . .	105
Metuchen, board of health of . . . . .	105
Middle township, board of health of . . . . .	119
Middletown township, board of health of . . . . .	119

Midland Park, board of health of . . . . .	105
Midland township, board of health of . . . . .	119
Milk . . . . .	84
Millburn township, board of health of . . . . .	119
Millstone, board of health of . . . . .	106
Millstone township, board of health of . . . . .	119
Milltown, board of health of . . . . .	106
Millville, board of health of . . . . .	100
Monmouth Beach, board of health of . . . . .	106
Monroe township (Gloucester county), board of health of . . . . .	119
Monroe township, (Middlesex county) board of health of . . . . .	119
Montague township, board of health of . . . . .	119
Montclair, board of health of . . . . .	100
Montgomery township, board of health of . . . . .	119
Montvale, board of health of . . . . .	106
Montville township, board of health of . . . . .	119
Morristown, board of health of . . . . .	100
Morris township, board of health of . . . . .	119
Mosquito work in the State . . . . .	94
Mountainside, board of health of . . . . .	106
Mount Arlington, board of health of . . . . .	106
Mount Laurel township, board of health of . . . . .	119
Mount Olive township, board of health of . . . . .	120
Mount Tabor, board of health of . . . . .	106
Mullica township, board of health of . . . . .	120

Names of persons who have violated law in reference to sale of milk during the year . . . . .	227
Names of persons who have violated law regulating sale of drugs . . . . .	233
Names of persons who have violated law regulating sale of food other than milk . . . . .	232
Names of persons who have violated law regulating sale of oleomargarine . . . . .	234
National Park, board of health of . . . . .	106
Neptune City, board of health of . . . . .	106
Neptune township, board of health of . . . . .	120
Netcong, board of health of . . . . .	106
Newark, board of health of . . . . .	100
New Brunswick, board of health of . . . . .	100
New Hanover township, board of health of . . . . .	120
New Providence, board of health of . . . . .	106
New Providence township, board of health of . . . . .	120
Newton township, board of health of . . . . .	120
Northampton township, board of health of . . . . .	120
North Arlington, board of health of . . . . .	106
North Bergen township, board of health of . . . . .	120
North Brunswick township, board of health of . . . . .	120
North Caldwell, board of health of . . . . .	106

Northfield City, board of health of . . . . .	106
North Haledon, board of health of . . . . .	106
North Hanover township, board of health of . . . . .	120
North Plainfield, board of health . . . . .	106
North Plainfield township, board of health of . . . . .	120
North Spring Lake, board of health of . . . . .	106
Norwood, board of health of . . . . .	106
Notifiable diseases . . . . .	87
Nuisances, investigation of . . . . .	159
Nutley, board of health of . . . . .	106
Oakland, board of health of . . . . .	107
Oaklyn, board of health of . . . . .	106
Ocean City, board of health of . . . . .	106
Ocean Grove, board of Health of . . . . .	107
Ocean township (Monmouth county), board of health of . . . . .	120
Ocean township (Ocean county), board of health of . . . . .	120
Oldmans township, board of health of . . . . .	120
Old Tappan, board of health of . . . . .	107
Oleomargarine . . . . .	84-201
Orange, board of health of . . . . .	101
Orange, report of health officer . . . . .	466
Organization of State department of health . . . . .	13
Orvil, board of health of . . . . .	107
Orvil township, board of health of . . . . .	120
Overpeck township, board of health of . . . . .	120
Oxford township, board of health of . . . . .	120
Pahaquarry township, board of health of . . . . .	121
Palisade township, board of health of . . . . .	121
Palisade Park, board of health of . . . . .	107
Palmira township, board of health of . . . . .	121
Park Ridge, board of health of . . . . .	107
Passaic City, board of health of . . . . .	101
Passaic township, board of health of . . . . .	121
Pasteurization of milk . . . . .	85
Paterson, board of health of . . . . .	101
Paulsboro, board of health of . . . . .	107
Pemberton, board of health of . . . . .	107
Pemberton township, board of health of . . . . .	121
Pennington, board of health of . . . . .	107
Pennsgrove, board of health of . . . . .	107
Pensauken township, board of health of . . . . .	121
Pequanock township, board of health of . . . . .	121
Perth Amboy, board of health of . . . . .	101
Phillipsburg, board of health of . . . . .	101
Pilesgrove township, board of health of . . . . .	121

Piscataway township, board of health of . . . . .	121
Pitman Grove, board of health of . . . . .	107
Pittsgrove township, board of health of . . . . .	121
Plainfield, board of health of . . . . .	101
Pleasantville, board of health of . . . . .	107
Plumsted township, board of health of . . . . .	121
Pneumonia, mortality from . . . . .	36
Pohatcong township, board of health of . . . . .	121
Point Pleasant, board of health of . . . . .	107
Pompton Lakes, board of health of . . . . .	107
Pompton township, board of health of . . . . .	121
Population . . . . .	18
Port Republic City, board of health of . . . . .	107
Princeton, board of health of . . . . .	107
Princeton township, board of health of . . . . .	121
Prospect Park, board of health of . . . . .	107
Quinton township, board of health of . . . . .	121
Rabies . . . . .	65
Rahway, board of health of . . . . .	101
Rahway Reformatory, epidemic of diphtheria . . . . .	152
Rahway Reformatory, outbreak of diphtheria . . . . .	259
Randolph township, board of health of . . . . .	121
Raritan, board of health of . . . . .	107
Raritan township (Hunterdon county), board of health of . . . . .	121
Raritan township, (Middlesex county), board of health of . . . . .	121
Raritan township (Monmouth county), board of health of . . . . .	121
Readington township, board of health of . . . . .	121
Red Bank, board of health of . . . . .	110
Registrars of vital statistics, list of . . . . .	127
Report of board . . . . .	3-9
Report of chief of bureau of vital statistics . . . . .	477
Report of chief of division of creameries and dairies . . . . .	175
Report of chief of division of food and drugs . . . . .	203
Report of chief of division of medical and sanitary inspection . . . . .	139
Report of chief of division of sewerage and water supplies . . . . .	265
Report of secretary . . . . .	10
Repositories for mailing cases, list of . . . . .	249
Ridgefield, board of health of . . . . .	107
Ridgefield township, board of health of . . . . .	122
Ridgefield Park, board of health of . . . . .	111
Ridgewood, board of health of . . . . .	111
Ridgewood township, board of health of . . . . .	122
Riverside, board of health of . . . . .	107
Riverside township, board of health of . . . . .	122
Riverton, board of health of . . . . .	108

Rivervale township, board of health of . . . . .	122
Rockaway, board of health of . . . . .	108
Rockaway township, board of health of . . . . .	122
Rocky Hill, board of health of . . . . .	108
Roosevelt, board of health of . . . . .	108
Roselle, board of health of . . . . .	108
Roselle Park, board of health of . . . . .	108
Roxbury township, board of health of . . . . .	122
Rutherford, board of health of . . . . .	108
Saddle River, board of health of . . . . .	108
Saddle River township, board of health of . . . . .	122
Salem City, board of health of . . . . .	101
Sandyston township, board of health of . . . . .	122
Sanitary districts, list of . . . . .	99
Sanitary inspection . . . . .	159
Sayreville township, board of health of . . . . .	122
Scarlet fever . . . . .	55
Scarlet fever, history of cases . . . . .	153
Score card for creameries . . . . .	177
Score card for dairies . . . . .	197
Seabright, board of health of . . . . .	108
Sea Girt Encampment, inspection of . . . . .	160
Sea Isle City, board of health of . . . . .	108
Seashore garbage nuisance . . . . .	161
Seaside Park, board of health of . . . . .	108
Secaucus, board of health of . . . . .	108
Secretary's report . . . . .	10
Sewage, analysis of samples of . . . . .	448
Sewerage and water supplies, division of . . . . .	85
Sewerage and water supplies, report of chief of division of . . . . .	265
Sewers, drains and disposal systems . . . . .	318
Shamong township, board of health of . . . . .	122
Shrewsbury township, board of health of . . . . .	122
Small-pox . . . . .	59-157
Somers Point, board of health of . . . . .	108
Somerville, board of health of . . . . .	110
South Amboy, board of health of . . . . .	108
Southampton township, board of health of . . . . .	122
South Atlantic City, board of health of . . . . .	108
South Bound Brook, board of health of . . . . .	108
South Brunswick township, board of health of . . . . .	122
South Cape May, board of health of . . . . .	108
South Harrison township, board of health of . . . . .	122
South Orange, board of health of . . . . .	111
South Orange township, board of health of . . . . .	122
South River, board of health of . . . . .	108

Sparta township, board of health of . . . . .	122
Springfield township (Burlington county), board of health of . . . . .	122
Springfield township (Union county), board of health of . . . . .	122
Spring Lake, board of health of . . . . .	108
Spring waters of New Jersey . . . . .	304
Stafford township, board of health of . . . . .	122
Standing committees, board of health of . . . . .	16
Stanhope, board of health of . . . . .	108
State and local boards of health conference . . . . .	93
State board of health, duties of . . . . .	15
State board of health, standing committees . . . . .	16
State board of sanitary examiners, report of . . . . .	165
State Department of Health, organization of . . . . .	13
State Institutions, inspection of . . . . .	163
State Institutions, water supplies for . . . . .	298
State laboratory diagnosis . . . . .	73
State laboratory of hygiene, report of director of . . . . .	235
State sanatoria for advanced cases of tuberculosis . . . . .	95
Stillwater township, board of health of . . . . .	123
Stockton, board of health of . . . . .	108
Stow Creek township, board of health of . . . . .	123
Suicide . . . . .	62
Suits instituted, food and drugs . . . . .	76
Summit, board of health of . . . . .	101
Sussex, board of health of . . . . .	109
Swedesboro, board of health of . . . . .	109
Tabernacle township, board of health of . . . . .	123
Teaneck township, board of health of . . . . .	123
Tenafly, board of health of . . . . .	109
Tewksbury township, board of health of . . . . .	123
Totowa, board of health of . . . . .	109
Town of Union, board of health of . . . . .	110
Trenton, board of health of . . . . .	101
Tuberculosis, State sanatoria for advanced cases . . . . .	95
Tuckerton, board of health of . . . . .	109
Typhoid fever . . . . .	47
Typhoid fever, history of cases . . . . .	142
Union township (Bergen county), board of health of . . . . .	123
Union township (Hunterdon county), board of health of . . . . .	123
Union township (Ocean county), board of health of . . . . .	123
Union township (Union county), board of health of . . . . .	123
Upper township, board of health of . . . . .	123
Upper Freehold township, board of health of . . . . .	123
Upper Penns Neck township, board of health of . . . . .	123
Upper Pittsgrove township, board of health of . . . . .	123
Upper Sadle River, board of health of . . . . .	109

Ventnor City, board of health of . . . . .	109
Vernon township, board of health of . . . . .	123
Verona, board of health of . . . . .	109
Vineland, board of health of . . . . .	109
Violators of law regulating sale of drugs, list of . . . . .	233
Violators of law regulating sale of food other than milk, list of . . . . .	232
Violators of laws regulating sale of milk who have paid penalties, list of . . . . .	227
Violators of law regulating sale of oleomargarine, list of . . . . .	234
Vital Statistics, Bureau of . . . . .	87
Vital statistics, report of chief of bureau of . . . . .	477
Voorhees township, board of health of . . . . .	123
Wall township, board of health of . . . . .	123
Wallington, board of health of . . . . .	109
Wallpack township, board of health of . . . . .	124
Wantage township, board of health of . . . . .	124
Warren township, board of health of . . . . .	124
Washington, board of health of . . . . .	109
Washington township (Bergen county), board of health of . . . . .	124
Washington township (Burlington county), board of health of . . . . .	124
Washington township (Gloucester county), board of health of . . . . .	124
Washington township (Mercer county), board of health of . . . . .	124
Washington township (Morris county), board of health of . . . . .	124
Washington township (Warren county), board of health of . . . . .	124
Waterford township, board of health of . . . . .	124
Water supplies for creameries . . . . .	289
Water supplies for dairies . . . . .	292
Water supplies for state institutions . . . . .	298
Water supplies of New Jersey, public . . . . .	273
Water supplies, private . . . . .	288
Water supplies, public, examination and inspection . . . . .	306
Wayne township, board of health of . . . . .	124
Weehawken township, board of health of . . . . .	124
Wenonah, board of health of . . . . .	109
Westhampton township, board of health of . . . . .	124
West Amwell township, board of health of . . . . .	124
West Caldwell, board of health of . . . . .	109
West Cape May, board of health of . . . . .	109
West Deptford township, board of health of . . . . .	124
West Hoboken, board of health of . . . . .	111
West Milford township, board of health of . . . . .	124
West New York, board of health of . . . . .	111
West Orange, board of health of . . . . .	111
Westville, board of health of . . . . .	110
West Windsor township, board of health of . . . . .	124
Westwood, board of health of . . . . .	109
Weymouth township, board of health of . . . . .	125



Wharton, board of health of. . . . .	109
Whooping cough. . . . .	54
Wildwood, board of health of. . . . .	109
Willingboro township, board of health of. . . . .	125
Winslow township, board of health of. . . . .	125
Woodbine, board of health of. . . . .	109
Woodbridge township, board of health of. . . . .	125
Woodbury, board of health of. . . . .	101
Woodcliff, board of health of. . . . .	109
Woodland township, board of health of. . . . .	125
Wood Lynne, board of health of. . . . .	109
Wood Ridge, board of health of. . . . .	109
Woodstown, board of health of. . . . .	110
Woolwich township, board of health of. . . . .	125