Annual report of the Provincial Board of Health of Ontario, Canada.

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ANNUAL REPORT

PROVINCIAL BOARD OF HEALTH

1923

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Forty-second Annual Report

OF THE

Provincial Board of Health

OF

Ontario, Canada

FOR THE YEAR

1923

PRINTED BY ORDER OF
THE LEGISLATIVE ASSEMBLY OF ONTARIO

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TORONTO
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1924

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To His Honour Henry Cockshutt, Esq.,
Lieutenant-Governor of the Province of Ontario.

May It Please Your Honour:

I herewith beg to submit for your consideration the Forty-second Annual Report of the Provincial Board of Health for the year 1923.

Respectfully yours,

Forbes Godfrey,
Minister of Health and Labour.

Toronto, February 1st, 1924.

To the Honourable Forbes Godfrey, M.D.,
Minister of Health and Labour.

Sir,—I have the honour to submit for your approval the Forty-second Annual Report of the Provincial Board of Health, made in conformity with and under the provisions of the Public Health Act, for the year 1923.

I have the honour to be, Sir,

Your obedient servant,

John W. S. McCullough,
Chief Officer of Health.

Toronto, February 1st, 1924.

ORGANIZATION

MINISTER OF HEALTH AND LABOUR.

THE HONOURABLE FORBES GODFREY, M.D.

The Provincial Board of Health

Adam H. Wright, B.A., M.D., M.R.C.S., Eng., *Chairman*.....Toronto
Henry R. Casgrain, M.D., C.M.....Windsor
Thos. E. Kaiser, M.D., C.M.....Oshawa
W. H. Howey, M.D., C.M.....Sudbury
A. S. McElroy, M.D., C.M.....Ottawa
James Roberts, M.D., C.M., M.O.H.....Hamilton
John W. S. McCullough, M.D., C.M., D.P.H.....Toronto

Executive

John W. S. McCullough, M.D., C.M., D.P.H.....Chief Officer of Health
Robert W. Bell, M.D., C.M.....Provincial Inspector of Health

District Officers of Health

District: No. 1. Thos. J. McNally, M.D., C.M., D.P.H.....London
No. 2. J. J. Fraser, M.D., D.S.O.....Toronto
No. 3. Daniel A. McClenahan, M.D., C.M., D.P.H.....Hamilton
No. 4. Norman H. Sutton, M.B.....Peterboro
No. 5. Paul J. Moloney, M.D., C.M.....Ottawa
No. 6. W. Egerton George, M.D.....North Bay
No. 7. G. L. Sparks, M.D.....Fort William
No. 8. Hugh W. Johnston, M.D.....Sault Ste. Marie

Sanitary Inspectors

Alex. White, *Chief Inspector.* John Richardson D. S. McKee Wm. C. Millar

---

Division of Sanitary Engineering

F. A. Dallyn, C.E.....Provincial Sanitary Engineer
A. V. DeLaporte, B.A.Sc.....Chemist in Charge of Experimental Station
A. E. Berry, M.A.Sc., C.E. (Tor.).....Assistant Engineer

Division of Laboratories

H. M. Lancaster, B.A.Sc.....Director
Charles M. Anderson, M.D., C.M., C.P.H.....Bacteriologist
A. H. Bonham, B.A.Sc.....Chemist
Dorothy J. McCullough, M.A.....Asst. Bacteriologist

Branches

Hibbert W. Hill, M.D., D.P.H., *Director* ..... London
James Miller, M.D., F.R.C.S. (Edin.), *Director* ..... Kingston
N. O. Thomas, B.A., M.B., *Director* ..... Fort William
N. F. W. Graham, M.B., *Director* ..... Sault Ste. Marie
J. S. Douglas, M.B., *Director* ..... North Bay
A. Y. McNair, M.B., *Director* ..... Peterborough
G. Murray Fraser, M.B. ..... Owen Sound
F. L. Letts, M.B., D.P.H. ..... Ottawa

Division of Preventable Diseases

R. R. McClenahan, B.A., M.B., D.P.H. ..... Director
J. W. Hunt, M.B., L.R.C.P., M.R.C.S. ..... Clinical Specialist
A. L. McKay, B.A., M.B. ..... Clinical Specialist
Chas. P. Fenwick, M.B ..... Clinical Specialist
Edna L. Moore, A.R.R.C ..... Social Service Nurse

Division of Industrial Hygiene

J. G. Cunningham, B.A., M.B., D.P.H. ..... Director
R. M. Hutton, B.A. (Oxon.) ..... Literary Research
A. R. Riddell, B.A., M.B. ..... Clinical Specialist

Division of Public Health Education

J. J. Middleton, M.B., D.P.H. ..... Director
Edward Jones ..... Moving Picture Operator

Division of Maternal and Child Welfare and Public Health Nursing

Mary Power, B.A. ..... Director
Beryl Knox ..... Associate Director
Marjorie Burgess, B.A. ..... Statistician
Wm. J. Bell, M.B. ..... Pediatrician

Division of Epidemiology

Consulting Staff

Public Health Administration ..... J. G. Fitzgerald, M.D., F.R.S.C.
Pediatrics ..... Alan Brown, B.A., M.B.
Obstetrics ..... Wm. B. Hendry, M.D., D.S.O.

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ANNUAL REPORT

OF THE

Provincial Board of Health

For the Province of Ontario

For the Year Ending 31st December, 1923

RESUMÉ OF THE TRANSACTIONS OF THE PROVINCIAL BOARD OF HEALTH BY JOHN W. S. McCULLOUGH, CHIEF OFFICER OF HEALTH.

This is the Forty-second Annual Report of the Provincial Board of Health for the year ending December 31st, 1923.

The Board convened at four regular sessions at which all the members were present, and the minutes of these sessions are contained in the Board's official minute book of proceedings.

Legislation.

The following legislation in respect to public health was enacted by the legislature during the session of 1923, viz.:—

I

Section 8 of *The Public Health Act* is amended by adding thereto the following clause:— Rev. Stat., c. 218, s. 8, amended.

(*q*) The manufacture of non-intoxicating beverages and distilled and mineral water, and the manufacture of syrups, wines and brewed beers. Manufacture of beverages.

Section 100 of *The Public Health Act* is amended by adding thereto the following subsections:— Rev. Stat., C. 218, s. 100, amended.

(6) A person, firm or corporation shall not manufacture or bottle for sale as food for man, any beverage such as carbonated water, natural and artificial mineral water, spring and distilled water, unfermented wine or cordials, concentrated syrup, extracts, essence, fruit juice, or any dry substance in concentrated form for the manufacture of any beverage, brewed ginger beer, or other non-intoxicating drink, without first obtaining a permit in writing so to do from the Medical Officer of Health and the local board of the municipality in which such manufacturing or bottling is to be conducted. Permit required for manufacturing or bottling of carbonated water, etc.

(7) When the Medical Officer and Local Board of Health desire to cancel a permit they must give notice in writing of such cancellation to the person or persons or the agent of such person or persons to whom the permit was issued and such cancellation shall not become effective until thirty days after receipt of such notice by the said person, persons or their agent. Cancellation of permit.

Revocation of permit, on what grounds.

(8) Such permit may be refused and if granted may be cancelled or revoked for failure to comply with the Regulations pertaining to the building, equipment and methods of manufacture or bottling of such beverage or if such beverage upon analysis is found to be contaminated or contain any injurious ingredients, or for other cause is found to be unfit for food.

Commencement of Act.

This Act shall come into force on the first day of March, 1924.

II

Rev. Stat., c. 218, s. 90, amended.

Section 90 of *The Public Health Act* is amended by inserting after the words "water supply" in the third line, the words "or for agricultural, domestic or industrial purposes" so that the section will read as follows:—

Provincial Board to have supervision of streams, etc.

90. The Provincial Board shall have the general supervision of all springs, wells, ponds, lakes, streams or rivers used as a source for a public water supply or for agricultural, domestic or industrial purposes with reference to their purity, together with the waters feeding the same, and shall examine the same from time to time when the necessity for such examination arises, and inquire what, if any, pollution exists and the causes thereof.

Rev. Stat., c. 218, s. 90, amended.

Section 90 of *The Public Health Act* is further amended by adding thereto the following subsections:

Inquiry by Provincial Board as to complaints of pollution of waters.

(2) The Provincial Board may inquire into and hear and determine any complaint made by or on behalf of a riparian proprietor entitled to the use of water, that any industrial waste or any other polluting material of any kind whatsoever which either by itself or in connection with other matter may corrupt or impair the quality of the water or may render such water unfit for accustomed or ordinary use has been placed in, or discharged into such water, or placed or deposited upon the ice thereof, or placed or suffered to remain upon the bank or shore thereof.

Report of Provincial Board.

(3) The Provincial Board may make a report upon such complaint and as to what remedial measures, if any, are required in respect to any alleged injury or invasion of right as it may deem just.

Application to Court on report of Board.

(4) Where the report of the Provincial Board recommends the removal or degree of treatment of any such polluting material any riparian proprietor interested may apply to a Judge of the Supreme Court or a County Judge by way of originating notice according to the practice of the Court, for an order for the removal or abatement of the injury in terms of the report of the Board and to restrain the proprietors of the industry from carrying on the same, or the offending party or parties from continuing the acts complained of until the injury or invasion of right has been abated to the satisfaction of the Provincial Board.

Court may act on report of Board or further evidence.

(5) The Judge may make such order upon the report of the Provincial Board or upon such further evidence as he may deem meet and on such terms and conditions as may be deemed proper.

On the 8th of June, 1923, the Board suffered a serious loss in the death of Dr. Robert W. Bell, who for nearly twenty years had filled the office of Provincial Medical Inspector. He had been in poor health for some months but so great was his sense of duty, he insisted in carrying on a portion of his work even when confined to his bed.

Dr. Bell was born in Carleton Place, Ontario about seventy-two years ago and was graduated from the medical department of McGill University in 1873. After some years' practice in Peterborough, where he was universally esteemed and where he held command of His Majesty's 57th Battalion, he entered the government service, being attached to the Insane Asylum's branch. In 1904 he was appointed Provincial Medical Inspector and soon became a leading authority in general public health, particularly in the line of epidemiology. In the diagnosis of smallpox his judgment was usually taken as final, he having seen an unusually large number of cases of this affection.

Dr. Bell was a most genial man and amongst his associates on the Board's staff and in the medical profession he was highly regarded.

The Chief Sanitary Inspector, Mr. Alex. R. White, has been transferred to Spadina House in the Division of Industrial Hygiene in order that there should be closer oversight of the general work of inspection in New Ontario.

Mr. H. M. Lancaster, B.A.Sc. for many years our Chief Chemist, left us at the 1st of June to assume charge of the Division of Food and Drugs in the Federal Department of Health, where, no doubt, he will bring to that Department the same energy and skilful administration of his work afforded here. His place as Director of Laboratories has been filled by the promotion of Dr. Chas. M. Anderson, C.P.H., the former chief bacteriologist.

Early in July the new Minister of Health, Dr. Forbes Godfrey, assumed his duties. It is a source of gratification to find for the first time in the history of Ontario a member of the medical profession in charge of the Department of Public Health, and in view of this the members of the Board and the staff look forward to increased activity and satisfactory advancement of public health work.

Insulin Distribution.

One of the earliest acts of the new Minister was to begin the free distribution of Insulin to needy persons requiring this means of treatment for diabetes. A favorable price was secured from the Connaught Laboratories and at the 1st of September supplies were made available at the eight laboratory centres of the Board and from the Board's of Health of Windsor (Border Cities), Hamilton and Brantford. The requisition of a qualified physician is all that is necessary to secure supplies of the remedy.

Tryparsamide.

Arrangements were made towards the close of the year with the Rockefeller Institute for a supply of tryparsamide for the treatment of suitable cases of general paresis. The cases in the various institutions will be assembled at one of the Ontario hospitals where the use of this remedy will be given careful supervision.

DIVISION OF LABORATORIES

DR. CHAS. M. ANDERSON, C.P.H., DIRECTOR

The service afforded by the chief laboratory at Toronto and the various branches shows considerable increase during the year. The only complaints received have been occasional delays in reporting on specimens mailed at week-ends and which failed to be received because of delay in delivery by the postal authorities of what is classed as second-class matter. Physicians sending specimens at the week-end are urged to ensure rapid delivery by affixing a "quick delivery stamp." However, arrangements have been made at the Toronto laboratories for an official to collect mail of this nature at the general post office on the evenings of Saturdays, Sundays and holidays. By this provision it is hoped that the cause for any complaint of the kind will be removed and the service of the laboratory, as it is desired to be, made of the promptest and most efficient character. Complete details of this service will be found in the report of the Director of this Division.

DIVISION OF PREVENTABLE DISEASES

DR. R. R. MCCLENAHAN, D.P.H., DIRECTOR

(*a*) *Venereal Disease Clinics.*

The V.D. clinics have now reached eighteen in number. All have been inspected either monthly or semi-monthly and are carrying on most satisfactory work.

The authorities of the Water Street Hospital, Ottawa, gave notice that after December, 1923, they would be unable to continue the treatments being given in the out-patient department. This hospital clinic, under its director, Dr. Dehaitre, has been very successful, especially in the treatment of syphilis. Arrangements have been made to establish a new V.D. clinic in connection with St. Luke's Hospital, Ottawa, where more commodious quarters have been obtained..

(*b*) During the year many demonstrations in treatment have been given to medical practitioners in various smaller centres. This work of an educational character has been very much appreciated by the physicians.

(*c*) Close supervision of venereal disease treatment in institutions such as the Ontario Reformatory, Guelph, Burwash Industrial Farm, Men's and Women's Farms near Toronto, Mercer Reformatory, Mimico Industrial School, etc., has been carried out; practically all of the syphilitic treatments at Guelph, Burwash, and the Mercer Reformatory were given by clinical specialists of the division.

(*d*) A survey of the anti-syphilitic work in the Ontario hospitals was made during the year and several hospitals were assisted in carrying out routine blood tests of the inmates.

(*e*) Several individuals requiring information and advice as to sex instruction or treatment for venereal diseases are seen daily by members of the division.

(*f*) Phenarsenamine has continued of the same high standard as in the past. A preparation of mercury salicylate is now manufactured by the laboratory and is distributed to clinics and to physicians when patients are unable to pay therefor.

(*g*) Educational work by means of films, lectures, literature and exhibits has been carried on even more extensively than in previous years, with very excellent and gratifying results. Especial reference should be made to the exhibit of the division at the Canadian National Exhibition, Toronto, and to the Fall Fair, Ottawa. Close co-operation in all educational propaganda has been maintained with the Canadian Social Hygiene Council.

(*h*) Various epidemiological investigations were made by members of the division during the year, such as the typhoid epidemics in Alliston and Cochrane, and minor epidemics of typhoid and diphtheria in other places.

(*i*) Through close co-operation with the district officers of health and the laboratory service, a very careful watch is being kept on all cases of communicable disease developing in the province. This close check will undoubtedly prevent many serious epidemics which otherwise might develop before being brought to the Board's attention.

(*j*) A travelling clinic for the diagnosis of tuberculosis has been established. The clinical specialist in charge of this clinic is co-operating with sanatoria in the province in the establishment of clinics in centres adjacent to the sanatoria.

(*k*) The new communicable disease regulations which have been adopted in all the provinces are now in force and have been well received by the medical profession generally.

(*l*) A detailed report of activities will be found in the annual report of the division.

DIVISION OF SANITARY ENGINEERING

F. A. Dallyn, C.E., Director

The work of this division continues to yield very gratifying results. Five new filter plants have been put into service. The sources of water supply at Hanover and Cochrane have also, through major improvements, been replaced by sources entirely above suspicion. Some thirty-five new chlorine equipments have been put in service, in some instances replacing units giving trouble; in others, replacing bleaching-powder equipments. Of the total, nineteen were in supplies not hitherto protected.

The typhoid fever outbreak at Cochrane in the spring of the year, caused primarily from the pollution of the town's water supply with infected sewage, is no reflection on the work of the Sanitary Engineering Division. The division reported upon the advisability of chlorinating this supply on November 25th, 1921, and March 3rd, 1922, and the town authorities had prepared by-laws to give effect to the recommendation. The Sanitary Engineering Division, upon receiving indirect evidence on March 11th that the Cochrane supply was seriously infected, rushed an emergency chlorine equipment to Cochrane and had it in operation March 15th, some days before the local authorities were alive to the nature of the epidemic. It is of the greatest interest that the wide-spread distribution of infected persons throughout the province coincident with the epidemic found no other municipal water supply in the province lacking the means to arrest any chance infection.

DIVISION OF INDUSTRIAL HYGIENE

DR. J. G. CUNNINGHAM, D.P.H., DIRECTOR

One hundred and eighty cases of occupational diseases have been reported to the division from various sources during the year.

A second investigation into the storage-battery industry has been made with a view to estimating results of recommendations for prevention suggested after the first investigation. These results are not satisfactory.

The incidence of lead poisoning in paint manufacturing was investigated, showing eight cases of poisoning among fifty-five men exposed. This was the only general trade investigation conducted during the year owing to the large number of individual cases reported.

A compilation of lead-poisoning literature has been completed and circulated. A considerable local and foreign demand has arisen for it and criticisms have been favourable.

A publication, entitled "Health Confessions of Business Women," has been completed and widely circulated. The book is based on a contest conducted among business girls through the newspapers, awarding prizes for letters received containing the most original methods of dealing with the maintenance of health. With these letters as a basis, a book has been produced which deals with the subject in an original way and is very readable. Among other things it contains practical suggestions for maintaining health in so far as personal hygiene can do it.

The need for research in occupational disease and for the extended use of existing governmental facilities for preventing occupational diseases is stressed in the body of the division report.

Effort has been continued to interest employers, employees, and physicians in maintaining the health of industrial workers.

DIVISION OF PUBLIC HEALTH EDUCATION

DR. J. J. MIDDLETON, D.P.H., DIRECTOR

The division maintained a weekly supply of health articles in upwards of one hundred newspapers throughout the province, prepared a new form for the Annual Reports of M.O.H.'s, and managed the Board's exhibit at the Canadian National Exhibition. This division also arranged the programme for the Ontario Health Officers' Convention. A programme of moving-picture showings and public addresses was also carried on. The distribution of public health literature supervised, new pamphlets prepared, and the annual report edited, as well as answering correspondence and other important details in connection with the health education of the public. A complete report of the work of the division will be found elsewhere in this volume.

DIVISION OF MATERNAL AND CHILD HYGIENE AND PUBLIC HEALTH NURSING

MARY POWER, B.A., DIRECTOR

During 1923 the field nurses worked in twenty-five towns, six villages and fifty townships; while five counties have been visited from a survey standpoint. Special service was rendered in the Cochrane epidemic and follow-up work in connection with the fire of October 1922 was continued throughout the winter. The seasonal work of reaching outlying settlements in the district of Thunder Bay and Rainy River was repeated this summer and the people living along the line of railway in certain portions of those districts without municipal organization were visited.

In compliance with the request of the Medical Officer of Health of Toronto, our staff co-operated in the inspection of fresh-air camps during the month of July. A nurse from the Department of Public Health and a provincial nurse from the respective district visited each camp, investigating sanitary conditions and inquiring into the advantage taken of the summer outing to instil health habits and promote hygienic living.

One nurse assisted in the tuberculosis survey among children in the town of Dundas.

Home-nursing classes have been given by the field nurses in the course of demonstrations and also by the nurse in charge of exhibits, while fall fairs and school fairs have proved an excellent opportunity for health teaching in each of the health districts.

In six centres public health nurses have been appointed by the community following the work of our nurses.

A tabulation of the recorded work of the field staff is as follows:

Exclusive of the special summer work undertaken in District No. VII, the nurses made 39,538 visits, held sixty-nine clinics with 1,105 attendance; saw 5,465 cases and attended 194 meetings. In addition, the nurses made inspections of 20,545 school children and noted 14,744 defects.

District Officers of Health.

The position left vacant in District No. IV has been filled by the appointment of Dr. N. H. Sutton, of Peterborough, which is now made the headquarters of the district, the branch public health laboratory serving that area being located in that city. The work of the district officers is of high importance, but the areas served by the respective officers is too large, especially in New Ontario, to be adequately served by them. At best it is only possible for the district men to afford a limited service in their respective districts. The individual reports of the several officers, found elsewhere, gives a detailed account of their work.

Sanitary Inspectors.

The Chief Inspector is now fittingly attached to the Division of Industrial Hygiene and a comprehensive report of the several inspectors is given elsewhere in this volume.

General Administration.

This volume completes the Forty-second Annual Report upon public health work in Ontario. During that period great changes have taken place not only in the scientific conception of sanitation but also in the methods of adminis-

tration. While the organization under the control of the Provincial Board is well-developed and capable of performing its work in a highly satisfactory manner, the general type of administration in the municipalities outside of a limited number of cities has not had a corresponding development. In the vast majority of the cities and in all of the towns, villages and municipalities, the local organization is little better than it was forty years ago. There is a local board of health whose members have as a rule no knowledge of proper methods of administration and a part-time medical officer of health who (with notable exceptions) has neither the knowledge of the subject nor the inclination to afford the necessary attention. Too much blame cannot in fairness be laid at the door of the medical officer of health for his lack of efficiency. His business in life is not public health, which pays him little or nothing, but the practice of his profession to which, if he shall successfully meet the competition of his confreres and in addition that of all sorts of quacks and interlopers in practice, his unremitting attention must be given. The enforcement of public health regulations is more likely to injure the medical officer's practice than to secure him the support and co-operation of either laymen or professional brethren. The so-called salary, usually a mere trifle, fails to compensate the medical officer of health for the disabilities incumbency of the office engenders. In short the "part time" medical officer of health is a failure. It has been a failure wherever tried and will, for obvious reasons, never be successful. As pointed out in last year's report, England with the longest experience in public health work is rapidly substituting the "part-time" officer for the "full-time" one. The same tendency is apparent in the United States, where since 1914, upwards of 200 county medical officers have been appointed. It is only a question of time until this plan, the most pressing necessity in the public health work of Ontario, must be established if we are to afford the public the best service in the most economical way and at the same time maintain our position in the ranks of advanced scientific opinion. True advancement in public health will not accrue to spasmodic efforts but to be steady and secure must have a sound basis. This can only be achieved by a sound system for the entire province.

Regulations.

Under the authority of the Board in that behalf the following Regulations were approved by the Lieutenant-Governor in Council on the 8th day of February, 1923, and published in *Ontario Gazette* on the 24th day of the same month.

REGULATIONS FOR THE CONTROL OF COMMUNICABLE DISEASES

Approved by the Lieutenant-Governor in Council, on the 8th day of February, 1923, and published in the *Ontario Gazette* on the 24th day of February, 1923.

REGULATION 1.—Diseases requiring notification, Sections 49, 50, 53, 55, 56, 61, shall apply to the following communicable diseases which must be reported to the Medical Officer of Health or secretary of the local Board of Health.

1. Anthrax.
2. Actinomycosis.
3. Botulism.

4. Cerebro-spinal meningitis—epidemic.
5. Chancroid.
6. Chickenpox.
7. Cholera, Asiatic.
8. Conjunctivitis, acute infectious.
9. Diphtheria.
10. Dysentery, amoebic and bacillary.
11. Encephalitis lethargica.
12. Gonorrhoea.
13. Influenza—epidemic.
14. German measles.
15. Glanders.
16. Leprosy.
17. Malaria.
18. Malignant oedema.
19. Malta fever.
20. Measles.
21. Mumps.
22. Paratyphoid fever.
23. Plague.
24. Pneumonia—(a) Acute lobar.
    (b) Bronchial or lobular.
25. Poliomyelitis, acute anterior.
26. Puerperal septicaemia.
27. Rabies.
28. Rocky Mountain spotted fever.
29. Scarlet fever.
30. Septic sore throat.
31. Smallpox
32. Syphilis.
33. Tetanus.
34. Trachoma.
35. Trichinosis
36. Tuberculosis.
37. Typhoid fever
38. Typhus fever.
39. Whooping cough.
40. Yellow fever.
41. Goitre.
42. Pellagra.

REGULATION 2.—Diseases requiring quarantine and placarding. Sections 49 to 72 inclusive and Rule 31 of Schedule B of the Public Health Act shall apply to the following communicable diseases and the houses where these diseases exist must be placarded:

1. Plague.
2. Chickenpox.
3. Cholera.
4. Cerebro-spinal meningitis—epidemic.
5. Diphtheria.

6. German measles.
7. Leprosy.
8. Measles.
9. Mumps.
10. Poliomyelitis—epidemic anterior.
11. Scarlet fever.
12. Smallpox.
13. Typhus fever.
14. Whooping cough.
15. Yellow fever.

A quarantine card must give the name of the disease and in every way conform to Rule 31 of Schedule B of the Public Health Act, as follows:

"The Medical Officer of Health, within six hours after he has received notice of the existence in any house of any communicable disease in respect of which it is his duty to do so, shall affix, or cause to be affixed, near the entrance of such house a card at least nine inches wide and twelve inches long, stating that such disease exists in the house, and stating the penalty for removal of such card without the permission of the Medical Officer of Health, and no person shall remove such card without his permission."

For example:

12"

9"

SMALLPOX EXISTS IN THIS HOUSE.

This card must not be removed except by permission of the Medical Officer of Health, under penalty of not less than $5.00 nor more than $500.

Signed.....
M.O.H.

The Medical Officer of Health may name upon such card the period of quarantine required.

The Medical Officer of Health of every municipality where a patient is suffering from any of the communicable diseases as set out in Regulation 2 shall forbid any person except the attending physician, health officer, clergyman, nurse, sanitary inspector or in case of death, the undertaker, from going into or leaving the premises without his permission, or the carrying off, or causing to be carried off, any material or article whereby such disease may be conveyed, until after the disease has abated and the premises, dwelling, clothing and other contents have been rendered free from danger by means of such cleansing and disinfection as the Provincial Board of Health may direct, and he shall prescribe the precautions to be taken.

REGULATION 3.—Period of isolation and quarantine according to Sections 57, 58 and 72 of the Public Health Act.

Disease	Quarantine Period for Contacts	Isolation Period for Patient
Plague	14 days	Until clinical recovery.
Chickenpox	21 "	When all scales have fallen off and lesions healed.
Cholera	Until 3 successive negative stool examinations have been made at 24-hour intervals after use of aperients.	Until clinical recovery and 5 successive negative stool examinations at 24-hour intervals and aperients given before each of first 4 examinations and a purge before the final examination.
Cerebro-spinal meningitis (epidemic)	10 days	Until clinical recovery.
Diphtheria	7 days or until a negative culture has been obtained from the nose and throat.	In localities where a bacteriological examination is unobtainable, 3 weeks, if convalescence is complete and no sore throat, nasal or aural discharges remain or if after 10 days from date of onset of a clinical case, 2 successive negative cultures taken from the site of the lesion with a 12-hour interval, are shown to the satisfaction of the M.O.H. In the case of chronic carriers, when a negative virulence test is obtained.
German measles	21 days	Until 2 weeks from appearance of rash.
Leprosy	——	Until clinical recovery.
Measles	16 days	Until 10 days from the appearance of the rash, and clinical recovery.
Mumps	18 days	Until 3 weeks from onset if all swelling has subsided.
Poliomyelitis (epidemic anterior).	7 days	Until 3 weeks after onset and the patient's temperature is normal.
Scarlet fever	10 days	Until 35 days from appearance of rash, if no sore throat or nasal or aural discharges persist.
Smallpox	14 days, or satisfactory proof of successful vaccination against smallpox within 2 years, or evidence of satisfactory vaccination, at the time, or an immune reaction, or satisfactory proof of having had smallpox.	28 days or until all scabs have fallen off and all lesions have healed.
Typhus fever	14 days, and complete delousing.	42 days.
Whooping cough	14 days	For 3 weeks after the commencement of the whooping.
Yellow fever	6 days	Until clinical recovery.
Children having itch, ringworm, scabies and other communicable diseases of the skin, ophthalmia neonatorum, trachoma, pediculosis and impetigo contagiosa.		Shall not return to school until clinical recovery therefrom.

REGULATION 4.—Meaning of the terms isolation and quarantine as used in the regulations.

By isolation is meant the separation of persons having a communicable disease, or carriers of the infecting organism, from other persons, in such places and under such conditions as will prevent the direct or indirect conveyance of the disease or infecting organism to any other person.

By quarantine is meant the restriction to their places of residence of persons who have been exposed to a communicable disease for a period of time equal to the incubation period of the disease to which they have been exposed.

REGULATION 5.—Release of the bread-winner.

In cases of any of the communicable diseases named in Regulations 2 and 3 the Medical Officer of Health may, if he is satisfied of the effectual isolation of the patient, permit those who do not have the direct care of the patient or patients, to leave the premises in order to attend to their regular duties; except when such individuals are employed or in any way engaged in the handling or preparing of food or are associated with children away from the quarantined house. Such individuals must, if they desire to attend to their regular duties, change their residence in a manner satisfactory to the Medical Officer of Health.

REGULATION 6.—Release of persons immune because of a previous attack.

If satisfactory proof of a previous attack in the case of a contact of a case of whooping cough, measles, German measles, mumps, anterior poliomyelitis, smallpox, scarlet fever, typhus fever, or chickenpox is submitted to the Medical Officer of Health such contacts shall be released.

REGULATION 7.—Release of children or teachers.

Children or teachers in a quarantined house, must be excluded from school, college, university or other institution of learning, except when such children or teachers change their residence in a manner satisfactory to the Medical Officer of Health, provided they do not attend such school, college, university or other institution of learning until the period of quarantine for the disease to which they have been exposed has elapsed.

REGULATION 8.—Release in certain communicable diseases.

In the case of teachers or children in a house quarantined for chickenpox, German measles, mumps, measles or whooping cough, the Medical Officer of Health may, if he is satisfied of the effectual isolation of the patient and satisfactory proof is given that such teachers or children have themselves at some previous time had the disease for which the house is quarantined, allow them to attend school, college, university or other institutions of learning without changing their residence.

REGULATION 9.—The Medical Officer of Health shall be satisfied that the cleansing and disinfection of any house, building, car, vessel or vehicle, or any part thereof and of any articles therein likely to retain infection, are satisfactorily carried out before the quarantine is removed.

REGULATION 10.—Letting of premises.

No person shall let for hire, cause or permit anyone to occupy premises previously occupied by a person ill of any communicable disease until such premises shall have been disinfected under the supervision of the Medical Officer of Health or persons acting under his instructions, in accordance with the Regulations of the Provincial Board of Health.

REGULATION 11.—Whenever an order or direction of the Medical Officer of Health, requiring the disinfection of articles or premises, is not complied with, the Medical Officer of Health shall forthwith cause to be placed upon the door of the premises a placard in word and form as follows:

NOTICE.

These premises have been occupied by a person affected with.....
They must not again be occupied until the orders for cleansing, renovation or disinfection have been complied with. This notice must not be removed under a penalty of $100.

.....M.D.

Place and date. M.O.H.

REGULATION 12.—Every doubtful case of communicable disease shall be classed and dealt with as if it were a case of communicable disease until such is disproved.

REGULATION 13.—No milk container from a house under quarantine shall be returned to any dairy or milk vendor.

REGULATION 14.—No person from a house in which there is a patient suffering from smallpox, scarlet fever, typhoid fever, paratyphoid fever, septic sore throat, dysentery, Asiatic cholera or diphtheria, shall handle milk, butter or any other dairy product which is to be sold or given to any party or delivered to any creamery or butter factory. Any of these products may be distributed under precautions laid down by the Medical Officer of Health.

REGULATION 15.—Every physician shall report forthwith, to the secretary of the local Board of Health the death from any communicable disease of any person under his care, within twelve (12) hours thereafter.

REGULATION 16.—The secretary of the local Board of Health must report weekly to the Provincial Board of Health all cases of communicable disease occurring within his municipality.

REGULATION 17.—In all communicable diseases where the discharges from the nose or throat or other secretions and secretions of the body likely to contain the infectious agent of the disease, such discharges must be collected and destroyed or disinfected as provided for in the regulations for cleansing and disinfection.

REGULATION 18.—When any of the communicable diseases named in Regulation 2 exist in any municipality the Provincial Board of Health may with the consent of the Minister, prevent any person or persons from passing to or from such municipality, and may for this purpose prevent the transportation of any person or persons to or from such municipality by means of any boat, vessel, steam, electric or other car, carriage, vehicle or premises. It shall be the duty of the local Board of Health, the corporation of the municipality and of every officer thereof to assist in every possible way in carrying out the provisions of this and every regulation of the Board.

Diphtheria

REGULATION 19.—A suspected case of diphtheria must be isolated until the diagnosis is confirmed or disproved. A clinical case of diphtheria must be isolated even if the results of the laboratory examinations are negative.

REGULATION 20.—So-called membraneous croup shall be classed, quarantined and cared for in the same manner as diphtheria.

REGULATION 21.—The quarantine of cases of diphtheria in public institutions where the population is resident shall be governed by both clinical and laboratory examinations. Immediately after the appearance of a case of diphtheria in an institution, the Medical Officer of Health shall notify the Provincial Board of Health, which shall supply facilities for taking cultures, if necessary, from all residents of the institution. All individuals, whether sick or well, who are found in the institution harbouring diphtheria bacilli shall be quarantined until a negative report is made upon nose and throat cultures.

Rabies

REGULATION 22.—When any animal suspected of having rabies has bitten a human being, the fact should be immediately reported to the Medical Officer of Health, who shall secure, or cause to be secured, such animal alive and without injury, if possible. The animal shall at once be securely chained up or confined in a safe and comfortable place and a report giving full particulars concerning the action taken, sent to the Provincial Board of Health. This report shall include the name of the locality in which the biting occurred (city, town, village or township), the date of biting, the name, residence and address of the owner of the animal, the full name of the person bitten, together with place of residence and the names, addresses and residences of all owners of animals which have been bitten by the animal in question, together with a list and descriptions of the animals bitten and the disposition made of the same. Such supposedly rabid animal must be kept under careful observation by the Medical Officer of Health for at least ten days. (If after this interval the animal is living and well he is not suffering from rabies.)

REGULATION 23.—When such animal dies or is killed, care must be taken not to injure the brain or spinal cord. The head and several inches of the neck of the animal must be cut off and sent to the laboratory of the Provincial Board of Health for examination.

REGULATION 24.—All persons bitten by the animal suspected of having rabies should at once communicate with the Provincial Board of Health, and be advised as to the necessity of receiving the Pasteur treatment. (Supplied free by the Provincial Board of Health.)

Epidemic Cerebro-Spinal Meningitis—Epidemic Anterior Poliomyelitis

REGULATION 25.—In every case of epidemic cerebro-spinal meningitis and epidemic anterior poliomyelitis, the discharges from the nose, throat and mouth of the patient must be received on cloths and burned at once. After death or recovery of the patient all personal clothing and bedding, together with the contents of the room and the room itself, must be thoroughly disinfected under the personal supervision of the Medical Officer of Health. Every doubtful case of this character must be classed as epidemic and cared for accordingly until proved to be otherwise.

Smallpox Regulations

REGULATION 26.—Where smallpox is present in any municipality in Ontario, the local Board of Health of the municipality may at once appoint one or more sanitary policemen for the purpose of assisting to arrest the spread of the disease.

If the Medical Officer of Health or Provincial Board of Health requires the appointment of any specific number of sanitary policemen, then such number shall be appointed by the local Board. In case the local Board neglects or refuses to make the required appointment, the Provincial Board may appoint as many sanitary policemen for such municipality as it deems necessary.

REGULATION 27.—Any default on the part of the authorities of any municipality in taking immediate and effective action in carrying out the Public Health Act, the Vaccination Act, the Regulations of the Provincial Board of Health, or any health by-law in force in the municipality, shall be at once reported by the Medical Officer of Health to the Provincial Board, in order that the said Board may take such measures as it deems necessary for placing the said municipality in a position to effectively combat the disease.

Conjunctivitis—Acute Infectious

With reference to the prevention of conjunctivitis—acute infectious (ophthalmia neonatorum).

REGULATION 28.—Every physician in attendance upon a lying-in-woman shall, immediately following the birth, instil into the eyes of the newly-born child, a sufficient quantity (a few drops) of a one per cent. solution of nitrate of silver (supplied free by the Provincial Board of Health) or of a forty per cent. solution of argyrol.

REGULATION 29.—If within two weeks after the birth of a child, one or both eyes shall become reddened, inflamed, swollen or show any discharge, every physician, midwife, nurse or person in charge of a maternity or other hospital where such child is, and every person in charge of a child shall forthwith report in writing to the Medical Officer of Health the name, age and address of such child together with the circumstances of the case.

REGULATION 30.—The Medical Officer of Health shall, upon receipt of the report referred to in Regulation 29, and if the child is not under the care of a legally qualified physician, direct the parents, or whoever has charge of the child, to immediately place it in charge of a legally qualified physician, or if the parents or person in charge are unable to pay the cost of such attendance, the Medical Officer of Health shall provide the necessary treatment at the cost of the municipality.

REGULATION 31.—The Medical Officer of Health shall send a weekly report of all such cases to the secretary of the local Board of Health for transmission to the Provincial Board, as required by Section 24 of the Public Health Act.

DIVISION OF PREVENTABLE DISEASES, PROVINCIAL BOARD OF HEALTH.

I have the honour to submit the following report of the work done by the Division of Preventable Diseases for the year ending December 31st, 1923.

1. *Scope of Work.*

Despite the fact that the great part of the work being done by the Division is still in connection with the treatment and control of Venereal Diseases, nevertheless there has been a considerable extension in the field of activity of the Division during the past year. This broadening in the scope of the work had to do, particularly, with the efforts of the Provincial Board to aid in the campaign against tuberculosis, investigations into epidemics of communicable diseases such as typhoid fever, diphtheria, etc., and a closer co-operation with the District Medical Officers of Health and provincial laboratories in connection with sporadic outbreaks of these diseases. Further, three new clinics for the free treatment of venereal diseases were opened during the year at North Bay, Peterboro and Sault Ste. Marie, and educational work along the lines of social hygiene was carried out on a large scale by the Social Service Department.

Before going on with the report in detail it is perhaps advisable to outline briefly the policy that has been carried out by the Provincial Board of Health as applied to tuberculosis. During the past year the Board appointed a clinician in the Division of Preventable Diseases for work in tuberculosis. A travelling clinic has been organized, is equipped with a portable X-ray apparatus, etc., and will be available to every district in the Province. The objects of the clinic are:—

1. To be of assistance to the general practitioner in the early diagnosis of all types and cases of pulmonary tuberculosis. This refers chiefly to those in districts not in close proximity to sanatoria, tuberculosis clinic, or X-ray unit. Further, to facilitate in the disposition of all cases needing sanatorium treatment.

2. To organize clinics in different centres, the arrangements for holding the clinic being made through the co-operation of the private physicians, and local and District Medical Officers of Health.

3. To endeavour to educate the people to the menace of tuberculosis, the importance of early diagnosis and means to be taken to cure the disease.

A considerable amount of work has already been done in connection with tuberculosis, particularly with reference to the recent survey in the Dundas area, a more detailed account of which will appear further on in the report under the heading of investigations.

2. *Personnel.*

Changes in the personnel of the Division occurred during the year. Two clinicians, Dr. Charles P. Fenwick and Dr. C. Brink, and one stenographer were taken on the strength. The Division now has a director, four clinicians, one social service nurse, and two stenographers.

3. *Finance.*

The amount of money available for the work of the Division during the year was $122,500, of which $57,473.68 was advanced by the Dominion Government.

4. *Diagnosis.*

(*a*) Laboratories.

The following tables will show the large amount of work that is being done by the nine laboratories of the Province and the great assistance they have been to the Division in the way of Diagnosis of communicable diseases:—

Laboratory	Wassermanns			Darkfield Examinations			G. C. Examinations				Diphtheria Swabs					T. B. Sputa			Typhoid Bloods		
											Release		Diagnosis		Total						
	Pos.	Neg.	Total	Pos.	Neg.	T't'l	Pos.	Neg.	Sus.	T't'l	Pos.	Neg.	Pos.	Neg.		Pos.	Neg.	T't'l	Pos.	Neg.	T't'l
Kingston	435	1,649	2,084	0	0	0	46	98	0	144	20	84	56	397	557	102	682	784	86	377	463
Fort William	193	759	952	7	20	27	85	240	0	325	318	1,513	74	172	2,077	38	199	237	46	92	138
Sault Ste. Marie	131	237	368	0	0	0	26	48	0	74	27	47	60	207	341	18	138	156	5	9	14
Peterboro	69	346	415	1	2	3	140	80	0	220	58	165	55	244	522	68	282	350	72	149	221
Owen Sound	27	114	141	0	1	1	54	258	0	312	8	22	16	109	155	84	270	354	11	88	99
North Bay	200	524	724	0	0	0	127	311	0	438	184	262	125	470	1,041	47	254	301	129	157	286
Toronto	2,932	12,561	15,493	.....	.....	.....	420	2,179	0	2,599	848	1,291	680	2,861	5,680	260	1,664	1,924	232	733	965
Ottawa	0	0	0	2	0	2	275	370	0	645	153	1,116	604	3,642	5,515	107	420	527	45	128	173
London	Report not in.																				
Total	3,987	16,190	20,177	10	23	33	1,173	3,584	0	4,757	1,616	4,500	1,670	8,102	15,888	724	3,909	4,633	626	1,733	2,359

The following table represents the tests performed by the laboratories of the Provincial Board and other laboratories in connection with venereal disease clinics as a result of patients being treated in the various venereal diseases. The remaining headings indicate the number of doses of Arsenicals given to patients, the number of reactions and clinic hours of the various clinics:—

Clinics	Wassermann				Comp. Fix.			Darkfield		Gonococcus						Dose	Other preparations	Reactions	Hours Clinic open
	Blood		S. Fluid		G. C.					Diagnosis			Prognosis			Phen.			
	+	—	+	—	+	+—	—	+	—	+	+—	—	+	+—	—				
Toronto General	1,180	1,293	44	35	63	17	228	5	58	181	17	291	139	0	499	2,702	811	0	1,833
St. Michael's	272	693	0	0	0	0	0	6	9	70	18	228	11	12	226	1,133	31	0	542
Grace	164	264	0	1	6	0	27	0	0	6	0	62	8	0	248	753	0	8	268
Sick Children's	312	460	0	0	0	0	3	0	0	26	0	54	5	3	85	1,814	50	33	880
Women's College	58	203	0	0	0	0	0	0	0	27	0	436	0	0	20	219	0	0	289
Toronto Western	59	94	0	0	0	0	0	0	7	12	0	7	2	0	0	434	2	0	174½
Hamilton General	151	262	4	2	0	0	0	0	1	44	0	99	11	0	148	1,267	102	8	512
Brantford General	46	80	3	1	0	0	0	0	0	13	0	1	13	2	28	302	47	10	268
St. Catharines	24	64	0	2	0	0	0	0	0	21	13	10	13	35	30	275	4	5	411 2/5
Victoria, London	102	172	0	0	0	0	0	0	0	15	3	13	21	0	9	546	56	4	1,554
Windsor Clinic	126	188	0	2	0	0	0	26	9	91	53	85	126	20	294	926	14	30	418
Ottawa General	87	152	1	0	0	0	0	0	0	23	1	26	3	0	2	1,464	0	65	295
Kingston General	62	321	1	4	0	0	0	1	0	68	9	31	138	16	74	376	30	0	514
Peterboro Clinic	13	28	0	1	0	0	0	0	0	8	0	26	63	8	21	17	0	2	109
North Bay Clinic	2	7	1	0	0	0	0	0	0	2	0	0	0	0	0	23	12	4	77
Sault S. Marie Clinic	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	139	0	13	99
Fort William Clinic	55	88	0	1	0	0	0	0	1	9	0	16	6	0	46	290	0	4	232
Owen Sound Clinic	19	43	0	0	0	0	0	0	1	19	0	77	16	0	83	129	13	8	492
Totals	2,732	4,412	54	49	69	17	258	38	86	635	114	1,462	575	108	1,813	12,809	1,172	194	8,967 9/10

(*b*) The following new cases of syphilis and gonorrhoea, as diagnosed by Wassermann test and smear examination, are reported by the laboratories for the year 1923:—

Laboratory	V.D.G.	V.D.S.
Toronto	257	972
London	98	696
Kingston	33	423
Fort William	179	72
Sault Ste. Marie	34	140
North Bay	127	125
Owen Sound	36	27
Peterboro	73	39
Ottawa	129	0
Total	966	2,494
(1922)	826	2,331
(1921)	674	1,996

Examinations for syphilis and gonorrhoea are also made in the city laboratories of Toronto and Hamilton and in certain laboratories privately owned. These figures are not included above but their number should not be large except in the case of G.C. smears.

(*c*) Reported by physicians.

The number of cases and deaths from communicable diseases reported by physicians during the year is shown on the following page along with the totals for 1922.

CASES AND DEATHS FROM COMMUNICABLE DISEASES

Reported Weekly by Local Boards of Health for Year 1923

Date	Smallpox		Scarlet Fever		Diphtheria		Measles		Whooping Cough		Typhoid		Tuberculosis		Infantile Paralysis		Cerebro-spinal Meningitis		Influenza	Acute Influenzal Pneumonia	Acute Primary Pneumonia	Syphilis	Gonorrhoea	Chancroid
	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Deaths	Deaths	Deaths	Cases	Cases	Cases
January	43	0	368	10	236	25	331	4	376	14	59	10	169	117	2	1	6	5	39	18	362	149	160	3
February	23	0	309	13	156	21	703	7	402	30	27	4	173	137	2	2	11	9	335	83	756	100	84	1
March	26	0	343	17	224	29	1227	9	432	24	557	22	187	128	....	....	12	10	317	66	540	161	178	....
April	29	0	329	11	170	21	1148	7	286	18	338	54	173	118	4	3	13	11	84	22	332	122	125	3
May	17	0	395	7	165	14	2359	14	142	16	89	24	221	118	....	....	9	8	47	12	250	99	209	6
June	13	0	280	20	203	22	2149	14	199	19	38	11	188	147	....	....	3	3	13	.....	150	166	174	1
July	14	0	243	4	225	24	1412	11	208	20	58	8	188	108	2	1	5	3	7	.....	47	87	127	1
August	9	0	215	6	194	12	256	3	197	13	114	14	213	135	....	....	....	8	....	4	83	161	212	7
September	29	0	270	6	245	17	95	0	230	8	131	25	169	74	6	2	2	1	7	2	93	173	222	6
October	23	0	517	8	286	13	208	0	185	7	137	16	187	90	....	....	....	....	9	.....	90	130	242	4
November	58	0	680	11	374	22	293	0	369	6	68	13	116	58	1	0	2	0	7	.....	128	187	91	2
December	51	0	1060	18	457	24	762	1	179	6	49	11	166	85	2	1	1	1	9	.....	128	166	168	9
Totals	335	0	5011	131	2935	244	10843	70	3205	181	1665	212	2150	*1315	19	10	64	59	874	207	2959	1699	1992	43
1922	977	6	3950	111	3529	410	8950	40	1691	90	576	127	2078	1442	205	25	71	64	....	375	2559	2136	2270	39

NOTE.—*Only 65 per cent. reported.

As will be observed there has been an increase in Scarlet Fever, measles, whooping cough, typhoid fever, tuberculosis, and acute primary pneumonia, and a decrease in smallpox, diphtheria, infantile paralysis, syphilis and gonorrhoea.

As far as these two latter diseases are concerned, the decrease is due, in part, to the great amount of free treatment carried on in the Government clinics, and to the fact that the physicians are not reporting their cases. It seems to be a very difficult matter to get physicians generally to report their cases, despite the persistent efforts of the Provincial Board in this regard.

(*d*) Clinical office work.

In addition to the treatments given in the various Government institutions and the numerous trips that are taken for the purpose of intravenous demonstrations and consultations by the venereal disease clinicians, a great deal of work is being done by them in connection with men and women who are continually coming into the offices of the Division for advice, and if necessary, treatment, as to their condition.

The following is a brief summary of the work done:—

No, of office consultations		339
No. of Wassermans taken		58
No. positives	18	
No. negatives	40	
No. of G. C. smears taken		91
No. positives	61	
No. negatives	30	
No. of V.D.S. treatments given		102

5. *Treatment.*

(*a*) *Clinics.*

There are now 18 clinics for the free treatment of venereal diseases established in the following centres: Windsor, London, Brantford, St. Catharines, Hamilton, Toronto (6), Kingston, Peterboro, Ottawa, Owen Sound, North Bay, Sault Ste. Marie and Fort William. Those at North Bay, Peterboro and Sault Ste. Marie were added during the year. Early in the year the Board was notified in writing by the authorities of the Ottawa General Hospital that they could not carry on with the venereal disease clinic after December 31st, 1923. Arrangements for new quarters for the Ottawa clinic were left in the hands of Dr. Lomer, Medical Officer of Health, and after considerable difficulty it was arranged with St. Luke's Hospital that they should take over the clinic, accommodation having been found in an adjoining house which, after certain alterations, will be quite suitable for the carrying on of the clinic. This arrangement with St. Luke's hospital necessitated a change in clinician, and Dr. Mothersill, G.U. specialist of St. Luke's hospital, now has charge of the clinic. With reference to this change of staff, the Division desires to thank Dr. DeHaitre, former chief of the clinic, for his splendid services in connection with the clinic and had it not been for the change of plans of the Water Street hospital authorities, Dr. DeHaitre would still be doing valuable work as head of the V.D. clinic in Ottawa.

Owing to the necessity of having night clinics, thereby inconveniencing physicians at the clinics whose office hours were interferred with, it was found necessary to appoint assistant physicians with remuneration to assist with the treatments, etc., in these clinics. Ten assistant physicians were appointed as follows: Toronto General hospital, 3; St. Michael's hospital, 2; Grace hospital, 1; Women's College hospital, 1; Hamilton General hospital, 1; Brantford General hospital, 1; and Windsor, 1.

The total number of out-patients treatment given in all the clinics for 1923 shows a slight falling off as compared with those given in 1922, though there is an increase in the number of treatments given in hospitals where there are clinics.

There was a substantial increase in the new admissions to the clinics. The following are the figures:—

1923		1922	
Total out-patient treatments	56,357	Total out-patient treatments	59,648
Male	32,119	Male	33,354
Female	24,238	Female	26,294
Total in-patient treatments	28,624	Total in-patient treatments	27,429
Male	14,540	Male	11,539
Female	14,084	Female	15,890
New admissions	4,632	New admissions	2,882

The Division made 72 inspections of the clinics in Toronto and 53 inspections of outside clinics during the year.

(*b*) *Treatment in Smaller Centres.*

Thirty-five trips were made to smaller centres by the V.D. clinicians during the year. These trips were in the nature of consultations and demonstrations in the use of Phenarsenamine.

The Toronto laboratory sent out the following amounts of sterile distilled water and 15% sodium hydrate for use in administering Phenarsenamine:—

22,538 ounces sterile distilled water,
1,148 ounces 15% sodium hydrate, and
372 ampoules 15% sodium hydrate.

(*c*) *Institutions.*

The Division still makes weekly trips to Guelph Reformatory and the Mercer Reformatory for the purpose of treating the infected inmates. Occasional trips are made to the Industrial Farm, Burwash, and the Victoria Industrial School, Mimico. Treatment is supervised at the Men's and Women's Farm, Concord. There has been the closest co-operation in the treatment of venereal disease between the Division and the Medical Officers of these Institutions.

The following figures show the amount of work done in these institutions by the venereal disease clinicians:—

Institution	No. Visits	V.D.S. Treatments	V.D.G. Treatments	Wass.
Industrial Farm, Burwash	16	360	257	58
Mercer Reformatory, Toronto	50	1,045	..	467
Ontario Reformatory, Guelph	50	761	103	..
Victoria Industrial School, Mimico	12	22 (Hg. rubs 3 mos.)	..	258
Women's Farm, Concord	1	Consultation	..	..
Men's Farm, Langstaff	1	Consultation	..	..
Ontario gaols	9	Inspection	..	..

The total treatments given in these Institutions for the year are as follows:—

Institution	Syphilis Treatments	Gonorrhoea Treatments	
Industrial Farm, Burwash	511	6,535	
Mercer Reformatory, Toronto	1,000	2,640	
Ontario Reformatory, Guelph	778	2,932	
Industrial School, Mimico	22 (Hg. rubs 3 mos.)		
Women's Farm, Concord	535	1,631	
Men's Farm, Langstaff	519	271+	irrigation

The extent of venereal disease among the inmates of Burwash, Guelph, and Mercer Reformatory in 1923 is shown below, with figures and percentages for 1922:—

		1923	1922
Burwash—	No. of admissions	709	746
	No. of syphilis cases	34	90
	No. of gonorrhoea cases	43	37
	Per cent. syphilis	4.8%	12%
	Per cent. gonorrhoea	6.0%	5%
Guelph—			
	No. of admissions	734	960
	No. of syphilis cases	63	78
	No. of gonorrhoea cases	37	66
	Per cent. syphilis	8.58	8.1%
	Per cent. gonorrhoea	5.04%	6.3%
Mercer—			
	No. of admissions	167	137
	No. of syphilis cases	62 (inc. D.I.)	48 (inc. D.I.)
	No. of gonorrhoea cases	68 (inc. D.I.)	65 (inc. D.I.)
	No. of double infection cases (D.I.)	36	24
	Per cent. syphilis	37.1%	36%
	Per cent. gonorrhoea	40.7%	47%

(*d*) The report of the Medical Committee of the Canadian Social Hygiene Council on the diagnosis and treatment of venereal disease was issued during the year. This is a splendid work and makes an important step forward in getting a standard treatment for venereal disease. The publication is being distributed by the Department of Health, Ottawa, and also by the Provincial Board of Health, Toronto.

(*e*) *Manufacture and Distribution of Phenarsenamine and Mercury Salicylate.*

The Board, through the Toronto laboratory, continues to manufacture Phenarsenamine. During the year the Toronto laboratory experimented with preparations of Mercury Salicylate. These experiments having proven satisfactory, this mercury preparation is now being distributed to all our clinics and Medical Officers of Health.

The following table illustrates the distribution of the products manufactured by the Board and used in the treatment of venereal disease:—

DISTRIBUTION OF PRODUCTS MANUFACTURED BY PHENARSENAMINE LABORATORY

FROM JANUARY 1ST TO DECEMBER 31ST, 1923.

	Phenarsenamine		Mercury Salicylate		Sterile Distilled Water	Sodium Hydroxide 15%		Silver Nitrate
	Ampoules	Grams	Ampoules	Grains	Ounces	Ampoules	Ounces	Ampoules
SUPPLIED FREE IN ONTARIO:								
To Ontario Government Institutions	1,047	704.9	759	2,355	18,550	.....	185	.....
To V.D. Clinics and Medical Officers of Health in Ontario	11,486	6,962.2	4,662	8,222	3,988	372	963	.....
To Physicians and Hospitals in Ontario	.....	.....	.....	.....	.....	.....	.....	4,700
SOLD:								
To other Provinces	1,005	603.0	.....	.....	.....	.....	.....	15,000
Total Distribution	13,538	8,270.1	5,421	10,577	22,538	372	1,148	19,700

NOTE:—On September 1st the Phenarsenamine Department took over the manufacture of silver nitrate ampoules. The above figures represent the amount of this product manufactured from September 1st to December 31st, 1923.

The Division carried out 251 Biological tests for Phenarsenamine and Mercury Salicylate during the year.

6. *Investigations.*

The Division found it necessary to carry out or co-operate in the following investigations during the year:—

(*a*) The incidence of venereal disease in Ontario hospitals.
(*b*) Typhoid epidemics.
(*c*) Diphtheria epidemics.
(*d*) Tuberculosis survey in Dundas area.
(*e*) Milk supplies.
(*f*) Goitre.

DETAIL.

(*a*) *Incidence of Venereal Disease in Ontario Hospitals.*

In order to obtain this information the Division not only made out and sent a questionnaire to ten Institutions, but in nearly every instance a personal visit was made by the Division and the matter discussed with the hospital authorities. Below is a summary of the findings in this investigation.

SUMMARY OF QUESTIONNAIRE SENT TO ONTARIO HOSPITALS RE INCIDENCE OF VENEREAL DISEASE

1. Number of patients in all hospitals..... Male - 3,317
Female - 3,745
Total - 7,062

2. Number of G.P.I's.:

Male	
18–29....	3
30–39....	12
40–49....	27
50–59....	10
60–70....	5
Female	
18–29....	2
30–39....	3
40–49....	5
50–59....	1
60–70....	1

Total.. 69 or 0.96% of patients.

1.71% of males suffering from G.P.I.
.35% of females suffering from G.P.I.

3. Wassermann test is done on admission in 6 of the 10 hospitals.
4. Wassermann test has been done on all patients at one hospital only, viz., Cobourg.
5. Number of patients showing positive Wassermanns, 93—1.3%.
6. Number of patients showing positive Wassermanns admitted in fiscal year, 1922, 91—4.2%
7. Number of patients showing positive Wassermanns on C.S.F. for fiscal year, 1922, 53—2.4%.
8. Number of patients admitted in fiscal year, 1922:

Males		Females	
18–29....	220	18–29....	197
30–39....	202	30–39....	293
40–49....	167	40–49....	330
50–59....	136	50–59....	261
60–70....	167	60–70....	174
over 70....	8	over 70....	3
Total...	900	Total..	1,258
Grand Total..	2,158		

9. Number of G.P.I's. in fiscal year, 1922, 72—3.3%.
10. Treatment of G.P.I's. carried out along standard lines. Arsenic, mercury, iodides and at 3 hospitals arsenic combined with spinal drainage.

11. Number of other cases V.D.S. in hospital, 24—0.34%.
12. Number of other cases V.D.S. in fiscal year admissions, 14—0.65%.
13. Specific treatment for V.D.S. cases—arsenic in various forms, e.g., phenarsenamine, diarsenol, neo-diarsenol, novarsenobenzol, etc., intramuscular mercury and iodides.
14. Arsenical products used—novarsenobenzol, diarsenol, phenarsenamine, neo-diarsenol, arsphenamine.

Mercurial products used—mercury salicylate, ung. hydrarg., hg. protiodid, mercurosal, hydrarg. perchlor.

15. Opinion of results obtained in treatment of G.P.I. Concensus of opinions is that results are unsatisfactory. Some claim to have prolonged life and slowed up the destructive processes. Opinion of results in other cases of V.D.S.: Results are fair or satisfactory. Most cases improve with treatment.
16. Follow-up work on cases of G.P.I. and V.D.S.: In some hospitals the relatives are advised to have a Wassermann taken, but in fully 50% of hospitals no follow-up work is attempted.
17. Comments on present scheme of examining contacts:
(a) Present system very incomplete.
(b) Seems satisfactory.
(c) We have found it satisfactory. The relatives have seemed willing to co-operate in all our cases.
(d) Yes, we quite approve of the action of the Public Health Department writing to local physicians, etc.
(e) Satisfaction with present system.
(f) No suggestions.
18. Number of cases V.D.G. in all hospitals:

Male	2
Female	2
Total	4—0.06%.

(b) Typhoid epidemics.

1. *Cochrane.*

About the beginning of 1923 an occasional case of typhoid fever began to occur in the town of Cochrane and about the 1st of March, several cases appeared and the situation became known to the Provincial Board of Health. The number of cases increased rapidly and, although at that time the cause of the outbreak was not clear, it was decided to chlorinate the water supply, which was done and in effect by March 15th, 1923. In the meantime, the cause of the outbreak was definitely traced to contamination of the water supply by town sewage.

So far as can be learned, at least 831 cases of typhoid fever developed in connection with the outbreak; twelve (12) of these cases developed the infection in Cochrane, but left the town and were treated in other towns in Ontario.

The following are considered the most important facts in connection with the epidemic:—

(i) Total number of cases was 831.
(ii) Total number of deaths was 59.
(iii) The age groups particularly affected were between 5 and 25 years.
(iv) Males and females were affected equally.
(v) Approximately ¼ to 1-3 of the population was affected.
(vi) Approximately 1600-1800 people received anti-typhoid vaccine during the epidemic.
(vii) Many cases received anti-typhoid vaccine while at the same time incubating the disease.
(viii) Most of the above cases had a shorter course of fever with speedier convalescence than the uninoculated cases.
(ix) 681 cases, who developed the disease, were not inoculated.
(x) 9 cases went to bed with typhoid fever four weeks or more after having received the second inoculation. At least two of these received vaccine which was inert through age.
(xi) 200 cases were treated in hospitals, the remainder being treated at home.
(xii) Owing to the small size of houses, and the small number of rooms in the houses, many secondary cases developed in spite of educational work by seven physicians, 65 nurses and 12 public health nurses.
(xiii) There were 469 primary cases and 362 secondary cases.
(xiv) $20,000 was voted by the Provincial Government to assist in defraying expenses for physicians, nurses, etc. All other expenses were met by the town with the assistance of the Canadian Red Cross Society.
(xv) The local Board of Health took all necessary measures in connection with sanitation receiving the advice of the District Medical Officer of Health and other members of the Board at various times.

2. *Alliston.*

There were twenty-two cases in this outbreak, the cause of which was a defective water supply. This has been remedied.

3. *Men's Farm, Langstaff.*

There were eleven cases and two deaths in the outbreak which occurred in September, 1923. The cause was a defect in the water supply which has since been remedied.

(*c*) *Diphtheria.*

Burwash Industrial Farm.

The division took an active part in controlling the epidemic of diphtheria which occurred in August, 1923, at the Burwash Industrial Farm. There were fifteen cases with no deaths. Two hundred and twenty-one swabs were taken.

(*d*) *Tuberculosis Survey in Dundas Area.*

In September, the Canadian Tuberculosis Association, with the assistance of the Hamilton Medical Society and Provincial Board of Health, undertook a survey of school and pre-school children in the town of Dundas and the township of West Flamboro. The services of the clinician were given in this work. Some 1,400 school and pre-school children were examined and x-rays of the chest taken on 1,100. The report of the survey will be issued by the Canadian Tuberculosis Association in April.

Two cities and four towns have already been visited in connection with the organization of tuberculosis clinics. It is hoped that fifteen to twenty clinics will be in operation during the summer of 1924.

(*e*) *Milk Supplies.*

Dairies and the general handling of milk supplies were inspected in the following towns:—

Cornwall,
Belleville,
Cobourg,
Lindsay.

(*f*) *Goitre.*

This disease is prevalent throughout the Province though there are areas in which it is more pronounced. Methods for treating and preventing the disease are being investigated.

7. *Social Service.*

(*a*) Follow-up work—

(1) Letters,
(2) Returns of Death from Syphilis,
(3) Sources of Infection and Contacts.

(*b*) Educational.

(*a*) Follow-up work—

(1) Letters.

During the year letters were received concerning 589 persons suffering from venereal disease. For many of those who had moved to other localities, arrangements were made for their treatment to be carried on in near-by clinics or by local medical officers of health.

(2) Returns of Death from Syphilis.

Deaths from syphilis were investigated by the division, and the following summary shows the work done along these lines:—

4 stillbirths—
- 2 cases, father and mother under treatment.
- 2 cases, not yet completed.

39 death returns (congenital syphilis)—
- 1 case, father positive, mother positive, 1 child positive, 2 children negative. } under treatment.
- 1 case, mother positive, father negative, children negative.
- 4 cases, mother under treatment, father negative.
- 1 case, parents negative.
- 1 case, mother dead, father negative.
- 1 case, mother negative.
- 1 case, father negative.
- 5 cases, mother and father positive and under treatment.
- 6 cases, mother under treatment.
- 1 case, mother positive, father under treatment three years ago, failed to continue.
- 2 cases, parents not located.
- 1 case, child was an orphan.
- 1 case, gonorrhoeal ophthalmia.
- 13 cases under investigation.

53 death returns (acquired syphilis)—

11 cases syphilis—
- 1 case, husband negative.
- 3 cases, no contacts.
- 1 case, wife negative, child negative.
- 6 cases under investigation.

30 cases cerebro-spinal syphilis—

Cases investigated—

10 cases cerebro-spinal syphilis—
- 7 cases, no contacts.
- 3 cases, contacts negative.

1 case, gumma of the brain—no contacts.

3 cases, G. P. I.
- 1 case, husband not located.
- 2 cases, no contacts.

5 cases locomotor ataxia.
- 3 cases, contacts negative.
- 2 cases, no contacts.

Cases under investigation—
- 4 cases, cerebro-spinal syphilis.
- 1 case, gumma of the brain.
- 1 case, G. P. I.
- 5 cases, locomotor ataxia.

9 cases syphilis of the cardio-vascular system—

Cases investigated—

1 case, pulmonary embolism.
2 cases, myocardial failure.
1 case, sortitis.

Cases under investigation—

3 cases, endocarditis.
1 case, abdominal aneurism.
1 case, myocardial failure.

Miscellaneous—

1 case investigated.
2 cases under investigation—
1 case, gumma of stomach.
1 case, syphilis of the larynx.

(3) Sources of Infection and Contacts, etc.

A great deal of work was done by the social service nurses along these lines, and the accompanying figures from their reports will give an idea of the work that has been done in following up contacts and sources of infection.

Referred by—

Self, 490; doctors, 446; friend, 476 Public Health Department, 275; private institutions, 55; Social Service Department, 31; hospital wards, 225; other clinics, 150; provincial posters and wax models, 46; provincial institutions, 32; police, 37; Children's Aid Society, 7; nurses, 53. Total, 2,323.

Alleged sources of infection investigated—

Syphilis—positive, 128; negative, 56; total, 184. Gonorrhoea—positive, 88; negative, 41; total, 129. Grand total, 313.

Number contacts located—

Syphilis—positive, 132; negative, 402; total, 534. Gonorrhoea—positive, 38; negative, 72; total, 110. Grand total, 644.

Visits by Social Service Nurses, 7,172.
Patients born in Canada, 1,315.
Patients born elsewhere, 680 (including British Empire.)
Average number of patients under treatment monthly, 7,082.
Number of patients lost, 732.

(*b*) *Educational.*

A very active educational campaign against venereal disease and along the lines of social hygiene was carried on by the division during the year. This was done by means of showing of films, moving pictures, exhibitions, addresses, meetings, and the distribution of literature. Cities, towns and villages in all parts of the Province were visited and many meetings held. Especially was this the case in Thunder Bay and Rainy River Districts where the Social Service Branch of the division spent practically the whole of the month of June in addressing meetings and showing films, etc.

The accompanying report of the Social Service Nurse will indicate briefly the work that is being done along the lines of social service.

During the past year special courses were arranged on four occasions for nurses working outside the city. Three of the nurses had just accepted positions with our own clinics, and the fourth nurse was sent by the St. John Health Centre, St. John, N.B.

In connection with the arrangement of these courses our thanks are due to the Toronto Department of Public Health, the Social Service Department of the Toronto General Hospital, the Neighbourhood Workers' Association, the Juvenile Court, Dr. Edna M. Guest, and the superintendent of the Mercer Reformatory.

Fifty-five trips were made to out-of-town points requiring 116 days. Thirty-four of these trips were for the purpose of showing films, and involved 76 showings. Attendance, 6,510.

Forty-five visits were made for the purpose of supervising clinics.

Thirteen half days were spent at the Mercer Reformatory. This is considerably less than last year, and it is regretted that more time was not available to spend in this work.

Twenty-nine meetings were attended, one being the National Conference of Social Work held in Washington in May.

Thirteen visits were made in connection with special cases. Two cases investigations were made and follow-up work is still under way on these cases.

Special exhibits illustrating the work of the division were shown at the Canadian National Exhibition, Toronto, and at the Fall Fair, Ottawa.

8. *General.*

(*a*) Wax Models.

During the year the board imported from Paris, France, some very fine wax models illustrating the lesions occurring in venereal diseases and various skin diseases. These models have been used for selected exhibits and have proven a great success.

(*b*) Regulations in Communicable Diseases.

New regulations are now in force and are being well received by the physicians and medical officers of health of the Province.

(*c*) Co-operation.

The division co-operated with the following organizations during the year—

Canadian Social Hygiene Council,
Canadian Red Cross Society,
Canadian Tuberculosis Association,
Various other divisions in the Provincial Board of Health.

(*d*) Work Contemplated.

(1) Organization of tuberculosis clinics.
(2) Some scheme for improvement of milk supply in smaller centres.
(3) Further venereal disease clinics in larger centres, if considered necessary.
(4) More intensive campaign of education *re* the seriousness of various communicable diseases.

(*e*) Letters for the Year.

In-coming letters, 4,048.
Out-going letters, 3,963.

(*f*) I wish to thank the members of the division for their support and cheerful co-operation during the year. When it is remembered that nearly 8,000 letters were received and sent out, numerous reports written and a great deal of other office routine attended to, the clerical staff is certainly to be commended for its splendid work.

R. R. McCLENAHAN, M.B.
Director, Division of Preventable Diseases.

Toronto, January 29th, 1924.

ANNUAL REPORT, 1923, DIVISION OF INDUSTRIAL HYGIENE

The activities of the Division of Industrial Hygiene are conducted with a view to prevention of sickness among wage earners, especially that part of it which can be accomplished most satisfactorily by employers and wage earners themselves. They include:

(1) Investigation of the incidence of occupational diseases and the means for their prevention.

(2) The preparation of technical and popular literature and addresses drawing the attention of employers, employees, and physicians to the waste from sickness among wage earners and the suggested means for prevention.

(3) The accumulation of data on the extent of sickness in industry for use in presenting the situation to employers, in order that they may institute means of prevention as a matter of good business.

(4) Supervision of sanitation in connection with medical service in unorganized territory.

(1) *The Incidence of Occupational Diseases.*

There are two sources of information.

(*a*) The co-operation of many agencies has been received in obtaining information regarding cases of occupational diseases which arise. These are employers and employees, physicians, accident prevention associations, Inspection Branch of the Mines Department, and, very recently, the Workmen's Compensation Board. The cases reported include:

Lead poisoning, 38.
Benzol, 13—1 death.
Mercury, 7.
Potassium, cyanide, 6.
Carbon monoxide, 2.
Dye asthma, 2.

Conjunctivitis associated with wood alcohol, 3; together with individual cases of cancer, tweak-wood poisoning, aniline.

Skin eruptions, 111; these include eruptions caused by dye (ursol), potassium cyanide, sugar, oil, formaldehyde, cyanamide, nickel, rash associated with constantly wet hands, urticaria associated with exposure to volatile substances like benzine, turpentine, etc.

When such cases are reported, the Division communicates with the private physician to enlist his interest and co-operation. The individual physician's response in this connection is notable and a source of gratification. The patient is visited and his permission obtained to interview his employer, when the attempt is made to study the processes and other exposed employees. Recommendations for prevention based on the findings are submitted to the employer. The division has been unable to investigate all the cases reported because the industries and plants represented are now so many and varied and widely scattered. In the meantime, data on the incidence of different types of occupational disease in Ontario, hitherto wanting, is being accumulated.

(*b*) Following the original plan, coincident with the study of individual cases, the division has continued the investigation of the incidence of lead-poisoning in lead-using industries. This phase of the work must receive less

and less attention in the face of the increasing numbers of individual cases reported. Two groups of plants were studied.

(i) Paint manufacturing.
(ii) A second study in storage-battery manufacturing.

(i) In nine (9) paint-manufacturing plants, fifty-five workers exposed to lead were given complete physical examination. Eight (8) cases of lead-poisoning of varying severity were identified. In the light of the numbers exposed this is high, but six (6) of these cases occurred in three (3) plants, two (2) showing conditions only fairly good and one (1) in bad condition. The remaining six (6) plants were kept in good condition.

(ii) In storage-battery manufacture, sixty-eight (68) men were examined. Thirty-eight (38) cases of varying severity were identified. In all cases but one *general* plant conditions were quite good. Special care required for the prevention of lead-poisoning was not in evidence however.

A similar investigation was carried out in this industry two years ago by this division when concrete recommendations for prevention were made. The findings in 1923, in spite of the previous demonstration of a comparatively high incidence of poisoning and of the presence of dangerous quantities of lead in the air, showed a failure to remedy conditions on a voluntary basis. The experience of the division in this respect is not limited to this industry.

This investigation also afforded opportunity to determine the value of certain suggested means for the early diagnosis of lead-poisoning. The presence of 300 per million red blood corpuscles showing basophilic granulation in workers exposed to lead has been used in factory legislation in Germany as an indication for their removal from exposure. Its value is controversial.

With the use by the division of a slight modification of Harlowe's stain, the presence of basophilia was detected in nearly every case where there was a history of exposure to lead and any symptoms or other signs which led to suspicion of lead-poisoning. In another group not exposed, in no case was basophilia demonstrated. The number of basophilic cells corresponded roughly to other indications of the severity of the case in all instances. In forty-one cases of this group the presence of hematoporphyrin, in high dilution (1-50 plus), of urine corresponded with the degree of basophilia. Examination of blood smears has been done in all reported cases investigated by the divison with the same result.

The presence of basophilic granules in red blood cells is used in the division as an important confirmatory sign of lead-poisoning and simple means for demonstrating basophilia have been placed before the progession of the province.

From this data certain considerations arise:

(*a*) The number of cases of occupational diseases in Ontario is considerable, in striking contrast to prevailing opinion three years ago. From time to time circumstances arise to show that the number of cases existing is considerably in excess of the number reported but the lack of facilities for investigation prevents detailed information being accumulated regarding them. This applies in the case of dermatitis from sugar, dye, oil, nickel, formaldehyde, and in carbon monoxide poisoning.

(*b*) The cases reported to the division were all well-developed, that is, beyond the early stage, and, with the exception of some of the skin cases, requiring rest in bed with medical treatment. For each such case, it can be reasonably assumed that there are still at work where these cases arose a number

of workers in varying earlier stages of poisoning, doing their jobs more or less ineffectively because of chronic ill health or actual sickness from intercurrent disease.

This is borne out by our experience in the individual cases investigated and by the trade investigations made; for example:

(i) Investigation in one plant from which had come a patient suffering from benzol poisoning, who later died, showed four men in the same department with a white-blood count of less than 4,000 cells per cubic millimetre with no other reason to account for it than exposure to benzol. These men would shortly have broken down under continued exposure.

(ii) In one plant with seventeen (17) cases of nickel rash reported, investigation showed forty-six (46) cases occurring over a period of a year.

(iii) In paint manufacturing and storage battery manufacturing where all the men examined were at work, four (4) men were encountered who had been treated for lead-poisoning, but twelve (12) men showed the effects of lead in a marked degree, the need for active treatment being unavoidable with continued exposure.

(*c*) It is generally recognized that labour turnover is high in occupations hazardous to health, so that the full degree of the effect of the occupation on health cannot be seen. A local experience with exposure to lead bears this out:

In one plant where there were eight (8) well-marked cases of lead-poisoning, fifty per cent. of those examined had been employed for less than six (6) months; seven (7) of these eight (8) marked cases were among men who had been employed for more than six months, but 32 per cent. of those employed less than six months showed definite effects of lead.

Prevention.

Obviously, some effective means of prevention should be instituted. Three years' attempt to prevent these diseases by recommendation alone have failed to produce results. While the number of plants and industries dealt with has been small, the individual attention which they have received has been considerable. This conforms with experience elsewhere.

In Great Britain, and to some extent in the United States, very detailed legislation administered by factory inspection departments exists, requiring the accepted means of prevention.

It is considered that legislation should exist in Ontario, setting forth in general, not detailed, terms the requirements for prevention of the commonest occupational diseases, but that the most effective and satisfactory means of prevention lies in the compensation under the Workmen's Compensation Act of all diseases due to industry, independent of other disease conditions existing in the individual and independent of the length of exposure necessary to produce the occupational disease condition presented. This last is necessitated, if for no other reason than that susceptibility to industrial health hazards varies extremely from one individual to another, influencing to a corresponding degree the time required to produce incapacity.

Experience in the division shows that where occupational diseases are compensated industrial executives are, as a rule, more than willing to assist in determining adequate means of prevention. The responsibility of the employer is acknowledged on all sides. It is not enough that he be penalized for a high incidence: he should receive a proportionate financial advantage over his competitor if the incidence of occupational disease in his plant is lower.

Prevention of these diseases involves attention to plant environment, in some cases supplemented by periodic physical examination.

Regarding plant environment, as indicated in last year's report, the need exists in the division for personnel with basic training in architecture and engineering, who can determine the most effective means for mechanical removal of dust and fumes which are dangerous to health in industrial processes, and who will prepare himself to advise on the most effective means of lighting and ventilating factories based on scientific findings which in some cases await practical application.

Experience in Great Britain as seen in the legislation shows that in certain trades attention to environment alone does not suffice for prevention but must be supplemented by periodic physical examination in order that symptoms and signs appearing in the worker may be discovered early, and the individual removed from exposure. This is the case in lead trades, in the India rubber trade (processes where lead, carbon bisulphide, and benzol are used), in chemical trades (chrome and nutro and amido processes). In addition, the inadequacy or impracticability of some methods of quantitative estimation of many substances encountered as health hazards in industry makes the use of physical examination as an indicator of the effectiveness of mechanical preventive measures adopted very important, but it is only of value in so far as it brings to light evidence of poisoning or undue susceptibility to poisoning before the worker is incapacitated. Of this nature are physical findings such as a degree of basophilia in the blood in lead-poisoning, a marked decrease in white blood corpuscles in benzol poisoning, the presence of methemoglobin in blood in carbon monoxide poisoning.

With other occupational diseases, and notably skin diseases, we are not so fortunate. Skin diseases form a high proportion of cases here reported. The greatest variation in susceptibility and effects exists. One worker shows the effects of exposure while another working under the same conditions does not. One worker succumbs to illness in a week and another not for six (6) months under the same conditions. Some are exposed for ten (10) to fifteen (15) years with no effect, while others work for the same time without effect and then suddenly develop marked sensitiveness which persists.

Some of the forms of dermatitis appear to be local in type and some systemic. Most cases resist treatment and all require removal from exposure for successful treatment, while for many no adequate means of prevention has yet been discovered.

Periodic physical examination here should yield information as to whether the individual is likely to develop dermatitis under the conditions of proposed employment. Such information is of first importance in the physical examination of men returning to work after illness and will be required more and more as schemes for rehabilitation develop; an example is the effort now directed toward estimation of muscle strength and cardiac efficiency for purposes of work. Indeed, in this respect rehabilitation and prevention have the same objective, with a larger field for its application in prevention.

Very minor excursions into this field have been made by the division in the effort to prevent some occupational conditions.

Dr. N. C. Sharpe exposed mice to volatile substances, first, with toxic doses for short periods of time at long intervals, and, second, with non-toxic daily doses of one hour's duration, this latter exposure corresponding as closely as possible with that prevailing in industrial conditions.

Those exposed to repeated small doses died earlier than the controls and showed microscopic changes on post-mortem examination. Those exposed to large, occasional doses showed no demonstrable effects.

Dr. G. W. Ross showed that the treatment of sugar dermatitis by Finsen light was satisfactory but that desensitization of the skin to prevent a recurrence on a second exposure to sugar did not take place.

Dr. F. Tisdale showed that the calcium content of blood was unaltered in cases of sugar dermatitis.

Dr. A. H. W. Caulfield has considered the question of anaphylaxis in relation to nonprotein organic compounds, particularly in connection with dye (ursol) asthma.

Some results may be expected if work of this type, properly organized, is commenced even in a small way. It has been recommended that an appointment be made in the division to study some of these conditions with this use of physical examination in mind.

With such a lead from the government, and employers benefiting financially through workmen's compensation in proportion to their success in preventing occupational diseases, industry might be expected to find it profitable and otherwise very satisfactory to group themselves for the study of their special health hazards, with a view to prevention, particularly through detection at a very early stage.

(2) The preparation of technical and popular literature and addresses, drawing attention of employers, employees, and physicians to the waste from sickness among wage earners, and the suggested means of prevention.

(*a*) *Technical.*

(i) A publication entitled "Lead Poisoning (A Compilation of Present Knowledge)," has been completed. This book contains in convenient form the latest available knowledge on the subject of lead poisoning, under headings of etiology, pathology, symptomatology, signs and diagnosis, laboratory and clinical tests, prevention, a fairly extensive chapter on the lead trades, a short chapter on treatment, and an extensive survey of the legislation dealing with the prevention of lead-poisoning in different countries.

It has received very favourable criticism from the profession in Canada and other countries, as evidenced by a number of private communications received from authorities on the subject.

It places in the hands of the profession in Ontario a valuable reference for the recognition of lead-poisoning in its earlier stages and it is hoped that it will help to give the disease the consideration it requires.

(ii) A publication by Dr. N. C. Sharpe, formerly on the staff of the division, on the hazard from lead to the health of operators using the spraying machine for painting, the result of experimental work which was carried on previous to 1923.

(iii) There is in course of publication a second article based on the work which Dr. Sharpe carried out, which it is hoped will add something to present knowledge of the subject.

(iv) At the Round Table Conference of the Ontario Medical Association Annual Meeting in Windsor, May, 1923, the principle of the part-time appointment of physicians in industry for purposes of health supervision was discussed and favourably received. This subject was brought to the attention of the profession because of a question occasionally met with, "What does the profession think of efforts to show employers that the prevention of sickness in

industry is good business?" and partly because of the fact that industries in Ontario will not employ full-time physicians for this work for some time to come, necessitating the employment of part-time physicians who are engaged at the same time in general practice.

(v) Of considerable importance is the activity of the Committee on Industrial Diseases of the Ontario Medical Association. This committee was established in 1922 on a motion by Dr. F. W. E. Wilson, Niagara Falls, who was elected first chairman. During that year, ending May, 1923, a circular letter was prepared to be sent to all physicians in Ontario, drawing attention to the prevalence of industrial diseases and requesting reports of such cases.

The division has had access to these reports which present problems in which the division is interested. It is hoped that information as to difficulties encountered by practising physicians in these cases will put the division in a better position to place in their hands the type of information required to prevent industrial diseases. A recent meeting of the committee was well attended and enthusiastic.

(*b*) *Popular.*

(i) A publication entitled "Health Confessions of Business Women" has been completed.

The book is based on a competition in the daily newspapers, with prizes, sponsored by the division, which called on business women for letters giving, from individual experience, health habits which have been found to be of greatest value. Between 200 and 300 replies were received. These have been arranged under suitable headings and contain health suggestions with practical hints for overcoming obstacles to their attainment, which are intensely human and could never have been enumerated in academic fashion.

The result is a little book which deals with a prosaic subject in a way which is interesting and at the same time informative.

The idea of producing a book for a selected group of workers actually written by that group is, it is thought, distinctly original and might well be more widely adopted.

(ii) The subject of industrial health has been drawn to the attention of workmen through occasional bulletins and of foremen and workmen through a Y.M.C.A. publication which reaches them. These articles dealt with physical examination and industrial accidents and fatigue.

For manufacturers articles were prepared for their journal, "Industrial Canada," and a chemical trade journal on industrial accidents, plant medical departments, and occupational diseases.

An exhibit at the Canadian National Exhibition depicted mechanically the destruction of health and life through industrial poisons, using posters in explanation.

3. *Accumulation of data on the incidence of sickness in industry.*

Continued effort has been made to obtain information as to what general sickness exists among wage earners and its effects, particularly as reflected in lost time from work. Local experience of this kind is necessary if the employer is to be interested; however, little information exists.

Nursing service in the plant is almost a necessity if anything like accurate statistics are to be obtained, mainly because the information does not otherwise exist as to whether the worker is away because of ill health or for other reasons. Certain plants are at present compiling such data. Our records to date show

from six (6) to eight (8) days' lost time from sickness per wage earner per year, which is about two and a half (2½) times as much as that lost from accidents in the same plants.

In this connection, the activities of the Child Welfare Division have been joined with those of this Division in presenting the desirability of appointing public health nurses in communities where industry, generally a single industry, is the mainstay of the community. A report from an industrial nurse employed in such a community and working in close co-operation with the community nurse follows and shows the type of information which can be acquired and some of the results of using it. This reports four (4) months' activity:

Sickness.

During these four (4) months sickness of employees in one hundred and forty-six (146) cases recorded, caused seven hundred and seventy-one (771) days' lost time. Sickness at home caused nineteen (19) men to lose seventy-one (71) days.

Total lost time from sickness was about two and a half (2½) times the *total* lost time from accidents.

A study of the records compiled from August 1st with respect to sickness show that the greater bulk of lost time occurred in two or three departments. Class of employees, greater percentage. Polish and Ukrainians concerned may be found to have a direct bearing on this feature.

Forty-two (42) employees have voluntarily come to the first aid room for advice and help on account of sickness, twenty-four (24) being referred to doctor for medical treatment. Thirty (30) cases told plant nurse of sickness at home and these cases were referred to the community nurse, who, through visits to the homes, brought them in touch with the doctor. These cases included a large range of ailments and conditions, most of which required medical or surgical treatment. Many of them would not have received proper attention soon enough but for the visit and advice of community nurse.

Fourteen (14) cases of furunculosis, among mechanics and paper machine men, have been treated and at present oil is under examination to determine, if possible, the cause of infection.

Twelve (12) occupational skin conditions have been seen and treated. Three (3) men who have lost considerable time on this account have been transferred to other work and the result being steady employment since.

Eight (8) men have asked for complete physical examination and eighteen (18) have been advised to have examination at an early date for various conditions: hernia, eye conditions, ear conditions, etc.

Infections.

Since August 1st, thirty-two (32) lost time accidents occurred and five hundred and sixteen (516) minor injuries have been treated. No infections occurred following these injuries, but community nurse, in her visits, discovered eight (8) infections following scratches which had not been reported.

It is not possible to estimate in every case how much time was saved to men involved in accident cases by treatment and constant care during period they are forced to be idle. We know, however, that men were able to return to work earlier because of proper care than they would have been if proper provision for such cases was lacking.

This report shows that the employees in this plant lose on an average four (4) days per man per year from sickness. This is low in comparison with most industrial groups and is partly due to preventive measures already adopted.

The accident records are of interest, since, although no effective safety campaign is continuously carried on in this plant, and the lost time from sickness is not high, sickness still causes two and one-half (2½) as much lost time as accidents. Again, the record shows that this lost time is concentrated mainly in two or three departments, making it possible to focus efforts on prevention. This example of what can be done in reducing infections stands in striking contrast to the fact that nearly fifteen (15) per cent. of all Workmen's Compensation cost in Ontario is due to infections.

4. *Supervision of sanitation in connection with medical service in unorganized territory.*

During the year the work of the Chief Sanitary Inspector and his staff of five men has been joined with that of this division. Their activities lie mainly

in unorganized territory in northern and northwestern Ontario, where the problem is almost entirely industrial, as represented by pulp and paper and sawmill industries in both their camp and mill operations, together with the mining industry.

This work is administered under the section of the Public Health Act dealing with unorganized territory, which now provides that the Board shall have supervision over physicians who accept contracts to care for the workers in these industries as far as the maintenance of good health is concerned.

Because of the existence of a contract, the physician's relation to his clientele involves more than that of physician to patient and enables him to apply preventive measures before incapacity results, to the benefit of the workman as well as himself. This fact enables the physician to proceed at once to consideration of the phases of the prevention of sickness among wage earners which involve health supervision of individuals who are well, in addition to supervision of their working and living environment, which is now required.

A necessary preliminary to intelligent work of this kind is a knowledge of the amount and kinds of sickness existing. The division is directing efforts toward obtaining the interest and help of contract physicians in accumulating such information, in the belief that we have something to offer in return.

Apart from the assistance received from the various Divisions and the field force in the Board of Health itself, acknowledgment is especially made to Dr. V. E. Henderson, Department of Pharmacology, University of Toronto, and to Dr. T. C. Routley, Secretary, Ontario Medical Association.

ANNUAL REPORT DIVISION OF PUBLIC HEALTH EDUCATION

FOR THE YEAR ENDING DECEMBER 31ST, 1923

The work of this division during the past year has been one of varied activities. The early weeks of the year were taken up with routine writing of health articles for the press, the answering of correspondence, and the checking up of reports on the sanitary inspection of schools. In cases where the sanitary conditions were bad, particulars were immediately sent to the Deputy Minister of Education and the Chief School Medical Officer so that the co-operation of the local school authorities with the local Medical Officer of Health might be assured in remedying the objectionable conditions.

During the month of January much time was taken up with the sending out of thousands of copies of the 1923 Health Almanac. Covering letters were sent to the secretaries of all the Women's Institutes throughout the Province, requesting their co-operation in the distribution of the almanacs. I may say that this co-operation was cheerfully given, and again I must record my earnest thanks to Mr. Putnam, the Superintendent, for having typed all the addresses of the various branch institutes scattered far and wide throughout the Province. There is no organization in Ontario that takes a keener interest in the dissemination of Public Health propaganda than the Women's Institutes.

The Public Health Almanac for 1923 was even more popular than the previous edition. Twenty thousand copies were distributed throughout Ontario and sample copies were sent to England and other countries. The almanac was favourably reviewed in the British Medical Journal, as a result of which numerous requests for copies came from England, and one from Shanghai, China.

In February the Director of the Division, in company with Mr. Jones, the moving picture operator, went to Providence, R.I., and secured some new models for the Health Exhibit. On account of the restricted space at the Provincial Board of Health's exhibit at the Canadian National Exhibition last August there was not enough room for all the models, but they were shown later at the Ottawa Fair in September. While in Providence a number of films on health subjects were purchased and these have since been widely shown in Toronto and throughout the Province. A few of the places in Toronto where the films have been shown are: Canadian Council of Jewish Women, St. George Street, Toronto; Junior Health League of the Toronto Public Schools; Church of Latter-Day Saints, as well as numerous other churches, clubs and organizations.

A number of the standard films were loaned at various times to local Boards of Health throughout the Province, and the films were also borrowed and shown in Hamilton, Brantford, Newmarket and many other places as the result of request from the local health authorities. Thousands of people also viewed the Public Health films that were shown in the Provincial Board of Health's tent every afternoon and evening during the two weeks of the Canadian National Exhibition.

The Ninth Annual Conference of the Ontario Health Officers' Association held on May 21st, 22nd and 23rd was a pronounced success. Upwards of 300 health officers were in attendance, as well as social workers and others interested in public health and preventive medicine.

One of the features of the convention was a paper on "Insulin in the treatment of Diabetes," by Dr. F. G. Banting, who gained world-wide fame for his remarkable discovery. Needless to say, there was a large attendance at this session and Dr. Banting's paper was much appreciated.

Another interesting address was given by Dr. F. C. Vaughan, Commissioner of Health for Detroit, on the subject of Public Health Administration.

The individual papers were all on timely topics, and the symposiums on "Tuberculosis" and "Cancer" reviewed the subjects from every angle and brought out some interesting and instructive discussions and criticisms.

The whole programme, in the opinion of many of those present, was well-balanced and the papers most instructive. Some of the members present even took the trouble after the convention to write to the Secretary expressing their appreciation of the programme presented.

The first session began on Monday, May 21st, at 10 o'clock, with the registration of delegates, after which a moving picture was shown. Next came a few remarks from the Chief Officer of Health, outlining the objects of the conference. The first paper was read by Dr. P. J. Moloney, District Officer of Health, whose subject was "Co-operation in Health Work among Public Officials." Dr. E. R. Secord, of Brantford, President of the Ontario Medical Association, gave an address urging the closest co-operation between the Health Officer and the general practitioner. The conference then adjourned to Hart House, where the members were guests of the Provincial Board of Health at luncheon. The speaker on this occasion was Hon. Mr. Justice Riddell, of the Supreme Court, who outlined the work of social hygiene and the efforts being put forward for combating venereal diseases.

The second session opened with the presidential address by Dr. D. V. Currey, M.O.H., St. Catharines, Ont.; next, Mr. Wills MacLachlan, Toronto, on the subject "Resuscitation," illustration of the Schaefer method. The last speaker at this session was Dr. H. F. Vaughan, Commissioner of Health, Detroit, Mich., who spoke on "Some Recent Aspects of Public Health Administration."

On the second day of the conference the proceedings opened with a paper on "The Schick Test and Active Immunization against Diphtheria," by Dr. James Roberts, M.O.H., Hamilton. The remainder of the session was taken up with a very interesting symposium on Tuberculosis. Dr. Harold Parsons dealt with the subject under the heading of "Tuberculous Contacts," Dr. I. H. Erb, Pathologist to the Hospital for Sick Children, Toronto, discussed "The Pathology of Mediastinal Tuberculosis," while "Tuberculous Infection in Infancy and its Effects" was discussed by Dr. A. Davis, of Toronto. Interesting slides and pathological speciments were shown and a discussion followed led by Dr. W. E. Ogden and Dr. A. H. W. Caulfield.

The fourth session of the conference was taken up with a symposium on Cancer, chiefly from the preventive viewpoint. The introductory paper was read by Dr. Adam Wright, who in a very able paper stressed the importance of preventing chronic intestinal stasis, if cancer of the intestinal tract is to be curtailed. After the reading of Dr. Wright's paper there was a discussion on "Ulcers of the Stomach and Duodenum and their relation to Cancer." The following gentlemen took part in the discussion: Professor Clarence Starr, Toronto; Dr. Wm. Goldie, Toronto; Dr. F. A. Cleland, Toronto; Dr. Grant Fleming, Toronto; Dr. W. J. Dobbie, Weston; Dr. H. W. Hill, Western University, London, Ont.; Dr. L. Hess, Hamilton. The session closed with the reading of a paper entitled "Milk and its relation to Disease," by Dr. A. J. Slack, of the Western University, London, Ont.

The fifth session commenced with a moving picture, followed by a paper on "Dentistry and Health," by Dr. H. S. Thompson, Dental Research Department, University of Toronto. The next paper was by Dr. J. G. Cunningham on "The Part-time Physician in Industry." Dr. W. L. Hutton, M.O.H.,

Brantford, read a paper on "Smallpox" and illustrated his remarks with some very interesting charts. The session concluded with a paper on "The Significance of Certain Vital Statistics, "by Mr. F. A. Dallyn, C.E., Director, Division of Sanitary Engineering, Provincial Board of Health.

The closing session was taken up with a paper on "Vital Statistics and Causes of Death," by Mr. S. J. Manchester, Director of Vital Statistics, Registrar-General's Department, followed by Dr. Banting's address on "Insulin."

In June the Director of this Division attended the annual meeting of the Canadian Public Health Association in Edmonton, and the summer months were taken up with the reading and correcting of proofs for the Annual Report and making preparations, and arranging contracts for the erection and construction of the booths at the Health Exhibit at the Exhibition grounds.

With wall decorations of blue and white, and gold lettering designating the various booths, a very instructive, interesting and elaborate exhibit was produced by the Provincial Board of Health at the Canadian National Exhibition in 1923. The main idea of the exhibit was the preservation of the health of all the people and the efforts of the Provincial Board of Health to maintain a high standard of health conditions throughout the Province. With this end in view a booth was erected showing a typical Ontario family, with wax figures representing the father and mother, a boy of school age, a girl of pre-school age and a baby in the cradle. All were represented in good health, and round the exhibit were grouped the booths of the different divisions showing their various activities in the work of health promotion and disease prevention.

The central figure of the Child Welfare booth was the public health nurse, artistically done in plaster, and in the foreground were panoramas depicting the scenes of the nurse's chief activities. These were the Indian wigwam, the pioneer's cottage, the farmhouse, and the city slums. This was a most attractive booth.

The Division of Industrial Hygiene had an interesting mechanical exhibit showing the bad effects on health of poisons that are used in various industrial processes. A cannon, operated by devils representing ignorance and carelessness, was shown in action and at every explosion of the gun an employee was disabled. The Divisions of Laboratories, Sanitary Engineering and Communicable Diseases also had attractive booths which daily interested large crowds of visitors. A word of praise is also due the Registrar-General's Department for their very interesting and instructive exhibit.

In order to standardize the Annual Reports of Medical Officers of Health and obtain the necessary information in definite sequence, a new form, containing headings to be filled in, was prepared, which included practically all the points on which health information and statistics are sought from year to year. Information was particularly desired regarding the salary of the M.O.H. and the total expenditure for Public Health work in each individual municipality, so that an estimate could be made of the total expenditure for health work throughout the Province.

The forms in question are to be filled in and presented to the local Boards of Health before November 15th annually, and a copy sent without delay to the Provincial Board of Health, Spadina House, Toronto. The following headings that have to be filled in are included in the form:

Municipality, County, Name and Address of M.O.H., Date, Estimated Population, Number of Births per annum (exclude "Still Births"), Number of Still Births, Number of Infant Deaths under one year, Infant Mortality rate per 1,000 Living Births, Number of Deaths from all causes, Death rate per

1,000 of the population. Communicable Diseases—Disease, No. of cases, No. of Deaths, Any special outbreak of communicable disease during the year? Methods adopted to combat the outbreaks. Milk supply—(*a*) Source, (*b*) Character, (*c*) Is supply pasteurized? Water Supply—(*a*) Source, (*b*) Character, (*c*) How purified? Any special Public Health Work carried on, such as Child Welfare, Ante-natal Clinics, Tuberculosis Clinics, Venereal Disease Clinics, etc., Any Public Health Education by M.O.H.? Did M.O.H. carry out Sanitary Inspection of Schools during the year and make report? Expenditure for Public Health purposes—(*a*) Salary or other remuneration of M.O.H., (*b*) Expenditure for other Public Health Work, (*c*) Total expenditure for Public Health. General remarks—Brief outline of activities of M.O.H. and local Board of Health.

I would again recommend the appointment of one or more public health lecturers or teachers to do field work in this division. Continual personal propaganda in Public Health is much more effective than sporadic demonstrations and speech-making, for if follow-up work is not carried on the public lose their enthusiasm in the subject and soon forget what they have learned.

J. J. MIDDLETON, M.B., D.P.H.,
Director, Division of Public Health Education.

ANNUAL REPORT MATERNAL AND CHILD HYGIENE DIVISION
1923

The work of the division this year has followed the lines of demonstration, as in previous ones, and this summary will show the activities as carried on in the respective health districts:

District No. I

Demonstrations of generalized public health nursing, including schools, were carried on in the Towns of Leamington, Essex, Kingsville and Tillsonburg, while the Townships of Westminster and Delaware were given service of this type during the months of November and December. The district had but one nurse for the months from July to November, as the other gave special service in the summer work in northwestern Ontario. One outstanding effort in this district during 1923 was the co-operation between the division and the agricultural representative for Essex County. In the spring a well-planned schedule was followed whereby home nursing instruction was given, followed by a child welfare clinic. In September an additional itinerary was undertaken covering the school fairs, in connection with which a child welfare clinic was held in each centre.

District No. II

For the greater part of the year District No. II has had but one nurse, owing to the fact of the special work in the Haileybury district following the fire and the Cochrane epidemic of typhoid in the early spring. The summary for the year, however, shows that demonstrations of generalized public health nursing, including schools, were carried on in the Town of Orangeville, Villages of Grand Valley and Milverton, together with work in four townships; in addition the Counties of Wellington, Waterloo and Perth were surveyed.

In Dufferin County also our co-operation was solicited by the agricultural representative and the public health nurse followed the schedule of the school fairs, having a small exhibit and mother's conference at each point. The course in Home Nursing given in Grand Valley was a signal success.

District No. III

During the year one of the public health nurses in District No. III was sent for duty to the northern fire area, only returning to the district in the month of March. The Town of New Toronto was given a demonstration, including schools, with the result that a permanent local nurse has been appointed. Assistance was given in the survey of tuberculosis among children in the Town of Dundas and vicinity, which work lasted for three months, and was followed by a survey of the County of Wentworth.

York Township has received a great deal of attention; as previously reported demonstrations of public health nursing, including schools, were carried on in several sections of the municipality, as a result of which the following appointments were made during the months of January and February, 1923:

Municipal Public Health Nurse for the Township of York (this service includes schools where no local work has been arranged for).

Public Health Nurse for the Village of Swansea (schools included in this service).

Public Health Nurse, S.S. No. VII, York Township (schools included in this service).

Five months were spent in the Town of Paris, giving a demonstration of Public Health Nursing, including schools. The next point of demonstration was the Town of Simcoe, which work is still in progress. A survey of Brant County, including City of Brantford, was also undertaken.

District No. IV

The district suffered in the matter of work owing to the fact that one of the nurses, who had been sent to the fire area, was retained in that section of the Province permanently. During the year a demonstration of generalized public health nursing, including schools, was undertaken in the Town of Lindsay. The Town of Cobourg was assisted in the installing of the newly-appointed local nurse, while the Township of Hamilton was fairly well covered in a demonstration of general public health work. An attempt was made to use the fall fairs in the Towns of Lindsay and Norwood.

District No. V

The summary for the year shows that the demonstration of public health nursing, including schools, in the Town of Hawkesbury, which was carried on by two nurses, was followed by a demonstration covering the same field in the Village of Vankleek Hill. Upon request of the authorities of the Township of Caledonia, the work was extended to this municipality. The Town of Arnprior was given the services of a nurse for a limited time, while complete demonstrations were undertaken in the Town of Morrisburg and Village of Lancaster. The Township of Lancaster was the scene of some work during the fall months.

District No. VI

The work of the division in this district at the beginning of the year meant continuance of the emergency nursing programme due to the Haileybury fire, making it necessary to retain the nurses in this field until the end of May. In addition, the total staff of the division was called upon to assist in the typhoid epidemic at Cochrane.

The service tendered in the Town of Cobalt took the form of a demonstration of generalized public health nursing, including schools, which was followed by the appointment of a municipal public health nurse to carry on the health programme at the termination of our effort. Intensive work was instituted in the Town of Cochrane at the end of the typhoid outbreak, child welfare clinics under the direction of the division being carried on for one week, making it possible for the entire child population to receive complete physical examinations. The Town of Parry Sound has been the headquarters for one nurse and many of the school fairs and fall fairs were supplied with a small exhibit and conferences for mothers held at the various points.

District No. VII

The Town of Rainy River was given a demonstration of generalized public health nursing, including schools, during the winter and spring months, while the Town of Dryden was given the same type of service from November until April, and the Town of Sioux Lookout from the month of September to the end of the year.

Special summer work was undertaken in three of the agricultural districts, namely Rainy River, Fort William and Port Arthur, during the course of which the settlers in outlying sections were seen by a systematic house to house visitation. The population along the line of railway also received attention, while school fairs presented opportunities which the public health nurses used to the best advantage.

District No. VIII

Demonstrations of generalized public health nursing, including schools, have been carried on in the towns of Bruce Mines, Thessalon, Cutler, Spanish and Spragge; in addition the town of Espanola was given a demonstration from August to November. The programme included the generalized work with special emphasis on the schools and in co-operation with the nurse in the industrial plant, with the result that the community has undertaken the work on their own responsibility.

Several townships in the vicinity of Iron Bridge were visited and the public health nurse devoted the month of September to fair work. Following the exhibition at Sault Ste. Marie, the schedule of school fairs, as requested by the agricultural representative, was followed. It must be remembered also that the nursing service in this district suffered from a disadvantage owing to the fact that the staff were transferred to the emergency fields in No. VI.

Summary

Because of the contingencies arising during the year, the regular work of the field nurses was considerably interfered with; in spite of this, however, they made 39,538 visits, saw 5,465 cases and attended 194 meetings. The work of the nurses in connection with schools shows a total of 20,545 inspections of school children, resulting in the noting of 14,744 defects. The staff nurses also held 69 child welfare conferences, with a total attendance of 1,105.

Canadian National Exhibition

The exhibit of the Division this year departed from the child welfare clinics which have been a feature for the last six years, and took the form of a series of special illustrations showing the various fields in which our nurses are stationed. The central point was a statue of a public health nurse (3 ft. 6 in. high); wax and plasticine were employed in the miniature representations of the city slum, the rural district in old Ontario, the pioneer's cabin on the frontier, and the Indian tepee. The accompanying illustration will show the general plan of the exhibit.

All of which is respectfully submitted.

Mary Power,
B. Knox,
Maternal and Child Welfare Division.

Toronto, 4th February, 1924.

ANNUAL REPORT, 1923, PROVINCIAL SANITARY ENGINEER

F. A. DALLYN, C.E. (TORONTO)

To the Chairman and Members of the Provincial Board of Health, Ontario.

Gentlemen,—I have the honour to transmit herewith my report of the activities of the Division of Sanitary Engineering for the year 1923.

The effectiveness of the measures initiated and supervised by this Department for the protection of municipal water supplies was rather severely tested during the early part of the year when the outbreak of typhoid at Cochrane* scattered infected individuals all over the province. Over 953 cases were reported from Cochrane and adjoining municipalities with some 84 deaths. Despite the widespread diffusion of infection from this outbreak, only one other outbreak of consequence has occurred during the current year: One at Hanover, which was attributed to the washing of milk utensils by water obtained from a sewage-polluted fire protection system.

Subtracting the reported cases and deaths from these two outbreaks, from the figures for the province as a whole, leaves a residual unaccounted for of 653 cases and 123 deaths. This compares most favourably with the year 1922, in which some 576 cases were reported with 127 deaths; 1919 and 1922 represent the banner years for typhoid in the Province of Ontario. In 1919, 145 deaths were reported by the Registrar General, and in 1922, the province realized for the first time in its history, an extremely low instance of typhoid in towns, the rate being 10.6 per 100,000, the lowest rate recorded in any previous year being 17.2 in 1918; with the prevailing average in excess of 30 for the past ten years. The rate for the cities in 1922—5.1—was influenced by one serious outbreak in an institution, the deaths being credited to one of our cities.

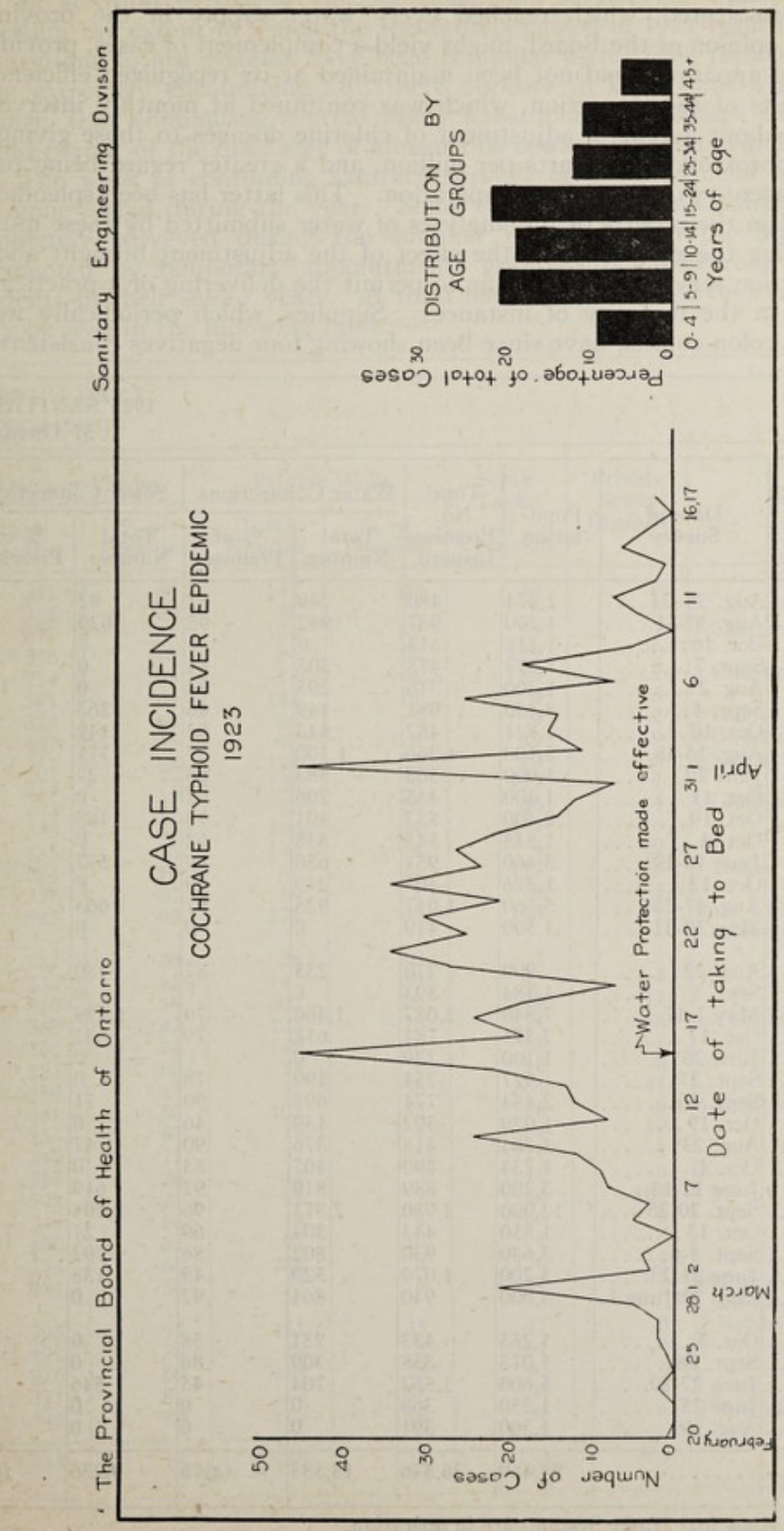
The explanation of this very favourable report for 1923, considering the distribution of infection, lies no doubt in the fact that as soon as the Department realized the nature of the epidemic in Cochrane, an inspection service was

*The epidemic as pictured by a curve showing cases and "date of taking to bed" suggests multiple sources of infection. The curve showing age distribution of the persons affected reveals an unusual number involved in the lower age groups, possibly suggesting involvement of the milk supplies as sources of infection.

The water supply at Cochrane is taken from a series of springs and there is an auxiliary supply from the overflow from these springs, known as Spring Lake. During the winter, which was preceded by a dry fall and possibly, also, owing to considerable railway construction going on in that area, the capacity of the municipal system was taxed to the utmost, with the result that the auxiliary intake supply from Spring Lake was opened. The continued use of water from the lake depressed the level of Spring Lake below that of the drainage outlet of the watershed, which, unfortunately, at the time of the outbreak received the sewerage of the town. At this time the whole area was covered under a heavy sheet of ice and snow, and it would appear that the pump attendant did not realize that there was a possibility of reversing the drainage so as to make it flow into the Spring Lake by lowering the level of Spring Lake to two feet below that of Sewerage Outlet Lake.

The possibility of pollution reaching the water supply was discussed with the Municipality in 1921-1922, and a By-law was passed to provide for expending a considerable sum for enlarging the reservoir capacity, and to develop the springs somewhat further. Unfortunately, the town did not proceed with that work, nor with the purchase of a chlorine apparatus for the water supply, which also was recommended.

The Director of the Division was in the area just one week before the outbreak was known to exist, and in view of some diarrhoea that was reported on as being contracted in Cochrane, he wired the office to secure a machine, and to have one of the Board's engineers bring it up and instal it. The machine was shipped two days later and was installed and in operation some three days before the local authorities realized that they had a typhoid epidemic on their hands. Any primary infection associated with the municipal water supply was completely under control March 15th, and no further infection was distributed by the municipal water supply system after that date.



Typhoid fever at Cochrane, first officially reported by local officials March 17th, 1923.

immediately instituted, which reached every water supply in the province which, in the opinion of the Board, might yield a complement of cases, provided the protective apparatus had not been maintained at its recognized efficiency.

The results of the inspection, which was continued at monthly intervals, was to bring about a general adjustment of chlorine dosages to those giving a residual of approximately .2 parts per million, and a greater regard being paid by superintendents to uniformity of operation. This latter has been splendidly demonstrated in the reports of the analyses of water submitted by these municipalities during the current year, the effect of the adjustment brought about by the inspection service being such as to permit the delivering of a practically sterile water in the majority of instances. Supplies, which periodically were showing high colon counts, have since been showing four negatives consistently.

Municipality	Date of Survey	Population	Total No. Premises Inspctd.	Water Connections		Sewer Connections	
				Total Number	% of Premises	Total Number	% of Premises
Alexandria	Aug. 24–25	2,274	480	249	52	92	19
Arnprior	Aug. 30-31	4,200	987	942	95	620	63
Arthur	Oct. 16	1,218	314	0	0	0	0
Brighton	Sept. 7	1,373	478	305	64	0	0
Cardinal	Aug. 22	1,300	316	295	93	0	0
Carleton Place	Sept. 4	3,430	981	449	46	363	37
Chesley	Oct. 10	1,721	482	443	92	149	31
Cobourg	Aug. 16-18	5,100	1,266	1,100	87	771	61
Deseronto	June 20	1,900	565	383	68	27	5
Durham	Oct. 11	1,400	435	206	42	0	0
Elmira	Oct. 19	2,400	533	401	75	168	32
Fergus	Oct. 2	1,815	543	335	62	0	0
Gananoque	June 18-19	3,460	951	656	69	577	60
Harriston	Oct. 12	1,326	405	279	69	0	0
Hawkesbury	Aug. 27-28	5,560	1,017	925	91	663	65
Humberstone	May 30-31	1,500	419	0	0	0	0
Iroquois	Aug. 22	900	270	235	87	180	67
Kemptville	Sept. 1	1,184	393	0	0	0	0
Lindsay	May 7-17	7,840	2,087	1,460	70	1,229	59
Listowel	Oct. 17	2,571	784	618	79	33	4
Madoc	June 26	1,100	329	0	0	0	0
Markdale	Sept. 27	927	254	199	78	0	0
Meaford	Sept. 26	2,484	774	698	90	71	9
Milverton	Oct. 19	1,029	302	139	46	0	0
Morrisburg	Aug. 23	1,363	418	376	90	47	12
Mount Forest	Oct. 4	1,734	490	407	83	0	0
Oakville	June 12-13	3,200	889	819	92	649	73
Owen Sound	Sept. 20-25	12,000	2,980	2,871	96	2,204	74
Palmerston	Oct. 13	1,850	443	304	69	27	6
Perth	Sept. 5-6	3,630	930	802	86	702	75
Picton	June 21-23	3,200	1,079	529	49	138	13
Port Colborne	May 29-June 1	3,000	940	864	92	0	0
Port Elgin	Oct. 5	1,255	433	251	58	0	0
Shelburne	Sept. 28	1,075	358	309	86	0	0
Trenton	June 27-29	5,600	1,562	704	45	546	35
Tweed	June 25	1,250	368	0	0	0	0
Vankleek Hill	Aug. 29	1,300	391	0	0	0	0
Totals (37)		98,469	26,546	18,533	(a)76	9,256	(b)46

(a) Where Municipal Water Systems are in operation.
(b) Sewered Municipalities only.

In addition to this service, an inspection service has been instituted to ascertain the extent to which the regulations passed in 1921 regarding auxiliary connections to fire systems have been complied with. The results so far have been extremely encouraging and there appears to have been a general compliance, thus eliminating a great many hazardous connections, some of which would permit of the discharge of almost raw sewage into municipal systems.

The work of continuing sanitary surveys of the provincial municipalities has gone ahead during the year. Some thirty-seven municipalities have been completely surveyed during the summer months, when the staff could be augmented by temporary appointments granted to engineering and medical students in their senior years. A total list of the 1923 surveys now available may be seen in the following table:—

SURVEY DATA

MUNICIPALITIES

Outdoor Privies		Private Wells		Septic Tanks or Cesspools	Private Sewer Outfalls	Remarks
Total Number	% of Premises	Total Number	% of Premises			
331	69	131	27	33	6	
334	34	26	2.5	5	5	
277	88	164	52	33	1	4 Chemical Closets.
336	70	84	18	129	0	
214	68	14	4.5	85	2	2 Chemical Closets.
591	60	141	14	4	3	
328	68	24	5	4	2	1 Indoor Toilet.
437	35	98	8	31	9	6 Chemical Closets.
387	68	141	25	22	6	1 Smead Dowd Privy.
313	72	125	29	127	7	
295	55	96	18	46	1	15 Indoor Toilets.
353	65	130	24	157	5	
333	35	134	14	6	19	
284	70	87	21	117	0	3 Indoor Toilets.
327	32	50	5	0	1	
385	92	271	65	48	1	Port Colborne Water, 3 connections.
81	30	28	10	1	1	
333	85	142	36	45	4	
816	39	602	29	10	11	
365	47	125	16	374	8	1 Chemical Closet.
254	77	119	36	48	2	
152	60	17	7	96	0	
380	49	51	6.5	261	41	
241	80	107	35	55	0	6 Indoor Toilets.
255	61	19	4.5	68	32	
349	71	31	6	127	1	
214	24	42	5	11	0	
598	21	68	2	64	104	
249	56	18	4	186	0	
200	22	91	10	1	1	
733	68	286	26	156	19	
471	50	37	4	481	2	Private Water Supply, 30 connections.
395	91	151	35	47	0	2 Indoor Toilets.
192	54	29	8	131	0	
916	69	436	28	42	7	
321	87	172	47	38	2	
345	88	172	44	24	0	1 Smead Dowd Privy.
3,385	13	4,458	17	3,113	303	

The division has been concerned in efforts to get under way a series of water-treatment schemes looking forward to placing a greater number of municipalities in that position where the water supply would present at no time unnecessary hazards. It is encouraging to note that these efforts have been rewarded by seeing definitely under way a scheme for the Essex border municipalities, providing for an adequate supply of treated water for Windsor, Walkerville, Ford City, Riverside and the adjoining township municipalities. Smith's Falls is definitely proceeding with a very much needed water filtration plant which we hope to see constructed during 1924. The town of Port Colborne is proceeding with water purification works which should be completed during 1924. The town of Cochrane has completed the installation of two deep wells which are furnishing the municipality with an adequate amount of water quite above suspicion, and these wells have put the town quite independent of the old auxiliary supply which heretofore had to be called upon at times of shortage. Hanover has now definitely abandoned the old sewage-polluted fire protection system, the new supply from Ruhl lake being made available. Goderich is definitely committed to major improvements to its supply, the contract for an improved intake to be let in January. North Bay, after a great deal of delay, has provided for the installation of a chlorine plant, much needed owing to the rather adverse conditions surrounding the intake location at Trout lake. In addition, there have been some major improvements for the Stamford Township water supply, which will preclude any future possibility of seepage from the power canal affecting the quality of the spring water. The supply has already been protected by the operation of a chlorinating plant. At Dunnville, Port Credit, Whitby, Grimsby, and North York filter plants have been completed during the year and are in successful operation. In addition, some thirty-five new chlorination plants have been installed during the year. The list is included in table No. 2A.

Following is a comprehensive list of the methods in vogue in protecting water supplies throughout the province. For convenience the list has been divided into four divisions covering:

(1) Filtration plants.

(2) Chlorination plants.

(3) Deep wells, springs and other supplies in use without treatment.

(4) Fire protection only.

TABLE 1 A

MUNICIPAL WATER FILTRATION PLANTS IN ONTARIO

Municipality	Source of Water Supply	Type of Filter	Capacity Imperial gallons per 24 hours	Purification Apparatus Installed
Amherstburg	Lower Detroit River	Filtered water supplied by the Brunner Mond Company	.....	1918
Arnprior	Madawaska River	Pressure mechanical	450,000	1900
Brampton	Springs and Snell's Lake	Gravity mechanical	900,000	1920
Chatham	Thames River	Pressure mechanical	3,500,000	1895
Cobourg	Lake Ontario	" "	1,300,000	1889
Cutler	Aird Bay, Lake Huron	" "	140,000	1921
Dundas	Catchment Area	Gravity mechanical	5,600,000	1918
Dunnville	Grand River	" "	1,300,000	1923
Grimsby	Lake Ontario	Pressure mechanical	1,300,000	1923
Haileybury	Lake Temiskaming	" "	700,000	1913
Hawkesbury	Ottawa River	Gravity mechanical	1,250,000	1918
Iroquois Falls	Abitibi River	Pressure mechanical	340,000	1916
Kincardine	Lake Huron	Slow sand	250,000	1922
Kingsville	Lake Erie	Pressure mechanical	1,300,000	1921
Lindsay	Scugog River	" "	2,000,000	1917
New Toronto	Lake Ontario	" "	1,500,000	1917
Niagara-on-the-Lake	Lower Niagara River	" "	1,100,000	1916
North York	Upper Don	Gravity mechanical	1,250,000	1923
Orillia	Lake Couchiching	Pressure mechanical	2,000,000	1915
Oshawa	Lake Ontario	Gravity mechanical	1,500,000	1917
Owen Sound	Sydenham River and Springs	Slow sand on river supply	.....	....
Perth	Tay River	Pressure mechanical	1,100,000	1915
Peterborough	Otonabee River	Gravity mechanical	5,000,000	1922
Port Credit	Lake Ontario	Slow sand	300,000	1923
Port Hope	" "	"	1,000,000	1915
Renfrew	Bonnechere River	Pressure mechanical	1,100,000	1918
Richmond Hill	Spring Creek	Gravity mechanical	275,000	1921
Rockland	Ottawa River	Pressure mechanical	200,000	1919
Scarborough	Lake Ontario	Gravity mechanical	1,250,000	1921
St. Thomas	Springs and Kettle Creek	Pressure mechanical	2,750,000	1893
Smooth Rock Falls	Mattagami River	" "	3,300,000	....
Sturgeon Falls	Sturgeon River	" "	690,000	....
Tecumseh	Lake St. Clair	" "	450,000	....
Toronto	Lake Ontario	Slow sand, Gravity mechanical	70,000,000	1912–17
Wallaceburg	Lower St. Clair River	Pressure mechanical	650,000	1914
Weston	Humber River	" "	1,400,000	1910
Whitby	Lake Ontario	Slow sand	700,000	1923
	PROJECTED PLANTS			
Belleville	Bay of Quinte	Gravity mechanical	.....	....
Crystal Beach	Lake Erie	Pressure mechanical	.....	....
Essex Border	Detroit River	Gravity mechanical	.....	....
Goderich	Lake Huron	" "	.....	....
Oakville	Lake Ontario	" "	.....	....
Port Colborne	Lake Erie	Pressure mechanical	.....	....
St. Catharines	Welland Canal and Impounding reservoir	Gravity mechanical	.....	....
Smith's Falls	Rideau Canal	" "	.....	....
Welland	Welland Canal	" "	.....	....

TABLE 1 B

MUNICIPAL WATERWORKS SYSTEMS

Situations in which Major Improvements are Desirable

Municipality	Stop-Gap Treatment	Recommended Improvements	Programme
Belleville	Liquid chlorination	Filtration	Nil
Brockville	" "	"	"
Cornwall	" "	"	"
Gananoque	Nil	Filtration and chlorination	"
Goderich	Liquid chlorination	Filtration, new intake	Under construction
Kenora	" "	" " "	Nil
Kingston	" "	Filtration	"
Oakville	" "	"	Under construction
Port Colborne	Chlorination by chloride of lime	Filtration, liquid chlorination	" "
Sault Ste. Marie	Liquid chlorination	Filtration	Nil
Smith's Falls	" "	"	Under construction
Welland	" "	"	Nil
Windsor	" "	"	Under construction

TABLE 2 A

LIQUID CHLORINATION EQUIPMENT INSTALLED, 1923

Municipality	Date Installed	Capacity pounds of Chlorine per 24 hours	Remarks
Alliston	January	10 pounds	New
Belleville—Canada Cement Co.	June	10 "	"
Chippawa—Norton Co.	June	25 "	Replacement
Cobalt	July	15 "	New
Cochrane	March	10 "	New. Two machines
		20 "	
Dunnville	May	40 "	Replacing bleach equipment
Elsas—Continental Wood Products Co	"	25 "	New
Essex	March	10 "	Replacing bleach equipment
Fort Erie	August	10 "	New
Goderich	June	25 "	Replacing bleach equipment
Grimsby	July	10 "	New
Hanover	September	10 "	Replacing bleach equipment
Hornepayne—C.N. Railway	April	10 "	New
Huntsville	July	25 "	"
Iroquois Falls	June	100 "	Duplication
Kapuskasing	March	20 "	"
Kingston	July	40 "	"
Langstaff—Toronto Jail Farm	October	10 "	Two new machines
Lindsay	August	30 "	Replacement
London	June	10 "	New. Emergency only
Meaford	April	10 "	New
New Toronto	May	25 "	.....
Port Colborne—Canada Cement Co.	October	100 "	New
Port Colborne—International Nickel Co.	August	25 "	Replacement
Port Credit	June	10 "	New
Stamford Township	"	10 "	"
Sturgeon Falls	September	25 "	Replacing bleach equipment
Teck Hughes Gold Mines	December	10 "	New
Thessalon	November	20 "	"
Thorold—Beaver Board Co.	July	10 "	"
Thorold—Ontario Paper Co.	"	5 "	"
Thorold—Pilkington Glass Works	"	15 "	"
Toronto	"	300 "	Duplication
Welland—Electro Metallurgical Co.	"	10 "	Replacement
Weston	September	50 "	Replacing bleach equipment
Total—35 installations.			

PLANTS PURCHASED AND TO BE INSTALLED DIRECTLY

Kirkland Lake—Township of Teck	20 pounds	New
North Bay	15 "	"
Timmins—Hollinger Mines	75 "	"

TABLE 2 B

MUNICIPAL WATER CHLORINATION PLANTS

Municipalities Using Approved Liquid Chlorine Equipment

Municipality	Date of Installation	
	Chloride of Lime Equipment	Liquid Chlorine Equipment
Alliston	....	1923
Amherstburg	1912	1919
Belleville	1916	1919
Brampton	....	1920
Brantford	1914	....
Brockville	1912	1916
Burlington	....	1922
Capreol	....	1922
Chatham	1912	1918
Cobalt	....	1923
Cochrane	....	1923
Collingwood	....	1917
Copper Cliff	....	1916
Cornwall	....	1920
Courtright	....	1920
Crystal Beach	....	1922
Cutler	....	1919
Depot Harbor	....	1919
Dundas	....	1917
Dunnville	1918	1923
Espanola	....	1919
Essex	1921	1923
Fort Erie	....	1923
Fort Frances	1912	1922
Goderich	1916	1923
Grimsby	1916	1923
Guelph	1915	1920
Haileybury	1914	1922
Hanover	1921	1923
Hawkesbury	....	1918
Hornepayne	....	1923
Huntsville	....	1923
Ingersoll	....	1916
Iroquois Falls	....	1917
Kapuskasing	....	1920
Kenora	1912	1922
Kingston	1912	1919
Lindsay	....	1917
London (emergency use only)	....	1923
Meaford	....	1923
Merritton	....	1920
Napanee	....	1920
New Toronto	1915	1923
Niagara Falls	1913	1916
Oakville	1914	1922
Orillia	1912	1917
Oshawa	1916	1917
Ottawa	1912	1916
Parry Sound	1916	1922
Pembroke	1914	1919
Peterboro	....	1916
Port Arthur	1913	1914
Port Credit	....	1923
Rainy River	1916	1922
Rockland	....	1917
St. Catharines	....	1914

TABLE 2 B

MUNICIPAL WATER CHLORINATION PLANTS

Municipalities Using Approved Liquid Chlorine Equipment

Municipality	Date of Installation	
	Chloride of Lime Equipment	Liquid Chlorine Equipment
Sandwich	1913	1917
Sarnia	1912	1917
Sault Ste. Marie	1913	1919
Smith's Falls	....	1916
Smooth Rock Falls	....	1918
Stamford Township	....	1923
Strathroy	1916	1918
Sturgeon Falls	....	1923
Sudbury	1915	1919
Thessalon	....	1923
Thorold	....	1915
Timmins	....	1921
Toronto	1909	1917
Walkerville	1913	1919
Welland	....	1917
Weston	1916	1923
Whitby	1920	1920
Windsor	1913	1917

TABLE 2 C

LIQUID CHLORINATION PLANTS IN ONTARIO FOR TREATMENT OF WATERS OTHER THAN MUNICIPAL SUPPLIES

Location	Operated by	Date of First Installation	Remarks
Amherstburg	Brunner Mond, Canada	1919	Town use also
	Detroit & Windsor Ferry Co.	....	.....
	Island Pleasure Resort	....	.....
Belleville	Canada Cement Co.	1923	.....
Capreol	Canadian National Railways	1922	Town use also
Chippawa	Norton Co.	1917	.....
Copper Cliff	International Nickel Co.	1916	Town use also
Courtright	Western Salt Co.	1920	" " "
Crystal Beach	Amusement Co.	1922	" " "
Cutler	Spanish Mills	1919	" " "
Depot Harbour	Grand Trunk Railway	1919	" " "
Elsas	Continental Wood Products Co.	1923	.....
Erie Beach	Swimming Pool	1923	.....
Espanola	Spanish River Pulp & Paper Co.	1919	Town use also
Goudreau	Goudreau Gold Mines, Limited	....	.....
Hawkesbury	Riordon Pulp & Paper Co.	1917	.....
Hornepayne	Canadian National Railways	1923	Town use
Iroquois Falls	Abitibi Power & Paper Co.	1917	" "
Jordan	Dominion Canners	1920	.....
Kapuskasing	Dominion Experimental Farm	1920	.....
	Spruce Falls Co.	1920	Town use
Kingston	Penitentiary	1922	.....
	Royal Military College	1918	.....
Kitchener	Y.M.C.A. Swimming Pool	1921	.....
Langstaff	Toronto Jail Farm	1923	2 machines
Murray	British American Nickel Co.	1917	.....
Port Colborne	Canada Cement Co.	1923	.....
	International Nickel Co.	1919	.....
	Maple Leaf Milling Co.	1919	.....
Smooth Rock Falls	Mattagami Pulp & Paper Co.	1918	.....
Teck Hughes	Teck Hughes Gold Mines	1923	.....
Thorold	Beaver Board Co.	1923	.....
	Ontario Paper Co.	1923	.....
	Pilkington Glass Works	1923	.....
Toronto	Broadview Y.M.C.A.	1922	.....
Welland	Electro Metallurgical Co.	1916	.....
	Union Carbide Co.	1920	.....

TABLE 2 D

WATER CHLORINATION PLANTS

Chloride of Lime Equipment

Municipality	Date of Installation	Remarks
Cobourg	1917	.....
Deseronto	1923	Fire supply
Keewatin	....	.....
Midland	....	.....
Niagara-on-the-Lake	1915	.....
Perth	1915	.....
Port Colborne	1914	.....
Port Hope	1914	.....
Port Stanley	....	.....
Prescott	1920	.....
Renfrew	1915	.....
St. Thomas	1913	.....
Tecumseh	1918	.....
Wallaceburg	1915	.....

TABLE 3

MUNICIPAL WATER SUPPLIES

Deep Wells, Springs, and Other Supplies in Use Without Treatment

Municipality	Population	Source of Supply
Acton	1,800	Wells
Aurora	2,400	"
Aylmer	2,300	Wells and springs
Barrie	7,000	Wells
Beamsville	1,200	Springs
Beeton	600	"
Bothwell	600	Wells
Bowmanville	3,500	Skinner's Spring
Bracebridge	2,500	Wells (artesian)
Brighton	1,400	Springs
Chesley	1,800	Wells
Clinton	2,000	"
Cochrane	2,200	Deep wells (new supply)
Coldwater	700	Springs
Creemore	600	"
Durham	1,600	"
Elmira	2,400	Wells
Englehart	700	"
Fergus	1,800	"
Fort William	21,000	Loch Lomond
Galt	14,000	Springs
Georgetwon	2,100	"
Gore Bay	600	"
Harriston	1,300	Wells
Kitchener	23,000	"
Leamington	3,900	"
Listowel	2,500	"
London	60,000	Springs and wells
Markdale	900	Spring Creek
Markham	.....	Springs
Midland	7,000	"
Mildmay	.....	Wells
Millbrook	800	"
Milton	.....	Springs
Mitchell	1,700	Wells
Mount Forest	1,800	"
New Liskeard	2,000	Springs
Newmarket	3,400	Wells
Norwich	1,300	"

TABLE 3—Continued

MUNICIPAL WATER SUPPLIES

Deep Wells, Springs, and Other Supplies in Use Without Treatment

Municipality	Population	Source of Supply
Orangeville	2,500	Springs
Palmerston	1,800	Wells
Paris	4,400	Springs
Parkhill	1,200	Wells
Penetanguishene	4,000	Springs and wells
Port Elgin	1,400	Springs
Preston	5,500	"
Ridgetown	2,300	Wells
St. George	.....	Springs
St. Mary's	4,000	Wells
St. Thomas	18,000	Wells (partial supply)
Seaforth	2,000	Wells
Shelburne	1,100	"
Simcoe	4,000	Springs
Stayner	1,000	"
Stouffville	1,100	"
Stratford	18,000	Wells
Tavistock	1,000	"
Tillsonburg	3,000	Springs
Trenton	5,900	"
Walkerton	1,500	Springs
Waterloo	2,400	Wells
Wingham	6,000	"
Woodstock	2,500	Springs

TABLE 4

MUNICIPAL WATERWORKS SYSTEMS

Municipal Supplies Used for Fire Protection Only

Municipality	Population	Source of Supply	Date of Installation
Alvinston	841	Sydenham River	1893
Blyth	700	Blyth Creek	1911
Caledonia	1,000	Grand River	1870
Campbellford	3,000	Trent River	1890
Deseronto	1,800	Bay of Quinte	1897
Dresden	1,500	Sydenham River	1912
Exeter	1,500	Au Sable River	1911
Lucknow	900	Nine Mile River	1890
Napanee	3,000	Napanee River	1890
Paisley	800	Saugeen River	1888
Picton	3,000	Bay of Quinte	1889
Port Perry	1,200	Lake Scugog	1905
Strathroy	2,600	Sydenham River	1903
Streetsville	600	Credit River	1912
Teeswater	850	Teeswater River	1889
Thamesville	800	Cornwall Creek	1911
Tilbury	1,900	Baptiste Creek	1902
Uxbridge	1,500	Ponds	1874

Special investigations were made during the year to assist the municipalities of Chatham, Essex, Forest and Richmond Hill in solving obscure problems in connection with their water supply.

At Chatham the problem was one of treating a very highly turbid water present in the Thames for a short period during the spring run-off, which hitherto had not been successfully combated. By means of some modifications to their

settling basins and the application of alum at certain strategic points in the basins this difficulty was completely overcome, so that the citizens were able to enjoy for the first time clear water during the spring run-off.

At Essex the problem was one of freeing the deep-well supply of sulphur, in order that it might be effectively chlorinated with a minimum of chlorine. This was accomplished by the introduction of air through filtros plates suspended in their storage well. As is elsewhere noted this very simple provision permitted the municipality to chlorinate with a dosage of 3.0 P.P.M., whereas the dosage formerly, 30-40 P.P.M., was unable to produce sterility before being air-treated.

At Richmond Hill the problem was one of overcoming the taste and colour due to the presence of iron in their filtered supply. It was readily ascertained that the difficulty arose from their stream, due to the blanket of ice, which excluded air and prevented the oxidation of the iron which normally occurred. The situation was immediately corrected when air was introduced into the settling basin in connection with the filter plant, through diffusor plates.

At Forest the problem was one of discovering means whereby a highly-charged carbonated water naturally soft could be freed of its medicinal property. It was found that the water very readily released its carbon dioxide when aerated in storage tanks by means of air introduced through diffusor plates.

The use of air through diffusor plates is a novel procedure, but has particular merit in that it promotes effective aeration without introducing the difficulties of freezing which surround plants attempting to use sprays during the winter months.

The question of water supplies on steamboats playing the Great Lakes was considered early in the year, at the request of the United States Public Health Service, at a conference in Washington.

Later, by an agreement with Ottawa, regulations were drafted in this office. These were accepted by the Dominion Department of Health, and during the summer were enforced with the assistance of the laboratories of the Board.

The regulations are as follows:

Regulations Concerning Water for Drinking and Culinary Purposes on Vessels Navigating on the Great Lakes and Inland Waters

1. Water furnished on such vessels for drinking and culinary purposes shall at all times be a potable water free of pathogenic bacteria and shall comply with the standard for drinking water and culinary water, namely: Shall not contain organisms of the colon group in excess of 2 per 100cc. of the water determined by the presumptive test as adopted by the American Public Health Association in their standard (current) methods for bacteriological examination of water. (Phelps' Method of Calculating.)

2. Water tanks for holding water for drinking and ordinary purposes shall not, except as herein provided, be filled from other than certified sources.

3. Water taken aboard from uncertified sources or from overboard en route for drinking and culinary purposes shall not be deemed satisfactory for the purpose of these regulations save and when treated by a process or processes that will yield a water of the prescribed standard, and no such system shall be installed except with the certified approval of the Department of Health of Canada.

4. All piping systems arranged for the express purpose of conveying water for drinking and culinary purposes shall at all times be maintained and operated under the direction of a certificated officer or engineer, and all such systems shall be operated without a connection to any other water system aboard.

5. Faucets, cocks, taps or other convenient outlets, subject to the direction of the Department of Health of Canada, other than the necessary hose connections, shall not be maintained on water systems other than the drinking and culinary supply, except as herein provided, and all such outlets shall be provided with a sign reading, "DO NOT DRINK THIS WATER," which shall be maintained in a conspicuous position.

6. Water containers, including raw water storage tanks, shall be identified as such by a conspicuous sign. They shall be sealed or kept under lock and key and at all times be maintained in a sanitary condition and cleaned as herein provided. The insertion of hose into such container or storage tank is hereby prohibited. Vents to such containers shall terminate in a return bend, and all outside vents through the hull of the ship shall discharge at least ten feet above the water line. Some form of protection, such as wire mesh, should be maintained over the opening to prevent the insertion of extraneous matter by unauthorized persons.

7. (*a*) Water held for drinking and culinary purposes in water containers, bubblers, or water-chilling systems shall not come in contact with the ice.

(*b*) Ice used for cooling table water shall be a clear and sanitary ice and shall be stored in a clean place and before the ice is placed in the water or water receptacle it shall be carefully washed and handled in a sanitary manner.

(*c*) Water coolers and containers shall be cleansed at least once a week while in use, and it is recommended that, where possible, the containers should have a steam pipe play the inside with live steam for a period of five minutes after thorough cleansing.

To clean storage tanks.—Before putting ships into commission, all drinking and culinary storage tanks must be scrubbed, flushed, and rinsed. During the season scrubbing of the interior of storage tanks on vessels, or the entrance into them for purposes other than repairing, is forbidden, but the storage tanks should be, every two weeks, drained and flushed, using for the final flushing a solution equivalent to one pound hypochlorite of lime of a strength not less than 25 per cent. available chlorine to 5,000 gallons of water; this solution to be driven through the whole system connected therewith to the faucets and afterwards thoroughly rinsed with water from a certified source.

To prepare solution.—Take one pound of hypochlorite of lime of a strength not less than 25 per cent. available chlorine for each 5,000 gallons capacity to be used; rub up with a small quantity of water in a pail. When thoroughly rubbed up, add water to fill the pail; thoroughly mix and let stand for 15 to 20 minutes to allow of sedimentation. Pour the fluid into a container, refill the pail with water and stir thoroughly and again allow to sediment for 15 minutes, decant the solution into a container and repeat for a third time, when all the available chlorine will have practically been extracted from the hypochlorite of lime. Pour all three then into the tank water to be disinfected.

8. For the better enforcement of these regulations every master shall post in a conspicuous place certificates as provided by sections 9 and 10, and no vessel, save as herein provided, shall leave port after the opening of navigation, 1924, without such a certificate or certificates.

9. The following conditions and practices may constitute grounds for issuing "Non-compliance notices":—

(1) Careless or insanitary handling of water from sources of supply to storage tanks and to points of consumption.

(2) Existence of by-passes around water treatment or purification apparatus. The physical disconnection and the removal of the short section of pipe, or an equally effective measure, will be insisted upon for any such circuit. Single or double-check valves in any such circuit will not be approved.

(3) Failure to post warning signs over faucets at which water other than drinking water is available.

(4) Having other than purified water available in galley or kitchen excepting the raw water used for the hot water supply, with a special hot-water tank, and, also, excepting the raw-water tap in the galley for scrubbing purposes, not over eighteen inches (18″) from the floor, if properly posted, and upon condition that a certified supply is available at the galley or kitchen-quarter sinks.

(5) Failure to maintain in a sanitary condition water storage tanks and a water supply system aboard vessels.

(6) Storage of drinking water in tanks, formed in part or whole by the hull or deck of the vessel when the latter is insufficiently protected, and, also, tanks through which the drains or sewer pipes pass.

10. *Inspection Certification.*—(*a*) A temporary certificate may be issued on presentation of a sworn statement of the company, properly executed, to the effect that it has inspected the system aboard the vessel and found the drinking-water system to be in accordance with the regulations as herein provided.

(*b*) A regular certificate may be issued, following the inspection of the drinking-water system by a duly authorized agent or inspector of the Department of Health of Canada. The inspection itself consists of the physical examination of the entire drinking-water system of the vessel, including the filling and distributing pipes and equipment for water-storage tanks and water-treatment apparatus.

(1) The method by which water obtained from certified sources ashore is delivered to the vessel (and care of the hose) shall be made a part of the inspection of the drinking-water system of the vessel. Where the company reports that water is obtained from certified sources ashore, when applying for a temporary certificate, they also shall furnish the names of the piers in the port or ports on which filling hydrants are located.

(2) Inspection of passenger vessels shall be made, where possible, first, before the vessel goes into commission for the season, and, second, reinspection shall be made from time to time during the navigation season for the purpose of checking the operation of treatment apparatus, and for the purpose of observing changes, in accordance with "Non-compliance notices." If on inspection the drinking-water system conditions are found to be not in accordance with the regulations, a "Non-compliance notice" shall be left with the master.

11. (*a*) Certificate forms in the prescribed type for water supplies used for the aforesaid purposes shall be procured from the Department of Health of Canada, Ottawa, Ont., and posted as provided in section 8.

(*b*) The Department of Health of Canada shall at all times maintain a record of the condition and character of the water supply available at certified sources, and such list or such information shall at all times be available to owners, agents, and masters of vessels operating on the Great Lakes and inland waters.

In the following prescribed areas water shall not be obtained overboard except with the knowledge and consent of the Department of Health of Canada:—

The harbour at Fort William; the harbour at Port Arthur, within an area of ten (10) miles of the aforesaid harbours; the lower St. Mary's river and within a distance of ten miles of the locks in the upper river; in the harbours, or within two miles of them; in the north channel in Georgian Bay, or within five miles of Lake Huron ports; the St. Clair river; port of Sarnia; Lake St. Clair; Detroit river; western end of Lake Erie, within sixteen miles of the Detroit river; any port in Lake Erie, or within five miles thereof; the upper Niagara; the lower Niagara; any point in Lake Ontario, within ten miles of the Niagara river; any harbour in Lake Ontario, within eight miles thereof, including Hamilton bay and Toronto bay; the Bay of Quinte; the St. Lawrence river, or any ship canal connected therewith below the town of Brockville.

12. Every vessel or steamboat company shall, on or before the last day of January, file with the Department of Health of Canada at Ottawa, three copies of a report giving the name, the vessel company, managing official, headquarters office, ports of call, season, names of vessels, character (passenger or freight), source of drinking, culinary and ablutionary water, together with the pier location; treatment of water on vessel, nature and date of last certificate, whether "Temporary" or "Non-compliance."

13. Application for a temporary certificate, including the company's statement of the drinking-water system, shall be filed with the Department of Health of Canada not later than the last day of March in each year.

14. For all new ships to be constructed after April 1, 1924, a blue print showing the location of, and protection provided for, all water systems or tanks intended to be used for the supply, or holding, of water for drinking or culinary purposes shall be submitted to the Department of Health of Canada for approval.

The matter of the better control of swimming pools, referred to in my report for 1922, has been dealt with by the following regulations, which you approved of at the meeting of the Board held the 17th of December, 1923.

Regulations Governing the Construction and Management of Swimming Pools

Section 1.—These regulations shall apply to swimming pools operated in connection with any school, hospital, or educational institution, or any Y.M.C.A. or Y.W.C.A., or any athletic association, or to pools inviting public patronage, but shall not apply to baths or pools where use is restricted to therapeutic purposes.

Section 2.—The water in every swimming pool must not be artificially heated to a temperature above 72° F. The room containing the pool shall be properly ventilated, and the temperature of the air at artificially heated pools must not be permitted to become more than 8°F. warmer nor more than 2°F. colder than the water in the pool at any time when the pool is in use, except in the case of pools operated in the summer as open-air pools. It is recommended that the air temperature should be 5°F. warmer than the pool temperature.

Section 3.—Provision shall be made at every such pool for the effective cleansing of the person of all bathers before entering the pool, and the use of such provisions shall be compulsory. All apparatus for this purpose shall be subject to inspection, and approval of the local Board of Health, and no pool shall be continued in use for which the approval of the local Board of Health

has not been obtained in writing under the signature of the Medical Officer of Health and the inspector of such premises.

Section 4.—The number of bathers using a swimming pool during any twenty-four hour interval shall not exceed twenty (20) persons for each thousand gallons of clean water added to the pool during that period, and at no time shall the number of bathers exceed three (3) persons per 1,000 gallons total capacity. The term clean water as used shall be interpreted to mean new, clean water used to refill the pool, new clean water used to replace loss by splashing or during cleaning, water taken from the pool and returned after effective filtration, or any combination of such waters.

Section 5.—At all times when the pool is in use the water shall be reasonably free from algae growths and sufficiently clear to permit a black disk six inches in diameter, on a white field, when placed at the bottom of the pool at the deepest point to be clearly visible from the side-walks of the pool at all distances, up to ten (10) yards, measured from a line across the pool through said disk.

Section 6.—There shall be maintained in the water of all swimming pools during the bathing period, an amount of available excess chlorine not less than 0.2 parts per million, nor shall the excess be more than 0.5 parts per million, as determined colorometrically with recognized standard ortho-tolidin solution.

Section 7.—Whenever alum or sulphate of alumina are used in connection with the purification or re-purification of swimming pool waters, the water at all times, when the pool is in use, shall show an alkaline reaction to Methyl Red.

Section 8.—There shall be maintained in connection with every swimming pool, sanitary conveniences, located adjacent and opening into the dressing or shower-bath rooms.

Section 9.—The connection for the re-circulation of water in swimming pools shall be made at a point which will permit of effective drainage of the floor of the pool, and every pool shall be provided with a scum gutter at or near water-level of sufficient depth to preclude re-entry of drainage, and all such gutters shall be connected through a handhole trap to a sewer.

Section 10.—The floors of all areas adjacent to the swimming pool, shower and dressing rooms shall be effectively drained and every such floor shall be constructed of impervious material.

Section 11.—Bathing suits and towels must be washed and handled in a manner satisfactory to the local Medical Officer of Health.

Section 12.—Each swimming pool shall be under the supervision of a responsible and trained operator, and no bathing shall be permitted in the absence of such supervision.

The operation of the new statute in respect to the correction of the pollution of streams by industries, prejudicial to agricultural interests, was tested out during the year in connection with Sixteen Mile creek in the vicinity of Milton, Ontario. The officers of this Department on several occasions inspected the pollution complained of, and made the following suggestions:—

(1) *The Robertson Iron Works.*—Robertson's, Limited, plant discharges daily from ten to fifteen thousand gallons of waste liquors, containing among other things 250 to 300 lbs. of 66° Be. sulphuric acid, a considerable quantity of iron, and the drainage from the septic tanks. This is discharged into a pond about 65 feet square, and, perhaps, 3 feet deep, located on the bank of the river. The liquid seeps away through the soil. There is ample evidence, however, that the pond overflows from time to time. This has occurred in the present year.

Should this pond overflow and cut its bank at a period of minimum stream flow, the waste would probably be dangerous to cattle for a distance of several miles.

Robertson's, Limited, should at all times prevent any overflow from this pond to the river. The storm water should be diverted by an open ditch and carried directly to the river. If this is done there would be no trouble from this source.

(2) *The Milton Worsted Knitting Mills.*—The Milton Worsted Yarn and Knitting Mills discharge about 6,000 gallons of waste liquor per day. These liquors contain, besides the residual dye stuff, about 12 lbs. of sulphuric acid. No wool is washed in this plant, but about 5 lbs. of soap compound are used daily as a water softener. These waste liquors might cause trouble during periods of minimum flow, and they most certainly cause a serious discoloration of the stream. If these liquors are discharged into the stream when the grist mill is operating, the colour is rapidly lost in the dilution. When the discharge into the stream is at a time of minimum flow, as often happens, the colour will persist for miles. On July 5th the stream was discoloured for over three miles, but the quantities were so small that the analyses were useless. This company has made no effort to remedy this condition, although a method for effectual removal of the colour has been pointed out to them.

(3) *The Halton Creamery.*—This plant has installed two small tanks for the treatment of their waste. The tanks, however, are too small, and apparently no drainage is provided for. The tanks overflow and the effluent runs down the bank. For a distance of some five or six yards the banks are covered with decomposing creamery waste. There are masses of flies and a noticeable bad odour. Samples of mud secured from this area were filled with maggots. It is altogether a most undesirable condition.

(4) There are several tile drains discharging into the creek which give every evidence of carrying septic tank effluent.

Samples of the waters of the creek were collected. These showed the discoloration and the pollution of these waters from the various sources herein referred to.

In view of the aforementioned facts, the Provincial Board makes the following recommendations, viz.:

(1) That Robertson's, Limited, make the improvement suggested.

(2) That the Milton Worsted Yarn & Knitting Company decolour their waste with chloride of lime, as already detailed to the company manager.

(3) That the Halton Creamery Company install a tile drainage area in connection with their tanks, so that at no time will the direct overflow from the tank reach the river.

(4) That the local Board of Health enforce the regulations prohibiting the discharge of private sewers into the river.

The lawyer for the plaintiff then took the matter before Chief Justice Orde and secured the following order:—

"Offending companies to remove or abate injury in terms of Board's report and unless they comply therewith within thirty days from this order they are thereafter restrained from continuing the acts complained of until the injury has been abated to satisfaction of Provincial Board. Applicant to get costs of application as against the two companies which actively oppose it. Reasons handed to Mr. Brown, the reporter."

The routine work of the office in connection with applications presented for the extension of sewerage and water systems continues to increase, the total amount involved for 1923 being $11,292,701.44, which is subdivided as follows:—

Sewers and sewer extensions—291 certificates $6,169,221 51
Waterworks and water purification—210 certificates 5,123,479 93

In concluding my report, I should like to direct your attention to the work of Mr. A. V. DeLaporte and Mr. A. E. Berry. Mr. DeLaporte has been responsible for the direction of the sanitary surveys and the experimental station. Mr. Berry has devoted a great deal of his time to a consideration of the problem of garbage collection and disposal in Ontario municipalities, and a very comprehensive statement of his findings is included in this report.

In addition, he was responsible for the supervision of some excellent work, carried on by Mr. Campbell at Whitby Institution, as to the effect of the sterile milk utensils on the keeping quality of the article. Some very encouraging results were obtained.

CERTIFICATES ISSUED *Re* SEWER EXTENSIONS FOR THE YEAR 1923.

Municipality	No. of Certificates	Extensions	Disposal	New	Industrial and Institutional Systems
Barrie	4	$3,288 67			
Belleville	5	78,320 31			
Bowmanville	1	745 23			
Brantford	1	48,733 45			
Brantford Twp.	1	1,891 00			
Brockville	1	18,523 50			
Campbellford	2	9,879 20			
Chatham	5	9,170 60			
Chippawa	1			$56,385 00	
Cobourg	3	19,873 37			
Cochrane	1	19,500 00	$23,000 00		
Cornwall	2	3,009 30			
Dunnville	1	2,184 45			
Eastview	1	22,430 14			
Elmira	1	4,816 80			
Englehart	1	9,239 28			
Etobicoke Township	1			4,000 00	
Ford City	5	335,912 52			
Fort Erie	1			35,000 00	
Fort William	2	5,348 55			
Galt	19	197,428 46			
Goderich	3	4,557 30			
Great Lakes Paper Co., Fort William	1				$12,235 63
Guelph	3	39,570 00	83,500 00		
Haileybury	1	1,800 00			
Hamilton	8	992,468 47			
Kapuskasing	3	44,843 41	15,000 00		
Kingston	4	15,874 46			
Kitchener	6	61,879 90			
Lafleshville	1	3,600 00			
Leamington	2	15,921 55			
Leaside	3	45,918 84			
Lindsay	3	10,063 16			
London	13	225,326 37			
Midland	1	16,131 25			
Mimico	4	12,416 75			
Newmarket	2	5,363 93			
Nelson Township	1	11,484 00			

CERTIFICATES ISSUED *Re* SEWER EXTENSIONS FOR THE YEAR 1923
—Continued.

Municipality	No. of Certificates	Extensions	Disposal	New	Industrial and Institutional Systems
Niagara Falls	7	$49,682 88	.....	.....	.....
North Bay	3	22,874 32	.....	.....	.....
Oakville	1	2,899 93	.....	.....	.....
Orillia	20	48,488 13	.....	.....	.....
Oshawa	3	58,441 10	.....	.....	.....
Ottawa	29	130,445 86	.....	.....	.....
Owen Sound	3	55,472 00	.....	.....	.....
Pembroke	3	6,022 42	.....	.....	.....
Peterborough	3	10,261 40	.....	.....	.....
Port Dalhousie	3	38,658 47	.....	.....	.....
Port Dover	1	.....	.....	$30,000 00	.....
Port Hope	5	12,938 00	.....	.....	.....
Port Nelson	1	6,568 78	.....	.....	.....
Preston	2	2,078 80	.....	5,610 00	.....
Renfrew	1	1,959 10	.....	.....	.....
Riverside	3	.....	.....	117,970 67	.....
Sandwich	5	66,621 94	.....	.....	.....
Sarnia	2	14,070 59	.....	.....	.....
Simcoe	3	10,647 26	.....	.....	.....
Smith's Falls	7	19,986 30	.....	.....	.....
St. Catharines	3	6,322 45	.....	.....	.....
St. Thomas	1	3,895 82	.....	.....	.....
Stamford Township	2	.....	.....	463,656 28	.....
Stratford	5	39,359 61	$35,000 00	.....	.....
Thorold	1	750 00	.....	.....	.....
Thurlow Township	1	150 00	.....	.....	.....
Timmins	1	24,550 00	.....	.....	.....
Toronto	31	1,196,246 00	.....	42,681 00	.....
Toronto Gen. Trusts Corp.	1	.....	.....	.....	$26,600 00
Trenton	4	93,332 16	.....	.....	.....
Walkerville	3	173,236 60	.....	.....	.....
Waterloo	1	28,419 18	.....	.....	.....
Welland	2	4,768 15	.....	.....	.....
Weston	2	91,538 50	.....	.....	.....
Whitby	3	3,428 46	.....	.....	.....
Windsor	3	10,047 20	.....	.....	.....
Woodstock	1	2,907 30	.....	.....	.....
York Township	3	679,000 00	5,000 00	.....	.....
	291	$5,213,582 93	$161,500 00	$755,302 95	$38,835 63

SUMMARY

Extensions	$5,213,582 93
Disposal Works	161,500 00
New	755,302 95
Industrial and Institutional Systems	38,835 63
	$6,169,221 51

CERTIFICATES ISSUED *Re* WATERMAIN EXTENSIONS, PURIFICATION, ETC., FOR THE YEAR 1923.

Municipality	No. of Certificates	Extensions	Purification	New	Industrial and Institutional Systems
Acton	1	$2,300 00			
Alliston	1		$11,577 00		
Amherstburg	1	16,700 00			
Belleville	1			$94,000 00	
Bowmanville	3	11,677 56			
Brockville	2	14,360 00			
Burlington	1	10,674 32			
Canadian National Railway, Depot Harbour	1				
Carleton Place	1	30,750 00			
Chippawa	1			74,359 00	
Cochrane	1	37,500 00	30,000 00		
Collingwood	2	31,000 00			
Dryden	1			30,000 00	
Durham	1			116,800 00	
Eastview	1	15,245 00			
Elmira	2	16,500 00		6,000 00	
Englehart	1	8,884 62			
Essex	1	36,000 00			
Etobicoke Township	7	307,160 50			
Fonthill	3	53,850 00			
Ford City	1	21,058 71			
Forest	1			102,038 00	
Fort William	6	20,127 96			
Galt	5	38,158 17			
Grantham Township	2	8,029 00			
Gravenhurst	1	4,153 14			
Great Lakes Paper Co., Fort William	1				$13,292 55
Grimsby	2	16,351 53			
Haileybury	2	21,645 44			
Hamilton	3	86,266 00			
Hanover	1	7,600 00			
Hespeler	3	4,864 50			
Hollinger Consolidated Gold Mines, Limited	1				77,870 00
Kapuskasing	2	21,993 65			
Kitchener	5	32,351 98			
Leaside	2	12,253 77			
Lindsay	1	17,953 09			
London	1	75,000 00			
Meaford	1	10,000 00			
Mimico	1	1,660 24			
Mitchell	1	1,001 85			
Nelson Township	1	9,061 36			
New Liskeard	2	20,981 10			
Newmarket	3	25,037 50			
New Toronto	2	52,741 07			
Niagara Falls	1	18,768 51			
North Bay	1	38,317 00			
North York	3	24,170 50		130,000 00	
Oakville	1	1,400 00			
Oshawa	4	101,848 48			
Pembroke	2	22,749 95			
Peterborough	2	20,865 13			
Port Colborne	2	6,000 00	78,000 00		
Port Credit	2	33,800 75			
Port Dover	3	49,790 00			
Preston	1	9,291 93			
Richmond Hill	1	35,000 00			
Riverside	18	73,115 07			
Sandwich	4	32,668 62			

CERTIFICATES ISSUED *Re* WATERMAIN EXTENSIONS, PURIFICATION, ETC., FOR THE YEAR 1923—Continued.

Municipality	No. of Certificates	Extensions	Purification	New	Industrial and Institutional Systems
Sandwich Township	3	$67,237 82			
Scarborough	3	87,784 80			
Seaforth	1	4,702 50			
Smith's Falls	2		$178,000 00		
Stamford Township	1	873 63			
St. Clair Beach	2			$30,270 90	
St. Mary's	1	10,110 42			
Stratford	2	17,673 25			
Sturgeon Falls	2	3,083 74	2,545 00		
Sudbury	1	4,407 57			
Teck Township	2			72,344 00	
Tecumseh	1	11,094 12			
Thessalon	1	11,000 00			
Thornbury	3	41,400 00			
Timmins	1	54,145 00			
Toronto	36	1,548,134 43			
Trafalgar Township	1			101,000 00	
Trenton	1	30,000 00			
Walkerton	1	20,000 00			
Waterloo	1	2,700 00			
Weston	2	27,189 00	3,000 00		
Whitby	2	15,434 20			
Windsor	1	150,000 00			
Woodbridge	1	22,000 00			
York Township	9	274,735 00			
	210	$3,972,383 48	$303,122 00	$756,811 90	$91,162 55

SUMMARY

Extensions	$3,972,383 48
Purification	303,122 00
New	756,811 90
Industrial and Institutional Systems	91,162 55
	$5,123,479 93

This leads the division to suggest that a service in connection with milk supplies, similar to that offered to the municipalities in respect to water supplies, might be developed were some amendments made in the Milk Act to permit of provincial regulations re cleansing of bottles and other utensils.

One of the inherent difficulties in the sanitation of milk supplies was the lack of a method suitable for sterilizing containers for a small dairy, where the installation of steam equipment would financially embarrass the industry. The experiments in this connection have been carried on by Mr. Berry and it would appear that this difficulty may be overcome through the use of chlorine solutions for the final rinse. The economic advantage, as shown from our experiment, is so great that I do not imagine that there will be any opposition from the producers to such a programme; in fact, there is assurance that we will have their most hearty co-operation.

The Experimental Station during the year completed a most valuable report on the merits of a system of sewage treatment known as the direct oxidation process. The report in this connection is somewhat voluminous and

is available in a separate report to the Department. I might say, however, in passing that this process is an attempt at improving the well-known lime precipitation process which has been in use in England and elsewhere for a number of years and generally abandoned on account of the cost of chemical adjustment. The process, however, yields an effluent which is quite clear, providing the settling tanks are all of sufficient capacity and one which is bacteriologically quite satisfactory for the discharge of it to streams. In this it compares favourably with the activated sludge process. The effluent, however, contains so much free caustic that there is a doubt in our minds as to whether the process is adaptable to the smaller streams where the causticity might have considerable effect upon the organic life of the stream. Furthermore, the process possesses so little advantage over the older one, that in Ontario, where the cost of electric power is low, this Department believes there is no field for this method. The activated sludge system of disposal continues, therefore, unrivalled in the field of sewage disposal in Ontario.

All of which is respectfully submitted.

F. A. DALLYN, C.E.,
Director, Sanitary Engineering Division.

Division of Sanitary Engineering

BULLETIN No. 11

The Keeping Qualities of Milk as Affected by the Various Factors Which Enter Into the Production and Handling

A. E. BERRY, M.A.Sc., C.E. (Tor.)

A Comparison of the Differential Media Used in the Isolation of B. Coli in Water Analysis

H. E. P. VALE, B.A.

The Collection and Disposal of Municipal Refuse

A. E. BERRY, M.A.Sc., C.E. (Tor.)

Some Results Obtained from Aeration of Water Supplies Using an Air Compressor and Diffusor Plates

A. V. DELAPORTE, B.A.Sc., A.M.E.I.C., and G. A. H. BURN, B.A.Sc.

The Protection of Wells Used as a Source of Domestic Water Supply

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Study of Pretreatment of Thames River Water at Chatham

A. V. DELAPORTE, B.A.Sc., A.M.E.I.C., and G. A. H. BURN, B.A.Sc.

THE KEEPING QUALITIES OF MILK AS AFFECTED BY THE VARIOUS FACTORS WHICH ENTER INTO THE PRODUCTION AND HANDLING

A. E. Berry, M.A.Sc., C.E. (Tor.)

With a view to determining the relative importance of various factors in the production and handling of milk, the Sanitary Engineering Division undertook in the summer of 1923 an investigation and series of experiments at the dairy farm in connection with the Ontario Hospital at Whitby. Conditions there were quite favourable for such work. A large herd was available, and the barns were well equipped with modern improvements. The dairying operations were carried on in a manner which might be looked for on the average dairy farm producing milk for sale. A description of the equipment and methods used will serve to illustrate the conditions under which these experiments were performed.

Stables

The barns are modern in every respect with well-cleaned concrete floors, steel cow stanchions, good lighting, a tight ceiling and water always available for the cows. The manure was removed regularly from the stable to the yard and later to the fields.

Milking

The work at the barns, including milking, was carried on almost completely by patients of the institution under the supervision of outside foremen. Milking was done partly by hand and partly by machine. Stripping of machine-milked cows was all done by the patients. A certain number of the best cows were hand-milked by foremen, a practice which afforded a good opportunity for procuring uniform methods. Dry milking was practised by all the foremen, but a number of patients were in the habit of wet milking, i.e., moistening the teats and hands with milk.

Milking Hours

The milking hours observed throughout the summer were: 5 a.m., 1 p.m., 5 p.m., and 8 p.m. The four periods were used in order to have fresh milk as it was required, and to avoid milking too many cows at one time.

The stables were cleaned and the cows fed just prior to the 8 p.m. milking. This involved the distribution of feed and bedding, from which a considerable quantity of dust was scattered and was still present while the milking operations were going on.

Utensils

The milking machines were of the common type operated by suction created through a gasoline engine driven unit. Two cows were milked simultaneously by the one machine. Considerable difficulty was encountered in keeping the cups of the machine on the teats. They frequently fell to the floor and were liable to become contaminated by the bedding and manure. Stable dust was entirely excluded from this milk by the closed-top construction of the receiving pail on the machine.

For hand-milking different types of pails were used. The foremen used the ordinary open-top pails, while the patients, for stripping, were given pails provided with a removable top and a small funnel-shaped arrangement somewhat similar to a common watering can. The milker uses this pail as a stool and milks directly into the funnel. This should exclude from the milk practically all stable dust and dirt from the cow.

Milk Routine

The methods in use did not aim to produce a specially clean milk—a difficult problem with that type of milker—but the results were quite comparable to that obtained on the present-day average dairy farm. Each cow's milk was weighed and strained into an eight-gallon can through a copper gauze and two thicknesses of cheesecloth. Upon completion of milking, the cans were taken from the stable to the pasteurizer located in the basement of one of the buildings. Here the milk was heated to about 170°F. and held for a few minutes. It was then cooled in running water and delivered to the various parts of the institution. None of this milk was more than twenty-four hours old when consumed. What was not required for use at the institution was shipped to the Queen Street Hospital in Toronto.

Cleaning of Utensils

The pails used for milking were washed in cold and hot water in the building adjoining the stable. They were then inverted and allowed to dry. Steam or disinfectants were not used for sterilization. The milk cans were washed in the pasteurizing room, and a steam jet was provided for sterilizing.

Object of Tests

The chief object of the experiments was to determine the relative importance of the following four factors in milk production and handling:—

(1) The care of utensils.
(2) The care of the cow.
(3) The stable.
(4) The personal element.

In previous experimental work it has been customary to consider almost entirely the bacterial content of the milk under various conditions. In view of the fact that there is not necessarily any specific relation between the amount of dirt, the bacterial content, and the keeping qualities of the milk it was decided in these experiments to determine in each case not so much the bacterial content as the keeping qualities of the milk, a factor which is of economic importance especially where milk is not to be consumed for some time after milking. Tests were consequently made at various hours to detect the increase in acidity resulting from the breaking down of lactose by the action of micro-organisms. Titrations were made on the milk, using decinormal sodium hydroxide and phenolphthalein. It was agreed for this work to consider the milk as sour when an acidity of 0.35 per cent. had been reached. At this point milk possesses an odour and is no longer salable or fit for human consumption.

The results of the various series of experiments are tabulated herewith:—

(1) The Care of Utensils

Series A:

A comparison of the keeping qualities of milk stored in sterile and non-sterile 8-gallon milk cans.

For this test two 8-gallon milk cans were used. One was sterilized by steam and the other washed but not steam-treated. Fresh milk was permitted to stand in these cans for periods of definite duration. Samples were then collected into sterile bottles and their keeping qualities determined at room temperature (20 to 25 degrees C.).

Three-Hours Storage in Cans

Steam-sterilized Can		Washed Can	
27½	hours	24	hours
20	"	15	"
22	"	20	"
27	"	18	"
34	"	28	"
51	"	35	"
Average 30	"	23	"

Percentage improvement.....30%

Four-Hours Storage in Cans

Sterile Can		Washed Can	
27	hours	24	hours
27	"	23	"
28	"	24	"
48	"	44	"
48	"	45	"
50	"	31	"
32	"	27	"
29	"	26	"
45	"	43	"
32	"	27	"
32	"	26	"
28	"	17	"
44	"	28	"
33	"	31	"
Average 36	"	Average 30	"

Percentage improvement.....20%

Note—This series was run separately and at a different time from those giving 3, 6, 9 and 11 hours storage.

Six-Hours Storage in Cans

Sterile Can		Washed Can	
22	hours	20	hours
20	"	14.5	"
20	"	18	"
20	"	17	"
50	"	34	"
Average 26	"	Average 20	"

Percentage improvement.....30%

NINE-HOURS STORAGE IN CANS

Sterile Can	Washed Can
22 hours	19 hours
19 "	14 "
18 "	17 "
19 "	16 "
33 "	27 "
49 "	32 "
Average 27 "	Average 21 "

Percentage improvement.....30%

ELEVEN-HOURS STORAGE IN CANS

Sterile Can	Washed Can
16 hours	13 hours
12 "	10 "
12 "	10 "
12 "	10 "
19 "	15 "
30 "	23 "
38 "	28 "
Average 20 "	Average 15½ "

Percentage improvement.....29%

Series B:

A comparison of the keeping qualities of milk stored in 8-gallon cans, which have been subjected to varying heat treatments:—

Four cans were used in this series. One was rinsed for several minutes in scalding water, another was steamed for 5 minutes, a third for 3 minutes and the fourth for half-minute.

Milk was allowed to stand in these for 4 hours.

The keeping qualities were as follows:—

Scalded Can	5-Minute Steam Treatment	3-Minute Steam Treatment	½-Minute Steam Treatment
35 hours	45 hours	44 hours	33 hours
33 "	46 "	42 "	31 "
52 "	55 "	54 "	47 "
53 "	67 "	65 "	49 "
42 "	61 "	62 "	40 "
49 "	56 "	62 "	48 "
34 "	53 "	52 "	32 "
35 "	52 "	54 "	33 "
54 "	53 "	49 "	34 "
55 "	54 "	51 "	32 "
52 "	51 "	49 "	28 "
		35 "	28 "
Average 45 "	Average 54 "	34 "	
		Average 50 "	Average 36 "

Percentage improvement:—

Five-minute steam treatment over scalding.....20%
" " " " 3-minute steaming..... 8%
" " " " ½-minute steaming.....50%
Three- " " " scalding.....11%
" " " " ½-minute steaming.....29%
Scalding over ½-minute steaming.....25%

Series C—Milking Pails:

A determination of the effect of the cleansing of milk pails upon the keeping qualities of the milk.

In this series samples of milk were collected from two pails, one of which had been thoroughly sterilized by steam and the other washed, rinsed in hot water and allowed to dry, while inverted. The samples were collected directly after milking. The foremen did the milking for these tests. The keeping qualities at room temperature were as follows:—

Sterilized Pail	Unsterilized Pail
42 hours	36 hours
29 "	26 "
45 "	36 "
43 "	31 "
36 "	24 "
40 "	24 "
41 "	30 "
54 "	32 "
51 "	27 "
50 "	34 "
67 "	44 "
91 "	45 "
102 "	36 "
Average 53 "	Average 33 "

Percentage improvement.....60%

Series D:

A further series of tests was completed, using sterile and washed pails respectively, in which the patients at the institution did the milking. Most of this was strippings after the milking machine had been used. These pails were of the spout type with covered tops, in which the milker sits on the pail and milks into the spout. Various conditions, such as dry and wet milking and the personal element, entered into these tests and the results are consequently less uniform and give a much shorter souring time than when the milking was performed by a trained milker under uniform conditions.

The keeping qualities are as follows:—

Sterilized Pail	Unsterilized Pail
24 hours	16 hours
30 "	13 "
20 "	18 "
29 "	21 "
24 "	16 "
34 "	21 "
28 "	29 "
24 "	12 "
26 "	18 "
Average 26½ "	Average 18 "

Percentage improvement.....47%

Series E:

A comparison of the keeping qualities of milk, using dirty, chemically cleaned, and steam sterilized milk pails. In these tests the dirty pail was one which had been used for milking and allowed to stand unwashed overnight, or a similar length of time—a practice which is sometimes found in small dairies. The chemically cleaned pail was treated with a washing compound.

The keeping qualities at room temperature were as follows:—

Unwashed Pail	Chemically-treated Pail	Steam-sterilized Pail
24 hours	30 hours	36 hours
16 "	34 "	42 "
28 "	40 "	51 "
14 "	37 "	50 "
27 "	40 "	49 "
16 "	35 "	48 "
12 "	40 "	41 "
27 "	30 "	38 "
12 "	22 "	38 "
12 "	26 "	40 "
..	31 "	42 "
28 "	22 "	46 "
11 "	25 "	50 "
28 "	44 "	53 "
26 "	38 "	51 "
Average 20 "	Average 33 "	Average 45 "

Percentage improvements:—

Chemically-treated over dirty pail.....65%
Steam-sterilized over dirty pail.....125%
Steam-sterilized over chemically-treated pail.....36%

Series F:

Sterilization of milk pails by a chlorine solution at Mimico.

This series was undertaken at the dairy farm in connection with the Ontario Hospital at Mimico on December 10th, 11th and 12th, 1923. Samples were collected from washed milk pails; and from those washed and immersed in a chlorine solution.

The milking in this series was all done by patients of the institution—a factor which did not in any way tend to produce uniform results, except by averaging the results for the entire supply. Owing to the cold weather at the time of the tests and due to the retention of the milking pails in a cold room, there was not an opportunity for any bacteria left in the pails after cleansing to multiply to the same extent as would be expected in warmer weather. The samples collected were incubated both at 20° C. and 37° C.

The keeping qualities were as follows:—

At Room Temperature (20° C.)

Chlorinated Pail	Unchlorinated Pail
70 hours	49 hours
71 "	26 "
72 "	49 "
55 "	55 "
77 "	57½ "
44 "	58 "
78 "	44 "
76 "	50½ "
71 "	55½ "
Average 68 "	Average 49 "

Percentage improvement.....39%

At 37° C.

Chlorinated Pail		Unchlorinated Pail	
22½	hours	17½	hours
21½	"	10½	"
23	"	17½	"
15	"	20	"
24	"	19½	"
13	"	10½	"
15½	"	15	"
21½	"	17	"
22½	"	15	"
Average 20	"	Average 16	"

Percentage improvement.....25%

Series G—Sterilization of Milk Bottles:

A series to compare the efficiencies of steam and scalding water on milk bottles. Three bottles were used. One had been treated with live steam for 5 minutes, a second for ½ minute, and a third immersed in scalding water (200° F. to 212° F.) for 5 minutes.

The keeping qualities were as follows:—

5-Minute Steam Treatment		½-Minute Steam Treatment		5 Minutes in Scalding Water	
65	hours	49	hours	62	hours
60	"	49	"	52	"
69	"	65	"	58	"
45	"	26	"	49	"
64	"	33	"	55	"
45	"	41	"	42	"
50	"	46	"	47	"
67	"	45	"	55	"
Average 58	"	Average 44	"	Average 52½	"

Percentage improvement:—

Five minutes steam over half-minute steam treatment.....32%
Five minutes steam over five minutes scalding water.....10.5%
Five minutes scalding water over half minute steam treatment.10%

Series H—Milking Machines:

To determine the effect of the cleanliness of the milking machine on the keeping qualities of the milk:—

In this series two milking machines were used. One was made as clean and sterile as possible by steaming the pail and using a washing compound on the tubing and cups and then immersing in a brine solution. The other was washed in the usual manner, but not sterilized.

Keeping qualities:—

Sterilized Machine		Washed Machine	
44	hours	34	hours
48	"	38	"
49	"	34	"
54	"	33	"
61	"	36	"
60	"	32	"
36	"	40	"
50	"	26	"
50	"	36	"
37	"	24	"
38	"	26	"
30	"	35	"
40	"	27	"
42	"	30	"
42	"	26	"
Average 45½	"	Average 32	"

Percentage improvement..... 42%

Series I:

A further series with two milking machines was carried out. One was washed in the usual manner while the second was cleaned in a strong washing solution, rinsed in hot water, drained and allowed to dry.

Keeping qualities:—

Thoroughly Washed Machine		Washed Machine	
54	hours	35	hours
40	"	34	"
45	"	41	"
61	"	55	"
58	"	51	"
72	"	61	"
64	"	59	"
49	"	45	"
53	"	45	"
65	"	45	"
59	"	52	"
58	"	49	"
58	"	45	"
Average 56½	"	47½	"

Percentage improvement..... 16%

(2) The Care of the Animal

Series A:

A series to determine the effect of cleanliness of the cow upon the keeping qualities of the milk.

Two cows were tested under similar conditions except that the flanks and udder of one were thoroughly brushed and wiped with a damp cloth some time prior to milking. No special attention was given to the cleaning of the other. The milking was done in each case by a foreman, and in sterile pails.

Keeping qualities:—

Cleaned Cow	Uncleaned Cow
72 hours	56 hours
63 "	47 "
77 "	52 "
79 "	65 "
82 "	46 "
76 "	49 "
65 "	53 "
79 "	50 "
80 "	45 "
Average 75 "	Average 51.5 "

Percentage improvement.....46%

(3) The Stable

Series A:

A determination of the effect of the dust or other material in the air of the stable upon the keeping qualities of the milk.

For this series two cows were used, one (isolated cow) of which was kept in a separate stable as free as possible from dust or other material which might gain access to the milk. Both cows were thoroughly cleaned and given the same attention. The same party did the milking and used every precaution to obtain a clean milk under the two different conditions. Wide-mouth pails were used in both instances.

Keeping qualities:—

Isolated Cow	Herd Cow
49 hours	49 hours
41 "	39 "
49 "	39 "
38 "	35 "
35 "	35 "
38 "	36 "
32 "	35 "
38 "	33 "
35 "	39 "
36 "	37 "
22 "	36 "
42 "	40 "
Average 38 "	Average 38 "

Percentage improvement..... Nil

(4) The Personal Element

Series A:

A series to determine the effect of the milker upon the keeping qualities of the milk.

For these tests the milker, in the first instance, took no extra precautions as to personal cleanliness, while in the other he used a clean suit and washed his hands and arms before milking. The cow was cleaned prior to milking and removed to a dust-free stable. The milk pails were all sterilized by steam. A comparison was also made with milk obtained under the best conditions while using a milking machine, namely, a sterile utensil, clean cow and stable free from dust.

Keeping qualities at room temperature:—

	Hand Milked	
No Special Precaution	Special Precautions	Best Machine Milk
51 hours	52 hours	50 hours
57 "	56 "	53 "
68 "	67 "	74 "
69 "	74 "	64 "
72 "	75 "	73 "
57 "	65 "	56 "
75 "	76 "	74 "
Average 64 "	Average 66½ "	Average 63½ "

Percentage improvement:—

Best hand milk over ordinary.....4%
" " " " machine milk.....4.7%
Ordinary hand milk over machine milk—very slight.

Series B—Wet and Dry Milking:

This series of tests was carried out with a view to comparison of the keeping qualities with wet and dry milking. The conditions, other than this, were kept as uniform as possible with sterile utensils and uniform methods.

Keeping qualities:—

Dry Milking	Wet Milking
50 hours	45 hours
53 "	40 "
43 "	32 "
47 "	34 "
40 "	30 "
53 "	49 "
49 "	47 "
55 "	53 "
62 "	69 "
Average 50 "	Average 44 "

Percentage improvement..... 11%

Summary and Conclusions

An analysis of the results obtained in these experiments should be made in conjunction with the conditions surrounding the tests. The conditions at this farm could not be considered as entirely ideal, nor yet as poor, but they would compare quite favourably with those found on the average dairy farm of similar proportions, where milk is produced for sale as such. Any of the factors considered in this study might prove to be of greater importance under extreme conditions. Either a very dirty cow, a very dusty stable or gross carelessness on the part of the milker might be responsible for comparatively brief-keeping qualities of the milk, but such conditions are not commonly encountered where any supervision or care at all is in practice. Consequently, these various factors met with in the production of milk should properly be considered under conditions which are fairly normal in present-day dairying.

The results obtained on the 8-gallon cans indicate an improvement in keeping qualities of 20 to 30 per cent. in the sterilized over the unsterilized can. It is important to note that the milk used in this test was taken from the general supply, i.e., milked by machine and stripped by the patients, and therefore

subject to somewhat wide variations. The storage period in the cans appeared to have little effect, as the 11-hour storage gave the same results as the 3-hour period. The milk pails in which there was no storage, except the time required to milk the cow, gave somewhat higher results than the cans. The sterilized pail showed an improvement of 60 per cent. over the washed pail and 125 per cent. over the unwashed pail. The steam-sterilized pail also gave an improvement of 36 per cent. over the chemically-treated pail. The results on the milking machines indicate an improvement of 42 per cent. in the sterilized over the washed. The lower per cent. improvement (16 per cent.) in the machine in which a washing solution was used in comparison with one washed in the normal way shows that steam treatment is much superior for this purpose than washing soda or similar compounds. A very considerable improvement (46 per cent.) was noted in the cleansing of the cow. This was, of course, in open-mouthed pails, and it would be quite possible to eliminate the major portion of this dirt by the use of modern, small-top utensils. The improved stable conditions gave no noticeable superiority in keeping qualities, while extreme personal cleanliness showed only 4 to 11 per cent. improvement. The effects of wet milking would, however, be largely dependent on the cleanliness of the milker. One party might, under such conditions, procure a supply vastly superior to another of less cleanly habits.

From the foregoing data it is evident that the utensils are the major factor to be considered in the production of a clean milk of maximum keeping qualities. Not only do the utensils prove to be a prolific source of bacterial contamination, but the organisms are apparently of a type which produce rapid souring. Adequate steam treatment or where this is impractical, chlorination, is most essential in the care of utensils. Next to the utensils appears the necessity for thorough cleansing of the flanks and udders of the cow, and the use of small-mouthed pails. The other factors, namely, the condition of the stable and the personal element, are of minor consideration except where gross negligence is encountered.

The effect of temperature upon the keeping qualities of milk has not been included in these results, although it is of the utmost importance in the handling of milk subsequent to production. Many of the adverse conditions associated with production may be mitigated by the maintenance of a low temperature during transportation. This, however, should not take the place of adequate precautions and cleanliness in the methods of production. Clean milk of low initial contamination is more desirable than that in which the development of the organisms has been retarded by low temperatures.

A COMPARISON OF THE DIFFERENTIAL MEDIA USED IN THE ISOLATION OF B. COLI IN WATER ANALYSIS

H. E. P. Vale, B.A.

The object of these tests was to make a direct comparison of the more commonly used differential media with a view to facilitating a choice of the most convenient one for B. coli isolation. The differential media are constituted in such a way as to give maximum proliferation of a specific group of bacteria and, if possible, to inhibit the growth of other bacteria, as well as providing some constituent which will indicate the probable presence of the specific species. The present day water bacteriological laboratory has a wide choice of media for such purposes both for enrichment and for confirmation.

Characteristics of B. Coli Communis

This organism is a short plump rod 1.3 micra long and varying in width from one-third to one-fifth of its length. Under varying conditions of cultivation it may appear to be more slender and after growth in water for some time it usually appears singly but occasionally it may be in short chains. It stains with the usual analine dyes and is decolorized by Gram's method. Spores are not formed. In young cultures it is actively motile but in old cultures, or those that have been grown on laboratory media for some time, there is little or no motility. It has the following reactions which are typical, and separate it from all other bacteria. It is anaerobe and facultative anaerobe with an optimum temperature for growth of 37.5°C, although some growth will appear between 20 and 40°C. In broth it first gives rise to a general clouding and later to a pellicle and light slimy sediment. On agar it forms grayish colonies which, as they grow older, become more and more opaque. It will ferment dextrose, lactose, mannit, maltose and dulcit with the formation of acid and gas; it produces indol with peptone solution, will liquefy gelatine slowly and has a negative Voges Proskauer reaction. The property of fermenting lactose with the production of acid and gas is made use of in water analysis to indicate its presence.

Enriching Media

The direct isolation of B. coli on solid media is to be recommended in highly polluted waters. If however, it is necessary to plate as much as 5 c.c. of water this method becomes impractical or if the incidence of the colon group is small the organisms may be completely hidden and hard to recognize. Consequently for its isolation from relatively large quantities of water where its occurrence is not general it is preferable to use a preliminary enrichment medium. This is an indirect method but, from a practical standpoint, is far superior to the direct plating method. The media more commonly used for enrichment are lactose broth, lactose peptone bile, and safranin broth.

To make a comparison the following procedure was adopted: Dilutions of sewage, 1-1,000, 1-5,000 and 1-10,000 were used and a set of eight tubes of each media viz: lactose broth, lactose peptone bile and safranin broth, inoculated with the following amounts of the dilution, 1-1,000, 1-100, 1-10, 1, 5, 10, 25 and 50 c.c. The twenty-four tubes were then incubated for twenty-four hours at 37.5°C and examined. The tubes showing ten per cent. of gas, or more were withdrawn and confirmed on eosin methylene blue agar. Suspicious colonies

were fished, replated, and slides were made, while one of the typical colonies was put through a methyl red test. The remaining tubes were then put back and incubated for another twenty-four hours after which all tubes, whether with more or less than ten per cent. of gas, were confirmed as before. This procedure was gone through with 212 sets and the following results obtained:

(1) In 57 per cent. of the samples, lactose broth gave a postive test in greater dilution than either the lactose bile or safranin lactose broth. The lactose bile gave a positive presumptive test, in 1.3 per cent. of the samples, in greater dilution than the lactose broth or the safranin lactose broth. The safranin lactose broth in no instance gave positive tests in greater dilution than the lactose bile or the lactose broth.

(2) All tubes which at the end of forty-eight hours showed less than 10 per cent. of gas were considered as doubtful. On subsequent examination it was found that B. coli could be isolated from better than 79 per cent. of these tubes.

(3) In 45 per cent. of the experiments where the last tube of safranin broth was doubtful and subsequently confirmed positive, the corresponding tube of lactose broth showed 10 per cent. or more of gas in forty-eight hours. In 31 per cent. of the cases where the last dilution of lactose bile broth was doubtful, the corresponding dilution of lactose broth was positive in forty-eight hours.

(4) The colon group was detected and confirmed in greatest dilutions by the various media according to the following percentages:—

	Per cent.
Lactose broth	57
Lactose bile broth	1.3
Safranin broth	0
Lactose broth and bile broth	30
Positive for all three	12

From these experiments it is concluded that the use of lactose broth is to be preferred as a preliminary enrichment medium. None of these media possess any particular advantage over the others in ease of preparation. It is worthy of note that the production of gas in the case of the lactose bile is at first more rapid than in the case of lactose broth or safranin and, further, that at the end of twenty-four hours it is equal to or slightly greater than in the case of lactose broth. This would naturally suggest that some product of the metabolism of B. coli forms a compound with some constituent of the bile which is inhibitory to the further growth of the organism. The selective action of safranin on organisms other than B. coli does not justify itself in these experiments. The inhibitory action of bile is marked but it has this in its favour as pointed out in Creel, namely, that the growth of spore forming anaerobes is very much less in bile than in the broth. Results even more striking than this have been obtained by other workers. Cummings, working on river waters, comes to the conclusion that 50 per cent. of the colon organisms are lost if preliminary enrichment is carried out with bile. Obst and Hauser came to the same conclusion. From the speed with which the gas is produced in the case of the bile, it seems likely that, if the inhibiting factor was found and the various constituents altered, this medium would be better than the broth now employed. The Committee on Standard Methods (1912) suggested that this inhibitory action is exerted on attenuated forms of B. coli.

Confirmation Media

The purpose of a confirmation medium is twofold, first to determine if B. coli is present and, second, to determine what variety of micro-organisms are present along with it. The media most commonly employed for this purpose, are:—

Endos medium
Lactose litmus agar
Lactose andrade agar
Eosin methylene blue agar
Neutral red agar.

The presence of B. coli is detected by its acid production from lactose, the presence of which is shown by an indicator. One of the main duties of a confirmation medium is to rule out the probable presence of Bacillus lactis aerogenes, an organism which also ferments lactose with the production of acid and gas, and has practically the same morphology as B. coli communis. Bacillus lactis aerogenes, as usually found, is slightly longer and more slender than B. coli, has a wide distribution in nature and is not generally considered an index of pollution. The ideal medium for confirmation is one in which B. coli can be readily recognized and, further, one by means of which the aerogenes section can be distinguished from it.

Endo's medium perhaps has the widest use to-day for this purpose, probably as a matter of habit, but it does not appear to be the most suitable because of the difficulties associated with its preparation, its method of adjustment of reaction, which is, to say the least, very unsatisfactory and because, in comparison with other media, it gives us no additional information. The method of adjustment of reaction is by titration with phenolphthalein, and the addition of sodium carbonate to increase the alkalinity. This naturally tends for lack of uniformity in the media, some lots being useless. For the bacteriologist who has a limited amount of time at his disposal this presents a constant source of worry. There is a further difficulty in that the different laboratories use different concentrations of indicators, and the appearance of a typical B. colon colony must therefore be described for each concentration of indicators used, a problem which leads to endless confusion. Another objection to Endo's medium is that for good results it must be prepared fresh every few days and this is associated with an added danger of breaking up of the lactose in sterilization. This medium has not been found preferable in any respect to the eosin methylene blue agar.

The chief objection to the lactose litmus agar arises from the fact that the time of pouring plates is very much increased because a definite amount of dye must be put separately into each plate before pouring. This method also increases the chance of contamination. There is a further objection in that great care is necessary for its preparation, and since the lactose is added before autoclaving the danger of hydrolysis is always present. Work with these media indicates that lactose has less tendency to break up if the medium is autoclaved for fifteen minutes at fifteen pounds pressure, instead of being sterilized in the Arnold on three successive days by the fractional method. These objections to the lactose litmus agar, namely, that the time of pouring plates in greatly increased and that fresh solutions of litmus must be prepared every few days and sterilized (as commercial litmus powder diluted and left unsterilized was found to produce a plentiful crop of various molds in a few days) is overcome by bringing the Ph of the agar to 7.2 just before sterilization

and adding one per cent. of andrades indicator. This type of confirmation medium has been found to be quite satisfactory, but it is considered that for water analysis eosin methylene blue agar is preferable for the following reasons:

Eosin methylene blue agar is easily prepared. There is no filtering and no adjustment of reaction and large quantities can be made and kept for months. The dyes are not added separately to each petri dish, as in the case of the lactose litmus agar, but to the flasks which contain the agar preparation. This facilitates a rapid and easy method of pouring plates. It has also been found that poured plates of this medium are much less likely to become contaminated than any of the above media, since they can be kept for a week in a cool dark place with relatively very little contamination. This agar is much more easily melted before pouring than is the case with either of the above media. The chief advantage, however, of eosin methylene blue agar is that with a little practice one can readily distinguish between B. coli and Lactis aerogenes. In the case of B. coli, the colony is 2 to 3 m.m. in diameter, shows no tendency to confluence, is very slightly raised above the medium and has a black centre. Lactis aerogenes colonies are 4 to 6 m.m. in diameter, show great tendency to confluence and are much more highly raised above the medium, exhibiting a moist slimy glistening appearance. Very often the B. coli colonies will shows a greenish, glistening, metallic sheen but this does not always occur and therefore is not wholly diagnostic for the Bacillus.

To sum up the various media. Eosin methylene blue agar seems most suitable for confirmation work for the following reasons: (1) Its ease of preparation; (2) its permanence both as regards the agar and poured plates and (3) its constancy of composition and freedom from the vagaries of the other confirmation media.

It is necessary that a microscopical examination be made of all suspicious colonies and that a methyl red test be also made so as to give an absolute differentiation between the colon and Lactis aerogenes sections. This process takes very little time but gives the bacteriologist a somewhat better insight into the morphology of the organism with which he has to deal. Ten smears can be put on one slide and several slides can be stained conveniently at one time.

There are a few organisms which ferment lactose and may sometimes be confused with B. coli and in turn confuse the results of the water examination. The first is Lactis aerogenes which has been dealt with above, and which can be differentiated on the confirming medium or, better still, with a methyl red or Voges Proskauer reaction. Lactose fermenting streptococci are frequently present in water, but they can be readily distinguished from the colon colony on solid media by the pin-head size and half-sphere shape. In making slides of suspicious colonies the colonies of this organism are easily eliminated. Another very frequently occurring bacterium is a fine gram negative bacillus about one to two microns in length and about a quarter as wide. It is not a typical B. coli in that it gives a negative Voges Proskauer reaction, and the colonies on agar are slightly more raised and more granular than B. coli. One organism isolated on two occasions from samples of well water possesses all the B. coli reactions and has its appearance in growth (with the difference that the colonies are slightly larger and more granular). It has a central spore and no motility.

Experience has shown that it is advisable to put not more than two conformations on one plate and that the inoculations be fairly heavy (one loopful for each), and that the loop be drawn straight across the plate and lifted to start the next streak.

THE COLLECTION AND DISPOSAL OF MUNICIPAL REFUSE

By A. E. Berry, M.A.Sc., C.E. (Tor.)

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1.—INTRODUCTION

The collection and disposal of municipal wastes dates back to that period when there existed a misconception in regard to the origin of disease. From time immemorial vapours and emanations, gaseous or otherwise, have been believed to be the frequent cause of disease. These miasms were thought to arise from stagnant marshes, decaying vegetation, putrid animal matter and indeed filth of every kind. This belief in the extra-corporal origin of disease reached its widest acceptance about the middle of the nineteenth century. The rise of the

germ theory strengthened it. The discovery of bacteria and of their wide distribution, and almost universal growth in dead organic substances and the theory that these bacteria were the real cause of disease, led scientists to look for the source of disease outside of the body, and chiefly in dead animal and vegetable matter. Remedial and preventive measures based on such beliefs in the omnipotence of environment naturally sought to remove household refuse and wastes of all description.

The refuse problem is to some extent a hygienic one, although it is more a question of economy, convenience and general cleanliness. Only indirectly is it a matter which concerns public health. Bad odours arising from the fermentation of garbage do not produce any specific diseases, yet they are offensive and their elimination is an important consideration. Ashes and street dust may irritate the eyes, nose, and throat and predispose one to bacterial infection. Accumulating rubbish is not only unsightly but may provide conditions favourable for mosquito breeding, while fermenting garbage and manure is a most suitable nidus for the breeding of flies. The role which these insects play in the spread of infectious diseases makes municipal refuse, although indirectly, a factor in relation to public health.

The development of methods for the collection and disposal of municipal refuse has been slow but progressive. In the early days the care of such material was left to the individual, who was advised to burn the combustible parts, and to deposit the non-combustible on low areas or at points sufficiently remote to avoid any objection. When garbage or other material of any food value was deposited outdoors, it was picked over and largely removed by birds and wandering animals. This practice sufficed where the population was not congested, and the accumulation did not become extensive.

The rapid growth of municipalities with centralized development, congested areas, and higher standards of living, brought into prominence the question of a more adequate disposal of those wastes resulting from the natural activities of the community. England led this progressive movement, and started works in the cities and towns to provide for such material. Germany followed and advanced the subject both in theory and in practice. France was chiefly interested in utilizing the valuable parts of the refuse. America was fortunate in that she was able, before attempting any methods of her own, to profit by the knowledge and practical experience gained through the operation of the European systems. The more important methods introduced in the "Old Land" were tried out on this continent, and others have been developed to meet the changed conditions resulting from a greater wastefulness of the people and a higher per capita production of salable refuse. The destruction of refuse in furnaces and the utilization of the heat produced has been considered most favourably by the large European cities. This is apparently due to the absence of those materials, in sufficient quantities as to make economical the extraction of grease and other salable products, so commonly recovered from the wastes of American cities.

The development of disposal methods in municipalities of modern growth is somewhat analogous to those changes through which the general problem has passed from the time of its inception. The primary methods adopted by localities of small population are usually somewhat ineffective, but tend to open the way for more serviceable practices. Little attention is normally given to this question until water and sewerage facilities have been established and the population has reached a sufficient size to conveniently carry the financial burden. Certain summer resorts, frequented chiefly by people accustomed to having a

garbage collection, are, however, an exception to this and possess quite modern and adequate methods. It is rather unfortunate that earlier attention is not given to this problem, since the financial burden of incineration or other extensive disposal works does not necessarily need to be a part of these early schemes. The initial service often provides only for the business sections, but as the demand increases the collection is extended to other sections, and the disposal methods altered to meet these conditions. The initial selection of a system should be such that additions may be made from time to time without creating works which will eventually become unsuited to the local requirements. The unfortunate location of a disposal site might sometime develop into a real transportation difficulty.

The relative magnitude of the problem of refuse collection and disposal can be seen from a comparison of the financial statistics of United States cities as shown in tables No. 1 and No. 2. In table No. 1 is given the per capita cost of the various departments included in the government of these cities according to population groups. In the grand total column of this table for all cities, the Division of Sanitation or promotion of cleanliness ranks sixth with a per capita cost of $1.58. Table No. 2 indicates the services upon which this amount is spent. Over seventy per cent. is used for refuse collection, while this combined with refuse disposal accounts for four-fifths of the total amount spent on sanitation or the promotion of cleanliness. The amount spent on "sewerage and sewage disposal" is, in comparison, quite small. From a financial aspect, therefore, refuse collection and disposal is by far the most important problem which comes under the sanitation of cities.

Two view points may be utilized in consideration of the problem of collecting and disposing of wastes, namely, that of sanitation, and that of economics. Present day authorities place the former in the position of prominence. It should, very properly, be associated with economical results, but the desire to produce a revenue should not eclipse and alter the methods necessary to obtain sanitary results. The commercial consideration in several instances becomes too prominent, with the result that the most suitable works for efficient sanitary results are either not established at all, or not as soon as conditions warrant their use.

TABLE NO. 1.

FINANCIAL STATISTICS OF U. S. CITIES—1918

Governmental cost payments for expenses of general departments by principal divisions of the general departmental service—per capita rate.

Department	Group I	Group II	Group III	Group IV	Group V	Grand Total
All general departments	$24.06	$22.66	$16.41	$14.40	$14.93	$20.11
General Government	2.97	2.65	1.18	1.14	1.20	2.14
Police Department	2.90	2.22	1.67	1.38	1.28	2.19
Fire Department	1.59	2.14	1.75	1.59	1.56	1.69
Conservation of Health	0.62	0.67	0.41	0.30	0.33	0.51
Sanitation or promotion of cleanliness.	1.93	1.60	1.35	1.17	1.08	1.58
Highways	2.14	2.65	1.90	1.58	1.88	2.06
Charities, Hospitals and Corrections	2.18	2.02	0.78	0.50	0.55	1.48
Education	7.08	6.77	6.05	5.80	6.11	6.56
Recreation	.87	0.79	.62	0.43	0.41	0.70

The cities have been placed in groups according to the following populations:

Group I—500,000 and over.
Group II—300,000 to 500,000.
Group III—100,000 to 300,000.
Group IV— 50,000 to 100,000.
Group V— 30,000 to 50,000.

TABLE NO. 2

DIVISION OF COST FOR SANITATION OR PROMOTION OF CLEANLINESS

Group Number	Total per capita Cost	Percentage Division of per capita cost				
		Sewerage and Sewage Disposal	Refuse Collection	Refuse Disposal	Public Convenience Stations	Other Sanitation
I.	$1.93	13.0%	77.0%	5.9%	0.6%	3.5%
II.	1.60	16.5	71.2	5.2	0.6	6.5
III.	1.35	13.8	74.7	5.4	1.0	5.1
IV.	1.17	19.5	70.0	5.1	0.9	4.2
V.	1.08	21.2	69.0	5.1	0.5	4.2
Grand Total for All Groups.....	$1.58	14.9%	74.5%	5.7%	0.5%	4.4%

The term "Wastes" broadly defined, includes all classes of surplus or unnecessary organic or inorganic matter produced as a result of living. This classification may be in turn subdivided into the two general headings, refuse and sewage. The latter term is well known and requires no definition. The term "refuse" is, however, applied to many different substances. It includes all forms of household and trade wastes in the nature of garbage, ashes, or rubbish and street sweepings. The major quantity of municipal refuse is produced in the household and composed of kitchen garbage, ashes, and rubbish.

Household refuse contains materials of widely varying composition and behaviour upon exposure. Ashes give the minimum of trouble and can be stored wherever convenient. When dry they are easily scattered by high winds, but odours are not produced. Rubbish is almost as stable as ashes, but is likewise blown about by winds and creates unsightly areas. Garbage is by far the most difficult to handle. Its rapid fermentation with the production of odours when left exposed to the weather, creates the necessity for more frequent collection and more careful attention than is required of ashes or rubbish.

The house treatment of the refuse is the only part in which the producer is asked to co-operate with the general service. This duty lies in the care and preparation of the materials for collection. The necessity for this is created by the process through which the material passes after it has been delivered to the point of final disposal. The various methods of disposal now in general use require different degrees of separation and treatment of the refuse, all of which must be carried out at the point of production.

There are two general systems or methods of collecting refuse in American municipalities,—(1) the combined system, and (2) the separate system. The former is one by which all classes of refuse are stored together in the one receptacle and collected in the one wagon. The latter requires different classes of refuse each to be kept in individual containers and collected separately. The adoption of the combined or separate system will, like the house-treatment, be governed by the selection of the method of final disposal.

The collection of public refuse is a public utility. It is quite distinct and separate from the house treatment and final disposal, although it forms with them an organic whole. Under some conditions the special organization managing it may be a separate one. In small communities, the collection is frequently made by contract, but it is generally more satisfactory to have it done by the municipal forces because of the greater ease in adjustment of details and complaints.

By "refuse disposal" is meant the final disposition, utilization, or destruction of the materials after their collection and delivery. Several methods are in common use. To be satisfactory, the disposal must satisfy two requirements; it must be sanitary, *i.e.*, not cause a nuisance or danger to health; and it must be economical. The expense should be the lowest which will effect a sanitary final disposal of all the refuse materials.

One important purpose of refuse disposal works, and one which receives but scant attention, is to provide a definite place to which all the waste materials can be brought. This prevents that promiscuous dumping on or near places where it might become objectionable—a practice very common in small communities. At such works the materials must be so handled as to control the organic decomposition and to prevent objectionable odours. A further objective of such works should be the recovery of valuable parts, and the production of steam together with reduction of the final residue to the smallest quantity and least offensive condition.

From the various methods of final disposal which have been inaugurated from time to time, a limited number have been developed to a favourable degree of efficiency and economy. Present day processes may be divided into two classes as follows:—

(1) Natural Methods.

(2) Artificial Methods.

The former, in order to effect a disposal involves the utilization of those natural agencies which exist in large bodies of water, the soil, and the atmosphere. These agencies comprise chiefly the water and soil bacteria, the larger forms of vegetable and animal life, and the physical action of rain, frost, sunlight, and other factors. The artificial methods have been adopted through necessity where conditions do not permit the use of the natural. They aim at the disposal of the material in a sanitary manner, with the formation of valuable by-products.

The choice of a method for final disposal rightly requires the consideration of a number of factors. Some municipalities are subjected to unfavourable conditions in regard to this problem while others possess opportunities. Among the undesirable circumstances must be considered the adverse financial conditions of most small communities. Sparse settlements and small populations are usually found along with these low finances. Certain municipalities are favourably situated to use particular methods, while the larger towns and cities have populations which enable them to invest in disposal works which will not only give excellent results but may be almost self-supporting. These advantages are, however, sometimes offset by the lack of suitable sites, and the unwillingness of the public to carry out certain necessary requirements. With these, and other circumstances known, municipal officials are better able to choose a process adapted to their requirements.

Small municipalities, with scattered residences and poor financial conditions, invariably select a method of disposal which requires a low initial expenditure and a small annual upkeep. For these conditions natural methods are used, such as dumping into large bodies of water, dumping on land, filling in low areas, plowing into the soil and burial. The first mentioned requires a location near some body of water. The others are in very common use to-day. Not only do they require small expenditures but the disposal points may be so located as to lessen the length of hauls, and to reclaim for useful purposes land of low previous value.

The success of the natural methods of disposal on land is entirely dependent upon the care and treatment provided. Promiscuous dumping of garbage and other organic wastes without any covering or attention is sure to result in the production of objectionable odours, and the creation of ideal breeding grounds for flies, mosquitoes, and rats. Proper supervision of these methods requires the attention of some responsible party to destroy the insect larvae and see to the covering of the fermentable wastes. During the winter months with the production of ashes at a maximum, they may be stored at the dumps, and used as a covering material in the summer to allay odours. Much low and can in this way be reclaimed and made useful.

Garbage disposal by feeding to hogs, while considered as a natural method, requires a somewhat large initial expenditure. The purpose of the method is to offset the costs of disposal by utilizing the food value of the garbage. Success has been attained in many municipalities, although the process has a number of disadvantages. The garbage must be carefully separated and fed to the hogs while fresh. This in turn increases the frequency of collection. Epidemics of infectious diseases among the hogs are quite frequent, and these result not only in a serious financial loss, but in addition cause an interruption to the service which leaves on hand large quantities of decomposing wastes. Such a possibility seems to warrant the provision of some alternative disposal for emergency use.

The larger municipalities where sufficient capital is available for the construction and operation of expensive works, may be considered to have a choice between two artificial methods, namely—Incineration and Reduction. Both may be made self-supporting. Incineration will be chosen where the site is in a built-up district or a locality in which odours would be objectionable; and where the public are somewhat averse to separating the garbage from the remainder of the household refuse. Reduction works may be chosen where the wastefulness of the people make it profitable to extract the grease and prepare the remaining tankage for the market. The adoption of this method will necessitate a location some distance from residential sections where odours produced will not commit any nuisance.

Incineration is a method by which all combustible waste materials are burnt in specially designed furnaces. Such furnaces are of two general types, namely, the low-temperature or crematories, and high-temperature destructors. The former does not reach a sufficient temperature (1200°F.) to destroy the gases of combustion, with the result that the disposal is not free from odours. The high-temperature furnaces produce, under forced draft, a high degree of heat which destroys all odours. This heat may be used in the production of steam in order to offset the cost of disposal. A clinker of some value also results from this process.

Recent improvements in the high-temperature destructors which make for successful operation, include the provision of drying hearths to receive the wet material; charging devices which minimize the cooling of the furnace during this operation; the use of a pre-heated forced draft; and clinkering devices which permit of the removal of the clinker in one solid mass.

The reduction process—an American development—aims at the recovery of the valuable parts of the waste; namely, grease and tankage. To accomplish this the garbage is separated into four parts; water, grease, tankage, and volatile matter. The latter product is the cause of so much objection against this method. It is claimed by experts that even the best of these plants cannot be

operated without the escape of some objectionable odours. The introduction of the Cobwell system, similar to that installed to reduce New York's garbage, has done much to minimize this defect.

2.—REFUSE MATERIALS

(a) CLASSIFICATION.

Municipal refuse materials are the solid waste matters resulting from the natural activities of a community. They are distinct from the liquid portions of the community wastes—generally called sewage. The general term "municipal refuse" includes the following classes of waste material:—

(1) *Public Refuse*—The rejected material collected from streets and lanes.

(2) *Trade Refuse*—The solid wastes from slaughter houses, factories, and various business establishments.

(3) *Market Refuse*—That resulting from the operation of commission houses and public markets.

(4) *Stable Refuse*—Composed chiefly of manure and straw from stables.

(5) *House Refuse*—Wastes from houses, apartments, stores, schools, churches, hostel, etc. It is composed of garbage, ashes, rubbish, and night soil.

A detailed classification of these materials is given in Table No. 3.

House Refuse.

In municipalities which are chiefly residential the major quantity of refuse is produced at the homes. It may be placed all together and collected as mixed refuse, or it may be separated into the three common divisions, namely—garbage, ashes and rubbish.

Garbage.

The term garbage includes all animal and vegetable waste matter originating in houses, kitchens, restaurants, and hotels, and generally contains the tin cans in which part of the food was originally supplied. It is by far the most difficult part of household refuse to treat. Much of the organic matter in the presence of the normal moisture content readily decomposes and becomes foul. In warm weather this action may take place within twenty-four hours.

Ashes.

House ashes are composed of the residue from coal and wood fires in houses, schools, churches and other buildings. Frequently they contain other inorganic materials such as glass, crockery, metallic substances, bricks, dust, and similar refuse.

Rubbish.

Rubbish comprises those miscellaneous materials from houses, and stores which are not classified definitely with garbage or ashes. It consists for the most part of wood, paper, rags, straw, leather, rubber, glass, barrels, bedding, excelsior, and sweepings from buildings. Normally the decomposition is quite slow and the resulting odour is but slightly offensive.

Mixed Refuse.

In some municipalities the method of final disposal does not require the separation of household wastes into the three component parts: garbage, ashes, and rubbish. These may then be placed together in one receptacle and con-

sidered as "mixed refuse". From a sanitary standpoint mixed refuse is somewhat more desirable than the separated constituents. When mixed with ashes and rubbish, the organic parts of the garbage tend to decompose less quickly and the loose materials are less apt to be blown about when dampened with the moisture from the garbage.

Night Soil.

The term night soil is applied to the contents of privies and cesspools. The removal of this material and the prevention of flies from gaining access to it, may become a problem of serious concern in those districts where sewerage facilities have either not been extended or are not being utilized.

TABLE NO. 3

CLASSIFICATION OF REFUSE MATERIALS

- MUNICIPAL REFUSE
  - PUBLIC REFUSE
    - Street manure and litter
    - Sweepings and dust
    - Leaves
    - Droppings from carts
    - Large dead animals
    - Snow
    - Cleanings from public catch basins
  - TRADE REFUSE
    - Steam ashes
    - Dry factory wastes
    - Slaughter house waste
    - Rubbish from office buildings and factories
    - Cleanings from private catch basins
  - MARKET REFUSE
    - Garbage from markets
    - Rubbish and cleanings from markets
    - Old boxes and barrels
  - STABLE REFUSE
    - Manure
    - Straw
    - Cleanings from stables
    - Fly maggots
  - HOUSE REFUSE
    - GARBAGE
      - Animal matter, including moisture
      - Vegetable matter, including moisture
      - Tin cans
      - Small dead animals
    - ASHES
      - Coal and cinders
      - Clinker and slate
      - Dust
      - Glass
      - Crockery
      - Brick and stone
      - Metal fragments
    - RUBBISH
      - Sweepings from buildings
      - Boxes and barrels
      - Wood
      - Paper
      - Rags
      - Excelsior
      - Straw
      - Leather
      - Rubber
      - Metalware
      - Bedding
      - Old furniture
    - NIGHT SOIL
      - Contents of privies

(b) Quantities and Their Variations.

House refuse is produced in varying quantities depending on the following main factors:

(1) Geographical location.

(2) Season of the year.

(3) Character of population, *i.e.*, industrial, residential, rural, etc.

(4) Efficiency of the collection system.

The average collection of refuse per capita per day in several American cities has been shown to be as follows:

Garbage	0.5 pds.
Rubbish	0.2 "
Street sweepings	0.5 "
Ashes	2.3 "

The above quantities are the average for a number of cities. To calculate the amount of refuse to be expected from a municipality, these amounts should be considered in conjunction with the factors previously mentioned.

Table No. 4

QUANTITIES OF MIXED GARBAGE AND RUBBISH COLLECTED IN SOME ONTARIO MUNICIPALITIES

Municipality	Population	Tons of garbage and rubbish per week	Pds. per day per 1,000 population
Chatham	15,100	40 to 60	945
Cobalt	4,610	48	2,980
Fort William	20,451	150	2,100
Iroquois Falls	2,000	24 to 30	3,850
Kingston	22,000	150	1,950
Kitchener	23,571	100	1,210
London	54,144 (garb. area)	210	1,100
New Toronto	3,128	30	2,740
Niagara Falls	15,895	36	650
Peterboro	21,605	108	1,430
Sarnia	15,176	24	450
Sault Ste. Marie	23,039	40 to 45	530
Stratford	18,500	100	1,100
Sudbury	9,076	52	1,650
Timmins	10,000	75	2,140
Toronto	538,771	1,000 to 1,100 (Incinerated)	560
Walkerville	7,303	60	2,350

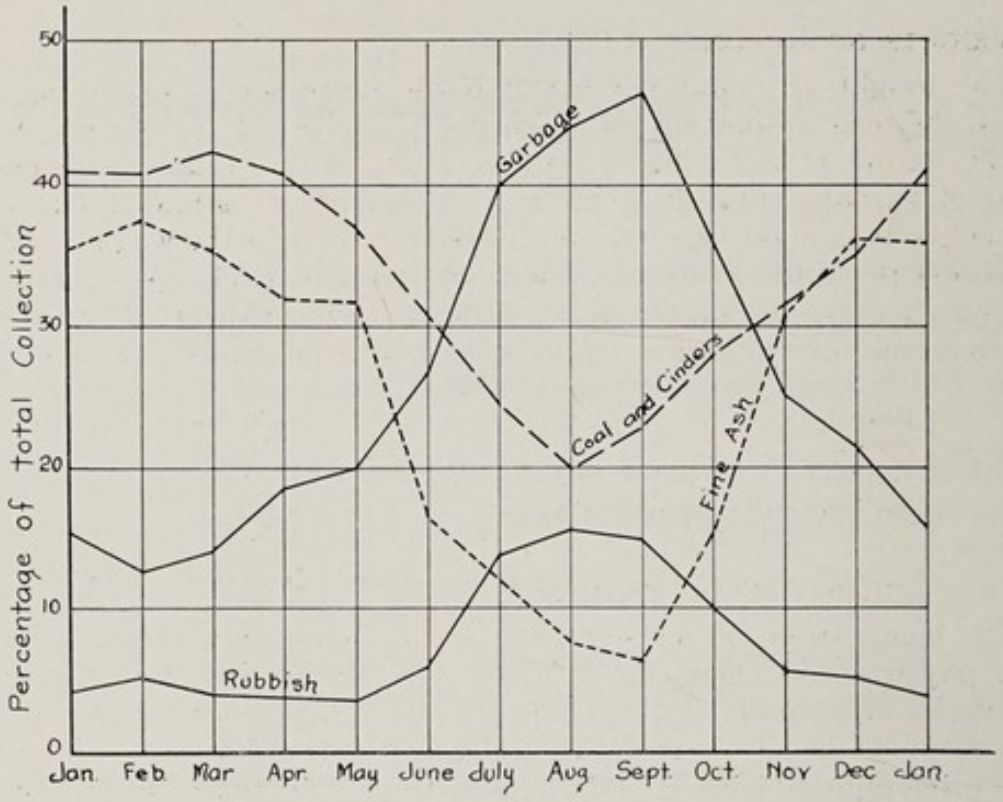


DIAGRAM NO. 1
Monthly variations by weight in components of household refuse for average municipality.

Geographical Location.

The per capita production of garbage and ashes is naturally affected by geographical location and climate. In the warmer areas to the south, more vegetables and fruits are consumed while the amount of coal required is quite small. Where natural gas is available for fuel there is a natural falling off in the quantity of ashes. In Europe the average per capita production of house refuse is approximately 380 pounds per year as compared with 860 pounds in American cities.

Season of the Year.

There is a marked difference in the quantities of refuse produced from one season to another. The maximum quantity of garbage occurs during the summer when fruit and vegetables constitute the principal diet. August or September usually yields the highest rate with February or March the lowest. The winter production of ashes is, on the other hand, greatly in excess of the summer amounts.

Character of Population.

Residential areas yield greater production of garbage than do manufacturing centres. The wealthier sections of a municipality similarly produce more refuse than do the poorer. Different nationalities may also have an important effect upon the production quantities.

Efficiency of Collection System.

Inefficient or inadequate collection systems tend to make untidy premises with a corresponding decrease in the amount of refuse collected. The more frequent and more thorough the collection service the greater will appear the per capita production of refuse for the municipality.

(c) Weights of Refuse.

The weight of a unit volume of house refuse varies according to several factors, the most important of which are: the class of population, the season, and the nature of the collection service. A heavy rainfall increases the unit weight of garbage even as much as 50 per cent. for separate loads. In cold weather the frozen garbage does not pack so tightly in the wagon, and therefore weighs less per unit volume. Long hauls tend to pack the material together and thus increase the unit weight. The following figures are frequently used as an average for the unit weights of the different constituents of household refuse:

Garbage	1,150	pds.	per cu. yd.
Ashes	1,350	"	"
Rubbish	200	"	"
Garbage and rubbish mixed	1,050	"	"
Street sweepings	850	"	"

(d) The Composition of Refuse.

The composition of refuse must be considered only through a knowledge of the physical and chemical analysis. The former indicates the proportions of the various materials, such as ashes, clinker, paper, shoes, organic material, etc. These proportions will naturally change greatly according to the factors bearing on the production of garbage. In an analysis of the mixed refuse from the City of Toronto in 1914, the two largest amounts were the vegetable matter, 48.5 per cent., and paper and cardboard, 22.1 per cent. Sawdust and dirt came next at 10.4 per cent., while only 5.13 per cent. of the total was ashes. All the percentages are by weight.

Chemical Analysis.

The most important information to be derived from the chemical analysis of house refuse, is the percentage weight of:—moisture, volatile matter, fixed carbon, and ash. To obtain best results truly representative samples should be collected over a wide range of time and conditions. Much other information can be had from the chemical analysis but the value of this will depend upon the process through which the material is to pass. The grease content will be important where the reduction method is used.

Table No. 5 may be considered as a representative chemical analysis:

Table No. 5

	Moisture	Volatile Matter	Fixed Carbon	Ash	Calorific value in B.T.U. per pd.
Garbage	73.3%	16.9%	4.7%	5.1%	8,300
Household Ashes	1.0	6.3	25.7	67.0	8,500
Rubbish	12.5	52.4	20.5	14.6	7,200
Mixed Refuse	45.1	26.6	23.8	14.4	8,000

3.—HOUSE TREATMENT

The disposal of municipal refuse begins at the point of its origin. The first step in this process is known as the House Treatment. By this is meant the preparation of the refuse for collection. This preparation, which must be made entirely by the householder or producer, will be dependent upon the method in operation for final disposal. It may involve a considerable degree of separation, or the materials may be all placed together and collected as mixed

refuse. Other methods of special treatment, such as wrapping the garbage in paper, may be required of the producer. In any event, the householder will expect to be informed by circulars or other means just what is anticipated in this respect.

Those factors which may be considered to influence the house treatment of refuse are as follows:

(a) Degree of separation.
(b) Receptacles.
(c) Flies.
(d) Special house treatment.

(a) *Degree of Separation.*

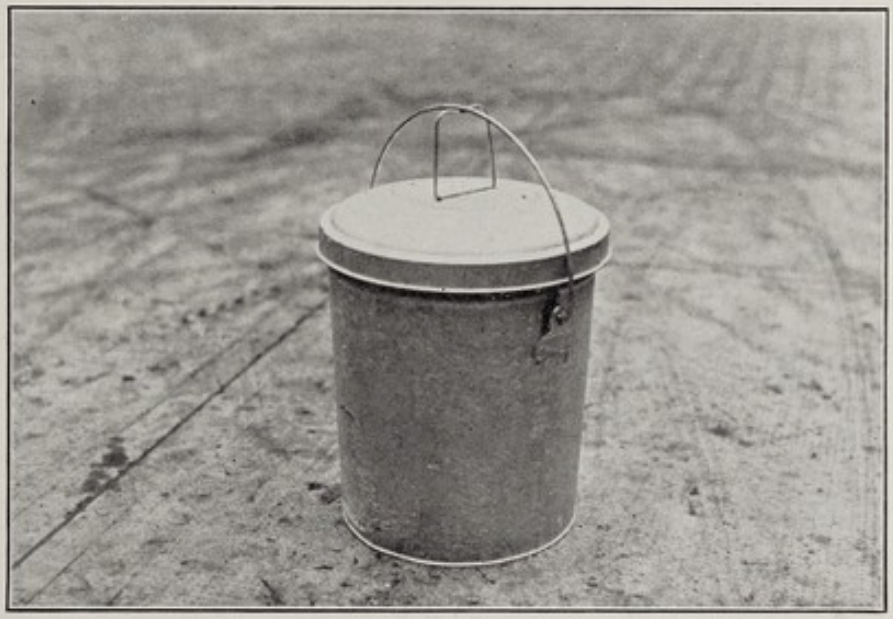
The degree of separation required in the house treatment will depend upon the method of final disposal, and any sanitary regulations which the particular municipality may formulate. When garbage is disposed of by the reduction process, or by feeding to hogs, it must be kept apart from the ashes and rubbish. If the ashes are to be utilized as a fill for low land, they also must be kept separate from the rubbish or at least from the bulk of it. Such a separation would require three different receptacles—a feature which is not favoured by most householders. The most common house treatment in the larger American cities comes under the two-can system, one of which is used for the garbage and the other for ashes and rubbish. Where mixed refuse is destroyed by incineration, the house treatment is greatly simplified by placing all materials in one receptacle. This procedure is most desired by householders, and requires less supervision by the collection department.

(b) *Receptacles.*

A garbage can should not only be of such a size that it can be readily loaded by one man when full, but it should be easily cleaned, sanitary, and have a tight fitting cover to prevent the entrance of flies and small animals. At one time, wooden boxes were commonly used for the storage of garbage, but these were too difficult to clean and to keep tight. A galvanized iron pail

Garbage receptacles which are both inconvenient and objectionable in appearance.

or can is best suited for this purpose. Its capacity usually varies between ¾ and 4 cu. feet, depending upon the weight of the refuse it is to contain. For garbage or ashes the size should be comparatively small in order that it can be carried and hoisted to the top of the collection wagon by one man. A can for rubbish of small unit weight may properly be of larger dimensions. For the reception of ashes or other heavy refuse, the most serviceable can is one made of heavy galvanized iron, well reinforced with side strips to withstand rough treatment. Tight fitting covers should be provided for all containers, and these should be wired to the handle to prevent their being lost or blown away.



A good type of garbage pail for homes.

The location of the garbage can to facilitate the work of the collector is a question upon which different opinions exist. The cost of collection is unquestionably decreased by having the householder place the container at the street curb. This practice is, however, an inconvenience to the residents, and in addition creates an objectionable appearance. The back door or side of the house is the most convenient location for the householder, and this eliminates the unsightly appearance of the streets on collection days. Where there are back lanes, this difficulty may be overcome by requiring the collection to be made from here. Each municipality should, as far as possible, require a uniform location for the cans so that no time will be lost by the collector in discovering their whereabouts. In certain sections where some of the houses are a considerable distance from the street, a great deal of time is lost if the collector is obliged to go all the way after the full can and return the empty.

In most municipalities the parties producing the refuse are expected to provide their own receptacles. In others the collection department provide the cans as they are required and charge their cost against the householder. The latter method may be used to advantage where the cans are cleaned by the collectors. In making the collection, the full can is placed on the wagon and an empty one left in its place. This practice permits of a thorough cleansing and disinfection of all the cans. Where the cleaning is left to the individual householder, it is frequently neglected with the result that bad odours occur, and

putrefactive organisms thrive in the corners where material is allowed to collect. Decomposition of the fresh garbage is greatly hastened by the presence of this material.

(c) *Flies.*

Unless garbage receptacles are tightly covered, the odours from the fermenting materials will attract flies. This material forms a suitable nidus for the eggs, and larvae rapidly develop. Most collections are too frequent to permit of a full development to the adult stage in the garbage can. This stage will not be reached at all if the disposal method is a type which will sterilize the material. Where the garbage is placed on dumps or buried, this development will not be checked and the adult fly will very soon return to the original dwellings. Not only do flies lay their eggs in this exposed garbage, but when the can is emptied, they seek the inside of the house in search of food and warmth and carry with them parts of this decaying refuse. The simplest procedure in order to avoid this nuisance is to provide proper receptacles and see that they are always kept tightly covered. Larvae which have already hatched may be destroyed by spraying with a three to four per cent. creosote disinfectant solution.

Receptacles which readily attract flies.

(d) *Special House Treatment.*

Certain municipalities require the householders to specially prepare the refuse before it is collected. These special preparations include chiefly the screening of ashes, burning of combustible material, and wrapping the garbage in paper. The latter is the most important and most commonly used. Before the garbage is placed in the receptacle, it is drained and wrapped in paper. This procedure greatly assists in maintaining a clean can and in the prevention of the fly nuisance. Where the refuse is destroyed by incineration, the paper aids in the combustion. Objection is made to this, however, where the garbage is either fed to hogs or disposed of by the reduction process. Wrapping is

best adapted for those municipalities where incineration is used for final disposal. This practice is also a distinct advantage in freezing weather in that there is less danger of the material adhering to the container.

4.—COLLECTION

The collection of refuse is an intermediate stage between house treatment and final disposal, and an intimate relation exists between all three. The organization of the collection service must satisfy the popular needs. The special requirements of the various classes of people living under different conditions must all be considered as well as the influence of the season. The frequency of collection and the efficiency with which it is carried out are of more concern to the householder than is the method of ultimate disposal. This is because the entire municipality comes in contact with the collection service and defects are consequently felt over a large area, whereas the disposal process may affect only those adjacent to the works.

The conveying of refuse from the points of origin to those of final disposal may quite properly be divided into two parts. One pertains to the primary collection or gathering of the material from the houses into the wagons, and the hauling of it to defined points for subsequent transportation, or, as in small communities, direct to the places of final disposal; the other part pertains to transportation of the refuse by secondary means after the original collection. Such methods may include transportation by barges, motor trucks, street railways, or railroad cars, the necessity for which increases with the extension in area of the community served.

(a) *Methods of Collection.*

A great variety of methods and equipment for collecting refuse is found in American cities. Many styles of wagons for ashes and garbage are in use and their capacities range from 1.5 to 6.0 cu. yards. Some are covered and others are open. The interval between collections varies from daily to once a week or even longer for ashes and rubbish. Some municipalities require a more careful attention to the cleanliness of the collection wagons than do others. In some cases the work of collection is done at night, and the householder sets out his can in the early evening. Two main requirements, no odour and no dust, must control the collection of refuse regardless of which of these methods are in operation.

(b) *Frequency of Collection.*

The time interval between collections should be sufficiently short to prevent any nuisance from the storage of the refuse. Garbage which is kept separate must be collected more frequently than either rubbish or ashes because of its putrescible nature. This interval should, in addition to eliminating any nuisance, satisfy the householder and give opportunity for approximately one full can of refuse to accumulate under average production.

In the larger cities, and especially in the more thickly populated sections, it is customary to make collections daily. This frequency is not only advantageous in maintaining sanitation, but very often the method of final disposal, especially hog-feeding, requires that the garbage be as fresh as possible. In all cases there should be a daily collection for hotels, restaurants, and boarding houses, where there is a large accumulation of organic wastes. Garbage not

mixed with other refuse should be collected from all residences at least three times per week. More frequent collections become necessary in summer than in winter. Ashes need be removed only often enough to prevent undue accumulations, while rubbish should be collected at least every two weeks, or there will be a tendency to untidy premises. Mixed refuse does not require as frequent collection as garbage, but to be satisfactory it should be made regularly at least twice a week in summer from residences and daily from hotels, restaurants, and boarding houses. In winter, especially in the colder climates, the collections may be reduced to once a week for residences.

(c) *Equipment.*

There are very many different types of wagons employed in refuse collection, and the size of these is one of the most important features. The most suitable capacity can best be determined after a careful study of local conditions. The working time of a collector may be divided into two parts, namely, the productive time, *i.e.*, the time spent in loading; and the unproductive time, or that spent in driving the loaded wagon from the last point of collection to the point of transfer or final disposal. The size of the wagon should be such that this unproductive time will be a minimum. For short hauls the size of wagon is relatively unimportant, but when it extends to a number of miles, the size should be carefully considered. Theoretically a wagon should be of such size that the time required to fill it leaves just sufficient time in one working day

A convenient wagon for refuse collection, with tarpaulin cover.

for one trip to the point of disposal. Such a size is, however, not always possible because of the weight of the materials. The following capacities are commonly used in practice:

For Garbage	3 to 4 cu. yds.
For Ashes and Rubbish	5 "
For Mixed Refuse	5 "

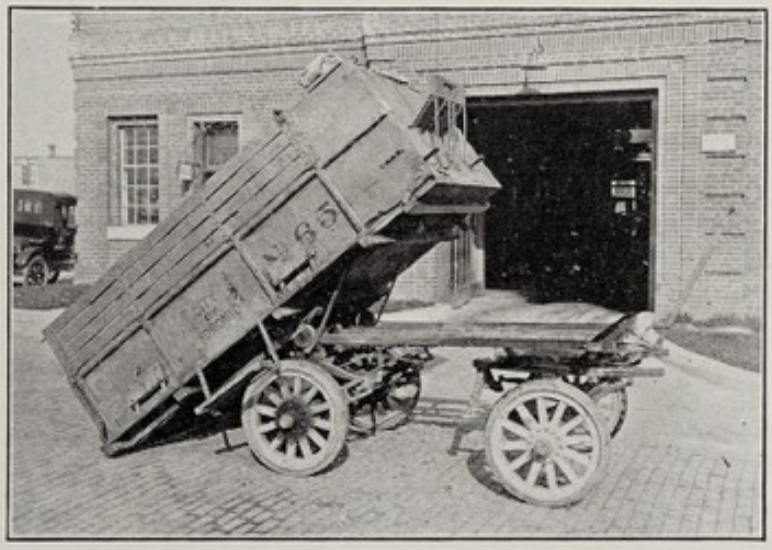
The loading height of a wagon should be such that the workman can conveniently turn into it the contents of the can. The top edge should be not more than six feet, and preferably not more than five feet from the ground. Where stepboards are placed at the rear and on the sides, a somewhat higher wagon may be loaded without difficulty.

Covering.

All refuse requires covering during transportation. Ashes and rubbish must be covered to prevent dust and loose papers from being blown about the street, while garbage should be protected from flies and screened from view. If flies are permitted to gain access to the garbage, they follow the wagons and spread over the entire community. Wagons used in some localities are provided with a hinged cover or lid. Difficulties are experienced with this type, however, in keeping pieces of refuse away from the lid, and in preventing garbage juices from adhering to the hinges and frames. The covering most commonly used at present is canvas or tarpaulins. These are quite satisfactory and enable the wagon to be piled up high without interference in the use of the top. They should be washed frequently.

Dumping.

Loaded wagons must be dumped as quickly and as conveniently as possible. The method of dumping depends partly on the method of disposal. Bottom dumping wagons are more serviceable where the refuse is placed on dumps, but they are more difficult to keep water-tight than others. Dumping at the rear by raising the forward end is particularly suitable where carts are used, and no difficulty is experienced in keeping them tight.



Rear dumping refuse collection wagon.

Horses vs. Motor for Primary Collection.

The large number of stops required in the primary collection of refuse has pretty well removed this from the field of the motor vehicle, except where more than one collector goes with each vehicle, and the length of stops is decreased. Lengthy hauls to disposal or transfer points may affect the use of motors in primary collection, but for average conditions, the horse, either with cart or wagon and team, seems best adapted for this purpose and is most extensively used.

(d) Private or Municipal Collection.

Collection by contract is frequently adopted by the smaller municipalities. The larger cities generally have their own department for this work, and are better able to exert proper supervision and care in carrying it out. In many

cases private collectors are permitted to collect from certain sections of the municipality. This is a practice from which serious complaints frequently arise, as these people are inclined to take only that part of the refuse which will be useful for their purpose. In every instance where collection is made by contract or privately, definite specifications should be drawn up and enforced by the local authorities to protect the interests of the householder.

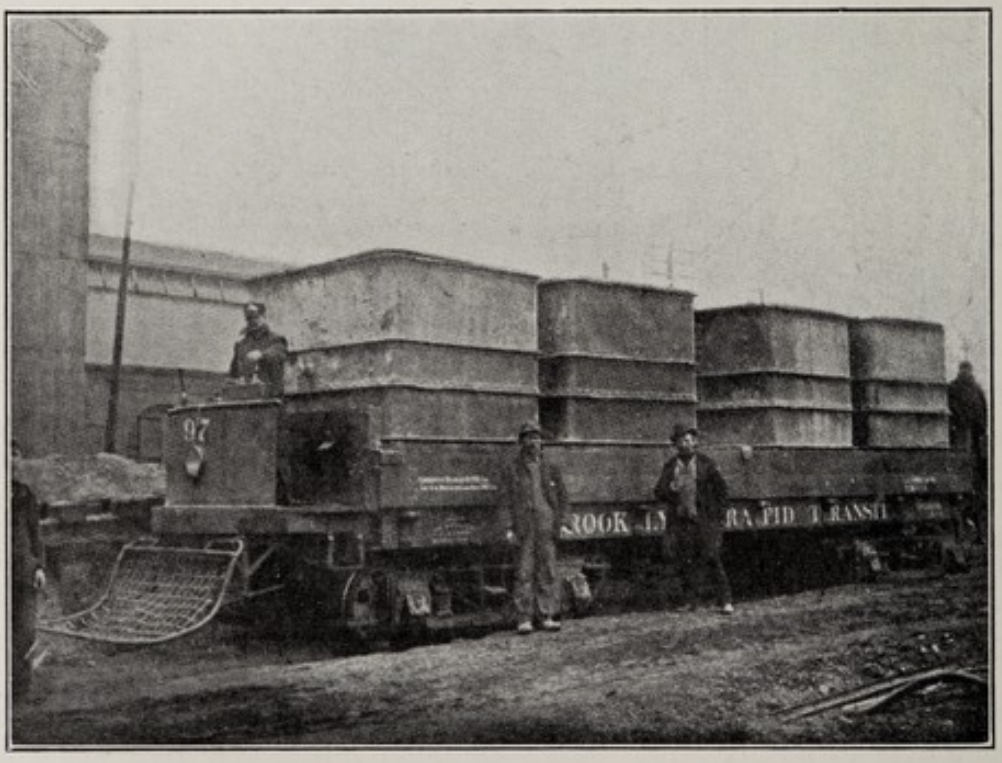
(e) Supplemental Transportation.

In small municipalities the amount of refuse produced and the distance to the point of final disposal, seldom warrants the use of supplementary transportation methods. In larger communities, however, too much time would be lost in having the slow moving collecting vehicles transport the refuse over long routes. As municipalities grow, central sites for disposal works become scarce and hauls are consequently increased. Where the material is disposed of by feeding to hogs or by reduction, there is little opportunity of utilizing several disposal plants centrally located in the one municipality and greater transportation distances become necessary.

Under these conditions the common practice is to have the garbage collected in horse-drawn wagons or carts and brought to a relay, transfer, or loading station. The four principal methods of supplemental transportation in use are:

(1) Boat.
(2) Steam railroad.
(3) Trolley car.
(4) Motor truck or motor trailers.

Boats or barges are confined to a disposal at sea or on the Great Lakes, where the material is dumped from ten to fifteen miles from shore. Deck scows are used for transporting garbage short distances over water routes to reduction works or other disposal sites.



Supplemental transportation by steel bins on trolley cars.

Steam railroad transportation is used to a large extent at present. Three special types of cars are built for the purpose. Garbage may either be dumped into metal tanks on cars, or the entire wagon bodies be taken to the disposal works on flat cars. Mixed refuse is transported in standard freight cars of the "gondola" type.

Three kinds of trolley cars have been used successfully:

(a) Flat cars upon which are carried large steel bins containing the refuse. The bins are loaded by means of travelling cranes.
(b) Side-dumping cars for trailer service.
(c) Triple-body steel dump cars—rocker type. These are made up of three bodies independent of each other and arranged to dump on either side.

Motor driven vehicles have been used extensively in the transportation of refuse, either by large trucks into which the refuse is loaded from the collection wagon, or by a number of trailers drawn by one tractor. Horses convey the wagons to the transfer station, where the shafts are removed and the wagon attached to the rear of the truck for conveyance to the point of final disposal.

Supplemental transportation by motor trailers.

(f) The Cost of Collection.

The collection of refuse materials is very frequently the most important and costly single element in the entire refuse problem. There is therefore great need for effective organization, proper equipment, and economical methods in this branch of the work. The unit costs of collection in the different municipalities vary a great deal. This, however, is not surprising when one considers the wide variation in the methods of collection, frequency of collection, density of population, and all the other factors which enter into the problem. To estimate the probable cost of any collection system on a large scale requires careful study of these different factors. Table No. 6 is inserted as a guide to the present day cost of collection in some of the Ontario municipalities.

TABLE

REFUSE COLLECTION DATA FROM ONTARIO

Municipality	Population	Number of Houses	No. of Collections per Week		Collection Equipment		Capacity of Equipment in Cu. Yds.	
			Summer	Winter	Wagons	Carts	Wagons	Carts
Belleville	12,243	3,500	2	2	3	1	2–3	1.5
Brantford	32,786	6,500	1	1	8	..	5	..
Brockville	9,254	....	2	2	..	1–2	..	1
Chatham	15,100	4,000	1	1	3–4	..	1	..
Cobalt	4,610	....	1	1	1	..	4½	..
Dundas	5,054	800	1	1	2	..	2.5	..
Dunnville	3,509	700	2	2	1	..	3	..
Ford City	5,800	400	2	2	1	..	2	..
Fort Frances	3,600	....	....	..	..	..	..	..
Fort William	20,541	6,000	1	1	3	..	3.5	..
Galt	13,092	3,200	1	1	..	2–3	..	2
Goderich	4,287	....	2	..	..	..	..	..
Guelph	18,000	4,340	1	1	4	..	4	..
Hamilton	120,234	....	1	1	20	..	4	..
Iroquois Falls	2,000	225	3	3	1	..	..	..
Kingston	22,000	5,000	2	2	..	7	..	5
Kingsville	1,827	510	2	1	1	..	..	..
Kitchener	23,571	5,778	1	1	8	..	4	..
London	54,144	13,741	2	1	9	8	4–5	2.5
Mimico	4,187	750	1	1	2	..	3	..
New Toronto	3,128	789	1	1	..	2	..	1.25
Niagara Falls	15,895	3,800	1	1	4	..	6	..
Niagara-on-the-Lake	1,640	550	3	..	1	..	2	..
North Bay	10,924	....	2	2	1	..	..	..
Oakville	3,566	....	2	2	1	..	2	..
Oshawa	12,246	2,700	1	1	2–3	..	1.5–2	..
Ottawa	116,205	30,000	1	1	10	6	7	3
Owen Sound	12,013	....	1	1	..	..	1.5	..
Paris	4,346	750	1	1	1	..	..	..
Peterboro	21,605	5,000	2	2	5	..	4.5	..
Port Arthur	15,201	3,300	2	2	3	..	4–6	..
Port Colborne	2,956	....	1	1	..	..	..	..
Port Dalhousie	1,424	....	Once a month	..	..	..	..	..
Sandwich	4,153	1,250	2	1	..	2	..	2
Sarnia	15,176	3,000	1	1	..	6	..	..
Sault Ste. Marie	23,039	3,500	1	1	1	3	2	2
Smooth Rock Falls	800	140	2	2	1	..	7	..
St. Catharines	21,194	4,883	2	1	5	..	6	..
Stratford	18,500	4,300	2	1	1	5	3	1.5
St. Thomas	17,850	....	1	1	0	5	4.5	..
Sudbury	9,076	1,350	1	1	1	1	6	1.5
Thorold	5,514	1,350	3	3	0	1	..	1.5
Tillsonburg	3,021	800	1	1	1	..	..	..
Timmins	10,000	1,200	2	Once in 2 weeks	2	..	3	..
Toronto	538,771	97,716	2	2	..	385	4	1¾
Walkerviile	7,303	1,500	2	2	1	..	2.5	..
Welland	9,356	8,640	1	1	2	..	..	..
Weston	3,104	800	1	1	..	1	..	2
Woodstock	10,333	....	1	1	..	3	..	2.25

No. 6

MUNICIPALITIES FOR THE YEAR 1922

No. of Cans emptied in one day by one Man	Collections made by	Total Annual Cost	Per Capita Cost	Cost per Residence	Method of Disposal
....	Contractor	$6,200.00	$0.51	$1.77	Dumps
125	City	32,000.00	0.98	4.93	Dumps and Fills
....	Town	3,300.00	0.36	....	Hog Feeding
250	Contractor	7,000.00	0.46	1.75	Incineration
25	Contractor	7,842.62	1.70	....	Incineration
75	do	Paid directly	by Household	er.	Dumps
200	do	1,080.00	0.21	1.35	do
190	do	.....	....	....	Incineration
....	.....	1,230.70	0.34	....	Incineration
....	do	7,250.00	0.35	1.21	do
....	City	7,000.00	0.53	2.19	Dumps
....	Contractor	.....	....	1.50 per month	do
200	Contractor	13,755.88	0.76	3.18	do
150	City	72,000.00	0.60	....	Fill
75	Town	3,000.00	1.50	13.30	Incineration
125	Contractor	9,000.00	0.41	1.80	do
....	Town	150.00	0.08	0.29	Dumps
115	Contractor	12,800.00	0.54	2.22	Incineration
300	City	60,000.00	1.10	4.35	do
300	Town	5,500.00	1.31	7.35	Incineration
200	Town	5,769.00	1.85	7.30	do
210	City	14,305.00	0.90	3.80	do
....	Contractor	700.00	0.43	1.27	Dumps
120	Contractor	Paid directly	by Household	er.	do
....	Contractor	2,756.00	0.77	....	do
360	do	6,700.00	0.55	2.48	do
250	City	95,000.00	0.82	3.16	do
100	Contractor	5,700.00	0.47	....	do
....	do	1,200.00	0.28	1.60	do
200	do	9,000.00	0.42	1.80	Incineration
150	City	11,380.00	0.75	3.46	Dumps
....	Contractor	4,200.00	1.42	....	do
....	Contractor	225.00	0.16	....	Dumps
180	do	2,300.00	0.55	1.84	do
85	do	10,000.00	0.66	3.33	Incin. and Feeding
200	City	5,200.00	0.22	1.48	Incineration
140	Contractor	720.00	0.90	5.14	Incineration
....	do	26,600.00	1.26	5.45	Dumps
120	do	14,000.00	0.76	3.25	Incineration
300	do	12,000.00	0.67	....	Dumps
270	Contractor	4,200.00	0.46	3.10	Incineration
400	Town	1,800.00	0.33	1.33	Dumps
50	Contractor	2,000.00	0.66	2.50	Burial
....	Contractor	8,225.00	0.82	6.85	Incineration
....	City	831,000.00	1.54	8.51	Incin. and Dumps
....	Town	.....	....	....	Incineration
330	Contractor	4,500.00	0.48	5.20	Dumps
....	Town	2,010.00	0.65	2.52	do
300	Contractor	5,200.00	0.50	....	do

5.—METHODS OF DISPOSAL.

Final disposition, utilization, or destruction of the refuse materials from a community should satisfy two important requirements:

(1) It must be sanitary and not create a nuisance or a menace to health.
(2) It should be as economical as possible consistent with sanitary results.

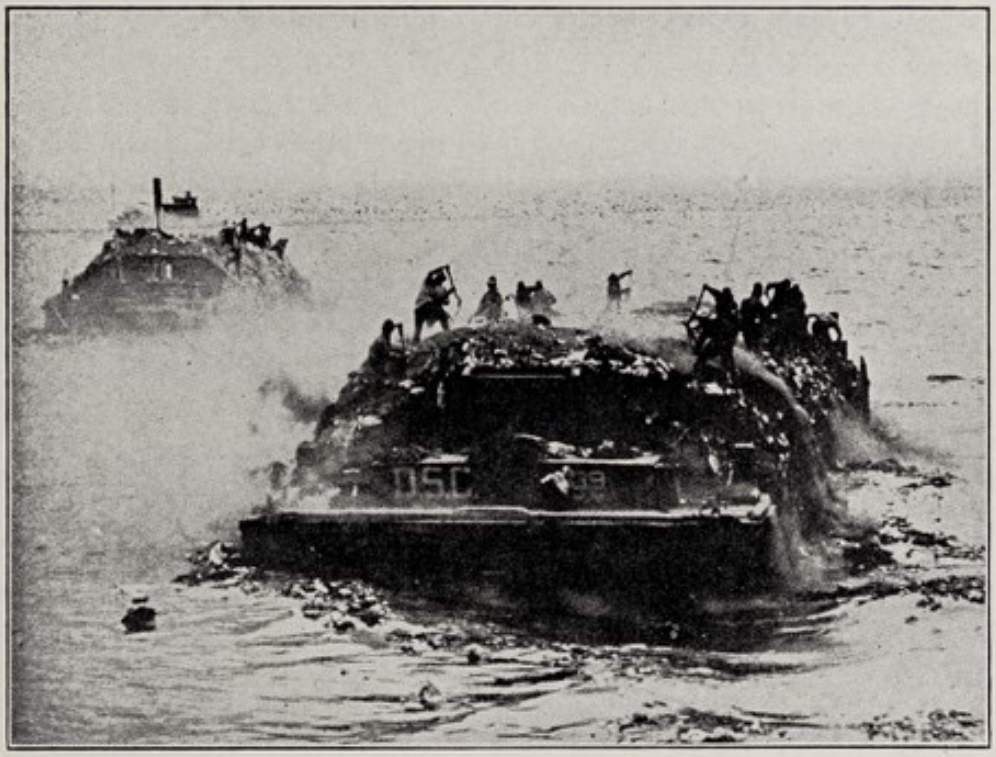
Disposal of refuse frequently has an indirect effect on public health produced through the agency of flies, mosquitoes, rats, and probably other causes. Simple methods may be sufficient for the small municipality but as the population increases, and the area becomes congested, a more adequate treatment is essential. Several methods of disposal have, from time to time, been tried out by various municipalities. The success of any particular one depends largely on local conditions. These different methods which have been developed to any appreciable extent are as follows:

(a) Dumping into large bodies of water.
(b) Dumping on land.
(c) Disposal by sanitary fill.
(d) Burial.
(e) Plowing into soil.
(f) Feeding to swine.
(g) Reduction.
(h) Sorting.
(i) Incineration.
(j) Grinding.
(k) Becarri process.

The choice of any particular one of these methods is usually made with a view to fulfilling certain requirements or conditions which exist in the municipality. The small town is by necessity more interested in those methods which require only a small financial expenditure. Following an increase in population, these earlier systems may be abandoned, without loss, in favour of more serviceable works. Some of these larger municipalities are most anxious to have the disposal costs offset to some extent by the recovery or utilization of the valuable constituents. They select either hog-farming or reduction. Others choose incineration with a view to procuring most sanitary results with the minimum of trouble, and with a possibility of using the heat produced.

(a) *Dumping into Large Bodies of Water.*

This method of disposal has been practised to an appreciable extent in the past by those municipalities situated on the shores of large bodies of water, but its use is now becoming more and more restricted. It is a method which utilizes the natural agencies of purification in large bodies of water. The refuse is collected and delivered to a wharf where it is loaded on scows, and sent out to sea, frequently as far as ten to fifteen miles. Unfortunately in this method the least harmful material sinks while the foulest floats, and is eventually scattered along the beach unless the scows are sent so far to sea as to make the procedure impracticable for all weather conditions and at a reasonable cost. This practice is particularly objectionable where the material is washed back to bathing beaches, or to those areas from which drinking water supplies are obtained.



Garbage disposal at sea.

Refuse washed up on the beach as a result of dumping in the water.

(b) *Dumping on Land.*

The disposal of refuse by dumping is a practice which has been followed for many years and probably will always be used for some classes of wastes. Mixed refuse from small municipalities is very frequently deposited on dumps until a more expensive and more serviceable method can be financed. In cities, street sweepings, building excavation, rubbish, and ashes are generally, in part at least, disposed of in this way. The promiscuous dumping of all classes of refuse on low or waste land without any attention is a most objectionable one, and almost certain to produce offence to nearby dwellings. Solid inoffensive materials can be placed on dumps without objection, but when rubbish or combustible matter is included there is an additional danger of fires smouldering for lengthy periods.

The success of the dumping method depends almost entirely upon the care given to the dumps. Without continuous attention, they cannot be used satisfactorily in built-up districts. Where garbage and other organic materials are left exposed, decomposition results with the production of odours and the attraction of flies.

Refuse dumps with proper handling can be made entirely free from nuisance, and will provide a very economical disposal, as well as a means for reclaiming and beautifying much waste land. Unless care is used, however, these dumps may become a serious source of annoyance.

The following set of rules is suggested for the care of dumps:—

(1) The deposit to be made in layers not exceeding 6 feet in depth; and not more than 50 square yards to be left uncovered at any one time.

(2) Each layer to be covered on all surfaces exposed to the air, with at least nine inches of ashes, earth or other suitable substance. Each covered layer should be allowed to settle before another is applied.

(3) No refuse to be left uncovered for more than seventy-two hours from the time of deposit.

(4) If the material deposited at any one time consists entirely of fish, animal, or other organic refuse it must be covered forthwith with earth or other suitable substance at least two feet in depth.

(5) A fly larvicide to be kept on hand, and all maggots destroyed before the pile is covered.

(6) No refuse to be allowed to be scattered, but must be kept as compact and tidy as possible.

(7) No scavenging to be allowed at the dump, except by municipal employees.

Sufficient competent labour should be provided by the municipality to enable these rules to be carried out. A good arrangement is to have the work done under the direction of the town foreman, or other municipal official, whose duty it will be to arrange for the hauling and storage of earth and ashes as a covering for the dump. The approaches to the dump or fill should be kept in good condition by the use of ties and old timbers so that wagons with earth from building operations may readily enter and discharge their loads in the most convenient place for covering the exposed refuse.

(c) *Disposal by Sanitary Fill.*

This method is a development of dumping. The refuse is used for filling up low areas, and a sufficient quantity of inorganic materials is mixed with the garbage to insure a thorough digestion without the production of offensive

odours. In this way much valuable land can be reclaimed, and by selecting sites at convenient points in the municipality, the length of haul may be greatly reduced, with a corresponding decrease in cost. The success of these fills, like that of the dumps, depends very largely on the care which is given them. Some official should be in charge to see that the organic materials are thoroughly mixed and covered.

A well-kept sanitary refuse fill.

(d) *Burial.*

Shallow burial in the soil constitutes a fully sanitary and adequate method of disposal. This process is confined largely to manure, night soil, and garbage. The other materials are too bulky and can be disposed of more easily by other methods. The success of this practice depends on the aerobic bacterial decomposition in the soil, and the material should therefore be covered only with a

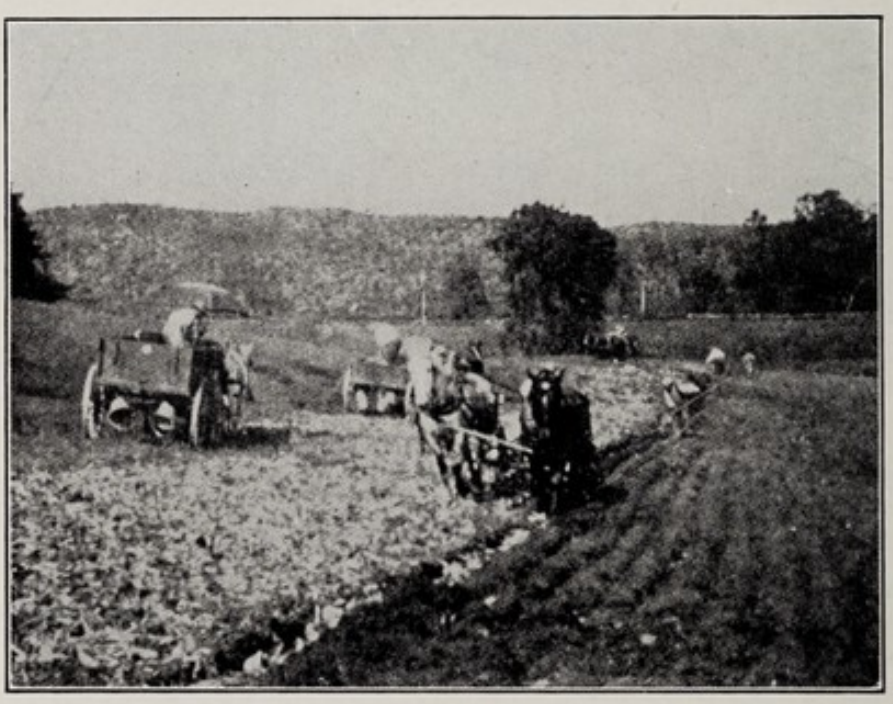
Garbage disposal by burial.

light layer—about six inches. The depth of garbage or refuse should not be too great for penetration by the bacteria—six to eight inches is sufficient. An open sandy soil is best adapted for this purpose; it decomposes the material more rapidly and can be re-used probably at the end of a year, while heavy clay soil, where the winters are severe, will not recover for about four years.

Burial in the soil is quite a successful disposal for night soil, and is used a good deal where the quantities are not large. For garbage and mixed refuse, however, the method is not used extensively, due no doubt to the difficulty in securing land for the purpose, and the amount of work involved in the operation. The material does not act as a good fertilizer. Care should be exercised in selecting a site for burial of this material that there be no drainage from the area into any water supply or wells used for domestic purposes.

(e) *Plowing into Soil.*

This method is quite similar to burial except that the refuse is spread in a thin layer over the ground and plowed in at intervals. A good deal of the



Refuse disposal by plowing into the soil.

material is normally not covered by the process, and may be blown about by the wind. It has not a wide application at present.

(f) *Feeding to Swine.*

There is in practically all household garbage some food value. With a view to utilizing this as far as possible, hog feeding has been practised in the United States for a number of years, not only in the smaller communities but in some of the largest cities. The present practice may be divided into the following groups:

(1) Collection of garbage by the municipality and delivery to contractors operating hog farms.
(2) Collection and disposal both by contractor.
(3) Collection and disposal by the municipality in which case the farm is operated by the city.
(4) Collection and disposal of the garbage by a large number of farmers.

Requirements for Hog Feeding.

The successful feeding of garbage to hogs is dependent upon certain requirements. One of these is that the garbage must be fresh and free from other refuse. This involves care in the house treatment in order to avoid including with the garbage materials of no food value to the hogs. The use of this food while fresh will require a more frequent collection especially during the warm weather. It is quite essential that the garbage be fed to hogs in summer within fifty or sixty hours after it is produced, or fermentation will have gone too far. Where the householders have been sufficiently instructed to properly separate the garbage from other wastes, and the hauls are not excessive, this method may be an economical one to the municipality in that the collection costs are considerably reduced by the profits from the hog farm. Difficulties are however, encountered in excluding from the garbage all foreign material except at hotels, restaurants, and boarding houses.

One of the chief reasons why this method of disposal has not been practiced on a larger scale is due to the susceptibility of hogs to such diseases as cholera, pneumonia, foot and mouth disease, and other infections which may be transferred through the agency of garbage. Sterilization of this food by cooking has been tried in some cases but does not appear to be very successful, due probably to the formation of certain organic acids which react unfavourably on the stomach of the hog. Cooking also increases the cost and makes the procedure more involved.

Diseases.

The susceptibility of the hogs to these infectious diseases can be greatly reduced by proper care and treatment.

Cholera.

Hog cholera can be largely controlled by vaccination. This is accomplished in different ways—either by the use of a virus or a serum or by both. The virus is essentially the blood of a hog actively suffering from cholera. When a small amount of this is inoculated into a healthy unimmunized hog, a slight attack of the disease occurs and antitoxins are produced. The serum is prepared from the blood of a hog which has received an inoculation of the virus. The serum alone will produce only temporary immunity because in itself it does not stimulate the organism to produce antitoxins. The common practice is therefore to treat the hogs with both virus and serum, which must be of good quality to be effective. This inoculation is made when the pigs are between four and ten weeks old.

Pneumonia.

Hogs die from pneumonia largely as a result of improper housing and protection against inclement weather.

Foot and Mouth Disease.

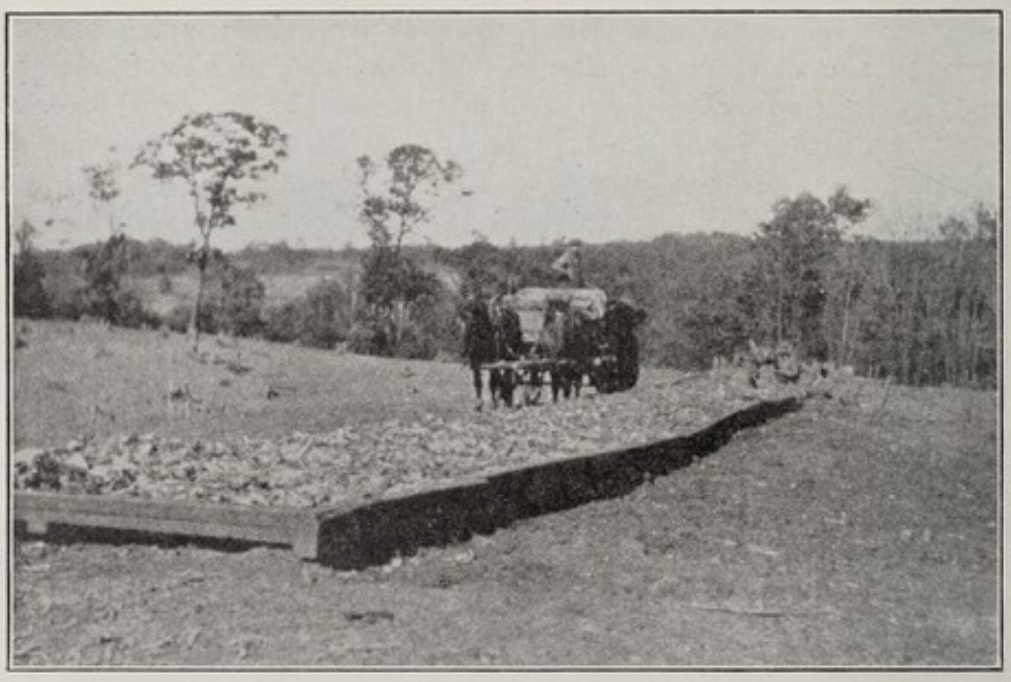
The foot and mouth disease has always been greatly feared in hog farming and as yet no remedy appears to be known. When this breaks out there is but one procedure available, namely, the destruction of the entire number, at not only a serious financial loss, but a grave interruption to the method of disposal.

Results of Practice.

The operation of piggeries in the United States on a large scale for a number of years, has resulted in the tabulation of a good deal of data in regard to the most successful methods—these are as follows:

(1) *Location of Farm.*

The pig farm should be located on soil that drains readily, preferably sandy or gravelly, and where possible, rolling. The pig houses should be located and so constructed as to permit of warmth in winter and coolness in summer. Plenty of good quality water should be available always. Where hogs are fed out of doors, the size of the farm should be sufficient to allow not more than fifty pigs per acre. When under cover this number can be increased to from four hundred to six hundred per acre.



Garbage platform for hog-feeding.

(2) *Methods of Feeding.*

Two different feeding methods are in use. The first is by feeding-lots where the garbage is deposited on platforms which can be moved from place to place. The hogs are not allowed to enter the lots until the garbage has been placed on the platforms. The material remaining after feeding is cleaned up and the ground is plowed at certain intervals.

The other method is to have feeding platforms near the railroad tracks or point of delivery and the hogs are brought to these at meal hours.

(3) *Quality of Pork.*

There is frequently some skepticism in regard to the quality of garbage-fed pork, but expert opinions seem to agree that this quality is in no way inferior to grain-fed pork. The packers do not differentiate between the two in regard to the price paid and medical experts have declared that no diseases are contracted as a result of using this meat.

(4) *Gain in Weight and Number of Animals Required.*

Numerous experiments indicate that a gain of about a pound per day can be expected of a growing hog. At Worcester, it has been found that about one hundred to one hundred and fifty pigs will consume one ton of garbage per day. This gives a gain of one pound in weight for every thirteen to twenty pounds of garbage. In other places, thirty-two to thirty-seven pounds of garbage were required to produce a gain of one pound. Hotel garbage has higher food value and less is required to give a similar gain in weight.

(5) *Price Paid for Garbage.*

Various forms of agreement are made between the hog-farm contractors and municipalities. Some pay the city a definite price per ton of garbage delivered. Others pay an amount proportionate to the profits derived from the sale of hogs. Contractors are not, as a rule, inclined to pay more than $1.00 per ton of garbage delivered. Such a figure is, in comparison with the expense for other methods of disposal, quite a favourable one. Table No. 7 gives the prices paid to a number of municipalities for garbage.

TABLE NO. 7

PRICES PAID TO CITIES FOR GARBAGE DELIVERED TO HOG FARMS

City	Year	Average tons of garbage delivered daily	Payment per ton at place of delivery
Minneapolis	1918	..	$1.26
Grand Rapids	1917	..	0.45
Portland	1918	..	3.90
Newark	1920	..	1.20
St. Paul	1917	..	1.95
Anderson	1917	..	1.00
Baltimore	1920	33	0.52
Buffalo	1920	60	0.50 to 0.90
Akron	1920	47	1.00
Highland Park	1920	15	0.45

(g) *Reduction of Garbage.*

The reduction process is applicable only for garbage and dead animals. The chief advantage in the use of this method rests in the recovery of valuable by-products—grease and tankage. The procedure involves a breaking up of the garbage by the application of heat and mechanical agitation, so that those constituents of any marketable value may be recovered. By this method the material under treatment is separated into four main constituents, viz.: volatile matter (driven off as gas), water, grease, and tankage. The volatile matter contains foul smelling gases, which, if allowed to escape, will produce a serious nuisance. The reclaimed garbage grease is used in the manufacture of soap, candles, glycerine, etc., and has been selling at from three to ten cents per pound. The resultant tankage is used as a filler or base for certain fertilizers and sells at from $5.00 to $10.00 per ton according to its ammonia content.

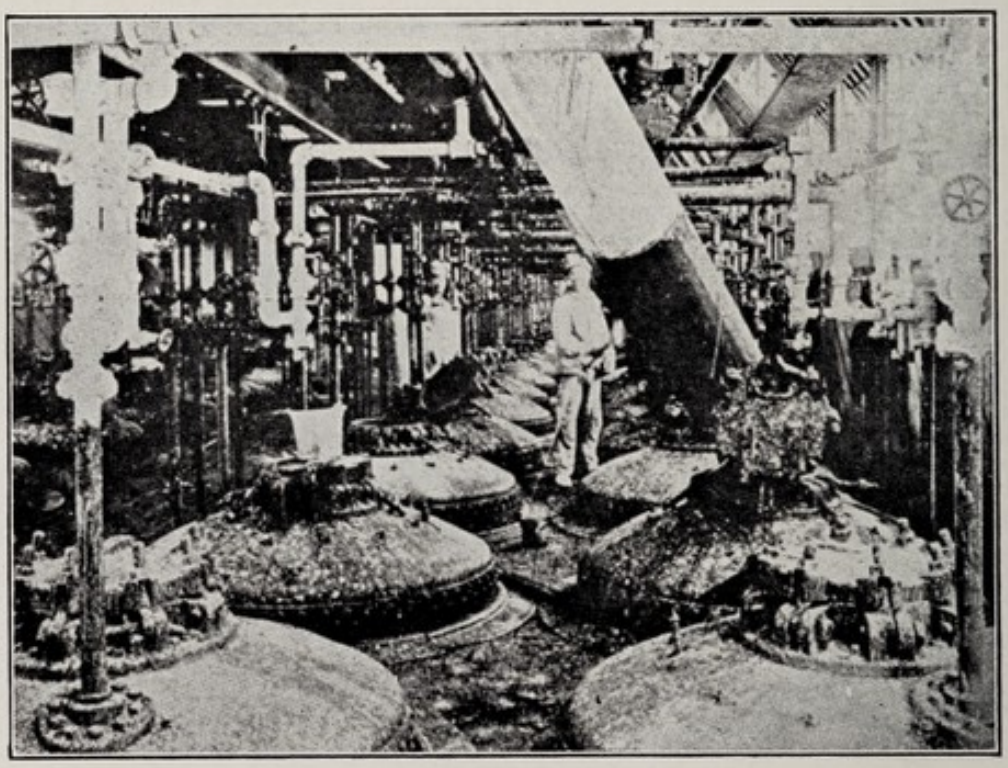
The necessity for expensive machinery and skilful operation, as well as the risks involved, have generally discriminated against the adoption of the process in cities having a population less than 100,000. It has, however, been

used with evident financial success in many of the larger places. Present day reduction processes may be divided into two classes:

(1) The drying method.
(2) The cooking method.

The drying method consists of crushing or grinding the garbage and passing it through direct heat driers to drive off the moisture and break down the cells. The dry solids are then placed in extractor tanks, and the grease recovered by percolation, using gasoline as a solvent.

The cooking method consists in first placing the garbage in digester tanks, where it is thoroughly cooked. The free grease and moisture is then extracted by pressure. The solids from the presses are dried, and in modern plants this dried tankage is percolated to recover any grease which has not been extracted by the presses.



Garbage digesters for use in the reduction process.

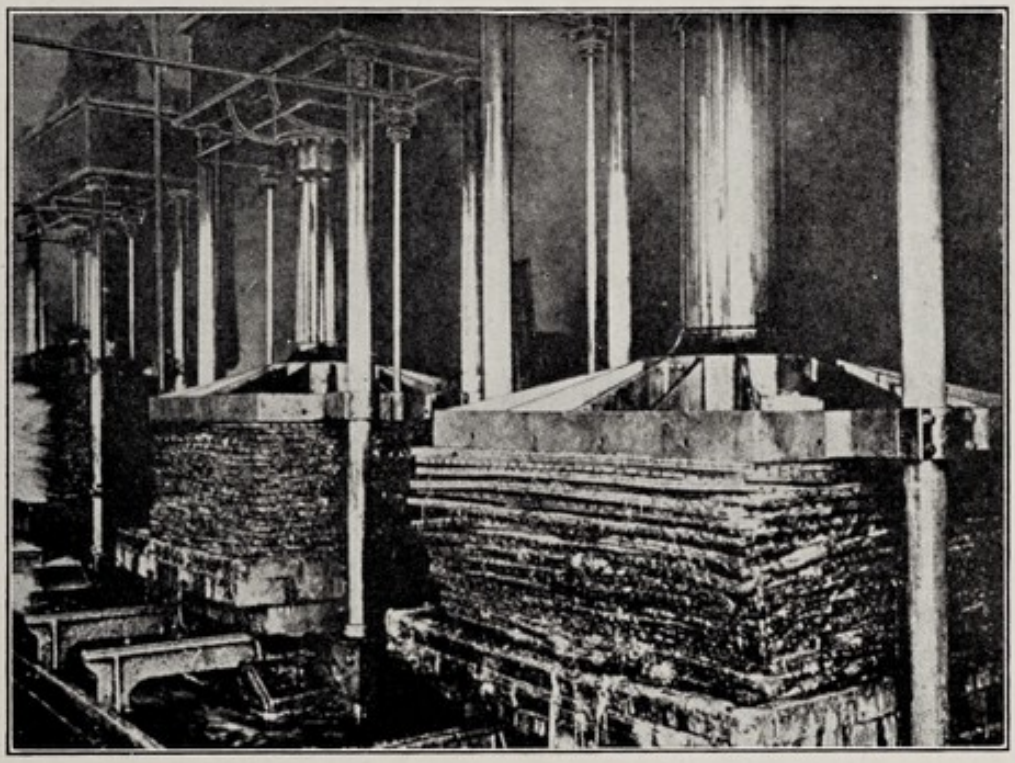
The location of a reduction plant is of first importance because of the possibility of the escape of objectionable odours. The odours resulting from the process must either be completely destroyed or the plant put in an area so remote as to cause no objection. Increased distances from the centres of population with transfer stations and supplementary transportation facilities, considerably augment the total cost of operation.

Reductive Processes.

Since the introduction to America in 1886 of reduction processes, many different types have been used. Some of these are as follows:

(1) Merz.
(2) Simonin.
(3) Arnold.
(4) Holthaus.
(5) Chamberlain.
(6) Wiselogel.
(7) Edson.
(8) Cobwell.

The Cobwell process invented by Raymond Wells is the most recent development in garbage reduction. A 1,500 ton-per-day capacity plant of this type is used for the reduction of New York's garbage. The material is fed in a thin even layer to picking conveyors where all glass, crockery, cans, and other substances which might clog the machinery are removed by men working on both sides of the conveyor. The garbage is then fed directly to the reducers. These are made of cylindrical steel sheets whose height is about one-half the diameter. The bottom and sides of a reducer are double jacketed and so arranged that live steam, at about one hundred pounds pressure, can be admitted to the jacket without coming in contact with the material in the centre. Stirring paddles work in the centre compartment. Each reducer in the New York plant has a capacity of about five tons of garbage.



Pressing the grease from cooked garbage.

After the reducer is filled the charging door is clamped down and a solvent admitted until the mass is just covered. The steam is then turned into the steam jacket or outer compartment and the agitators started. The vapours from the garbage are carried to a condenser where the solvent is separated for further use. Cooking is continued until the material is completely dehydrated. This requires ordinarily about seven hours. The solvent and grease from the garbage is then drawn off through the bottom of the reducer to a still or treating tank from which the solvent is recovered by distillation. Three washings of the cooked garbage with solvent are usually required. The solvent in the grease is finally vaporized in steel tanks and the grease is left as residue to be drawn off to storage.

The mass left in the reducers is known as "tankage". It is discharged uniformly to a belt conveyor for transportation to the tankage house. During transportation the tankage is picked and screened after which it is taken to dry-grinding pans. From here it is re-screened and transferred to the storage-house ready for shipment.

PRODUCTS.

(1) *Grease.*

The most valuable product derived from the process is the grease. Ordinary garbage is considered to contain from 2 to 3 per cent. by weight of grease. During the war this figure was considerably lower on account of the greater saving by the public.

(2) *Tankage.*

Tankage is the second by-product of the process for which there is usually a fair market. The average amount which can be produced from garbage ranges from 10 to 20 per cent. by weight. Table No. 8 gives the percentage recovery of grease and tankage from two plants over a period of years.

TABLE NO. 8

REDUCTION PLANT RECORDS

Year	Recovery of By-products in per cent. of Total Garbage			
	Cleveland		Columbus	
	Grease	Tankage	Grease	Tankage
1905	2.63	....	....	....
1906	3.07	....	....	....
1907	3.14	....	....	....
1908	3.46	9.2	....	....
1909	3.70	11.3	....	....
1910	3.75	13.2	....	....
1911	3.53	12.8	1.85	12.9
1912	3.38	11.5	2.72	11.6
1913	3.13	9.7	2.72	10.5
1914	2.95	10.5	2.73	9.7
1915	2.81	10.4	2.21	10.0
1916	3.06	11.2	3.08	10.3
1917	2.73	11.3	2.26	10.21
1918	2.36	11.0	2.16	10.26

Wastes.

Wastes from the reduction process are in the form of solids, liquids, and gases, all of which are capable of creating nuisances. The gases are the most objectionable. The satisfactory operation of such a plant depends very largely on the method of handling these wastes. The gases which dissolve in water may be taken care of in this way, while the present day procedure is to deodorize the insoluble gases by oxidation in a hot fire.

In the Cobwell process no insoluble gases are created because the garbage is not decomposed as in other systems. This factor is one of the chief advantages of the method. Reduction plants as a rule are not free from odours, and about half of the reduction works in America have been abandoned because of these offensive gases and vapours. Experts have testified, however, that while gases are given off from all reduction plants, the Cobwell system is much superior to those of earlier design.

The field of usefulness for the reduction process appears rather to be on the decline than the increase. The greater conservancy and waste prevention in the older European countries has always influenced against its adoption

there. The financial conditions in America may, in the near future, so curb the wastefulness of the people as to materially reduce the profits from grease extraction unless improved or new methods of lower cost are forthcoming.

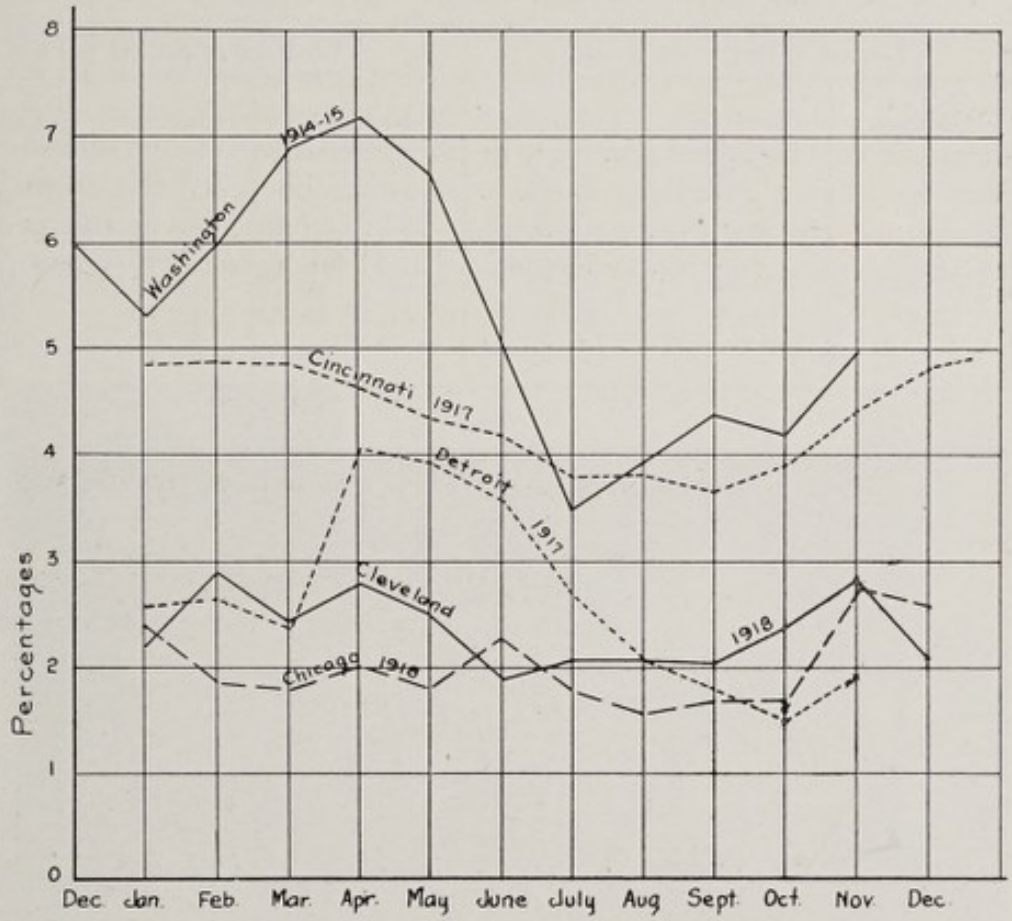


DIAGRAM NO. 2

Average monthly percentages of grease in raw garbage in some American cities.

Costs of Garbage Reduction.

The relatively small number of reduction plants in operation makes it somewhat difficult to obtain reasonably sound cost data. Many of the present plants are operated by contractors who pay the city an agreed price per ton of garbage delivered to the works. The cost figures for the operation of these plants are not only difficult to obtain, but cannot well be compared with city, owned works. Table No. 9 gives the cost of reduction over a period of years

TABLE NO. 9

COST PER TON FOR GARBAGE REDUCTION

City	Cost per ton of Garbage								
	1912	1913	1914	1915	1916	1917	1918	1919	1920
Cleveland.....	$1.97	$2.00	$....	$2.04	$....	$3.18	$4.40	$....	$....
Columbus.....	....	1.90	1.86	1.94	2.21	4.19	5.47	5.19	5.54

for two representative city-owned plants in the United States, while Table No. 10 sets forth the prices received for the by-products.

TABLE No. 10

MARKET PRICE OF GREASE AND TANKAGE FROM GARBAGE

Year	Grease in cents per pound			Tankage in dollars per ton		
	Chicago	Cleveland	Columbus	Chicago	Cleveland	Columbus
1913....	....	4.26	3.75	....	6.00	6.79
1914....	....	4.17	4.33	....	6.75	7.41
1915....	....	4.41	3.76	....	8.75	7.00
1916....	7.29	6.50	5.16	4.16	7.75	7.84
1917....	7.34	8.00	7.50	4.16 to 10.27	9.58	10.85
1918....	11.57	13.50	11.75	10.27 to 16.85	18.50	19.80
1919....	....	5.0 to 7.6	6.72	....	10.00	15.65

Refuse sorting.

(*h*) *Sorting.*

Sorting of refuse is a method of disposal which is frequently used in conjunction with some other process. The salable materials are picked out and marketed, while the remainder is disposed of by incineration or some other means. The practice of this method makes for economy. It should, however, be at all times under the supervision of some competent person and not be permitted by all who choose. To allow to the public the privilege of picking over the discarded refuse entails insanitary results, and the possibility of the spread of disease.

A well developed system of sorting requires suitable buildings provided with conveyors and up-to-date machinery. A desirable location requires proximity to a railroad station in order to facilitate shipping. All rubbish should be delivered to the plant in as dry and clean a condition as practicable.

Where the amount is large sufficient provision must be made for storage. The present day practice is for the collecting wagons to dump their load on to a platform from which the material is raked by hand to a sorting conveyor. Sorting platforms on which pickers stand are provided on either sides of the conveyors. All materials of any value are removed from the rubbish as it passes along these conveyors in thin layers. The picked materials are dropped into separate bins and later prepared for sale. The disposal of tin cans from sorting mills is always a serious problem, but pressing them into small bales appears to be the most convenient form for marketing.

The recovery of waste materials is justified only when the operation is entirely sanitary. In every case all picked materials should be disinfected before they leave the works. For sanitary reasons sorting is not generally favoured nor extensively adopted, but under certain circumstances it may be advisable.

Sorted refuse baled ready for shipment.

(*i*) *Incineration.*

Incineration is one of the various methods of disposal which gives opportunity for a revenue to offset the cost of such treatment. This process has a present day wide application both for small as well as large municipalities. It has been adopted more extensively in Great Britain and Europe than in America. In Europe it may be said to be the invariable practice to utilize the heat from the destruction of mixed refuse, and usually to show a profit over the cost of incineration. In America, where there are excellent opportunities for heat recovery, this source of revenue is almost entirely disregarded. Westmount, Quebec, is one of the few cases where the heat is utilized. Heat recovered from this process is usually applied in the production of steam for some near-by industrial plant or to generate electricity. In addition to actual power production there is a considerable revenue to be derived from the clinker and also from the marketable wastes.

Incineration is particularly advantageous as a means of eliminating the rat problem so frequently encountered in dumps. Where the combustible material in dumps is not burned regularly or properly cared for, these rodents rapidly increase and may result in a serious nuisance as well as spreading disease. Incineration burns their food, and destroys their hiding-places.

The choice of incineration for disposal should be governed largely by two factors:

(1) The absence of objectionable house treatment.

(2) Economics.

Incineration does not require any separation of household wastes—a feature which is greatly favoured by the public. Mixed refuse also necessitates a less frequent collection. Under the economics of the problem must be considered the location of the works, and the possibility of utilizing the heat of combustion. High-temperature destructor plants may be operated in built-up sections of a community without fear of incurring a nuisance. A central location which would materially reduce transportation costs may do much to disfavour the selection of any other method. In addition to this factor there is the value of recovered heat. A high-temperature destructor of a modern type will furnish sufficient waste heat for the evaporation of from one to two pounds of steam per pound of refuse burned, depending on the composition of the materials, in addition to any preheating of air required for the furnace operation. It is generally assumed that three-quarters of a pound of refuse should produce one pound of steam.

Plant Location.

Experts maintain that the waste products from high temperature destruction cause the least objection of any method of disposal. When it becomes advisable to locate such works in built-up sections, care must be exercised that no nuisance results from agencies not directly connected with the treatment. The concentration of loaded collecting wagons on streets adjoining the works waiting to unload, may result in a serious inconvenience as well as transportation difficulties. Rapid unloading facilities with the provision of extensive grounds will overcome this objection. The fly nuisance in the vicinity of such a plant cannot be lightly dismissed. Unless the refuse is well covered during transportation to the destructor, it will attract a large number of flies which eventually gain access to the adjoining houses. The furnaces in which the garbage and refuse are burned can be classified under two general types:

(1) Thos in which the temperature is generally below 1,200° F. and which are technically known as incinerators or crematories.

(2) Those in which a temperature of over 1,200° F., usually 1,400° F., is maintained and technically termed destructors.

The crematories were chiefly developed in America and are sometimes called the American type. They have been designed to destroy the refuse in the cheapest way without considering the odorous fumes which are omitted. In the destructor type complete sanitary results are obtained, and the high temperature of combustion destroys the volatile gases. These require forced draft and special means for maintaining high temperatures.

Design and Construction.

The design of an incinerator plant may be discussed conveniently under the following divisions:

(1) The furnace proper.
(2) Charging apparatus.
(3) Air supply.
(4) Flues and furnace accessories.
(5) Clinker and ash handling.
(6) Dust.
(7) Ventilation.

The design and arrangement of these essential parts of the plant depend on local conditions and the results desired, although the principles of design are somewhat similar for all types of furnaces.

(1) *The Furnace Proper.*

The furnace structure for a mixed refuse incinerator usually has walls of face-brick, backed with common brick and lined with fire-brick. The walls are kept in position, on the outside, by a series of vertical and horizontal channel-iron or I-beam back stays held at the top and bottom by heavy tie-rods. A furnace contains ordinarily from two to six grates with a common combustion chamber. The setting or arrangement of the grate depends on the general design and is partly controlled by the necessity for keeping the grate cool by contact with the forced draft. Preheated air comes to the grate at about 300° F., a temperature which is not high enough to burn out the grate bars.

The area of a grate depends on the character of the refuse, and has been determined largely by practice. A fixed grate ordinarily has an area of from twenty to thirty square feet, and is built up of bars of cast-iron channels. Uniform distribution of the air supply is maintained by spaces about 3/16 of an inch between the bars, and many small perforations. The forced draft air supply is usually introduced through the sides of the ash pit, and up through the grates. The division of the furnace into a number of grates, rather than one, produces a more uniform average fire and a more even heat in the combustion chamber.

Drying Hearth.

Furnaces designed to consume wet material must be provided with a drying hearth and a main grate. The size of furnace required is dependent upon the moisture content of the garbage and the consequent rate of drying. A common design of garbage furnaces provides a sufficient area of drying hearth to accommodate an amount equivalent to one day's collection of garbage. The whole quantity can then be stored within the furnaces and raked by hand on to the main grate as the moisture evaporates. To facilitate stoking and provide drainage the drying hearth is in some designs inclined to the main grate at an angle of 45°. Various types of hearths are employed. One device includes the use of perforated fire-brick arches. These arches must be well constructed to withstand warping caused by the wet refuse above and the intense heat below. Another device consists of a water cooled pipe basket set in a high brick furnace and in which the refuse is dried before dropping on to the grate.

Fire-bricks used in the construction of furnaces should be laid in fire-clay mixed to the consistency of cream. Each brick must be hammered into place to ensure proper contact with the others.

(2) *Charging Apparatus.*

Original furnaces were hand charged through openings in the top, front or back.

Apparatus for mechanically charging the refuse into the furnace from the top, have been successfully used of late. Various mechanical devices have been used at different plants. They are chiefly advantageous in that the charging door need be open for only a short time, and this prevents the inrush of cold air to the furnace, accompanied by a lowering of temperature.

(3) *Air Supply.*

Air must be supplied for the combustion of mixed refuse at a rate of from 4.5 to 6.0 pounds per pound of refuse. A velocity of air in the flues of not more than twenty feet per second and averaging about ten feet per second is desirable. This prevents the burning out of the exposed ironwork.

Five methods of supplying air can be made use of:—

(*a*) Natural or chimney draft.
(*b*) Forced draft by a steam jet set in or near the ash pit.
(*c*) Forced draft by fans or blowers.
(*d*) Induced draft by a steam jet or fan placed at the base of a chimney.
(*e*) Combination of forced and induced draft.

The natural draft is the method adopted most frequently for supplying air to furnaces on account of its simplicity and small comparative cost. As a general rule the velocity of the up-draft in the chimney should not exceed ten feet per second.

Either fans or steam jets are used to produce artificial draft in practically all high temperature destructors. Present practice appears to favour the fan draft. Steam jets are cheaper than fans but they can only be operated by steam.

Induced draft is not used frequently. Combination of this with forced draft increases the capacity of the plant and the flexibility of the furnace to destroy refuse of different characteristics.

Temperature.

The temperature of the air as it reaches the grates is of prime importance. In all modern destructors the air is preheated to a temperature as high as 400° F. The value of preheating consists in reducing the volume of waste heat promoting more efficient combustion and increasing the temperature of the furnace. The temperature of the air must be kept at a point which will not burn out the grate bars, but will be high enough to efficiently aid in combustion.

The air supply may be preheated by any one of several methods: A common procedure is to install a battery of tubes in the outlets from the boiler or the main flue.

The waste gases pass through these tubes while the air is forced around the outside and takes up heat on its way to the ash pits. By this means the rate of transmission of heat from the gases to the air may be as much as 1,000 B.T.U. per hour per square foot of tube surface.

(4) *Flues and Furnace Accessories.*

The flues leading to the chimney should be of ample cross-sectional area to decrease the velocity of the gases as much as possible and so prevent dust being carried in suspension.

The combustion chamber is placed between the grates and the boiler or chimney. It serves to equalize and steady the temperature from the various grates as well as to afford time for complete combustion before the gases reach the comparatively cold boiler or chimney walls. It also serves as a pocket for catching dust.

(5) *Clinker and Ash Handling.*

Clinker and ash remain after the combustion. The clinker is a hard, vitreous mass and may cover the entire grate to a considerable depth. If the door is wide enough it can be removed in one piece, but otherwise it must be broken up. Clinkering is the name given to the process of removing this mass.

It should be done as quickly as possible in order to reduce to a minimum the rush of cold air to the furnace and to lessen the time in which the grate is out of service. Mechanical clinkering not only reduces this time, but makes the operation one of comparative ease. Two different methods known as the "pull" method and the "push" method have been used quite successfully. By these the clinker is removed in one piece and carried away by cranes to be broken up for use.

(6) *Dust.*

Much dust frequently comes from the dumping of the collection wagons, the charging and clinkering of the fires, and the disposal of clinkers. An effective remedy for this is a liberal use of water and the withdrawal of the dusty air from the building by suction of the forced air draft.

(7) *Ventilation.*

The ventilation of the building is closely associated with the dust problem and should be considered primarily with reference to the workmen. Fresh and clean air in large amounts is required for protection from the heat of the furnaces. Plenty of window and roof ventilation usually suffices rather than requiring a mechanical plant.

Incinerator Specifications.

Some of the older specifications and guarantees exacted from contractors were inclined to be too severe and unworkable. The present-day guarantee usually includes the following, or somewhat similar clauses in regard to the prevention of nuisances.

(1) The temperature in the combustion chamber of each furnace shall not fall below 1250°F. for more than three minutes in any one hour.
(2) That the average temperature shall be at least 1400°F.
(3) That the gases of combustion from the chimney shall not be of a degree of darkness or density greater than chart No. 1 of Ringleman's smoke scale.
(4) That the residue of the furnace shall not contain more than 1 per cent. of organic matter exclusive of carbon.
(5) That no dust shall be emitted from the chimney.

Costs of Incineration.

Two incinerators operating in Canada furnish interesting cost data for this process. The Toronto destructor burning garbage and rubbish averaged a total charge of $1.29 per ton of refuse destroyed, 87 cents of which represents the labour cost. In 1919 the total cost per ton at the Westmount, Que., incinerator was $1.28 of which amount 83 cents was for operating charges. Cost figures and other information in regard to Ontario disposal plants are tabulated in Table No. 11.

TABLE

REFUSE DISPOSAL BY INCINERATION IN

Municipality	Population	Furnaces Designed by	Date Installed	Number of Cells	Capacity, Tons Daily
Chatham	15,100	Canadian Incinerator Co.	1922	2	15
Cobalt	4,610	.....	1910	..	10
Ford City	Refuse disposed of in the Walkerville incinerator			.....	.....
Fort Frances	3,600	G. A. Overson	1914	1	2
Fort William	20,451	Ideal Incinerator Co.	1913	3	50
Iroquois Falls	2,000	A. H. Reid & Co.	1919	4	5
Kingston	22,000	G. C. Wright	1915	..	20
Kitchener	23,571	Canadian Incinerator Co.	1915	1	15
London	54,144	Heenan & Froude	1913	3	50
Mimico	Refuse disposed of in the New Toronto incinerator			.....	.....
New Toronto	3,128	A. H. Reid & Co.	1918	6	14
Niagara Falls	15,895	Sparks Incinerator Co.	1919	2	24
Ottawa	116,205	Heenan & Froude	1912	..	75
Peterboro	21,605	A. H. Reid & Co.	1913	..	20
Sarnia	15,176	Jarvis Engineering Co.	1919	2	15
Sault Ste. Marie	23,039	A. H. Reid & Co.	1914	..	..
Smooth Rock Falls	800	N. America Incinerator Co.	1921	..	5
Stratford	18,500	A. H. Reid & Co.	1914	..	20
Sudbury	9,076	Local	1915	1	5
Timmins	10,000	A. H. Reid & Co.	1920	2	20
Toronto	538,771	Canadian Griscom-Russell Co., Limited	1917	12	180
Walkerville	7,303	Canadian Incinerator Co.	1913	1	10

(*j*) GRINDING.

Grinding or broyage, as a method of refuse disposal, was developed in France. It has not yet gained an extended field, especially in America, but has some advantages worthy of consideration. It is more generally applicable to mixed refuse, but may be used for garbage when this is sufficiently dry. Before treatment the larger materials such as bones, glass, iron, etc., are picked out and sold. The remainder is ground between two rotating steel-toothed plates from which it is screened, and delivered to cars for removal. The ground substance has an appearance not unlike leaf mould. It is used as a fertilizer. Analyses have shown the average composition to be as follows:—

Total nitrogen	9.31	parts per 1,000
Total phosphoric acid	7.12	" "
Total potash	5.28	" "
Total lime	54.90	" "

The odour of the final material is quite pronounced when it leaves the works, but this usually disappears in about three weeks. A recent modification of this process is a mixing of the ground refuse with coal dust to form briquettes for which there is a sale as household fuel. The cost of preparing the fertilizer has not permitted of a profitable sale, yet it has reduced the previous cost of disposal.

No. 11

ONTARIO MUNICIPALITIES FOR THE YEAR 1922

Flue Gas Temperature	Kind of Draft	Capital Cost	Annual Operating Costs				Tons Refuse burnt per w'k	Cost per Ton of Refuse
			Labour	Fuel	Capital Charges	Total		
		$ c.	$ c.	$ c.	$ c.	$ c.		$ c.
1,000° F.	Forced	30,000.00	2,000.00	500.00	4,500.00	7,000.00	40–60	3.36–2.24
.....	.....	5,000.00	.....	.....	.....	1,400.00	48	0.56
.....	.....	.....	.....	.....	.....	125.00 per month	.....	.....
.....	.....	2,000.00	1,080.00	200.00	.....	1,280.00	.....	.....
1,000 – 1,800° F.	do	35,000.00	626.46	220.50	4,803.06	11,818.64	150	1.52
.....	Natural	4,500.00	1,200.00	.....	.....	1,200.00	24–30	0.96–0.77
1,200° F.	do	9,950.00	3,426.42	386.04	933.10	5,941.80	150	0.79
.....	Forced	19,500.00	1,500.00	.....	.....	1,700.00	100	0.33
1,700° F.	do	48,705.00	10,019.53	.....	.....	11,800.00	210	1.08
.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	Natural	15,000.00	1,380.00	.....	1,990.00	3,370.00	30	2.16
1,800° F.	Forced	18,700.00	.....	.....	.....	13,500.00	36	0.72
.....	do	34,650.00	.....	.....	.....	.....	.....	.....
.....	Natural	10,000.00	2,197.50	.....	835.82	3,649.60	108	0.65
.....	Forced	34,000.00	2,256.00	2,362.35	4,648.65	9,800.79	24	0.79
.....	Natural	16,000.00	1,165.00	605.00	1,308.23	3,242.14	40–45	1.56–1.38
.....	do	900.00	.....	.....	.....	720.00	.....	.....
600° F.	do	12,000.00	1,600.00	.....	400.00	2,000.00	100	0.38
200° F.	Forced	2,400.00	1,080.00	.....	.....	1,122.12	52	0.41
.....	Natural	18,000.00	1,835.00	1,430.00	1,580.00	4,845.00	75	1.24
1,600-1,800°F.	Forced or natural	225,000.00	.....	.....	.....	70,000.00 to 75,000.00	1,000 to 1,100	1.33
.....	Forced	20,200.00	1,620.00	223.92	2,102.38	4,000.00	60	1.28

(*k*) The Becarri Process.

This method has not had any extensive adoption on this continent as yet, but in Europe there is a plant at Florence which deals with the mixed refuse of about 100,000 population, as well as some stable manure. The principle involved here is storage of the refuse in bins to allow natural rotting to take place, and to increase the fertilizing value of the material. The refuse is first freed of most of the heavy debris or rubbish by hand picking. At Florence there are 154 concrete cells approximately cubical in form and each of about 20 cubic meters capacity. Each is provided with a ventilating tower in which are trays of earth and sulphate of iron. At the bottom are grids over channels leading to a sump, and in each corner is a vertical air duct with outside connections and also with inside connections with several fillets which extend horizontally around the inner walls of the cells.

The sorted refuse is placed in a cell, wet with water if need be, and allowed to ferment for about 45 days, including the cooling period. The contents of the cells become quite hot and resemble farmyard manure in the process of rotting. The final product resembles humus, and the coarser particles are screened out. It is said to be a good fertilizer and to sell for about ten times the price of stable manure rotted in open pits. The plant appears to be free from odours and flies, both in the cells and in the screening shed.

6.—DISPOSAL OF MISCELLANEOUS REFUSE

Every municipality is confronted with a problem in the disposal of those waste materials which do not come under the treatment of household refuse. They are often very offensive and lead to the introduction of multitudes of flies and other insects. Miscellaneous refuse may be considered to include, principally, stable refuse, street refuse, night soil, dead animals, etc. In this connection street refuse rarely constitutes a problem so difficult of solution as do the others. Their disposal in order to avoid a nuisance, requires varying degrees of treatment and careful attention.

(a) Stable Refuse.

Stable refuse or manure consists of animal droppings, straw and the usual cleanings from stables. Horses, cows, sheep, and pigs are commonly found within the boundaries of municipalities. In the majority of towns and cities regulations are in force which forbid the keeping of animals other than horses within certain limits. The manure from these stables possesses excellent fertilizing qualities and is usually disposed of for this purpose. When allowed to accumulate in exposed piles, many complaints are frequently voiced in regard to the odours and fly nuisance resulting therefrom.

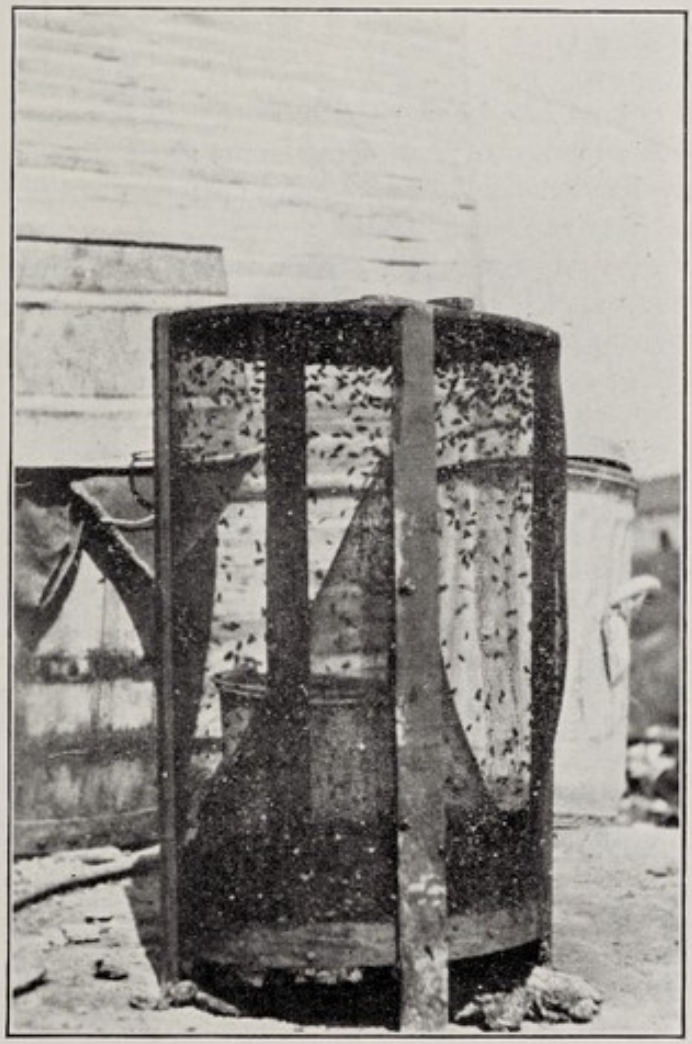
The most important object in the disposal of manure should be the prevention of a fly nuisance. All manure serves as a breeding ground for domestic flies. The different types each have their preference. Those generally found in greatest numbers about stables utilize the fresh horse manure whenever available, not only as food, but as a media in which to deposit their eggs. If this is not at hand, other fermenting substances will be made use of.

The types of flies most commonly found about stables include the following: The House fly (musca domestica), the Stable fly or biting house fly, and the Blow flies in some localities. House flies are usually the more common about horse barns. The stable flies are inclined to be more numerous about cattle than horses. The blow flies do not molest cattle and horses, but they are frequently quite numerous about pig stables. The common house fly is a non-biting type, which can take in food only in a liquid condition. The stable fly is a blood sucking species, and is found in large numbers on the backs and sides of animals, where it becomes engorged with blood. The blow flies include the green bottles and the blue bottles, but are easily distinguished by the bright metallic appearance of their bodies. Their food is chiefly meat, but they have been found to feed and breed extensively in moist pig manure, and in privies or decaying vegetation.

The development of all these types of flies is by the following stages:—the eggs, the larvae, the pupae, and finally the adults. The duration of each stage varies with the type of fly, the weather, and the suitability of the breeding-grounds. In summer weather the house-fly will reach maturity in as short a period as eight days. The stable and blow flies each require about three weeks to pass through the entire process. All growth takes place in the larval period. The pupa stage is one of resting. The larvae, or maggots, are quite active but can move about only by crawling and in a limited zone. This restricted movement permits of an efficient application of control measures. In the adult stage the movements are too rapid and widespread to effectively apply remedial methods.

Remedial Measures.

A number of methods have been found most effective in fly control work under practical conditions. These include the use of larvicides, maggot traps, and storage bins.



The conical type fly-trap when well baited gives excellent results.

Larvicides.

As the term implies, larvicides aim at the destruction of the larvae or maggots. They may be classed in general as stomach poisons and contact poisons. The former has to be ingested by the larvae. Solutions of borax and hellebore are frequently used for this purpose. The application of contact poisons destroys the maggots very quickly. Such poisons include kerosene, creosote, and certain other commercial disinfectants. Stomach poisons cannot be expected to produce efficient results on account of the length of time required to act, and to the migratory habits of the larvae which carry them beyond the manure and to points not affected by the solution. Contact poisons, on the other hand, act very quickly, and immediately restrict these movements. They need moreover be applied only to those parts of the manure in which the larvae are present upon examination. This materially reduces the cost of treatment. The movement of larvae in a manure pile is always towards the bottom edge, prior to pupation. By applying the larvicide at the correct time only this area need be treated.

Some of the creosote disinfectants which have been successful for this purpose include the following:—

(1) Lyman s Disinfectant.
(2) Creonoid.
(3) Pyxo[1].
(4) Creolin.
(5) Carbonol.

Lyman's disinfectant has been used extensively in this work and found to be very effective. A solution of 3 to 4 per cent. strength is required to destroy house and stable fly larvae. It is applied by spraying the infested parts of the manure. The resulting action is rapid and the larvae are destroyed almost immediately. An examination within five minutes from the time of application will reveal any areas which have not been dosed. The other disinfectants act similarly and the choice of the particular one rests largely on the cost of each. To effectively treat a bushel of infested manure requires from one to one and one-half gallons of the solution.

Kerosene, when sprinkled on the manure at the rate of one quart to a bushel of manure and washed down with twice that amount of water, will rapidly destroy all larvae. The cost of this is somewhat higher than for the above mentioned disinfectants.

Maggot Traps.

Maggot traps have been recommended as an efficient means of destroying a high percentage of larvae found in manure. Such a trap consists of a tank of water, about six inches in depth over which is constructed a wooden platform, to support the manure. The principle involved is that the larvae while migrating to the dry edge of the pile will drop into the water and be drowned. The manure must be kept in place for about ten days and watered frequently. This method will probably destroy about 75 per cent. of all larvae, but the amount of attention required, and the size of tanks, place it at a disadvantage.

Manure Boxes.

The storage of manure in fly-tight bins, with periodic removal about every ten days or two weeks, has long been recommended for stables in towns and cities.

Unfortunately the majority of fly eggs are laid while the manure is fresh and in the stable. Storage in bins with removal to some outlying point does not prevent the complete development of the fly, and its subsequent return to habitation. Storage can only be made effective by providing bins in duplicate with a fly-trap fixed to the top of each. Each should be of sufficient size to store at least ten days' supply of manure from the stable. The bins are used alternately. One is filled with manure in ten days, and is allowed to stand full while the other is being used. In this period all eggs which were deposited before the manure was placed in the bin will have developed into adult flies. In attempting to reach the open, these are caught in the trap at the top of the bin. At the end of this period the manure may be removed and placed in the open without fear of being further infested by flies. It should be stacked in neat, tight piles with the drier material on top. The amount of manure to be provided for will depend on the quantity of bedding used. Where this is small and the horses are in the stable only at night and feeding hours, one to one and one-half bushels per horse will be the approximate quantity.

This method will be found entirely practical for stables where only a few horses are kept. For larger numbers too big a box is required and the use of larvicides must be recommended.

Pig manure frequently becomes a prolific breeding ground for blow flies. This can be prevented by spraying the infested parts with Lyman's disinfectant of 5 to 6 per cent. strength.

(b) Night Soil.

Night soil is the name given to excreta when it does not form a part of house sewage. It originates in municipalities without any sewers, and in the outlying districts of a sewered town. Where an organized collection system is in operation, the common practice requires each householder to provide a standard can. Collection is made about twice per month in a water tight wagon. Each wagon requires two men to empty the cans. In winter the cans are taken to the point of disposal and thawed out before emptying.

Final Disposal.

Final disposal of night soil may be effected in a number of ways. In a sewered municipality, it can be discharged into the sewers through a specially constructed and housed manhole. In non-sewered towns it should either be buried in shallow trenches or burned in conjunction with rubbish. Under no conditions should it be placed on dumps or left exposed to the action of flies.

Time of Collection.

Night soil collection should always be made at night in order to avoid complaints from the odours and offensive appearance. The wagons should not pass through the main streets where other roads are available. Care should be exercised to see that none of the material is scattered along the roads or in the yards adjoining the privies.

Treatment of Privies.

All privies should be effectively protected against the activities of flies. Both house and blow flies frequent these places in large numbers. The latter will hatch very readily in the contents, and carry infection to food supplies. Fly-proof privies are seldom possible, while removal of the contents every two weeks, will not prevent the development of the adult fly. The application of a light coat of chloride of lime every four or five days to the fresh and exposed contents of the privies will not only destroy all larvae, but will prevent the flies from coming in contact with the excreta.

(c) Dead Animals.

Dead animals, not larger than cats and dogs, may well be disposed of with the household refuse. Larger animals require special methods. In some places they are buried, but this requires a large pit and considerable labour, with no revenue in return. In many of the larger centres, they are reduced by private companies for grease and tankage—both marketable. Special provision can be made to handle these where an incinerator is in operation. In every case they should be removed as speedily as possible after death.

7.—SUGGESTED BY-LAWS

(*a*) A Suggested Scavenging By-law for.....

A By-law to regulate cleansing and scavenging within the Municipality of the.....of.....

Whereas it is deemed advisable to regulate the cleansing and scavenging of the area within the Corporation of the..... of.....

Therefore, the Council of the Municipality of the..... of.....enacts as follows:

(1) On and after the.....day of.....a system for establishing, maintaining and regulating within the said Municipality the collection and disposal of ashes, rubbish, refuse and garbage shall be put into force.

(2) The collection and disposing of ashes, rubbish, and garbage within the Municipality shall be placed under the control and management of the committee on.....

(3) All slops and liquid matter objectionable in the opinion of the Local Board of Health, Medical Health Officer or Sanitary Inspector, and all household refuse and garbage, excepting ashes, shall be placed in suitably covered receptacles of either tin, zinc or iron properly protected against the entrance of flies, and satisfactory to the Board of Health, and shall be placed in a convenient location so that the same may be readily collected by licensed scavengers as the Board of Health may direct.

(4) All necessary receptacles for the collection of refuse, garbage, ashes, etc., shall be supplied by the owner, tenant or occupant of the premises to meet the requirements of this By-law.

(5) No owner, tenant, occupant or person shall within the Municipality suffer the accumulation of, or deposit of, or permit the deposit upon his premises, or upon the streets, lanes and private lands in the rear of, or adjoining his premises of any garbage, manure, filth, boxes, paper or other refuse of a similar character, or anything which may be dangerous to the public health, or which may attract flies or permit their breeding therein, or which may in any way provide unnecessary cause for fires or the spreading of fires, nor shall such owner, tenant, occupant or person permit or allow any filthy liquid matter from any cesspool, stable or pig-pen to flow or drain upon such streets, lanes or private lands.

(6) When any dumb animal shall die within the limits of the said Municipality, the owner shall within 12 hours thereafter cause the carcass to be removed to the place provided by the Corporation, and if not done the same shall be removed by the scavenging department at the rate as per schedule attached, but nothing in this clause shall relieve the offender from the penalty imposed by this By-law.

(7) The Council of the said Municipality shall enter into contract with a person to be called the licensed scavenger, to aid in carrying out the provisions of this by-law, and the said licensed scavenger and all men, horses, vehicles and outfit used in the work shall be subject to the regulations of the Local Board of Health.

(8) All carts, waggons, sleds, sleighs or other vehicles used for the conveyance of manure, earth, ashes, or other material, which is loose and might drop upon the street, shall have boxes of such size and construction and shall be loaded in such a manner that the contents thereof shall not litter the streets.

(9) All refuse, garbage, ashes and other offensive matter collected by the licensed scavenger shall be deposited on the town dumping grounds, the site of the said grounds to be approved by the Local Board of Health.

(10) The town dumping grounds shall be kept in a tidy and sanitary condition and all deposits made upon the grounds shall be under the direction and control of the Medical Officer of Health, or Sanitary Inspector. The following set of rules shall apply to the maintenance of the town dumps:

(*a*) Deposits shall be made in layers not exceeding six feet in depth; and not more than fifty square yards shall be left uncovered at any one time.

(*b*) Each layer shall be covered on all surfaces exposed to the air, with at least nine inches of ashes, earth, or other suitable substance. Each covered layer shall be allowed to settle before another is added.

(*c*) No refuse shall be left uncovered for more than 72 hours from the time of deposit.

(*d*) If the material deposited at any one time consist entirely of fish, animal, or other organic refuse, it shall be covered forthwith with earth or other suitable substance at least two feet in depth.

(*e*) A fly larvicide shall be kept on hand and all maggots destroyed before the pile is covered.

(*f*) No refuse shall be allowed to be scattered, but must be kept as compact and tidy as possible.

(*g*) No scavenging shall be allowed at the dump except by municipal employees.

(11) Nothing contained in this By-law shall prevent anyone from removing and transporting to the dumping grounds any ordinary garbage or ashes provided the same is done and deposited in the manner provided in this By-law.

(12) It shall be the duty of the Sanitary Inspector to keep vigilant supervision over all streets, lanes, and by-ways within the said Municipality, where animal dirt, manure, garbage, filth, refuse or other matter or thing may be found.

(13) Any person convicted of a breach of any of the provisions of this By-law shall forfeit and pay at the discretion of the convicting magistrate a penalty not exceeding the sum of $25.00 for each offence.

(*b*) A Suggested By-law for the Collection and Disposal of Night-soil in the Municipality of.....

This By-law may be given two readings by the Council of any Municipality, and after approval by the Provincial Board of Health, may be read a third time, and become law as an amendment to Schedule B of the Public Health Act.

(1) No person shall construct or maintain in said Municipality any system of sewage disposal by means of privy vault, dry-earth closet or by broad irrigation, subsoil irrigation or otherwise, except upon a permit issued by the local Board of Health of the said Municipality. Application for said permit shall be made in writing to the local Board of Health, and shall be accompanied by a detailed description of the system and its location on the premises of said applicant.

(2) No privy vault, cesspit, or dry-earth closet shall be allowed to exist within the limit of the area defined as follows:

(3) On and after the.....day of....., a system for establishing, maintaining and regulating within the said Municipality, the collection and disposal of night-soil shall be put into force.

(4) The Council of the said Municipality shall at the first of each year appoint a contractor for the collection, transportation and disposal of night-soil from the Municipality of..... The cost of such collection shall be assessed and collected as taxes, against the premises where privy vaults, or dry-earth closets exist, or against any premises from which night-soil is collected.

(5) No person other than the contractor appointed by the Municipality shall engage in the business of collection or transportation of night-soil, or drive any cart for such purpose, in the Municipality of the..... of.....

(6) All carts or vehicles used in the transportation of night-soil, or other offensive substances, shall be so constructed and loaded as to prevent the escape of any such offensive material during transportation.

(7) No cart or other vehicle for carrying night-soil or any other offensive or noxious substance, or the contents of any privy, vault or cesspit, shall, without necessity thereof, be allowed to stand or remain before or near any building, place of business, or other premises where any person may be, nor shall any such cart or vehicle be allowed to occupy an unreasonable length of time in loading or unloading, or in passing along any street or through an inhabited place or grounds.

(8) Such carts, vehicles, and all implements used in connection therewith shall be kept in an inoffensive and sanitary condition, and when not in use shall be stored and kept in some place where no needless offence shall be given to any person.

(9) The contractor appointed by the Municipality shall make collections regularly from all closets once every two weeks, and all such collections shall be made between the hours of.....p.m. and.....a.m.

(10) Every owner, lessee or tenant of any property upon which there exists a privy shall provide galvanized or other approved containers for use in the same and shall provide means by which cans may be removed and replaced.

(11) The following code of rules and regulations for the maintenance of privies, cesspits and dry-earth closets shall constitute a part of this By-law and any person or persons violating or neglecting any of the said rules and regulations shall be liable to fines and penalties imposed by Section 12 of this By-law:

Rule 1. All earth privies, cesspits, dry-earth closets and other systems shall be so constructed, screened and maintained that flies neither find access thereto nor breed therein.

Rule 2. Every such earth closet shall be so constructed that adequate access may be had to every part thereof for the purpose of cleansing and disinfecting.

Rule 3. Every person who shall construct an earth closet in or in connection with a building within the limits of this corporation, shall provide, construct or fix in connection with such earth closet suitable means or apparatus for the frequent and effectual application of dry earth, ashes or other deodorizing substance to any filth which may from time to time be deposited in the receptacle of such earth closet.

Rule 5. Every owner, lessee, or tenant of any property upon which there exists a privy, shall have the fresh and exposed fecal matter of the said privy sprinkled with a coat of Chloride of Lime not less than one-quarter of an inch thick, at least every five days, for the period from May 1st to October 1st of each year.

(12) Any person or persons convicted of a breach of any of the provisions of this By-law shall forfeit and pay at the discretion of the convicting magistrate a penalty not exceeding the sum of $25.00 for each offence.

NOTE.—The final disposal of night-soil will be governed by local conditions. The following three alternative clauses are submitted for this purpose:

(13) (*a*) To apply to a municipality in which a sewerage system has recently been constructed, but where the outlying areas are not yet served:

"The contractor shall dispose of all collected night-soil through a sewer manhole specially constructed for this purpose, and located at ....., and shall use sufficient water for flushing purposes to prevent any clogging in the sewer."

(13) (*b*) To apply to municipalities where there are areas adjacent to an incinerator, and without sewer accommodation:

"The contractor shall transport all night-soil collected to the municipal incineration plant, and discharge the same in a convenient place ready for burning, as directed by the man in charge."

(13) (*c*) To apply to municipalities without sewers or an incineration plant:

"The contractor shall transport all night-soil collected to such areas as the council may direct, and shall plow in or bury the same so that no part is left uncovered."

SOME RESULTS OBTAINED FROM AERATION OF WATER SUPPLIES USING AN AIR COMPRESSOR AND DIFFUSER PLATES.

A. V. DeLaporte, B.A.Sc., A.M.E.I.C., and G. A. H. Burn, B.A.Sc.

The value of aeration for the removal of some objectionable properties from water has long been recognized by waterworks engineers. Aeration has hitherto generally been accomplished by some device which separates the water into fine streams or sprays, and brings the water into intimate contact with the air. These devices have not proven particularly satisfactory for the severe climate in Ontario.

During the year 1923, some interesting results were obtained by the Engineering Division in the aeration of municipal water supplies by bringing the air into intimate contact with the water. This result was accomplished by means of an air compressor and diffuser plates such as are used in the Activated Sludge Process for sewage treatment. Experiments were carried out at Essex, Forest, and Richmond Hill.

Experiment at Essex.

The town of Essex secures its water supply from three deep wells. One of these, the Garrow well, is located about a mile from the pump house. The other two, designated as the north and south wells, are located within the pump house in the centre of the town.

All three wells have to be pumped. The ground level at the Garrow well is three or four feet lower than that at the pump house and the water is pumped into a riser pipe until a head is developed sufficient to produce a flow through the six-inch cast iron pipe line to the pump house. This well is pumped continuously, and is estimated to produce 60,000 gallons daily.

The discharge from the north and south wells enters the reservoir through a common pipe line near the point of the Garrow well discharge. Their combined flow is estimated to be 80 to 90 gallons per minute, and they are pumped long enough to supply the amount of the daily consumption above the supply from the Garrow well. At the time of the experiments they were being pumped about eight hours daily.

There are two reservoirs at the pump house, one of these is circular, 25 feet in diameter and 50 feet deep. The second is elliptical, 25 feet in depth, and has a capacity of 27,000 gallons. A ten-inch opening connects the one with the other.

The pumping equipment consists of a centrifugal service pump, rated capacity 150 g.p.m., taking suction from the small reservoir, and two fire pumps whose suctions are in the large reservoir.

For some time previous to the aeration experiments the town tap had been showing considerable pollution and about the 1st of April, 1923, at the suggestion of the Provincial Board of Health, a Wallace and Tiernan Liquid Chlorine Apparatus of the M.S.A. type was installed. It was impossible, however, to detect any residual chlorine in the tap, even with this machine operating at its maximum capacity. The water from all three wells had a strong odour of H_2S and it was thought that the absorption of chlorine was associated with the presence of H_2S in solution. It was believed that the removal of this H_2S might be accomplished by aeration.

Accordingly, a small Curtis air compressor, 2½ inches by 3 inch stroke driven by a 2 horsepower motor was installed on April 18th. This supplied

air to a square diffuser plate (Jones & Atwood) one square foot in area, located approximately in the centre of the large reservoir at a depth of 30 feet.

Daily tests were made on the north well, south well, a mixture of the north and south wells, the influent from the Garrow pipe line and the tap water. Analyses performed consisted of determination of dissolved oxygen, alkalinity, free CO_2, chlorine as chlorides, H_2S and iron. These analyses were made from April 17th to 28th, inclusive, the results are tabulated in Tables No. 1 to 5.

Laboratory tests were first made to determine the quantity of chlorine necessary to satisfy the demand of a mixture of the north and south wells, and of the Garrow well, and produce a residual after 15 minutes contact. A standard chlorine solution was used, and 100 c.c. samples were treated with various amounts of chlorine. These experiments indicated that it required 35 to 40 p.p.m. of chlorine to produce a residual in a mixture of the north and south wells, and from 7 to 9 p.p.m. in the Garrow well.

The dissolved oxygen in the tap and in the well water ranged from 1.4 to 2.0 c.c. per litre. The H_2S in the north and south wells varied from 9.0 to 10.5 p.p.m., and in the Garrow well influent from 2.0 to 3.0 p.p.m.

On commencing aeration, the chlorine solution, which heretofore had been applied at the point where the three wells discharge into the reservoir, was introduced into the small reservoir, first through a manhole at the side and later through a small hole in the floor beside the suction main of the service pump.

It was unfortunately impossible to obtain samples of the water immediately after aeration and before chlorination in order to determine the improvement due to aeration alone. However, the effect was at once evident in a lowering of the chlorine demand. The rate of application of the chlorine solution was changed until a rate of 4.1 pounds per 24 hours, approximately 3.0 p.p.m., was arrived at, which gave a residual at all times.

The dissolved oxygen in the tap water was increased from 2.0 c.c. per litre to 4.5 c.c. per litre. The free CO_2 and alkalinity were decreased materially and the H_2S was entirely removed. The fairly high amount of chlorine, 3.0 p.p.m., still required to produce a residual of .2 to .3 p.p.m. after 15 minutes contact may be attributed to the fact that the aeration equipment installed for the experiment was inadequate to remove all of the H_2S when the north and south wells were being pumped.

The value of aeration in treating a water supply such as that of the town of Essex was definitely established and undoubtedly with a larger air compressor, all of the H_2S could be removed by this means and the chlorine demand thereby cut down still further.

Experiment at Forest.

The work here was undertaken to determine the feasibility of aerating a highly carbonated deep well supply in order to eliminate objectionable taste and certain medicinal properties.

For the experiment, the town's elevated tank, 10 feet in diameter and 10 feet deep, was used. Three diffuser plates, each 3 feet by 4 inches, were placed in the bottom of the tank and connected with an air compressor capable of delivering approximately 15 cubic feet of air per minute. Water was pumped into the tank directly from the well, until it contained about 4,000 gallons. Air was then turned on and analyses for free CO_2 and dissolved oxygen were made to detect any changes which might take place. These results are given in Table No. 6.

The free CO_2 was entirely eliminated in 55 minutes and the dissolved oxygen increased from 2.1 to almost 9.0 c.c. per litre in the same period. This was accomplished with a complete removal of the objectionable properties of the water.

Experiment at Richmond Hill.

The town of Richmond Hill secures its water from a spring creek. The creek is dammed to form a shallow lake several acres in extent. This pond during the summer is filled with various types of aquatic plants, becoming practically a marsh. The surface becomes very warm and the heavy weed growth aids stratification by tending to prevent movement of the water. Water from this pond is passed through a mixing chamber, sedimentation tank, and gravity mechanical filters to a clear water well. From there it is pumped to a standpipe. The water consumption in the town is very small, so that the ordinary plant operation is to filter and pump a few hours on two or three days a week just enough water to fill the standpipe and clear water well. Consequently, the water is in the system for possibly a month and in the outer edges of the town probably six weeks.

During the winter, when the creek and pond were covered with ice, the water in the mains developed an objectionable colour, odour, and taste due to iron and organic matter. The application of alum to the raw water was discontinued and a diffuser plate, one foot square, was placed in the sedimentation chamber in such a position as to give a maximum of agitation, compressed air being forced through from a small gasoline engine which had been converted into an air compressor. The amount of air available was insufficient. The chemical results shows a slight improvement in the water, but the change noted in the physical properties of the water was very marked and out of all proportion to the chemical improvement noted. A portion of the iron in the raw water was precipitated and was removed on the filters. The dissolved oxygen was increased from an average of 0.3 c.c. per litre to 2.3 c.c. per litre and probably the organic matter was partially oxidized. This resulted in practically an entire removal of the objectionable physical properties of the tap water. The odours, taste, colour, and sediment which developed in the mains before aeration disappeared entirely, or were reduced to such an extent as not to be objectionable. Only once or twice since aeration was commenced has sediment or odour developed in the water in the mains.

In midsummer, the conditions noted in the winter also prevail, in part due to the lack of motion in the pond. The water at the bottom, protected from the heat of the sun and from circulation or mixing with the warmer surface water by the weed growth, presents all the characteristics of the water during the winter months.

Aeration is not carried to completion at Richmond Hill due to the small capacity of the air compressor. The results obtained indicate that with adequate aeration the objectionable constituents could be entirely eliminated. This supply would be materially improved if there were a greater consumption of water in the town so that the plant operation would be continuous and the water would not be standing in the system, producing what amounts to dead end conditions. The results of this experiment are given in Table No. 7.

TABLE No. 1.—ESSEX, NORTH WELL

Date	Time	D.O. c.c.p.l.	Temp. °C.	Bicarb. Alk.	Free CO_2 as $CaCO_3$	Chlorine as Chloride	H_2S	Total	Iron	
									Ferrous	Ferric
Apr. 17	10.00 a.m.	1.5	11.0	155	8.8	148	9.27	1.6	0.0	1.6
18	1.15 p.m.	1.8	11.2	154	11.0	151	9.22	0.2	0.0	0.2
19	1.20 p.m.	1.5	11.5	154	11.0	155	9.27	0.2	0.0	0.2
20	10.25 a.m.	1.8	12.0	156	9.9	150	9.48	1.3	0.0	1.3
21	10.30 a.m.	1.5	12.0	154	8.8	143	9.69	0.3	...	...
23	10.15 a.m.	1.7	11.3	154	8.8	152	9.27	0.3	0.0	0.3
24	11.20 a.m.	1.5	11.0	156	8.8	144	10.46	0.4	0.0	0.4
25	11.30 a.m.	1.9	11.1	156	11.0	146	10.29	0.2	0.0	0.2

TABLE No. 2.—ESSEX, SOUTH WELL

Date	Time	D.O. c.c.p.l.	Temp. °C.	Bicarb. Alk.	Free CO_2 as $CaCO_3$	Chlorine as Chloride	H_2S	Total	Iron	
									Ferrous	Ferric
Apr. 17	9.45 a.m.	1.8	10.5	154	13.2	134	9.14	1.0	0.0	1.0
18	11.35 a.m.	1.2	11.2	158	13.2	145	10.54	7.0	0.2	6.8
19	1.00 p.m.	1.7	12.0	150	9.9	140	9.05	0.4	0.0	0.4
20	10.00 a.m.	1.7	11.5	156	9.9	138	10.33	0.6	0.0	0.6
21	9.45 a.m.	1.5	11.5	156	11.0	142	10.88	0.7	...	...
23	10.35 a.m.	1.7	11.0	152	9.9	143	9.69	0.3	0.0	0.3
24	12.40 p.m.	1.9	11.1	154	11.0	140	9.95	0.2	0.0	0.2
25	11.50 a.m.	1.8	11.1	154	9.9	139	10.41	0.2	0.0	0.2

TABLE No. 3.—NORTH AND SOUTH WELLS

Date	Time	D.O. c.c.p.l.	Temp. °C.	Bicarb. Alk.	Free CO_2 as $CaCO_3$	Chlorine as Chloride	H_2S	Total	Iron	
									Ferrous	Ferric
Apr. 17	11.00 a.m.	2.5	10.8	150	8.8	139	8.92	1.0	0.0	1.0
18	11.15 a.m.	2.5	10.8	160	12.1	146	10.54	0.7	0.0	0.7
19	9.15 a.m.	2.0	11.1	158	11.0	138	10.29	1.4	0.0	1.4
20	9.20 a.m.	2.6	11.0	156	12.1	138	9.86	0.4	0.0	0.4
21	9.05 a.m.	2.5	11.3	156	9.9	141	10.46	0.6	...	...
23	11.00 a.m.	2.8	10.8	154	8.8	145	9.31	0.3	0.0	0.3
24	11.00 a.m.	2.7	11.0	156	11.0	140	11.05	1.0	0.3	0.7
25	11.15 a.m.	3.0	10.8	156	8.8	140	10.50	0.2	0.0	0.2

TABLE No. 4.—GARROW WELL INFLUENT

Date	Time	D.O. c.c.p.l.	Temp. °C.	Bicarb. Alk.	Free CO_2 as $CaCO_3$	Chlorine as Chloride	H_2S	Total	Iron	
									Ferrous	Ferric
Apr. 17	3.50 p.m.	1.5	7.0	154	3.3	55	2.17	0.2	0.0	0.2
18	9.10 a.m.	1.8	9.0	154	3.3	53	2.21	0.1	0.0	0.1
19	4.25 p.m.	1.4	9.5	150	3.3	52	2.55	0.0	0.0	0.0
20	1.50 p.m.	1.5	9.5	154	3.3	54	2.64	Trace	0.0	Trace
22	11.45 a.m.	1.8	9.5	154	3.3	51	2.51	...	...	...
23	9.00 a.m.	1.4	9.5	152	3.3	53	2.51	0.1	0.0	0.1
24	9.10 a.m.	1.6	9.5	152	2.2	52	2.64	Trace	0.0	Trace
25	9.15 a.m.	1.7	9.5	156	2.2	53	2.59	0.0	0.0	0.0
25	9.50 a.m.	2.4	11.4	154	2.8	53	2.93	Trace	0.0	Trace

TABLE No. 5.—ESSEX TAP

Date	Time	D.O. c.c.p.l.	Temp. °C.	Bicarb. Alk.	Free CO_2 as $CaCO_3$	Chlorine as Chloride	H_2S	Total	Iron Ferrous	Ferric
Apr. 17	1.25 p.m.	1.8	13.0	138	6.6	117	0.60	1.0	0.0	1.0
18	9.50 a.m.	2.0	10.0	142	6.6	92	0.34	0.3	0.0	0.3*
19	10.00 a.m.	2.7	10.5	138	4.9	89	0.34	0.4	0.0	0.4
	11.20 a.m.	3.0	10.4	...	4.4	...	0.00	...	...	...
	3.20 p.m.	3.5	11.0	...	4.4	...	0.21	...	...	...
20	9.40 a.m.	4.8	10.5	...	5.5	...	0.00	...	...	...
	11.20 a.m.	4.8	11.2	...	3.3	...	0.00	...	...	...
	1.15 p.m.	4.4	11.0	138	4.4	86	0.21	0.4	0.0	0.4
	3.45 p.m.	4.1	11.0	...	6.6	...	0.00	...	...	...
21	9.25 a.m.	4.9	10.5	...	3.3	...	0.17	...	...	...
	11.15 a.m.	4.5	11.0	138	4.4	82	0.00	0.3	...	...
	2.00 p.m.	4.4	11.3	...	4.4	...	0.00	...	...	...
	3.00 p.m.	4.3	11.5	...	3.9	...	0.12	...	...	...
22	11.20 a.m.	4.8	10.5	140	3.9	76	0.00	...	...	...
23	9.50 a.m.	5.0	10.5	140	5.5	78	0.00	0.4	0.0	0.4
	1.30 p.m.	4.7	11.0	...	5.5	...	0.42	...	...	...
	4.00 p.m.	4.9	10.4	...	5.5	...	0.00	...	...	...
	4.35 p.m.	4.8	10.6	...	4.4	...	0.00	...	...	...
24	10.50 a.m.	5.3	10.5	...	4.4	...	0.00	...	...	...
	1.00 p.m.	5.2	11.0	138	5.5	80	0.00	0.4	0.0	0.4
	3.20 p.m.	5.3	10.5	...	6.0	...	0.00	...	...	...
25	1.30 p.m.	5.4	11.8	140	5.5	82	0.00	0.3	0.0	0.3

*Aeration commenced 5.15 p.m., April 18th.

TABLE No. 6.—AERATION OF WATER SUPPLIES, FOREST, ONT.

Time	Free CO_2 in p.p.m.	D.O. in c.c. per litre	Temp. °C.
Before aeration	4.5	2.1	10.0
5 minutes	4.3	2.1	10.0
10 "	3.0	...	10.0
15 "	2.5	6.8	10.0
20 "	2.5	....	....
25 "	2.5	7.9	10.0
30 "	1.7	....	....
35 "	1.7	8.1	10.0
45 "	1.7	....	....
55 "	0.0	....	....
65 "	0.0	9.2	10.0
2 hours	0.0	10.0	10.0

TABLE No. 7.—RICHMOND HILL

EFFLUENT FROM SEDIMENTATION BASIN

Date	D.O. c.c. per Litre	Temp. °C.	Free CO_2 as $CaCO_3$	Total Fe.	Total Alk.	
Feb. 16	0.1	2.5	8.0	...	...	
" 21	0.3	3.0	6.0	...	...	
Mar. 1	0.7	3.0	10.0	3.0	...	Aeration started.
" 7	3.1	2.5	4.0	3.2	...	
" 14	1.3	4.0	6.0	1.8	...	
" 21	2.4	2.5	5.0	...	...	
June 2	7.4	18.0	14.0	...	207	
" 2	6.7	18.0	14.0	...	...	
" 2	6.0	18.0	....	...	...	
" 2	6.2	19.0	....	...	...	

SURFACE OF FILTERS

Date	D.O. c.c. per Litre	Temp. °C.	Free CO_2 as $CaCO_3$	Total Fe.	Total Alk.	
Mar. 1.....	0.8	4.0	6.0	2.2	...	
" 7.....	...	....	....	4.2	...	
" 14.....	...	....	....	1.6	...	

EFFLUENT FROM FILTERS

Date	D.O. c.c. per Litre	Temp. °C.	Free CO_2 as $CaCO_3$	Total Fe.	Total Alk.	
Feb. 21.....	2.7	2.8	5.0	...	...	
" 21.....	2.8	3.0	7.0	...	...	
" 21.....	2.2	3.2	5.0	...	...	
Mar. 1.....	1.0	4.2	9.0	1.2	...	
" 1.....	1.3	4.5	5.5	2.2	...	
" 7.....	2.1	2.7	5.0	4.8	...	Aeration started.
" 7.....	1.5	3.0	4.0	2.4	...	
" 14.....	0.8	3.2	9.0	2.3	...	
" 14.....	0.3	3.0	6.0	1.5	...	
" 21.....	2.2	3.5	5.0	...	...	
" 21.....	2.7	2.8	5.0	...	...	
June 2.....	7.1	17.5	6.0	...	...	

CLEAR WATER WELL

Date	D.O. c.c. per Litre	Temp. °C.	Free CO_2 as $CaCO_3$	Total Fe.	Total Alk.	
Feb. 16.....	0.1	3.0	9.0	...	...	
" 21.....	0.0	3.0	6.0	...	...	
Mar. 1.....	0.8	4.2	9.0	3.0	...	
" 7.....	0.6	2.0	4.0	2.0	...	
" 14.....	0.3	4.0	7.0	1.5	...	
" 21.....	1.9	3.0	4.0	...	...	
June 2.....	7.4	16.2	4.0	...	178	

TOWN TAP

Date	D.O. c.c. per Litre	Temp. °C.	Free CO_2 as $CaCO_3$	Total Fe.	Total Alk.	
Feb. 16.....	0.1	5.8	9.0	...	...	
" 21.....	0.4	1.5	5.0	...	...	
Mar. 1.....	1.1	5.0	5.0	3.8	...	
" 7.....	...	....	....	6.2	...	
" 14.....	...	....	....	1.3	...	

THE PROTECTION OF WELLS USED AS A SOURCE OF DOMESTIC WATER SUPPLY

The protection of well water against the admission of filth is always a problem to those who must depend upon domestic wells for the supply of drinking water.

Proper protection excludes from the water not only those organisms which are pathogenic to man, but in addition all other materials of foreign or animal

origin. Surface drainage, unless excluded, will introduce sufficient pollution to cause adverse water analyses. The top layer of the soil is invariably heavily impregnated with organisms which are of intestinal origin; and while these may not always be pathogenic their presence is an indication of a direct access to the well of surface drainage.

Well water may be adversely affected by surface drainage gaining access through the top or by faulty location in respect to other sources of pollution. A new well should be so located that surface water or drippings can be diverted way from that area. The next best protection is ground water storage, which is had in deep wells or in areas in which the soil, sand, etc., offers considerable resistance to movement.

One of the most common avenues of entrance of pollution to a well, especially a shallow dug one, is by means of the top and upper section of the lining. A covering made of planks is seldom watertight especially after being in use for a short period. In some rural districts it is the practice to dispose of the privy contents on the manure pile. The farmer's boots, stock, chickens, etc., may convey such germs and refuse to the top of the well, where it is washed into the well supply either by water from the spout or a rainstorm. When the well is in low land or on the side of a hill a heavy storm may cause a flooding of the well top, and if the protection is not adequate contamination is sure to follow. The most suitable well top is one made of concrete with a sufficient slope and gutter to carry off floodings and splashings from the immediate vicinity of the well. The lining of the well for a distance of ten feet from the surface should be made watertight, and the excavated material rammed back in place to provide a filtering medium. The tops of drilled, driven, and bored wells should be similarly protected to avoid drainage following down the well-casing to the water-bearing strata.

Proper location of a well will prevent contamination from underground sources. The dissemination of infectious materials is purely mechanical and is dependant upon the agencies which exist in the soil. The natural tendency is for disease germs to pass vertically downward through the soil and not laterally. Where horizontal transference takes place it is due in the majority of cases to fissures in rock or clay, coarse sand or gravel, and rapid movement of the ground water. The effect of this material upon the quality of the well water is chiefly a question of storage. Where it can be retained in the soil before reaching the well for a sufficient time to destroy the activity of infective material no danger will follow. The majority of typhoid and other germs, whose natural habitat is the human body, do not survive in the soil beyond ten days or two weeks. Consequently, location of the well should insure a sufficient storage period to accomplish this purpose.

In the accompanying table of well water analyses from the sanitary surveys of 1923, it is natural to expect that the number of dug wells of fair quality should be very small, where either no pumps or only wooden tops were provided. Dug wells with concrete tops show an improvement. This figure is not higher because the concrete tops have not always been supplemented by watertight walls and gutters. Drilled and driven wells show a decided improvement, since the construction of these types facilitate the protection against surface drainage. Here again the percentage of fair quality wells might be increased by better attention to the casings and tops.

PRIVATE WELLS—SANITARY SURVEYS OF 1923

Table Showing Types of Wells and Numbers Giving Favourable Bacterial Analyses

Municipality	Dug Wells No Pump		Dug Wells Wood Tops		Dug Wells Concrete Tops		Springs		Drilled Wells		Driven Wells		Totals	
	Total Number	Number Showing Fair Quality	Total Number	Number Showing Fair Quality	Total Number	Number Showing Fair Quality	Total Number	Number Showing Fair Quality	Total Number	Number Showing Fair Quality	Total Number	Number Showing Fair Quality	Total Number	Number Showing Fair Quality
Alexandria	57	4	67	9	1	..	..	..	3	2	..	..	128	15
Arnprior	..	..	17	1	..	..	..	..	8	2	..	..	25	3
Arthur	1	..	101	7	8	1	..	..	13	2	..	..	123	10
Brighton	29	2	34	..	10	2	..	..	2	1	1	..	76	5
Cardinal	..	..	7	..	3	..	..	..	3	..	..	..	13	..
Carleton Place	4	1	1	..	..	..	..	..	91	15	..	..	96	16
Chesley	1	..	17	2	1	..	1	..	..	..	..	..	20	2
Cobourg	6	..	74	..	10	..	..	..	4	..	..	..	94	..
Deseronto	52	7	37	9	24	9	1	1	5	2	..	..	119	28
Durham	..	..	97	4	15	1	9	1	4	1	..	..	125	7
Elmira	..	..	60	9	20	7	1	..	3	1	..	..	84	18
Fergus	..	..	19	..	20	..	1	1	22	3	..	..	62	4
Gananoque	3	..	45	3	8	..	4	3	68	17	..	..	128	23
Harriston	..	..	36	1	1	..	..	..	5	1	..	..	42	2
Hawkesbury	7	..	16	1	2	..	1	..	20	14	1	1	47	16
Humberstone	..	..	..	..	..	..	..	..	271	176	..	..	271	176
Iroquois	2	..	16	..	4	..	2	..	3	..	..	..	27	..
Kemptville	1	1	63	5	19	4	..	..	50	18	..	..	133	28
Lindsay	17	3	376	151	101	51	10	3	55	41	1	..	560	249
Listowel	..	..	67	13	4	1	..	..	3	1	1	1	75	16
Madoc	8	..	33	3	15	4	1	..	53	34	..	..	110	41
Markdale	..	..	6	1	..	..	1	1	9	6	..	..	16	8
Meaford	1	..	35	2	4	..	8	..	3	2	..	..	51	4
Milverton	..	..	44	1	3	..	..	..	3	2	..	..	50	3
Morrisburg	2	..	16	..	1	..	..	..	..	..	..	..	19	0
Mount Forest	2	1	11	..	1	..	2	..	1	..	..	..	17	1
Oakville	18	5	20	1	2	..	1	..	1	..	..	..	42	6
Owen Sound	8	1	26	5	6	2	15	3	7	5	..	..	62	16
Palmerston	..	..	4	..	..	..	..	..	4	3	..	..	8	3
Perth	12	..	48	..	7	2	1	..	9	1	..	..	77	3

PRIVATE WELLS—SANITARY SURVEYS OF 1923—Continued

Table Showing Typfs of Wells and Numbers Giving Favourable Bacterial Analyses

Municipality	Dug Wells No Pump		Dug Wells Wood Tops		Dug Wells Concrete Tops		Springs		Drilled Wells		Driven Wells		Totals	
	Total Number	Number Showing Fair Quality	Total Number	Number Showing Fair Quality	Total Number	Number Showing Fair Quality	Total Number	Number Showing Fair Quality	Total Number	Number Showing Fair Quality	Total Number	Number Showing Fair Quality	Total Number	Number Showing Fair Quality
Picton	32	3	101	13	71	20	11	3	54	13	..	..	269	52
Port Colborne	..	..	1	1	..	..	1	1	34	15	..	..	36	17
Port Elgin	..	..	3	1	1	..	1	1	5	5	120	94	130	101
Shelburne	..	..	26	..	2	1	..	..	4	3	..	..	32	4
Trenton	54	3	169	13	78	7	7	..	83	12	..	..	391	35
Tweed	12	..	68	1	36	7	7	2	36	6	..	..	159	16
Vankleek Hill	5	..	124	5	15	2	..	..	9	4	..	..	153	11
Totals	334	31	1,885	262	493	121	86	20	948	408	124	96	3,870	939
Per cent. of Good Quality	..	9.3	..	13.9	..	24.6	..	23.3	..	43.0	..	77.4	..	24.2

STUDY OF PRETREATMENT OF THAMES RIVER WATER AT CHATHAM.

By A. V. Delaporte, B.A.Sc., A.M.E.I.C., and G. A. H. Burn, B.A.Sc.

The City of Chatham secures its domestic water supply from the Thames River. During the months of March and April, the river is subject to wide variations in turbidity, the satisfactory removal of which has offered serious difficulties in previous years under the existing facilities for treatment.

Description of Plant Equipment and Arrangement.

The raw river water is pumped by means of low-lift pumps to a storage reservoir 765 feet by 75 feet by 14 feet deep (capacity 5,000,000 gallons.) The low-lift pumping equipment consists of a steam pump, rated capacity 750,000 gallons per 24 hours, which is operated continuously at varying rates and an electric pump, rated capacity 3,000,000 gallons per 24 hours, which is operated from 10 p.m. until the basin is full, usually about 7 a.m. Up to this year, it has been the practice to apply the alum dosage at the suction side of these low-lift pumps. The reservoir provides about three days' storage.

The service pumps, of which there are two, are electrically driven and will deliver 1,600 g.p.m. and 1,400 g.p.m. approximately. These pumps draw the water from the reservoir and force it through the filters into the mains; ordinarily one pump is sufficient to supply the domestic demand and maintain a pressure of 60 pounds. There are eight filter units of the horizontal pressure mechanical type, each 20 feet long by 8 feet in diameter. The filtering capacity estimated at 2 gallons per square foot per minute is 2,560 g.p.m. (3,686,400 gallons per 24 hours). The domestic consumption which varies from 1,000 g.p.m. to 1,600 g.p.m. is well within this range but the safe rate may be exceeded in case of fire and is exceeded when the filters are being backwashed. It is then necessary to turn on the second pump, water being forced through seven filters, capacity 2,240 g.p.m., at a rate of from 2,800 to 3,000 g.p.m.

To further safeguard the supply it is chlorinated. Chlorine is added at the rate of 5 pounds per 24 hours to the suction of the service pump. In addition, sufficient chlorine is pumped into the main after filtration to maintain a residual of .2 p.p.m. after 15 minutes contact.

Only the water passing out into the city system is metered. Water used in backwashing the filters must be estimated.

New Baffling System.

During the fall of 1922, the baffling system as suggested by the Provincial Board of Health was constructed in the storage reservoir. It consists of a primary system located about one day's supply from the outlet and a secondary system at the outlet of the storage reservoir. Under average conditions it is about two hours from the time water entering the first system leaves it and the same interval elapses from the time water entering the second system leaves the basin.

Arrangements for Application of Alum.

(1) *Suction of Low-lift Pumps.*

The alum feed apparatus in the pump house consists of two small solution tanks which discharge into a larger storage tank. The alum solution flows by

gravity into a float chamber into which the suction lines to the two low-lift pumps are introduced. There is no device provided to maintain a constant rate of flow of the alum solution, the float valve being attached to the domestic water system to insure maintenance of the level in the float chamber in case the alum feed should become blocked and guard against the sucking of air into the suction line. This apparatus has a capacity of between 2 and 3 grains per gallon when both low-lift pumps are being operated.

(2) *First Baffling System Entrance.*

A small frame cabin was erected on top of the piling and a tank arrangement consisting of a single dissolving tank and two feed tanks. At first the alum solution fed directly into a funnel and lead pipe which introduced the solution from 1 to 2 feet below the surface of the water in the reservoir. Later a float valve and small orifice box was added by means of which a constant rate of application of the alum solution was ensured. This apparatus has a capacity of about 5 g.p.g. under average conditions.

(3) *Second Baffling System Entrance.*

A temporary arrangement was set up in the open for adding alum at this point. It consisted of three barrels, one for mixing and dissolving the alum, the other two for feeding the solution. This, owing to the severity of the weather during the period of the investigation, could not be used continuously. The maximum quantity of alum added here was just over 1 g.p.g.

Purpose of Investigation.

The purpose of the investigation was to determine the alum dosage necessary to remove the high turbidities in the raw water and establish if possible any relationship existing between the turbidity, alkalinity, Ph value and required amount of alum under actual working conditions. Laboratory experiments were also performed using H_2SO_4, lime, soda ash and permutit in conjunction with alum.

Preliminary Observation.

The work commenced on March 8th, 1923. At this time the river was subsiding and the turbidity in the raw water was between 350 and 400 as against over 800 on the day previous. Alum was being added at an average rate of from 2.0 to 2.5 g.p.g. to the suction of the low-lift pumps and at about 2.0 g.p.g. at the entrance to the first baffling system. Preliminary laboratory experiments showed that with a dosage of 2 or 3 g.p.g. in raw water with a turbidity of over 250 no appreciable floc was formed in 24 hours. It was thought that greater efficiency might be got from the alum if it were all added at the baffling system. The alum feed at the suction of the low-lift pumps was discontinued at 10 p.m., March 11th.

Tests Made on Water.

The chemical tests performed on the water consisted of Alkalinity, Free CO_2 and Ph value. Turbidities were also determined. Samples for analysis were secured of the raw water, water entering the first baffling system, water leaving the first baffling system, influent to filters and the tap.

Table Number 1 gives the result of analyses made from March 8th to 13th, inclusive. This covers the period that would be affected by the alum dosage at the suction of the low-lift pumps. Generally speaking there was a 50 per cent. reduction in the turbidity in passing from the river to the entrance

of the baffling system. The Ph value was lowered from 7.9-8.1 to 7.2-7.3. The maintenance of this lower Ph value was probably due to the fact that during this time the basin was covered with ice, thus preventing the ready escape of Free CO_2 liberated by the alum. The higher values of Free CO_2 obtained during this time would tend to confirm this theory.

The dosage of alum at the baffling system cut down the Ph value of the water from 7.3 to 6.8-6.9 under best working conditions. On March 12th and 13th, when the turbidity of the water entering the filters ranged from 30 to 45 with a Ph value of 6.8, the tap was practically free from turbidity.

Table Number 2 gives the results of analyses performed from March 12th to 28th. During this period an attempt was made to remove most of the turbidity by a single treatment of alum at the first baffling system. On some days, about 1 g.p.g. was added at the entrance of the second baffling system during the day, the idea being to produce a slight floc which would pass on to the filters and assist in the removal of any remaining turbidity. Varying dosages of alum were used, beginning with about 2.2 g.p.g. on March 12th and 13th, and increasing to about 5 g.p.g. March 25th to 28th.

The efficiency of the baffling system could be readily observed even by the casual observer by a comparison of the appearance of the water passing through the baffling system. The water passes first through a series of baffles designed to secure a good mixture of the alum solution with the untreated water and thence to an enlarged section through which the velocity is much reduced. On all days there was always an excellent floc showing by the time the water arrived at the end of the mixing baffles. Considerable settling took place at this point where the velocity was checked, there being a very marked ring of very turbid water extending a short distance into the clearer water in the enlarged section of the system. From here the water entered the upper section of the reservoir where there was a further check in velocity and consequently additional removal of turbidity.

Difficulties Encountered in Applying Alum.

During the whole course of the tests, the work was hampered considerably by inclement weather conditions. On several nights there were severe frosts and, as there were no heating arrangements in the cabin on the baffling system, the alum solution feed was constantly freezing up and allowing untreated water to pass through the baffling system. At other times clogging of the feed line with dirt caused interruptions in the application of the chemical. It was not until March 23rd that this difficulty was finally overcome by keeping a man on duty at the basin continuously.

During the first ten days of the test also, the alum feed from the tanks was by gravity and necessarily varied with the head in the tank from which the solution was being drawn. On March 17th a smaller solution tank with float valve attachment was installed, thus ensuring the application of the alum solution at a constant rate.

In addition, the rate of flow through the baffling system is variable. It is affected by three factors: (1) consumers' demands, (2) present arrangements of pumping into the basin and (3) backwashing of filters.

The consumers' demands vary during the day from 1,000 g.p.m. to 1,600 g.p.m., the consumption from 6 a.m. to 6 p.m. being from 900,000 to 1,000,000 gallons. From 6 p.m. to 6 a.m. the consumption is from 500,000 to 600,000 gallons, and the rate of pumping is not subject to such great variations. In case of fire, the rate may increase to 3,000 or perhaps 4,000 g.p.m.

Under the present system of pumping from 1,000,000 to 1,200,000 gallons of water into the reservoir from 10 p.m. to 7 a.m., the basin is from 12 to 15 inches lower at 10 p.m. than at 7 a.m. The amount of water that passes through the baffling system from 7 a.m. to 10 p.m. is less than the consumption during this time by the capacity of 12 to 15 inches of that section of the reservoir past the baffling system. Similarly during the rest of the day the flow is greater than the consumption for the period by that amount (approximately 150,000 gallons).

The backwashing of each filter requires at least 1,500 g.p.m. Backwashing once in 24 hours requires about 20 minutes for each filter. Backwashing twice in 24 hours required from 12 to 15 minutes for each filter.

Owing to the distance of the baffling system from either end of the reservoir, changes in the rate of pumping into or out of it will not affect the flow through the baffling system immediately; i.e. the increased flow created by the filling of the reservoir will continue for some time after 7 a.m. when the electric low-lift pump is stopped. Similarly, increased flow at the outlet end due to backwashing the filters will not cause an increase in flow through the baffling system until some time has elapsed.

This varying rate of flow is responsible for the different Ph values that were obtained from samples secured from the outlet of the first baffling system at different times during the day but with the same application of alum. Owing to the unsatisfactory arrangements for adding alum at the upper baffle it was impossible to give the water a second treatment at this point continuously, consequently there were times when the load upon the filters was too great and they were unable to remove all of the remaining turbidity.

General Observations on Results.

A comparison of the tabulation of results in Tables Numbers 1 and 2 reveals the following:

(1) The application of about 2 g.p.g. of alum to the suction of the low-lift pumps together with the estimated storage of two days accomplished a reduction in turbidity of a little more than 50 per cent. at the inlet of the first baffling system. This result was obtained with raw water turbidities of from 400 to 190.

(2) The effect of storage alone gave a percentage efficiency which decreased to almost zero when the raw water turbidity was 200 or less. It would appear that these turbidities are due to finely divided particles of clay which settle very slowly, and which are probably in a colloidal condition.

(3) In order to secure a clear effluent that had a turbidity of less than 10, it was necessary to reduce the turbidity of the influent to less than 75 p.p.m. This required a dosage of 5 g.p.g. of alum. Incidentally, this dosage of alum reduced the Ph value to 6.8-7.0.

(4) A Ph value of 6.8-7.0 would appear to be the optimum for most economical filtration of the Thames River water when dealing with high turbidities.

Results of Laboratory Experiments.

In addition to the practical application of alum to the supply, several experiments were carried on in the laboratory at the waterworks plant.

One series of experiments was carried on to determine the effect of various dosages of alum. Eight samples taken on different days at the inlet of the first baffling system were treated with varying amounts of alum from a standard

solution. These samples were allowed to stand in long cylinders overnight. Observations were made of floc formation and the next day Alkalinity, Free CO_2 and Ph determinations were made on all cylinders.

The results of this experiment are tabulated in Table Number 3. It will be noted that with turbidities ranging from 250 to 600 in the original samples it required at least 4 g.p.g. to give a good floc in 18 hours, and 5 g.p.g. to give a good floc in 1 hour. These figures further bear out the results obtained in the work on a large scale on the city supply. The higher Ph values obtained in the laboratory experiments are probably due to the increase in temperature of samples in the laboratory from 2°-3°C. to 16°-20°C., resulting in a loss of the Free CO_2 developed in the alum reaction.

Table Number 4 gives the results of treating two samples of the raw river water with various dosages of alum. The results obtained are quite comparable with those of Table Number 3.

Table Number 5 shows that there is a variation of the Ph value with a different time interval. Unfortunately Free CO_2 determinations were not made so that the reason for the variations cannot be definitely stated.

Tables Numbers 6, 7, 8 and 9 give the results obtained in laboratory experiments using sulphuric acid, soda ash, permutit and lime in conjunction with alum. The results secured with any of these were not favourable enough to justify the construction of necessary equipment for the application of any of these chemicals on a practical scale.

Table Number 10 shows the daily consumption and the quantities of alum used during the period of the tests.

Summary.

From the results obtained during this investigation, it is quite clearly shown that raw waters with wide ranges of turbidity as is typical of the Thames River can be successfully treated with alum and sedimentation so as to reduce the turbidity to such an extent that a filtration plant operating under average conditions will not be overloaded.

The correct dosage of alum would appear to be dependent upon the formation of a floc adequate in volume to carry down the turbidity with it. Sufficient alum should be added to reduce the turbidity of the water entering the filters to less than 75 and preferably to less than 50, in order to secure a clear effluent. With this supply, best results were obtained with a dosage of 5 g.p.g.

A second dosage of alum maintained continuously at the entrance to the upper baffle would materially increase the efficiency of the filters.

It should be noted, too, that at the beginning of the tests the filters were washed only once in 24 hours. This was changed to washing every 12 hours but, with turbidities of over 25 p.p.m., an improvement in the filter effluent might possibly be secured with a more frequent backwash of the filters.

TABLE NO. 1

RESULTS OF ANALYSES. CHATHAM, MARCH 8TH—13TH.

Date	Raw Water						Inlet, Baffling System					
	Time	Turb.	Alk.	Free CO_2	Ph.	Alum g.p.g.	Time	Turb.	Alk.	Free CO_2	Ph.	Alum g.p.g.
March 8th	2 p.m.	400	125	3.0	8.1	.....	11 a.m.	375	160	8.0	7.3	1.82
	4 p.m.	350	130	.....	8.0	2.19	.....	.....	.....	.....	.....	.....
March 9th	10.15 a.m.	200	124	3.0	8.0	.....	9.30 a.m.	180	120	7.0	7.2	.....
	11.30 a.m.	210	120	3.0	8.0	2.53	2 p.m.	140	126	6.0	7.3	1.84
	4.15 p.m.	200	122	3.0	7.9	.....	.....	.....	.....	.....	.....	.....
March 10th	9.10 a.m.	180	138	3.0	7.9	.....	10.15 a.m.	140	122	6.0	7.3	.....
	2 p.m.	190	140	4.0	7.9	2.46	3.15 p.m.	110	126	.....	7.3	2.32
March 11th	2.55 p.m.	190	150	4.0	8.1	2.56	3.50 p.m.	100	126	6.0	7.3	2.51
March 12th	9.30 a.m.	600	180	3.0	8.1	.....	10.10 a.m.	90	130	7.0	7.3–7.4	.....
	11.35 a.m.	500	176	3.5	7.9–8.0	.....	1.55 p.m.	95	136	5.0	7.3	.....
	2.45 p.m.	500	182	4.0	7.9–8.0	.....	4.05 p.m.	90	134	6.0	7.3	2.21
	4.45 p.m.	550	182	3.0	7.9–8.0	.....	.....	.....	.....	.....	.....	.....
March 13th	10 a.m.	600	220	3.0	7.9–8.0	.....	9.15 a.m.	110	145	6.0	7.5	.....
	2.30 p.m.	900	240	3.0	7.9–8.0	.....	11 a.m.	140	146	6.0	7.4–7.5	.....
	4.15 p.m.	1000	240	4.0	7.9–8.0	.....	2 p.m.	180	154	6.0	7.5	.....
	.....	.....	.....	.....	.....	.....	3.50 p.m.	200	146	7.0	7.4–7.5	2.19

March 8th—Alum feed frozen at baffling system, 8.00 a.m.
March 9th—Alum feed frozen night of March 8th and 9th.
March 10th—Alum feed frozen night of March 9th and 10th.
March 11th—Alum feed to suction of low-lift pumps discontinued, 10.00 p.m.
March 12th—Backwashing of filters every 12 hours commenced.
March 13th—Alum feed stopped night of March 12th and 13th.

TABLE NO. 1A

RESULTS OF ANALYSES. CHATHAM, MARCH 8TH–13TH.

Date	Influent to Filters					Tap Water					River Level Normal 574.50
	Time	Turb.	Alk.	Free CO_2	Ph.	Time	Turb.	Alk.	Free CO_2	Ph.	
March 8th	3.30 p.m.	250	145	8.0	7.3	3.00 p.m.	60	.....	.....	.....	579.0
March 9th	10.30 a.m.	110	136	.....	7.2	9.50 a.m.	45	134	6.0	7.3	
	11.50 a.m.	110	140	8.0	7.2–7.3	3.40 p.m.	30	.....	.....	.....	577.5
	2.00 p.m.	130	140	9.0	7.2–7.3	.....	.....	.....	.....	.....	
March 10th	10.15 a.m.	100	124	8.0	7.1	9.45 a.m.	25	140	.....	7.2	
	11.35 a.m.	.....	122	.....	7.0	2.30 p.m.	25	138	6.0	6.9	576.5
	2.45 p.m.	90	124	8.0	7.0	.....	.....	.....	.....	.....	
	3.15 p.m.	85	128	.....	7.1	.....	.....	.....	.....	.....	
March 11th	3.45 p.m.	60	112	9.0	6.9	3.10 p.m.	Less than 10	120	8.0	7.0	
	4.35 p.m.	45	112	8.0	6.9–7.0	.....	.....	.....	.....	.....	576.0
March 12th	9.00 a.m.	45	108	9.0	6.9	9.20 a.m.	Less than 10	120	10.0	6.9	
	10.05 a.m.	35	120	7.0	6.8–6.9	11.30 a.m.	Less than 10	108	8.0	6.8–6.9	
	11.15 a.m.	35	110	6.0	6.9	3.00 p.m.	Less than 10	106	7.0	6.8–6.9	578.5
	1.50 p.m.	30	106	6.0	6.8	.....	.....	.....	.....	.....	
	3.15 p.m.	30	110	8.0	6.8	.....	.....	.....	.....	.....	
March 13th	9.10 a.m.	35	114	6.0	6.8	10.40 a.m.	Less than 10	110	6.0	6.8	
	11.45 a.m.	45	112	7.0	6.8	3.35 p.m.	Less than 10	118	5.0	6.8	577.75
	2.50 p.m.	45	116	7.0	6.8	.....	.....	.....	.....	.....	
	4.30 p.m.	45	118	.....	6.8–6.9	.....	.....	.....	.....	.....	

March 8th—Alum feed frozen at baffling system, 8.00 a.m.
March 9th—Alum feed frozen night of March 8th and 9th.
March 10th—Alum feed frozen night of March 9th and 10th.
March 11th—Alum feed to suction of low-lift pumps discontinued, 10.00 p.m.
March 12th—Backwashing of filters every 12 hours commenced.
March 13th—Alum feed stopped night of March 12th and 13th.

TABLE NO. 2

RESULTS OF ANALYSES. CHATHAM, MARCH 12TH-28TH.

Date	Raw Water					Inlet, Baffling System					Alum g.p.g.	Outlet, Baffling System				
	Time	Turb.	Alk.	Free CO_2	Ph.	Time	Turb.	Alk.	Free CO_2	Ph.		Time	Turb.	Alk.	Free CO_2	Ph.
March 12	Average	535	180	3.5	7.9–8.1	.....	.....	.....	.....	.....	2.21	.....	.....	.....	.....	.....
13	Average	835	233	3.3	7.9–8.0	Average	160	148	6.2	7.4–7.5	2.19	Average	100	123	7.3	6.8–7.2
14	10.30 a.m.	1,250	242	3.5	8.2	10.00 a.m.	375	160	5.0	7.8	.....	10.00 a.m.	250	150	7.0	7.3
14	3.15 p.m.	1,200	230	4.0	8.1	2.30 p.m.	375	160	3.5	7.7	2.86	2.35 p.m.	225	140	6.0	6.9
14	.....	.....	.....	.....	.....	4.45 p.m.	375	160	5.5	7.7	.....	4.45 p.m.	.....	130	7.0	6.9
15	2.35 p.m.	550	170	2.5	8.0	10.10 a.m.	350	180	4.0	7.7	.....	3.45 p.m.	190	138	5.0	7.0
15	.....	.....	.....	.....	.....	3.45 p.m.	400	176	4.5	7.7	3.12	.....	.....	.....	.....	.....
16	10.45 a.m.	375	160	2.5	.....	10.15 a.m.	400	160	4.0	.....	.....	10.10 a.m.	190	142	2.0	.....
16	3.15 p.m.	400	170	2.5	.....	2.45 p.m.	400	160	3.0	.....	3.27	2.50 p.m.	170	130	4.5	.....
16	.....	.....	.....	.....	.....	4.25 p.m.	400	160	4.0	.....	.....	4.20 p.m.	200	126	5.0	.....
17	2.40 p.m.	520	220	3.5	.....	10.45 a.m.	400	160	3.0	.....	.....	10.45 a.m.	160	134	3.0	.....
17	.....	.....	.....	.....	.....	3.10 p.m.	500	170	3.5	.....	3.34	3.15 p.m.	240	144	5.0	.....
18	4.15 p.m.	1,500	266	1.5	.....	3.00 p.m.	500	182	3.0	.....	3.69	3.00 p.m.	200	146	3.5	.....
19	11.05 a.m.	900	188	2.5	.....	10.35 a.m.	500	180	3.5	.....	.....	10.35 a.m.	250	150	5.5	.....
19	3.15 p.m.	750	190	2.5	.....	2.20 p.m.	600	180	3.0	.....	4.19	2.25 p.m.	250	180	4.5	.....
20	10.45 a.m.	480	158	2.5	.....	9.45 a.m.	500	176	3.5	.....	.....	9.45 a.m.	170	138	4.5	7.1
20	3.30 p.m.	380	160	2.5	.....	2.50 p.m.	475	174	2.0	.....	3.92	2.50 p.m.	250	144	2.5	7.3
20	.....	.....	.....	.....	.....	4.10 p.m.	450	172	2.5	.....	.....	.....	.....	.....	.....	.....
21	9.45 a.m.	320	152	3.0	.....	9.10 a.m.	350	142	1.5	.....	.....	9.15 a.m.	325	136	2.5	7.6
21	1.45 p.m.	320	150	2.5	.....	2.15 p.m.	450	146	2.0	.....	3.68	4.00 p.m.	140	94	4.0	6.8
21	.....	.....	.....	.....	.....	4.00 p.m.	400	140	3.5	.....	.....	.....	.....	.....	.....	.....
22	10.20 a.m.	250	146	3.0	.....	9.20 a.m.	275	130	2.5	.....	.....	9.20 a.m.	250	130	2.5	7.6
22	1.50 p.m.	280	142	3.0	.....	2.20 p.m.	275	144	1.0	.....	2.84	2.25 p.m.	80	84	10.5	6.5–6.6
22	.....	.....	.....	.....	.....	4.30 p.m.	300	140	3.5	.....	.....	4.30 p.m.	75	78	5.0	6.6
23	10.00 a.m.	320	152	2.0	.....	9.30 a.m.	250	140	2.0	.....	.....	9.30 a.m.	120	116	4.5	6.9–7.0
23	1.50 p.m.	300	152	3.0	.....	2.20 p.m.	250	148	1.0	.....	4.39	2.20 p.m.	100	102	3.5	6.7–6.8
24	10.25 a.m.	400	172	3.0	.....	9.20 a.m.	320	144	3.0	.....	.....	9.20 a.m.	100	116	4.5	7.0–7.1
24	1.50 p.m.	350	170	3.0	.....	2.45 p.m.	300	150	3.5	.....	4.28	2.45 p.m.	90	112	5.0	6.8–6.9
24	.....	.....	.....	.....	.....	4.15 p.m.	351	146	3.0	.....	.....	.....	.....	.....	.....	.....
25	3.15 p.m.	390	162	2.5	.....	2.55 p.m.	250	148	3.5	.....	5.24	2.55 p.m.	80	102	8.0	6.8
26	10.25 a.m.	230	136	2.0	.....	9.45 a.m.	250	148	4.0	.....	.....	9.45 a.m.	150	138	4.5	7.4
26	2.40 p.m.	200	136	2.5	.....	3.15 p.m.	325	150	4.0	.....	4.98	3.15 p.m.	95	104	8.0	6.8
27	10.15 a.m.	200	142	3.0	.....	9.20 a.m.	200	148	2.5	.....	.....	9.20 a.m.	110	120	5.5	7.2
27	1.50 p.m.	150	.....	.....	.....	4.00 p.m.	220	138	2.5	.....	.....	4.00 p.m.	55	102	5.0	6.8-6.0
28	10.40 a.m.	120	156	2.0	.....	9.45 a.m.	200	150	4.0	.....	.....	9.45 a.m.	110	130	4.5	7.3

TABLE NO. 2A. Part 2.

RESULTS OF ANALYSES. CHATHAM, MARCH 26TH–28TH.

Date	Influent to Filters						Tap Water					River Level Normal 574.50	
	Time	Turb.	Alk.	Free CO_2	Ph.	Alum g.p.g.	Time	Turb.	Alk.	Free CO_2	Ph.		
March 26	11.40 a.m.	60	116	5.0	6.9–7.0	.....	2.10 p.m.	5	114	4.25	7.0–7.1		
	2.10 p.m.	55	112	4.0	7.0–7.1	.....	4.25 p.m.	5	116	5.0	7.0–7.1	576.50	
March 27	11.15 a.m.	50	106	4.0	6.8–6.9	.....	10.30 a.m.	5	110	5.0	6.9–7.0		Alum feed upper baffle 1.1 g.p.g. 8 a.m. 27th–8 a.m. 28th
	1.30 p.m.	60	112	4.0	6.9	.....	1.30 p.m.	5*	112	3.5	6.9		
	2.25 p.m.	60	108	3.5	6.9	1.1	2.50 p.m.	5*	104	4.5	6.9	575.00	
March 28	11.20 a.m.	50	106	3.5	6.9–7.0	1.1	10.45 a.m.	5*	108	4.0	6.9–7.0		
	.....	.....	.....	.....	.....	.....	11.20 a.m.	5*	108	4.5	6.9–7.0	*Turbidity less than 5	

TABLE NO. 2A.

RESULTS OF ANALYSES. CHATHAM, MARCH 12TH–28TH.

Date	Influent to Filters					Alum g.p.g.	Tap Water					River Level Normal 574.50	
	Time	Turb.	Alk.	Free CO_2	Ph.		Time	Turb.	Alk.	CO_2 Free	Ph.		
March 12	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	578.50	
March 13	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	577.75	Alum feed stopped night of Mar. 12-13th.
March 14	11.40 a.m.	45	120	6.0	6.8	.....	11.00 a.m.	10	122	5.5	6.8	.....	
14	3.35 p.m.	60	124	5.5	6.9	.....	3.45 p.m.	7	120	5.0	6.9	578.25	
March 15	10.00 a.m.	50	134	6.5	7.0	.....	11.55 a.m.	10	136	6.0	7.0	.....	
15	11.30 a.m.	50	140	4.5	7.1	1.0	.....	.....	.....	.....	.....	578.75	Alum feed upper baffle 1.0 g.p.g. 10 a.m.-6 p.m.
15	2.50 p.m.	75	134	5.5	7.0	.....	.....	.....	.....	.....	.....	.....	
March 16	11.00 a.m.	80	136	5.5	.....	.....	11.15 a.m.	12	132	6.5	.....	.....	Alum feed upper baffle
16	11.35 a.m.	80	138	4.5	.....	1.0	11.30 a.m.	12	134	5.0	.....	578.25	1.0 g.p.g. 8 a.m.-6p.m.
16	3.25 p.m.	75	138	2.5	.....	.....	3.25 p.m.	12	136	4.5	.....	.....	
March 17	11.25 a.m.	80	126	5.0	.....	....1.0	11.25 a.m.	10	130	4.5	.....	577.75	Alum feed upper baffle
Low duty electric pump not operated night of 16th-17th.													1.0 g.p.g. 8 a.m.-12 noon.
March 18	3.45 p.m.	110	148	4.0	.....	.....	3.45 p.m.	20	140	4.0	.....	.....	Alum feed stopped
Ice going out on river from 1.30 p.m.			Basin filled.		.....	.....	4.00 p.m.	25	138	4.0	.....	580.50	night of Mar. 17-18th
March 19	11.40 a.m.	100	134	4.0	.....	.....	11.30 a.m.	20	134	4.0	.....	.....	
19	4.00 p.m.	120	138	4.5	.....	.....	4.00 p.m.	25	140	4.5	.....	580.00	
19	.....	.....	.....	.....	.....	.....	4.20 p.m.	25	134	4.0	7.1	.....	
March 20	11.45 a.m.	120	134	4.0	7.1–7.2	.....	11.10 a.m.	15-20	134	4.0	7.1–7.2	.....	Alum feed upper baffle
20	2.00 p.m.	130	140	4.5	7.1–7.2	.....	11.45 a.m.	20-25	136	4.0	7.1–7.2	.....	1.0 g.p.g. 8 a.m.-6p.m.
20	4.05 p.m.	120	136	4.0	7.1	1.0	2.00 p.m.	20-25	136	4.0	7.2	.....	Low duty elect. pump
20	.....	.....	.....	.....	.....	.....	3.45 p.m.	15	132	4.0	7.1	579.25	not operated night of Mar. 19th-20th.

March 21	11.25 a.m.	130	132	4.0	7.2	.....	10.45 a.m.	30	116	4.0	7.3	.....	Alum feed stopped ngt.
21	1.25 p.m.	120	122	4.0	7.2	.....	11.25 a.m.	25	128	3.5	7.2	.....	20-21st. Basin filled.
21	2.10 p.m.	150	122	5.0	7.3	1.0	1.25 p.m.	25	116	3.5	7.2	.....	Alum feed upper baffle
21	3.30 p.m.	140	122	4.0	7.3–7.4	.....	3.00 p.m.	30	120	4.0	7.3	578.00	1.0 g.p.g. 10 a.m.–2 p.m.
March 22	11.25 a.m.	150	120	4.0	7.4	.....	10.55 a.m.	25	118	4.5	7.3–7.4	.....	Alum feed stopped ngt.
22	1.30 p.m.	150	120	4.0	7.3	1.0	11.25 a.m.	30	122	4.5	7.4	.....	of 21st-22nd.
22	3.50 p.m.	160	118	4.0	7.2	.....	1.30 p.m.	30	118	4.0	7.3–7.4	.....	Alum feed upper baffle
22	.....	.....	.....	.....	.....	.....	3.30 p.m.	30	112	3.0	7.2–7.3	576.00	1.0 g.p.g. 9 a.m.-4 p.m.
March 23	11.45 a.m.	90	108	3.5	6.9–7.0	.....	10.45 a.m.	15	102	3.5	7.0	.....	
23	1.25 p.m.	90	102	4.0	6.9–7.0	.....	11.45 a.m.	12	104	4.0	6.9–7.0	.....	
23	.....	.....	.....	.....	.....	.. 1.0	1.25 p.m.	12	104	4.0	7.0	.....	Alum feed upper baffle
23	.....	.....	.....	.....	.....	.....	3.50 p.m.	15	100	4.5	7.0	576.00	1.0 g.p.g. 8 a.m.-5 p.m.
March 24	1.15 p.m.	90	108	4.5	7.0	.....	1.15 p.m.	10	110	4.5	7.0–7.1	.....	
24	.....	.....	.....	.....	.....	.....	3.35 p.m.	10	112	4.5	7.0	576.50	
March 25	3.35 p.m.	70	110	5.0	7.0	.....	3.35 p.m.	5	112	4.0	7.0	.....	
25	.....	.....	.....	.....	.....	.....	3.50 p.m.	5	114	5.0	7.0	577.50	

TABLE NO. 3

	No. 1					No. 2					No. 3					No. 4				
Sample	Turb.	Floc	Alk.	Free CO_2	Ph.	Turb.	Floc	Alk.	Free CO_2	Ph.	Turb.	Floc	Alk.	Free CO_2	Ph.	Turb.	Floc	Alk.	Free CO_2	Ph.
Original	.. 500	.....	182	3.0	.....	600	.....	180	3.0	.....	475	.....	174	2.0	.....	450	.....	146	2.0	.....
2 g.p.g.	.....	Very slight in 18 hours	156	3.5	.....	.....	Very slight, 18 hrs.	150	3.0	7.6	.....	Very slight, 18 hrs.	124	3.0	7.6+	.....	Very slight, 18 hrs.	136	3.5	7.6+
3 g.p.g.	.....	Slight 18 hrs.	146	3.0	.....	.....	Slight 18 hrs.	146	3.5	7.6+	.....	Slight 18 hrs.	120	3.5	7.6+	.....	Slight 18 hrs.	130	3.0	7.6+
4 g.p.g.	.....	Good 18 hrs.	144	5.5	.....	.....	Good 18 hrs.	142	3.0	7.6+	.....	Good 18 hrs.	114	3.0	7.6	.....	Good 18 hrs.	122	4.0	7.6+
5 g.p.g.	.....	Slight 1 hr. Good 18 hrs.	136	5.0	.....	.....	Fair 1 hr. Good 18 hrs.	134	4.0	7.6+	.....	Good 1 hr.	105	5.5	7.5	.....	Good 1 hr.	112	4.5	7.5
6 g.p.g.	.....	15 min.	138	4.5	.....	.....	Good 30 min.	126	4.0	7.4 to 7.5	.....	45 min.	100	4.0	7.4 to 7.5	.....	45 min.	104	4.0	7.5
7 g.p.g.	.....	15 min.	130	6.5	.....	.....	25 min.	120	5.0	7.3	.....	30 min.	96	5.0	7.3–7.4	.....	30 min.	96	7.0	7.3–7.4
8 g.p.g.	.....	15 min.	120	6.0	.....	.....	20 min.	110	5.0	7.3	.....	30 min.	94	5.5	7.3	.....	15 min.	92	4.0	7.4
Alk. 16 g.p.g.	.....	15 min.	100	13.0	.....	.....	15 min.	82	14.0	6.7–6.8	.....	15 min.	76	13.0	6.8–6.9	.....	10 min.	84	13.0	7.0–7.1

TABLE NO. 3—Continued

	No. 5					No. 6					No. 7					No. 8				
Sample	Turb.	Floc	Alk.	Free CO_2	Ph.	Turb.	Floc	Alk.	Free CO_2	Ph.	Turb.	Floc	Alk.	Free CO_2	Ph	Turb.	Floc	Alk.	Free CO_2	Ph.
Original	275	.....	144	1.0	...	250	.....	148	1.0	.....	350	.....	146	3.0	.....	250	.....	148	3.5	.....
2 g.p.g.	.....	Very Slight, 18 hrs.	118	3.0	7.6+	.....	Very slight 18 hrs.	134	4.0	7.6+	.....	Slight 18 hrs.	132	3.5	7.6+	.....	Very slight 18 hrs.	136	3.5	7.6+
3 g.p.g.	.....	Slight, 18 hrs.	118	3.5	7.6+	.....	Slight 18 hrs.	128	3.5	7.6+	.....	Good 18 hrs.	128	4.0	7.6+	.....	Slight 18 hrs.	132	4.0	7.6+
4 g.p.g.	.....	Good 18 hrs.	116	3.0	7.6+	.....	Good 18 hrs.	124	3.5	7.6+	.....	Good 1¼ hrs.	120	5.0	7.6	.....	Good 18 hrs.	128	4.5	7.6+
5 g.p.g.	.....	Good 1¼ hrs.	110	4.0	7.5	.....	Good 1½ hrs.	118	4.0	7.4	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
6 g.p.g.	.....	Good 40 min.	100	4.5	7.5	.....	1 hr.	104	4.0	7.3–7.4	.....	40 min.	108	5.0	7.3	.....	45 min.	112	4.0	7.6
7 g.p g.	.....	30 min.	94	8.5	7.2–7.3	.....	30 min.	98	5.0	7.3										
8 g.p.g.	.....	15 min.	86	6.0	7.3	.....	15 min.	94	6.0	7.3										
Alk. 16 g.p.g.	.....	15 min.	80	13.0	6.9	.....	15 min.	88	11.0	6.9										

NOTE.—All samples taken at inlet of baffling system.
Analyses made from 18-22 hours after treatment.
Original temperature of samples 2°-3°C.
Temperature at time analyses were made 16°-20°C.
In all samples but No. 7, 2 g.p.g. and 3 g.p.g. samples were turbid on filtration; 4 g.p.g. filtered clear and remainder settled clear.
No. 7 sample—3 g.p.g., 4 g.p.g. and 6 g.p.g. settled clear; 2 g.p.g. turbid on filtration.

TABLE NO. 4.

No. 1.						No. 2.					
Sample	Turb.	Floc	Alk.	Free CO_2	Ph.	Turb.	Floc	Alk.	Free CO_2	Ph.	
Original	350	.....	170	3.0	.....	390	0	162	2.5	.....	
2 g.p.g.	.....	Very slight 24 hrs.	156	3.0	7.6+	.....	Very slight 24 hrs.	136	4.0	7.6+	Initial temp. 2°-3°C.; temp. at time analyses were made 16°-20°.
3 g.p.g.	.....	Slight 24 hrs.	150	4.0	7.6+	.....	Slight 24 hrs.	134	4.0	7.6+	In both samples 2 g.p.g. and 3 g.p.g. were still turbid on filtration; 4 g.p.g. filtered clear; 6 g.p.g. settled clear.
4 g.p.g.	.....	Fair 1½ hrs.	146	4.0	7.6+	.....	Good 18 hrs.	130	4.0	7.6+	Analyses made 24 hours after treatment.
6 g.p.g.	.....	45 min.	134	5.0	7.6	.....	25 min.	114	4.0	7.6	

TABLE NO. 5.

No. 1.					No. 2.				No. 3.						
Sample	Turb.	Floc	Ph. 1 hr.	Ph. 19 hrs.	Floc	Ph. 1 hr.	Temp.	Turb.	Floc	Ph. 1 hr.	Temp.	Ph. 4 hrs.	Temp.	Ph. 24 hrs.	Temp.
Original	200	.....	.....	.....	.....	.....	.....	200	.....	.....	.....	.....	.....	.....	.....
2 g.p.g.	.....	Slight 18 hrs.	7.3-7.4	7.6+	Good 15 min.	7.0-7.1	16°C.	.....	Fair 3½ hrs. Clear 24 hrs.	7.2-7.3	5°C.	7.3	19.5°C.	7.6+	16°C.
3 g.p.g.	.....	Settled clear 18 hrs.	7.0-7.1	7.4-7.5	.....	.....	.....	.....	Good 1¼ hrs.	7.1	5°C.	7.1–7.2	19.5°C.	7.5-7.6	16°C.
4 g.p.g.	.....	45 min.	6.9	7.0-7.1	3 min.	6.8-6.9	16°C.	.....	45 min.	6.9	5°C.	6.9-7.0	19.5°C.	7.2-7.3	16°C.

TABLE NO. 6. H_2SO_4

Sample	Alk.	Free CO_2	Acidity to Sulphates	Ph.	Floc 1 g.p.g. Alum	
Original	230	4.0	.....	8.1	.....	Alum added 19 hrs. after H_2SO_4.
80 p.p.m. H_2SO_4	76	52.0	8.0	6.0	Good, settled 3 hrs.	
60 p.p.m. H_2SO_4	130	40.0	0.0	6.7-6.8	Nil 3 hrs.	
40 p.p.m. H_2SO_4	154	22.0	0.0	7.3	Nil 3 hrs.	
20 p.p.m. H_2SO_4	164	16.0	0.0	7.4-7.5	Nil 3 hrs.	

TABLE NO. 7—SODA ASH.

Sample	Bicarb. Alk.	Normal Carb. Alk.	Ph.	Alum			
				2 g.p.g.	4 g.p.g.	6 g.p.g.	
Original	170	0	8.0	.....	.....	.....	Ph. determination 18 hrs. after treatment with soda ash.
80 p.p.m.	588	12	7.8?	No floc	.....	.....	Alk. determination 2½ hrs. after treatment with soda ash.
40 p.p.m.	175	10	7.8?	.....	No floc	.....	Alum added 18 hrs. after treatment with soda ash.
20 p.p.m.	172	16	7.8?	.....	.....	Good floc 30 min.	

TABLE No. 8.—PERMUTIT.

Sample	Bicarb. Alk.	Normal Carb. Alk.	Ph.	Alum 2 g.p.g.	Alum 4 g.p.g.	Alum 6 g.p.g.	Alum 8 g.p.g.	Alum 10 g.p.g.	
Original.....	170	0	8.0	.....	.....	.....	.....	.....	Ph. determination 18 hrs. after treatment with Permutit.
Permutit.....	154	10	7.9?	No floc	No floc	Fair 18 hrs.	1½ hrs.	1½ hrs.	Alk. determination 1 hr. after treatment with Permutit. Alum added 1 hr. after treatment with Permutit.

TABLE NO. 9.—LIME.

Sample	Bicarb. Alk.	Nor. Carb. Alk.	Hydroxide Alk.	Ph.	Alum 1 g.p.g.	Alum 2 g.p.g.	Alum 4 g.p.g.	Alum 6 g.p.g.	Alum 8 g.p g.	Alum 10 g.p.g.	
Original.....	170	0	0	.....	.....	.....	.....	.....	.....	.....	Alk. and Ph. determinations made 19 hrs. after lime treatment. Alum added 20 hrs. after lime. One sample alk. 230-Ph. 8.1 treated with 180 p.p.m. CaO gave complete sedimentation in 18 hrs. Req'd 4 g.p.g. alum to produce floc.
360 p.p.m.....	0	88	12	8.4	10 min.	.....	.....	.....	.....	.....	
288 p.p.m.....	64	40	0	8.2	.....	Slight 2 hrs.	.....	.....	.....	.....	
216 p.p.m.....	80	20	0	8.2	.....	.....	.....	.....	.....	Good 10 min.	
180 p.p.m.....	72	28	0	8.2	.....	.....	.....	.....	Good 10 min.	.....	
144 p.p.m.....	84	20	0	8.2	.....	.....	.....	Good 10 min.	.....	.....	
102 p.p.m.....	84	20	0	8.2	.....	.....	Good 10 min.	.....	.....	.....	
72 p.p.m.....	102	12	0	8.2	.....	Slight 4 hrs.	.....	.....	.....	.....	
36 p..p.m.....	124	16	0	8.2	No floc.	.....	.....	.....	.....	.....	

TABLE NO. 10.

Date	Consumption				Alum Solution		First Baffling System		Second Baffling System	
	Meter Reading		Washwater Estimated	Total	Lbs.	Grains per Gal.	Lbs.	g.p.g.	Lbs.	g.p.g.
	U.S. Gal.	Imp. Gal.								
March 8	1,552,000	1,293,000	240,000	1,533,000	480	2.19	400	1.82	.....	.....
March 9	1,540,000	1,283,000	240,000	1,523,000	550	2.53	400	1.84	.....	.....
March 10	1,453,000	1,210,000	240,000	1,450,000	510	2.46	480	2.32	.....	.....
March 11	1,385,000	1,154,000	240,000	1,394,000	510	2.56	500	2.51	.....	.....
March 12	1,520,000	1,266,000	240,000	1,506,000	40	2.50	475	2.21	.....	.....
March 13	1,570,000	1,308,000	300,000	1,608,000	.....	.....	505	2.19	.....	.....
March 14	1,550,000	1,291,000	360,000	1,651,000	.....	.....	675	2.86	.....	.....
March 15	1,590,000	1,324,000	360,000	1,684,000	.....	.....	750	3.12	75	1.0
March 16	1,570,000	1,308,000	360,000	1,668,000	.....	.....	780	3.27	75	1.0
March 17	1,570,000	1,308,000	360,000	1,668,000	.....	.....	795	3.34	40	1.0
March 18	1,330,000	1,108,000	360,000	1,468,000	.....	.....	775	3.69	.....	.....
March 19	1,520,000	1,266,000	360,000	1,626,000	.....	.....	975	4.19	.....	.....
March 20	1,590,000	1,324,000	400,000	1,724,000	.....	.....	965	3.92	80	1.0
March 21	1,600,000	1,333,000	400,000	1,733,000	.....	.....	910	3.68	40	1.0
March 22	1,560,000	1,300,000	400,000	1,700,000	.....	.....	690	2.84	80	1.0
March 23	1,590,000	1,324,000	350,000	1,674,000	.....	.....	1050	4.39	80	1.0
March 24	1,640,000	1,366,000	350,000	1,716,000	.....	.....	1050	4.28	.....	.....
March 25	1,440,000	1,200,000	350,000	1,550,000	.....	.....	1160	5.24	.....	.....
March 26	1,640,000	1,366,000	320,000	1,686,000	.....	.....	1200	4.98	.....	.....
March 27	.....	.....	320,000	.....	.....	.....	1200	.....	140	1.1
March 28	.....	.....	320,000	.....	.....	.....	1200	.....	140	1.1

DIVISION OF LABORATORIES

To the Chairman and Members
of the Ontario Provincial Board of Health:

GENTLEMEN:

I have the honour to submit the following report and tabulated statements of the work of the Division of Laboratories for the year 1923.

It will be noted that the total number of specimens examined is slightly in excess of last year. This increase has largely been due to the increased number of diphtheria examinations. There were some small outbreaks among the school children in the localities bordering on the city, and with a view to locating diphtheria carriers numerous school children were examined.

Rabies has been held under complete control again during the past year. No rabid animals have been found in the Province for over two years.

In order to recognize early cases of typhoid fever your laboratories send reports on all specimens for examination for typhoid to the district officer of health and to the central office of the board whether the result is positive or negative. It is believed that in this way outbreaks of typhoid fever might be investigated early and the necessary preventive measures applied for their control.

The laboratory service in connection with diphtheria has been greatly improved during the past year. Arrangements were made with the post office management whereby we could collect the mail on the evenings of Saturdays, Sundays and holidays. This means that swabs arriving at the post office will be brought directly to the laboratory and cultured so that reports may be sent to physicians the following day without delay.

The branch laboratory directors were called to Toronto during the past summer for a series of lectures and demonstrations on the diagnosis and treatment of diabetes and the therapeutic application of Insulin. After the sessions we supplied the branch laboratories with the technique, apparatus and reagents for carrying out blood sugar determinations.

A suitable outfit is being prepared for physicians to send in blood from great distances. We were able to find a mixture of chemicals which would prevent clotting and preserve the blood sugar content four or five days, unchanged. This will be of great assistance to physicians in the outlying parts of the Province.

BRANCH LABORATORIES

All of our laboratories are in charge of graduates in medicine, thoroughly competent to carry on the work. Year by year the physicians in the districts in which a branch laboratory is located are using this laboratory service to a greater extent and as time goes on the routine work in the central laboratory should diminish; the work may be done quite as well and should be more expeditiously handled than at the central office on account of the shorter time consumed in transporting the specimens. The report of each laboratory is given in full in this report.

Report of the Chemical Department Division of Laboratories for the Year 1923

The work conducted in the chemical department is of three distinct types, namely:

(1) The analysis of submitted samples.
(2) The manufacture of medicinal products.
(3) Research.

The following is a brief outline of the work carried on under these three subdivisions during the year 1923.

Analysis of Submitted Samples

(*a*) *Water.*—In the course of the year forty-three samples of water were analyzed to ascertain chemical constituents. Of these forty-three samples fifteen were analyzed to learn the content and nature of the dissolved mineral salts; seventeen for a complete chemical analysis; four to determine the hardness; two for sulphuretted hydrogen and two for a quantitative determination of the arsenic dissolved.

(*b*) *Milk.*—During the year 185 samples of milk were submitted and tested to ascertain if they conformed with the regulations.

(*c*) *Liquors.*—The number of analyses of liquor for alcoholic strength conducted for the Board of License Commissioners, amounted to 2,430. This was a considerable increase over the preceding year when 1,417 samples were tested. In addition to the analysis for alcoholic strength considerable time was expended upon the analysis of six medicated wines, to ascertain the amounts of medicinal ingredients contained in them. The staff of chemists was not augmented during the year and this considerable increase of work affected the whole department by making it difficult to render as prompt a service as is desirable. However, a recent rearrangement with the Board of Liquor License Commissioners promises relief from this condition.

(*d*) *Coal.*—Two hundred and one samples of coal, as supplied to government institutions, were submitted by the departments of the Provincial Secretary and Public Works. These were analyzed and reported.

(*e*) *Miscellaneous.*—Analyses were conducted to ascertain:

(1) If a bread sold for diabetics was a gluten bread.
(2) The value of a proprietary disinfectant.
(3) If a soap purchased by a government institution conformed with the specifications.

The Manufacture of Medicinal Products

(*a*) *Phenarsenamine.*—During 1923, sufficient phenarsenamine was manufactured to fulfil the requirements of the syphilitic patients receiving free treatment in this Province and in addition to supply the purchases of a sister province. There were distributed during 1923, 15,538 ampoules containing 8,270 grams of phenarsenamine.

(*b*) *Mercury Salicylate Suspension.*—This suspension was manufactured in sufficient quantity to meet the needs of the division providing free treatment to syphilitics.

(*c*) *Silver Nitrate Ampoules.*—On September 1st, the chemical department took over the manufacture of silver nitrate ampoules. Since that date this department has manufactured sufficient to fulfil the requirements of Ontario physicians and, in addition, to supply the order of 15,000 ampoules purchased by another province.

(*d*) *Administration Service.*—Sterile distilled water and sodium hydroxide solution are prepared and supplied when needed for the free administration of phenarsenamine. During the year 22,538 ounces of the former and 1,418 ounces and 372 ampoules of the latter were prepared.

Research

Small researches were conducted by this department in connection with:

(1) The preparation of a mercury salicylate suspension.

(2) The toxicity resulting from the use of certain rubber tubing in the administration of 606.

(3) The estimation of blood sugar.

(4) An outfit that would permit the transportation from a distance of specimens of blood for sugar determination.

All of which is respectfully submitted.

C. M. Anderson, M.D.,
Director of Laboratories.

A. R. Bonham, B.A.Sc.,
Chief Chemist.

SUMMARY OF DIAGNOSTIC WORK

Main Laboratories—Toronto

Disease	Year		
	1911	1922	1923
Diphtheria (Swabs)	1,068	4,308	5,680
Release from quarantine	173	1,516	2,139
Positive	91	354	848
Negative	82	1,162	1,291
Diagnosis	895	2,792	3,541
Positive	226	560	680
Negative	669	2,232	2,861
Tuberculosis (Sputum)	1,650	2,232	1,924
Positive	402	290	260
Negative	1,248	1,994	1,664
Typhoid (Blood)	749	1,042	965
Positive	70	203	232
Negative	679	839	733
Syphilis			
Colloidal Gold Reaction		229	324
Wassermann Reaction		16,451	15,499
Very strongly positive		1,693	1,437
Strongly positive		318	397
Positive		1,144	1,104
Negative		13,296	12,561
Gonorrhoea		2,839	2,559
Positive		409	420
Negative		2,430	2,179
Rabies (Brains of animals)		8	5
Negri bodies present		0	0
Negri bodies absent		8	5
Milk	168	242	185
Water	1,718	2,608	2,618
Bacteriological	1,668	2,546	2,582
Chemical	50	62	43
Coal (For public institutions)			201
Liquor (For license)	241	1,417	2,430
Miscellaneous	86	429	238
Totals	5,680	31,857	32,675

SUMMARY OF OUTFITS, VACCINE, PHENARSENAMINE AND TREATMENTS SUPPLIED DURING THE YEAR 1923.

Outfits		
Syphilis (Wassermann)	20,336	
Gonorrhoea	4,611	
Water	3,180	
Diphtheria	12,882	
Tuberculosis	6,859	
Typhoid	3,491	
		51,359
Vaccine		
Typhoid-paratyphoid	30,515	
Pertussis (Whooping Cough)	40,742	
		71,257cc
Silver Nitrate (for prevention of Ophthalmia)		23,660
Pasteur Preventative (for Rabies)		
Cases		5
Injections		105
Phenarsenamine		
Ampoules		13,538
Grams		8,270.1
Mercury Salicylate		
Ampoules		5,421
Grains		10,577
Sodium Hydroxide		
Ampoules		372
Ounces		1,148
Sterile Distilled Water		
Ounces		22,538

SUMMARY OF DIAGNOSTIC WORK

Branch Laboratories—1923

	Kingston			London			Fort William			Sault Ste. Marie			North Bay			Peterboro'			Owen Sound			Ottawa		
	....	....	569	....	....	1392	....	....	2077	....	....	341	....	....	1041	....	....	522	....	....	155	....	....	6515
Diphtheria (Swabs)	....	104	....	....	....	323	....	246	....	....	74	....	....	446	....	....	223	....	....	30	....	....	1269	....
Release from Quarantine	20	....	....	86	....	....	74	....	....	27	....	....	184	....	....	58	....	....	8	....	....	153	....	....
Positive	84	....	....	....	237	....	172	....	....	47	....	....	262	....	....	165	....	....	22	....	....	1116	....	....
Negative	....	465	....	....	....	1069	....	1831	....	....	267	....	....	595	....	....	299	....	....	125	....	....	4246	....
Diagnosis	56	....	....	88	....	....	318	....	....	60	....	....	125	....	....	55	....	....	16	....	....	604	....	....
Positive	409	....	....	....	981	....	1513	....	....	207	....	....	470	....	....	244	....	....	109	....	....	3642	....	....
Negative	....	....	784	836	....	....	....	....	237	....	....	156	....	....	301	....	....	350	....	....	354	....	....	527
Tuberculosis	102	....	....	....	129	....	38	....	....	18	....	....	47	....	....	68	....	....	84	....	....	107	....	....
Positive	682	....	....	....	....	697	199	....	....	138	....	....	254	....	....	282	....	....	270	....	....	420	....	....
Negative	....	....	463	....	....	358	....	....	138	....	....	14	....	....	286	....	....	221	....	....	99	....	....	773
Typhoid	86	....	....	71	....	....	46	....	....	5	....	....	129	....	....	72	....	....	11	....	....	45	....	....
Positive	377	....	....	....	287	....	92	....	....	9	....	....	157	....	....	149	....	....	88	....	....	128	....	....
Negative																								
Syphilis:—	....	....	0	....	34	....	....	....	43	....	....	0	....	....	0	....	....	0	....	....	10	....	....	0
Colloidal Gold Reaction	....	....	2084	....	....	4472	....	....	952	....	....	368	....	....	724	....	....	415	....	....	41	....	....	0
Wassermann Reaction	300	....	....	969	....	....	118	....	....	74	....	....	118	....	....	33	....	....	13	....	....	0	....	....
Very strongly positive	70	....	....	....	174	....	28	....	....	39	....	....	57	....	....	8	....	....	12	....	....	0	....	....
Strongly positive	65	....	....	....	....	40	47	....	....	18	....	....	25	....	....	28	....	....	2	....	....	0	....	....
Positive	1649	....	....	3289	....	....	759	....	....	237	....	....	524	....	....	346	....	....	14	....	....	0	....	....
Negative	....	....	0	....	....	....	....	....	27	....	....	0	....	....	0	....	....	3	....	....	1	....	....	2
Spirochæta Pallida	0	....	....	....	....	....	7	....	....	0	....	....	0	....	....	1	....	....	0	....	....	2	....	....
Positive	0	....	....	....	....	....	20	....	....	0	....	....	0	....	....	2	....	....	1	....	....	0	....	....
Negative	....	....	144	....	....	494	....	....	325	....	....	74	....	....	438	....	....	220	....	....	312	....	....	645
Gonorrhoea	46	....	....	....	129	....	85	....	....	26	....	....	127	....	....	140	....	....	54	....	....	275	....	....
Positive	98	....	....	....	....	366	240	....	....	48	....	....	311	....	....	80	....	....	258	....	....	370	....	....
Negative	....	....	0	....	1163	....	....	....	890	....	....	800	....	....	71	....	....	124	....	....	186	....	....	1097
Milk	....	....	702	....	....	1407	....	....	814	....	....	2371	....	....	1129	....	....	1037	....	....	395	....	....	2734
Water	702	....	....	....	915	....	814	....	....	2363	....	....	1129	....	....	1037	....	....	395	....	....	2696	....	....
Bacteriological	0	....	....	....	....	492	0	....	....	8	....	....	0	....	....	0	....	....	0	....	....	38	....	....
Chemical	....	....	0	....	....	19	....	....	0	....	....	0	....	....	0	....	....	0	....	....	0	....	....	0
Liquor (for license)	....	....	180	....	....	885	....	8	449	....	....	225	....	....	14	....	....	790	....	....	409	....	....	1314
Miscellaneous																								
Totals	4,926			12,198			5,952			4,349			4,004			3,682			2,052			12,007		

Grand Total All Branches..... 49,170

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Municipalities	Outfits sent out								Doses of Typhoid-paratyphoid Vaccine supplied	Whooping Cough Vaccine	Silver nitrate for prevention of Ophthalmia	Pasteur Preventive Treatment	
	Syphilis (Wassermann)	Syphilis (Treponema Pallida)	Gonorrhea	Water	Diphtheria	T.B.	Typhoid	Total				Cases	No. of Injections
Algoma—													
Foleyet				12		10		22	120	10			
Gogama	10							10					
Marshville				1				1					
Richard's Landing									10				
Sault Ste. Marie									300	420	120	1	21
Spragge										70	15		
Brant—													
Brantford	610		24	25	240	175	12	1086	1010	1240	905		
Burford					12	9	6	27	10		10		
Oshweken	24				6	5		35		120			
Paris	36		6	5		10		57	190	220	100		
St. George											30		
Scotland				1				1					
Bruce—													
Cargill										60			
Chesley				5				5		30			
Holyrood				1				1					
Kincardine				31				31			90		
Lucknow										30			
Mildmay				2	6		6	14	10				
Paisley										20			
Port Elgin	2		4	2	12	4	6	30		30			
Ripley				2				2					
Tiverton				8				8	30		20		
Walkerton	6		33	10		4		53			5		
Wiarton				2				2		40			
Carleton—													
Kinburn					24			24		10	10		
Ottawa	3267		606	12	996	392	390	5663	1015	3550	2100		
Stittsville				1				1					
Dufferin—													
Grand Valley				4	12			16	10	100			
Orangeville					60	8		68					
Dundas—													
Iroquois			6		6			12	10		20		
Morrisburg	14		6	12	12	10	12	66	90	120	40		
Durham—													
Blackstock	9					10	6	25	30				
Bowmanville					60	10		70		120	50		
Canton				1				1					
Enniskillen				11	36	4		51					
Garden Hill											10		
Millbrook				25				25			20		
Newcastle				1				1					
Port Hope				78		25		103	20		40		
Elgin—													
Aylmer										20	25		
Port Stanley									20	20	10		
St. Thomas										160			
Essex—													
Belle River				1				1					
Essex						25		25	10				
Harrow	3							3					
Kingsville						12		12					
Leamington	18				12			30	20				
Newington	4				6			10					

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	Syphilis (Wassermann)	Syphilis (Treponema Pallida)	Gonorrhea	Water	Diphtheria	T.B.	Typhoid	Total				Cases	No. of Injections
Essex—Cont.													
Pelee Island									10	20			
Sandwich	50							50					
Windsor	1484		900		696	700	96	3876	350	370	650		
Frontenac—													
Harrowsmith									10				
Kingston	423					200		623	1290	260	830		
Mountain Grove	4				6	5		15	10		10		
Sharbot Lake	18		12		6	9		45	10	40	15		
Glengarry—													
Alexandria			4		6	5	6	21		20			
Apple Hill	12				12			24					
Dalhousie Mills					12			12					
Dalkeith				4		5	6	15					
Martintown	6			2	24	5		37					
Maxville					36			36					
Williamstown					12	5		17					
Grenville—													
Kemptville	4		4	4	30	20		62					
Prescott	6						6	12					
Grey—													
Dromore				1				1	20				
Dundalk				1				1					
Durham				1				1	50	60	30		
Hanover				17	6	10	18	51	50		20		
Markdale				7				7	10				
Meaford				1				1					
Owen Sound				12				12	620	710	575		
Priceville	1				6			7					
Thornbury				2		5	6	13					
Haldimand—													
Canfield					5			5		50			
Cayuga							6	6		50	10		
Dunnville	6			32	48	15	24	125			25		
Hagersville	4			1	6	6	8	25					
Jarvis	24							24	20				
Haliburton—													
Minden				1				1					
Halton—													
Acton			6	1	48	10		65					
Bronte				3				3					
Burlington	12			61				73		10	15		
Freeman				1				1					
Georgetown	18		12	1	30	14	6	81	10	20	45		
Milton	6			2	12	5		25					
Oakville	12		12	73	24		18	139	20	20	20		
Port Nelson				8				8					
Hastings—													
Bancroft											30		
Belleville	176		12	66	102	95	90	541	150		60		
Deseronto						10		10		50	10		
Eldorado	12		12			8		32	30		40		
Frankford				1		35		36					
Harold				2				2					
Madoc				1				1					
Roslin	12				24		6	42	10				

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	Syphilis (Wassermann)	Syphilis (Treponema Pallida)	Gonorrhea	Water	Diphtheria	T.B.	Typhoid	Total				Cases	No. of Injections
Hastings—Con.													
Shannonville				6				6	20				
Springbrook											10		
Stirling				1				1					
Trenton	72			3	48	30		153	60	280	25		
Tweed	6				12	5		23	20	30			
Huron—													
Brussels				1				1					
Blyth					12	8	6	26					
Clinton									25	25			
Ethel						10	12	22					
Exeter				4		5		9					
Goderich	24			18	30	13	24	109	50		175		
Kippen				2				2					
Seaforth	6			2	24		24	56	60	30			
Wingham	6				36	25		67					
Kent—													
Blenheim									40	50			
Charing Cross				2				2					
Chatham	96		6	48	70			220	290	400	445		
Dresden							36	36	70		80		
Mull				1				1					
Ridgetown				38		10	12	60	20		15		
Tilbury									20	10	25		
Wallaceburg	6					5		11					
Lambton—													
Alvinston									10				
Corunna				1				1					
Forest				5		5	12	22			5		
Petrolia									80		10		
Sarnia	102		60	12	42	83	18	317	130	20	105		
Watford											45		
Wyoming										10			
Lanark—													
Almonte									10		55		
Carleton Place				1				1					
Dalhousie Lake				5				5					
Lanark									90				
Middleville										10	10		
Perth	74				42	5	12	133	20				
Smith's Falls	8			6	6	8		28	50				
Leeds—													
Athens	6				6			12		20	5		
Brockville	48				30	49	24	151	100	190	210		
Charleston					6			6	10				
Elgin					18	10	12	40					
Frankville	4				12			16			20		
Gananoque	12							12			60		
Lansdowne					12		12	24	20				
Lyn										190			
Lennox and Addington—													
Napanee				27				27					
Odessa										40			
Tamworth									20				
Lincoln—													
Beamsville	12		12	12	12	10		58					

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	Syphilis (Wassermann)	Syphilis (Treponema Pallida)	Gonorrhea	Water	Diptheria	T.B.	Typhoid	Total				Cases	No. of Injections
Lincoln—Con.													
Grimsby	1			32		10		43		50			
Merritton	6				12	15	18	51					
Niagara-on-the-Lake	12		12		24	15		63		50	80		
Port Dalhousie										20			
Queenston				17				17					
St. Catharines	671		28	96	324	161	24	1304	220	1015	905		
St. David's				1				1					
Smithville					18			18		30			
Wellandport	2			4	24		6	36	40	40	10		
Manitoulin—													
Gore Bay	6							6					
Mindemoya	6							6	10				
Middlesex—													
Ailsa Craig				2				2					
Ilderton									20		20		
Komoka				1				1					
London	2100		585	3	996	1650	1200	6534	1070	1340	1320		
Mount Brydges										800			
Muncey				1				1					
Parkhill					24			24			25		
Strathroy	12			4	24		12	52	10	20	5		
Muskoka and Parry Sound—													
Bala				3				3			30		
Baysville				2				2					
Beaumaris				2				2					
Bracebridge	6			18	12	13		49					
Byng Inlet	12			3				15					
Depot Harbour	12			15	24	14		65	25	20			
Fox Point				1				1					
Gravenhurst	342			10				352					
Huntsville										40			
Juddhaven				2				2					
Kearney				2				2			15		
Muskoka Falls				6				6					
Nipissing				1				1					
Pakesley				10				10	30				
Parry Sound	52		12		12	34		110	60	200	130		
Port Carling						5		5		60	60		
Port Sydney				1				1					
Powassan				1				1					
Rosseau											20		
Scotia Junction				4				4					
Severn Bridge				3	18	15	12	48					
Spence				1				1					
Sprucedale						5		5		30			
Torrence				1				1					
Nipissing—													
Field									20	40	5		
Mattawa				1				1					
North Bay				6				6	2480	1530	240		
Sturgeon Falls				12				12					
Norfolk—													
Delhi	12		12	34	156	24	70	308	30	50	45		
Langton											15		

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Municipalities	Outfits sent out								Doses of Typhoid-paratyphoid Vaccine supplied	Whooping Cough Vaccine	Silver nitrate for prevention of Ophthalmia	Pasteur Preventive Treatment	
	Syphilis (Wassermann)	Syphilis (Treponema Pallida)	Gonorrhea	Water	Diphtheria	T.B.	Typhoid	Total				Cases	No of Injections
Norfolk—Con.													
Port Dover	36		36			20	30	122	10		135		
Port Rowan	6							6	120	60	15		
Simcoe	18			21		5		44	70		45		
Vittoria				1				1					
Waterford	3		2	4	6		6	21		30	25		
Northumberland—													
Brighton	12		24	2				38		60			
Campbellford				26				26		10	10		
Castleton				1				1			5		
Cobourg	424		6	11		4		445	30	50			
Colborne				18				18					
Hastings					6	5		11			10		
Warkworth				1				1	20	90			
Ontario—													
Beaverton				3	66	5		74	40	20			
Brechin					48			48					
Brooklin				1				1					
Brougham				1				1					
Cannington	12			12		10		34					
Claremont					6	5		11					
Dunbarton				1				1					
Longford Mills				2				2					
Oshawa	100		100	52	988	129		1369	360	240	480		
Pickering				2				2					
Port Perry			6	27	30	24	18	105	100	10	5		
Sunderland				3				3	130	40			
Uxbridge			4	7	6	10	6	33	30				
Whitby	288			4	18	108		418			15		
Oxford—													
Bright				1				1					
Burgessville				6	18	10		34					
Drumbo				6	12	15		33		60			
Embro				1				1					
Innerkip				1				1					
Norwich					24	10		34			15		
Otterville			12	114	6	8		140			10		
Tavistock				1				1					
Tillsonburg				9		10	24	43	60				
Woodstock	12							12	20				
Peel—													
Alton	6							6			10		
Bolton					24	12		36		30	5		
Brampton	12			2	102	30		146		40	10		
Caledon	4			13		5		22	40	20			
Cheltenham				1				1					
Clarkson										20	45		
Cooksville				5				5					
Dixie				1				1					
Inglewood				1				1		30			
Lakeview Beach				1				1					
Lorne Park				3				3					
Mono Road				3				3					
Palgrave											45		
Port Credit	36		18	9	36	60	12	171		10	10		
Streetsville	48			1	12	10	12	83	10	10	5		

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	Syphilis (Wassermann)	Syphilis (Treponema Pallida)	Gonorrhea	Water	Diphtheria	T.B.	Typhoid	Total				Cases	No. of Injections
Perth—													
Listowel	6		6	17		25	12	66					
Mitchell	12			10			6	28	40	10	45		
St. Mary's	30		6		36	30		102			30		
Shakespeare			14			5		19		50			
Stratford	12		6	10	12	10		50	55	30	470		
Peterborough—													
Bailieboro				1				1					
Havelock				12				12					
Lakefield													
Peterborough				3				3	1080	580	580		
Prescott—													
Alfred				24		5		29	20	60			
Hawkesbury									10	160	165		
Le Faivre	2					4		6					
St. Eugene	6				12	5		23					
Vankleek Hill	6		6		6		18	36	50	30	15		
Prince Edward—													
Bloomfield											10		
Consecon	6				12	5		23					
Demorestville				12				12					
Hillier											20		
Picton	36			60	24		18	138			30		
Wellington	6			34				40					
Rainy River—													
Emo									20	50	65		
Fort Frances	48				24		24	96	140	530	50		
Renfrew—													
Arnprior	36			13	36	30		115			5		
Beachburg					12			12					
Calabogie				13		10		23	20				
Eganville	6			3				9		80	30		
Pembroke	42			24		6		72	60	210	90		
Renfrew					6		6	12		30	50		
Russell—													
Bourget									80	120	45		
Metcalfe				1				1	35				
Osgoode	4		6			5		15					
Rockland	3							3					
Russell											30		
Vars	6		6					12		90	20		
Vernon										10			
Simcoe—													
Alliston	4			12				16			5		
Angus						10		10					
Anten Mills				2				2					
Barrie	48		60	12	240	60	84	504	120	100	95		
Beeton				1	12			13	10		10		
Belle Ewart				1				1					
Bond Head						10		10					
Bradford				2	36	5		43					
Camp Borden	30			24	12			66					
Coldwater	24				30	4		58			60		
Collingwood	192		86		138	82	66	564	10	50	70		
Cookstown	12			2		15	12	41					
Craigvale				4				4					

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	Syphilis (Wassermann)	Syphilis (Treponema Pallida)	Gonorrhea	Water	Diphtheria	T.B.	Typhoid	Total				Cases	No. of Injections
Simcoe—Con.													
Creemore	6					15		21					
Elmvale				1	12	5	12	30					
Everett	6			6	6	4		22			5		
Ivy				1				1					
Jackson's Point				1				1					
Lefroy				1				1					
Midland	30			1		5		36	90	30			
New Lowell				1				1					
Nottawa				2				2					
Orillia	168		6	167	114	50	18	523	140				
Penetanguishene	6		12		72	28		118		10	40		
Stayner					30			30					
Thornton				8			6	14					
Tottenham				1		4		5					
Victoria Harbour	12			12		16		40	30				
Washago				1				1					
Stormont—													
Aultsville						5		5		10			
Cornwall	60			5	72	125	72	334	50		65		
Sudbury—													
Burwash	500			3	750			1253	60				
Chelmsford	18							18					
Copper Cliff	12				15			27		30			
Creighton Mine			6	4	310	14	12	346					
Espanola	12			6	18	20		56	30		50		
Massey										340	80		
Sudbury									150	30			
Webbwood										20	45		
Thunder Bay—													
Dorion				1				1					
Fort William				2				2	1750	450	875		
Grant	12							12					
Hydro				3				3					
Nipigon				6				6					
Port Arthur				2				2					
Schreiber				4				4					
Timiskaming—													
Ansonville	10			2				12	20	10	5		
Cobalt				7		30		37	150	80	135		
Cochrane	12			6	12	10		40	3300				
Elk Lake				1				1			30		
Englehart	12							12		120			
Haileybury	12		17		12	12	12	65	10	30	20		
Hearst					6			6	40	75			
Iroquois Falls						4		4	20				
Kapuskasing						35	18	53	2250	20	25		
Kirkland Lake					30			30	450		25		
Larder Lake	30							30					
New Liskeard				24		20	24	68	50				
Schumacher									50				
Silver Centre				9				9					
Smooth R'k Falls					12			12	400				
South Porcupine	36		12	1		10		59	530	30			
Sutton Bay				1				1					
Timmins	18					4		22					

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	Syphilis (Wassermann)	Syphilis (Treponema Pallida)	Gonorrhea	Water	Diphtheria	T.B.	Typhoid	Total				Cases	No. of Injections
Victoria—													
Bobcaygeon				6		5		11					
Coboconk					6	8	12	26					
Cresswell				1				1					
Fenelon Falls	4			16	6	4	6	36					
Kinmount									20				
Kirkfield				25				25					
Lindsay				5				5					
Lorneville				2				2					
Woodville				1				1					
Waterloo													
Ayr	12		12	12	36	10	12	94	25		25		
Bridgeport				1				1					
Elmira					132	15		147		30	15		
Freeport	2					18		20					
Galt	152		72	12	144	94		474			325		
Hespeler	16				12	32		60					
Kitchener	222		136	64	396	159	48	1025	60	160	580		
Lenwood						5		5					
New Dundee				1		5		6	30				
New Hamburg	124		24	12	48	35	36	279					
Preston				13		15		28	30		100		
St. Clements				2				2					
St. Jacobs				2	24			26			25		
Waterloo	36		24		132	15		207			130		
Wellesley									20				
Welland—													
Bridgeburg	12			3	30	5		50	20				
Chippawa				97	12	5	6	120	20		15		
Crystal Beach				1				1					
Fenwick				1				1			55		
Fonthill				8				8					
Fort Erie					18			18					
Niagara Falls	318		125	118	60	137	138	896	330	120	365		
Port Colborne				24	12		24	60	60				
Ridgeville				1				1					
Ridgeway	24		24	36	24	25	30	163	30	30	25		
Thorold	30			21		10		61			15		
Wainfleet	3			2		5		10					
Welland	134			51	96	81		362	100	470	175		
Wellington—													
Arthur	6							6			5		
Belwood				1				1					
Clifford					18	10	6	34	20				
Drayton	18				24			42	10				
Elora				18				18					
Erin			6	13		5	24	48	90				
Fergus	4							4					
Glenallan						5		5			10		
Guelph	920		16	9	738	100	42	1825	360	377	230		
Harriston											10		
Hillsburg									10	50			
Moorefield				6				6					
Mount Forest				3	6	10	6	25	20				
Palmerston	12							12	40		15		
Rockwood											10		

YEARLY REPORT.

Outfits, Vaccines and Treatments supplied by Laboratory at Toronto during the year 1922.

Municipalities	Outfits sent out								Doses of Typhoid-paratyphoid Vaccine supplied	Whooping Cough Vaccine	Silver nitrate for prevention of Ophthalmia	Pasteur Preventive Treatment	
	Syphilis (Wassermann)	Syphilis (Treponema Pallida)	Gonorrhea	Water	Diphtheria	T.B.	Typhoid	Total				Cases	No. of Injections
Wentworth—													
Ancaster				2				2					
Bartonville				1				1					
Binbrooke										10			
Dundas				3				3			20		
Freelton									10	10	25		
Fruitland				3				3					
Hamilton	43			27	24			94	540	2280	1775	1	21
Lynden	12			12				24	10	10			
Stoney Creek				15	36			51					
Winona			24	2	24			50			10		
York—													
Agincourt	24			13	346	22		405	55	130	70		
Aurora				1	24			25					
Birchcliff	6			18				24					
Downsview				1				1					
Eglinton				1				1					
Humber Bay				4				4					
Islington	6		12	5	24	10		57					
Keswick					6	5	12	23					
King				1				1	25				
Lambton Mills				13	6	5		24					
Langstaff				2				2					
Lansing				7				7					
Long Branch	3			9				12					
Maple	3		12	1			6	22					
Markham				21				21					
Mimico	317		25		174	5		521	250	30			
Mimico Beach					42	20	6	68					
Mount Albert					12	17		29					
Mount Dennis				1	24	10		35		10			
Newmarket	40			13	48	5		106	10		40		
Newtonbrook			6	4				10		140			
New Toronto	12		12	4	162			190	50	60	10		
Oak Ridges				2				2					
Pefferlaw					18			18					
Queensville							12	12					
Richmond Hill	4		4	10	6	5	12	41			40		
Roches Point				3				3					
Scarboro				31	6			37			5		
Schomberg				1				1					
Sharon				1				1					
Sherwood				1				1					
Stouffville			4	14	24			42	110	30			
Sutton West										40			
Swansea					6			6					
Thornhill				18	18	10		46	245				
Todmorden				2				2					
Toronto	5224		1230	252	1476	528	239	8949	4770	17730	5000	3	63
Unionville				9		10		19			15		
West Hill				1				1					
Weston				37	138	30		205					
Woodbridge				2			6	8		10	5		
York Mills				4				4					
Totals	20336		4611	3180	12882	6859	3491	51359	30515	40742	23660	5	105

REPORT FROM LABORATORIES OF THE PROVINCIAL BOARD OF HEALTH OF

Municipalities	Diphtheritic Swabs				Tuberculosis Sputa		Typhoid Bloods		Syphilis						
	Release		Diagnosis							Wassermann Reaction				Spirochaeta Pallida	
	+	−	+	−	+	−	+	−	Colloidal Gold Reaction	Very Strongly Positive	Strongly Positive	+	−	+	−
Algoma—															
Bruce Mines															
Collins Inlet								2							
Cutler						1									
Foleyet						2		1			1		9		
Gogama						1							3		
Hornepayne			1												
Marshville								1							
Providence Bay															
Sault Ste. Marie											1		5		
Thessalon					1								2		
Tionaga															
Brant—															
Brantford	1			5	13	55	5	1		18	4	10	79		
Burford				1		6	2	3					1		
Cainsville				1						2			4		
Mount Pleasant													1		
Oakland															
Oshweken					1					1		1	8		
Paris				1		7		6		1			9		
St. George				1		1		2					3		
Bruce—															
Cargill								1							
Chesley						1									
Kincardine							1	1		1					
Lucknow						1									
Mildmay							1	7				1			
Paisley						1							1		
Port Elgin		1	1	6		3	1	2					1		
Ripley	2					3	1	1					3		
Southampton												1			
Tara								1							
Teeswater			1												
Tiverton															
Walkerton			1	1	1	3	1						5		
Wiarton															
Carleton—															
Carp													3		
Kinburn		1	1	2											
Manotick							1	2							
North Gower		1				2		1							
Ottawa						2	1	7		275	52	170	1603		
Westboro										1			1		
Dufferin—															
Corbetton															
Grand Valley	4	2	1					1							
Orangeville	4	4	1	12	1	4									
Shelburne				3				1							
Dundas—															
Chesterville	2	1	3												
Hallville															
Iroquois						3		3					3		
Morrisburg					2	10				1			1		
Winchester			3	1		4		3							
Durham—															
Bethany															
Blackstock				1		1	1	1							
Bowmanville	17	5	4	5	1	8	1	2		1			12		

ONTARIO AT TORONTO FOR THE YEAR 1923.—SPECIMENS EXAMINED.

Gonorrhea		Rabies Diagnosis				Milk										Waters		Liquors for License Department	Miscellaneous Specimens	Total for Year
			Negri Bodies			Food Content		Preservatives		Bacteriological										
										Tubercle Bac.		Pus Cells								
+	—	Animal	+	—	Animal Inoculations	Fats	Total Solids	+	—	+	—	+	—	Count	Extraneous Matter	Number of Milk Samples	Chemical	Bacterial			
																			9		9
																					2
																1					2
	3																	2	13	1	32
																1		1			6
																					1
																					1
																		1			1
																			29		35
																					3
																		5			5
4	21																	35	45	3	299
																		2			15
																					7
																					1
																		1			1
1	3																				15
1	1	1																2			29
																				1	8
																					1
																		8			9
																	2	17	4		26
																					1
																					9
																					2
																		1			16
																					10
																			3		4
																					1
																					1
																		1			1
																			12		24
																		2	14		16
																					3
																					4
																					3
																		1			5
7	16																		34	3	2170
																					2
																		1			1
																		4			12
																		1	9		36
																		1		2	7
																					6
																		1			1
	4																				13
	2																	4	7		27
																					11
																		1			1
																		1			5
	1																	2			59

REPORT FROM LABORATORIES OF THE PROVINCIAL BOARD OF HEALTH OF

Municipalities	Diphtheritic Swabs				Tuberculosis Sputa		Typhoid Bloods		Syphilis						
	Release		Diagnosis							Wassermann Reaction				Spirochaeta Pallida	
	+	−	+	−	+	−	+	−	Colloidal Gold Reaction	Very Strongly Positive	Strongly Positive	+	−	+	−
Durham—Con.															
Canton															
Enniskillen	7	8		3		1		1							
Hampton															
Newcastle															
Orono	4	7	2	3		5		2							
Pontypool															
Port Hope			1	2	3	24	2	4					7		
St. Christopher															
Elgin—															
Aylmer															
Port Burwell						1		1							
Port Stanley													2		
St. Thomas															
Straffordville						1									
Essex—															
Amherstburg						2		1					14		
Belle River					1	1						1			
Comber								1							
Essex	1					11	1	1			1		2		
Ford						1						4	8		
Harrow				1		1							1		
Kingsville	1			5	1	2		5							
Leamington	1	5				2		2		1		4	4		
McGregor													1		
Newington				1									2		
Sandwich			1			3				2	1		13		
Tecumseh													1		
Walkerville										1			9		
Windsor						8				33	6	18	242		
Woodslee	2	4		3									1		
Frontenac—															
Arden						1									
Mountain Grove				1		2									
Sharbot Lake				1		6		2		1			11		
Glengarry—															
Alexandria						2							1		
Apple Hill			1	1		2						3	2		
Dalhousie Mills		6	1		1			1							
Dalkeith			1												
Dunvegan						1									
Martintown	5	5	3	9	1	4	1	2							
Maxville	1	11	4	5				2							
Williamstown	4	9		1	2	6									
Grenville—															
Kemptville				1	5	4				1		1	12		
Prescott					1								5		
Grey—															
Ayton						2									
Chatsworth													1		
Durham			1			1		1							
Flesherton						3							1		
Hanover	6	4	3	3	2	4	8	18							
Holstein															
Markdale															
Meaford													1		
Owen Sound										1			11		
Priceville				1		1							1		
Thornbury					2	1	1	4							

ONTARIO AT TORONTO FOR THE YEAR 1923.—SPECIMENS EXAMINED.

Gonorrhea		Rabies Diagnosis				Milk										Waters				
			Negri Bodies			Food Content		Preservatives		Bacteriological										
										Tubercle Bac.		Pus Cells								
+	—	Animal	+	—	Animal Inoculations	Fats	Total Solids	+	—	+	—	+	—	Count	Extraneous Matter	Number of Milk Samples	Chemical	Bacterial	Liquors for License Department	Miscellaneous Specimens	Total for Year
																		1			1
																		3			23
																		1			1
																		2			2
																1		4			28
	1																	1			2
1																		18		1	63
																		2			2
																		1			1
																				2	4
																					2
																			9		9
																					1
																					17
																					3
																					1
																			26	1	44
																					13
																					3
																					14
	2																				21
																					1
																					3
																					20
																					1
																				5	15
	1																			2	338
																					10
																					1
																					3
4	7																				32
																					3
																					9
																					9
																					1
																					1
																		3			33
																					23
																				1	23
																		4			28
																			4		10
																					2
																					1
																		5			8
																					4
																		17			65
																		1			1
																		6			6
																		2			3
																			28	1	41
																		2			5
																		3			11

REPORT FROM LABORATORIES OF THE PROVINCIAL BOARD OF HEALTH OF

Municipalities	Diphtheritic Swabs				Tuberculosis Sputa		Typhoid Bloods		Syphilis							
	Release		Diagnosis							Wassermann Reaction				Spirochaeta Pallida	
	+	−	+	−	+	−	+	−	Colloidal Gold Reaction	Very Strongly Positive	Strongly Positive	+	−	+	−
Haldimand—															
Caledonia	....	....	1	2	2	2	....	2	....	....	....	....	1	....	....
Canfield	....	....	....	....	....	1	....	....	....	1	....	....	....	....	....
Dunnville	13	25	12	9	1	9	....	6	....	2	....	....	7	....	....
Fisherville	....	....	....	2	....	....	....	....	....	....	....	....	1	....	....
Hagersville	....	....	....	1	1	3	....	2	....	....	....	....	1	....	....
Jarvis	....	2	....	5	....	5	....	1	....	1	....	....	....	....	....
Selkirk	3	1	3	5	....	....	....	....	....	....	....	....	....	....	....
Haliburton—															
Haliburton	....	4	....	4	....	3	....	1	....	....	....	....	12	....	....
Minden	....	....	....	....	....	1	....	2	....	....	....	....	....	....	....
Wilberforce	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Halton—															
Acton	27	28	5	4	1	10	....	3	....	....	....	....	1	....	....
Bronte	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Burlington	2	....	....	5	1	1	5	5	....	1	1	....	3	....	....
Freeman	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Georgetown	1	5	3	27	....	11	1	3	....	....	....	....	7	....	....
Milton	2	5	5	3	....	2	....	....	....	1	....	1	3	....	....
Norval	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Oakville	9	6	2	7	2	1	1	5	....	2	....	2	6	....	....
Port Nelson	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Hastings—															
Bancroft	....	....	....	....	....	....	....	....	....	....	....	....	1	....	....
Belleville	....	2	1	20	6	50	7	35	....	11	8	5	80	....	....
Eldorado	....	....	....	....	....	1	....	....	....	....	....	....	....	....	....
Foxboro	....	....	2	....	....	....	....	....	....	....	....	....	1	....	....
Frankford	....	2	....	3	....	4	1	....	....	....	....	....	2	....	....
Madoc	....	....	....	....	....	1	....	2	....	....	....	....	1	....	....
Marmora	....	2	....	....	....	....	....	....	....	....	....	....	....	....	....
Point Ann	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Roslin	2	1	1	3	....	3	1	2	....	1	....	....	1	....	....
Stirling	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Sulphide	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Trenton	....	....	....	3	....	10	....	....	....	13	5	1	36	....	....
Tweed	....	....	....	8	....	3	....	....	....	....	....	....	....	....	....
Huron—															
Auburn	2	1	1	....	....	....	....	....	....	....	....	....	....	....	....
Bayfield	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Brussels	....	1	1	1	....	2	....	3	....	....	....	....	....	....	....
Blyth	....	....	....	....	....	1	....	....	....	....	....	....	....	....	....
Dungannon	....	....	....	1	....	3	....	....	....	....	....	....	....	....	....
Ethel	....	....	....	3	1	4	1	2	....	....	....	....	....	....	....
Exeter	....	....	....	....	....	3	....	....	....	....	....	....	....	....	....
Fordwich	....	....	....	....	....	1	....	....	....	....	....	....	....	....	....
Goderich	1	4	5	14	2	11	9	10	....	....	....	....	13	....	....
Gorrie	....	....	....	....	....	1	....	....	....	....	....	....	....	....	....
Kintail	....	....	....	....	1	1	....	....	....	....	....	....	....	....	....
Kippen	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Seaforth	....	2	....	1	....	....	2	1	....	1	....	....	1	....	....
Wingham	....	1	....	12	2	8	1	3	....	....	....	....	3	....	....
Wroxeter	....	....	....	1	....	....	....	....	....	....	....	....	....	....	....
Kenora—															
Keewatin	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Kenora	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Kent—															
Blenheim	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Charing Cross	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....

ONTARIO AT TORONTO FOR THE YEAR 1923.—SPECIMENS EXAMINED.

Gonorrhœa		Rabies Diagnosis				Milk									Waters				
			Negri Bodies			Food Content		Preservatives		Bacteriological									
										Tubercle Bac.		Pus Cells							
+	—	Animal	+	—	Animal Inoculations	Fats	Total Solids	+	—	+	—	+	—	Count	Extraneous Matter	Number of Milk Samples	Chemical	Bacterial	Liquors for License Department	Miscellaneous Specimens	Total for Year
																		1			11
																					2
2																		20	15	1	112
																					3
																					8
																		5			19
																					12
	1																		1		26
																					3
																		1			1
1																		1			81
																2		3			5
																		30	6		60
																		1			1
9	5																	2		1	75
																		7	1		30
																		1			1
1	4															5		54		6	113
																		9			9
																					1
5	7																	55	3	12	307
																					1
																					3
																				1	13
																		1			5
																					2
																		2			2
																		6			21
																		1			1
																2					2
																		3	1	1	73
																					11
																					4
																		1			1
1																		3			12
																					1
																					4
																					11
																					3
																				1	2
																			11		80
																					1
																					2
																		1			1
																		5			13
	1																	19			50
1																					2
																			10		10
																		1	25		26
																		3			3
																		1			1

REPORT FROM LABORATORIES OF THE PROVINCIAL BOARD OF HEALTH OF

Municipalities	Diphtheritic Swabs				Tuberculosis Sputa		Typhoid Bloods		Syphilis						
	Release		Diagnosis							Wassermann Reaction				Spirochaeta Pallida	
	+	−	+	−	+	−	+	−	Colloidal Gold Reaction	Very Strongly Positive	Strongly Positive	+	−	+	−
Kent—Con.															
Chatham			1	3	2	10	1					1	8		
Dresden						2		7							
Duart															
Highgate													1		
Mull															
Ridgetown	1					1									
Tilbury													3		
Wallaceburg						2							3		
Wheatly				1											
Lambton—															
Arkona															
Brigden					1										
Camlachie								3							
Corunna															
Forest						2		1							
Oil Springs		1													
Petrolia	4	5		3	2		1	2							
Sarnia	1		3	2	1	5		5		14	5	6	51		
Thedford				5		1		2							
Watford								1							
Lanark—															
Almonte						4									
Carleton Place			2	1	1	1				2	1		5		
Dalhousie Lake															
Lanark		1	1				1	1					2		
Middleville					1	1	1	1							
Pakenham													1		
Perth	5	7	3	2	1	2	1	5		6	2	5	27		
Smith's Falls			1	3		2				2	1		10		
Leeds—															
Brockville		4		13	6	17	1	5		5	2	5	27		
Elgin					1	1									
Gananoque		1		2				1				1	5		
Lansdowne						2		1							
Lyn						1		1							
Rockport															
Lennox and Addington—															
Camden East						1									
Cloyne															
Napanee															
Odessa															
Tamworth								1				1	2		
Lincoln—															
Beamsville	1		1	2	1	6						1	7		
Grimsby				1						2			1		
Jordan Station				1		1		1							
Merritton		1		5		5	1	4		1			1		
Niagara-on-the-Lake		9			1	7							7		
Port Dalhousie		2		2		1	2	4				1			
Queenston															
St. Ann's															
St. Catharines	15	27	6	23	13	65	7	15		49	8	23	353		
St. David's													1		
Smithville			2	3			1								
Wellandport			1	13											

ONTARIO AT TORONTO FOR THE YEAR 1923.—SPECIMENS EXAMINED.

Gonorrhea		Rabies Diagnosis				Milk									Waters		Liquors for License Department	Miscellaneous Specimens	Total for Year
			Negri Bodies			Food Content		Preservatives		Bacteriological									
										Tubercle Bac.		Pus Cells							
+	—	Animal	+	—	Animal Inoculations	Fats	Total Solids	+	—	+	—	+	—	Count	Extraneous Matter	Number of Milk Samples	Chemical	Bacterial			
																		2	10	2	40
																		1			10
																1					1
																					1
																		1			1
																		12			14
3	2																				8
																					5
																					1
																		1			1
																					1
																					3
																		1			1
																		3			6
																					1
																		1		1	19
7	7																		72	4	183
																				1	9
																					1
																		1			5
																		1	6		20
																		3			3
1																				1	8
																		22			26
																		2			3
																				2	68
																		2	6		27
		Coal	sam	ples,	8													2	5		100
																					2
3	4																		2		19
																					3
																					2
																		1			1
																					1
																		1			1
																		1			1
																	2				2
1																					5
2	2																	7			30
																3		20			27
																					3
																					18
	1															1		4			30
																		1			13
																		57			57
																		1			1
1	6															58		17	40	2	728
																		2			3
																					6
																					14

REPORT FROM LABORATORIES OF THE PROVINCIAL BOARD OF HEALTH OF

Municipalities	Diphtheritic Swabs				Tuberculosis Sputa		Typhoid Bloods		Syphilis						
	Release		Diagnosis							Wassermann Reaction				Spirochaeta Pallida	
	+	—	+	—	+	—	+	—	Colloidal Gold Reaction	Very Strongly Positive	Strongly Positive	+	—	+	—
Manitoulin—															
Gore Bay													1		
Mindemoya	1						2	1							
Middlesex—															
Ailsa Craig					1	4	1	1							
Glencoe															
Komoka															
London												2			
Muncey															
Newbury															
Muskoka and Parry Sound—															
Bala				1											
Bayville															
Beaumaris															
Bracebridge			2			7	1	2					10		
Burk's Falls						1	1								
Byng Inlet			2										2		
Depot Harbour				9		1	1	2				1	1		
Fox Point															
Gravenhurst				1				2		8	1	14	302		
Huntsville															
Juddhaven															
Magnetawan				1	1	2		1							
Muskoka										2			2		
Muskoka Falls															
Nipissing															
Pakesley								1							
Parry Sound	2	8	3	13	2	8		5		12	2	5	25		
Port Carling						1									
Powassan															
Rosseau															
Sanatorium													6		
Severn Bridge					3	3									
Sprucedale		1	2	3	1	2				1			5		
Sundridge															
Trout Creek				1		1		1					1		
Windermere															
Nipissing—															
Capreol															
Field						1									
North Bay							2	1							
Sturgeon Falls													1		
Warren						3									
Norfolk—															
Delhi		3	5	40	1	13		3		3		1	14		
Port Dover			2	2		8	1	5		1	1	1	16		
Port Rowan				2		3	1	2		3					
Simcoe		4	5	8	2	23	3	8		11	3	4	27		
Vittoria															
Waterford	3	1	4	6	1	8							1		
Northumberland—															
Bewdley															
Brighton						2		1			1	4	17		
Burnley															
Camborne						1		1							
Campbellford													1		
Castleton					1			1							

ONTARIO AT TORONTO FOR THE YEAR 1923.—SPECIMENS EXAMINED.

Gonorrhea		Rabies Diagnosis				Milk										Waters				
			Negri Bodies			Food Content		Preservatives		Bacteriological										
										Tubercle Bac.		Pus Cells								
+	—	Animal	+	—	Animal Inoculations	Fats	Total Solids	+	—	+	—	+	—	Count	Extraneous Matter	Number of Milk Samples	Chemical	Bacterial	Liquors for License Department	Miscellaneous Specimens	Total for Year
...	...	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	2	....	3
...	...	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	2	....	....	6
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...	...	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	....	1
...	...	Coal	sam	ples,	63	....	....	....	....	....	....	....	....	....	....	....	....	1	10	....	76
...	...	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	....	1
...	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	....	2
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...	...	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	2	....	2	26
...	...	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	2
...	...	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	3	....	....	7
...	...	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	7	....	....	22
...	...	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	....	1
1	...	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	15	....	....	344
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...	...	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	2	....	....	2
...	...	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	3	....	....	8
...	...	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	2	....	....	6
...	...	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	2	....	....	2
...	...	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	2	....	....	2
...	...	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	2	....	....	3
1	5	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	9	1	....	101
...	...	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	2	3
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...	...	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	2	....	....	2
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...	...	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	....	16
2	2	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	4
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...	...	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	3
...	...	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	21	....	2	106
16	14	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	8	....	....	75
...	...	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	11
2	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	21	35	1	158
...	...	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	....	1
2	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	27
...	...	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	....	1
...	3	1	dog	...	....	....	....	....	....	....	....	....	....	....	....	....	1	3	....	1	34
...	...	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	....	1
...	...	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	2
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...	...	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	18	....	....	21

REPORT FROM LABORATORIES OF THE PROVINCIAL BOARD OF HEALTH OF

Municipalities	Diphtheritic Swabs				Tuberculosis Sputa		Typhoid Bloods		Syphilis							
	Release		Diagnosis							Wassermann Reaction				Spirochaeta Pallida	
	+	−	+	−	+	−	+	−	Colloidal Gold Reaction	Very Strongly Positive	Strongly Positive	+	−	+	−
Northumberland—Con.															
Cobourg	2	1	....	8	....	13	4	4	....	....	2	2	411	....	....
Grafton	....	....	....	1	....	1	....	....	....	....	....	....	....	....	....
Hastings	....	....	....	8	....	1	....	....	....	....	....	....	....	....	....
Roseneath	....	....	....	2	....	1	....	2	....	....	....	....	....	....	....
Warkworth	....	....	....	1	....	2	....	....	....	....	....	....	1	....	....
Ontario—															
Ashburn	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Beaverton	1	....	2	10	1	3	....	2	....	....	....	....	....	....	....
Brechin	2	4	5	6	....	1	....	....	....	....	....	....	....	....	....
Brooklin	....	....	....	....	....	2	....	....	....	....	....	....	....	....	....
Brougham	....	....	....	....	....	1	....	2	....	....	....	....	....	....	....
Cannington	....	....	....	2	....	6	....	2	....	....	....	....	....	....	....
Claremont	....	....	....	2	1	1	....	1	....	....	....	....	....	....	....
Dunbarton	....	....	1	1	....	....	....	....	....	....	....	....	....	....	....
Oshawa	15	60	11	94	....	5	1	2	....	9	4	6	52	....	....
Port Perry	....	....	....	6	2	7	....	2	....	....	....	1	2	....	....
Sunderland	....	....	....	....	....	....	2	1	....	....	....	....	....	....	....
Uxbridge	....	....	1	2	1	6	1	2	....	....	....	....	1	....	....
Whitby	....	6	2	9	....	13	....	4	....	17	5	10	121	....	....
Oxford—															
Burgessville	....	....	....	3	....	1	....	....	....	....	....	....	....	....	....
Drumbo	....	....	1	2	....	1	....	....	....	....	....	....	....	....	....
Embro	....	....	....	3	....	1	....	....	....	....	....	....	....	....	....
Ingersoll	....	....	....	....	....	....	1	1	....	....	....	....	....	....	....
Mount Elgin	....	....	....	....	....	1	....	....	....	....	....	....	....	....	....
Norwich	....	....	....	....	....	3	....	....	....	....	....	....	....	....	....
Otterville	....	....	....	....	2	5	1	....	....	....	....	....	....	....	....
Plattsville	....	....	....	3	....	4	....	1	....	....	....	....	....	....	....
Tavistock	....	....	....	1	....	4	....	1	....	....	....	....	....	....	....
Tillsonburg	....	....	2	4	1	8	1	4	....	4	....	1	7	....	....
Woodstock	....	....	....	3	....	....	2	1	....	....	....	1	18	....	....
Peel—															
Alton	....	....	1	4	....	....	....	1	....	....	....	....	1	....	....
Bolton	....	1	1	....	1	8	....	....	....	....	....	....	....	....	....
Brampton	14	17	19	21	2	3	....	1	....	....	....	....	5	....	....
Caledon	....	....	2	....	....	3	....	1	....	....	....	....	....	....	....
Cheltenham	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Clarkson	....	1	....	....	....	....	....	....	....	....	....	....	....	....	....
Cooksville	2	3	3	1	....	1	....	1	....	....	....	....	1	....	....
Credit Forks	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Dixie	....	2	....	2	....	2	....	....	....	....	....	....	....	....	....
Inglewood	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Lakeview Park	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Lakeview Beach	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Lorne Park	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Malton	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Meadowvale	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Mono Road	....	....	....	....	....	....	....	1	....	....	....	....	....	....	....
Palgrave	....	....	....	....	....	1	....	....	....	....	....	....	....	....	....
Port Credit	....	3	2	12	1	11	....	2	....	3	2	....	12	....	....
Streetsville	....	....	....	....	....	1	....	....	....	....	....	....	....	....	....
Perth—															
Atwood	....	....	....	1	....	....	....	....	....	....	....	....	....	....	....
Listowel	....	....	....	2	....	7	....	5	....	1	....	....	....	....	....
Mitchell	....	1	....	3	1	1	1	1	....	....	....	....	6	....	....
St. Mary's	....	....	....	....	....	2	....	....	....	....	....	....	....	....	....

ONTARIO AT TORONTO FOR THE YEAR 1923.—SPECIMENS EXAMINED.

Gonorrhea		Rabies Diagnosis				Milk										Waters				
			Negri Bodies			Food Content		Preservatives		Bacteriological										
										Tubercle Bac.		Pus Cells								
+	—	Animal	+	—	Animal Inoculations	Fats	Total Solids	+	—	+	—	+	—	Count	Extraneous Matter	Number of Milk Samples	Chemical	Bacterial	Liquors for License Department	Miscellaneous Specimens	Total for Year
9	11	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	9	18	....	494
....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	....	3
....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	9
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....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	....	20
....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	2	20
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....	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	6
....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	2	....	....	4
2	2	....	....	....	....	....	....	....	....	....	....	....	....	....	....	12	....	40	21	....	336
....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	11	....	12	....	....	43
....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	4	....	....	7
....	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	9	....	....	24
3	2	Coal	sam	ples	116	....	....	....	....	....	....	....	....	....	....	....	....	6	....	....	314
....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	4
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....	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	3	....	29
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....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	3	....	....	3
....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	....	1
....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	2	....	....	2
....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	2	....	2	5
....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1
2	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	3	....	11	....	....	64
....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	2	....	....	3
....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1
....	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	12	12	29
....	2	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	10	....	2	28
....	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	3

REPORT FROM LABORATORIES OF THE PROVINCIAL BOARD OF HEALTH OF

Municipalities	Diphtheritic Swabs				Tuberculosis Sputa		Typhoid Bloods		Syphilis						
	Release		Diagnosis							Wassermann Reaction				Spirochaeta Pallida	
	+	−	+	−	+	−	+	−	Colloidal Gold Reaction	Very Strongly Positive	Strongly Positive	+	−	+	−
Perth—Con.															
Shakespeare						1									
Stratford	3	3	1		1	1		3					2		
West Monkton															
Peterborough—															
Bailieboro				1											
Havelock				2											
Peterborough		2								3		1	18		
Prescott—															
Hawkesbury				1	1			2		2			3		
Le Faivre												1	1		
L'Orignal															
Plantagenet								1							
St. Eugene				6		3		2					4		
St. Isadore de Pres.					1	4									
Vankleek Hill	5	2	1		2	3	1	8					2		
Prince Edward—															
Bloomfield				1		1									
Consecon	1	4	2	10		4							1		
Demorestville															
Picton	8	9	1	9		4	4	3		1	1	2	7		
Wellington						1							2		
Rainy River—															
Fort Frances												1	2		
Rainy River															
Shenston															
Renfrew—															
Arnprior				1		8		2		1		2	8		
Beachburg						2									
Calabogie				2	1	1		4				1	2		
Cobden				1		7		2					1		
Eganville				1		2		1					3		
Pembroke					1	4		4		4	1	4	20		
Renfrew				1		3		2		2			1		
Westmeath						1					1	1	3		
Russell—															
Bourget															
Clarence Creek	1	1													
Eastview Centre										1					
Metcalfe						3		1					1		
Osgoode					1								3		
Rockland												3	2		
Russell					1	3									
Vars						1		5					3		
Simcoe—															
Allandale												1	4		
Alliston	6	3	1	4	1	4		5		1			1		
Angus								1							
Anten Mills				4											
Barrie	11	19	6	31	5	22	6	18		7	1	1	20		
Beeton		2	2	11		3		2					2		
Bond Head						2		1							
Bradford	10	12	4	7	5	1		5							
Camp Borden				2								1	7		
Camp Couchiching															
Churchill				1				1							
Coldwater	6	8	3	6	2	4	1	1			1		3		
Collingwood	10	21	12	31	7	41	1	7		7	3	1	106		

ONTARIO AT TORONTO FOR THE YEAR 1923.—SPECIMENS EXAMINED.

Gonorrhea		Rabies Diagnosis				Milk										Waters				
			Negri Bodies			Food Content		Preservatives		Bacteriological										
										Tubercle Bac.		Pus Cells								
+	—	Animal	+	—	Animal Inoculations	Fats	Total Solids	+	—	+	—	+	—	Count	Extraneous Matter	Number of Milk Samples	Chemical	Bacterial	Liquors for License Department	Miscellaneous Specimens	Total for Year
1	1																	14		1	18
																		6	1	5	26
																		1			1
																					1
																		11			13
																		2	7	3	36
1	4																	1			15
																					2
																			2		2
																					1
																					15
																					5
1	1																				26
																					2
																	1			1	24
																		11			11
1	2																5	20	4		81
																		16			19
																			7		10
																			1		1
																				1	1
																					22
																				3	5
	2																	2			15
																					11
1	1																	3			12
																		26	2	1	67
																	1		19		29
																					6
1																					1
																		1			3
																			1		2
																					5
1																					5
																					5
																					4
																					9
																					6
																		8			34
																		1			6
																		2			2
11	16																	11	3		188
																					22
																					3
																		3			47
																		6			16
																		2			2
																					2
																		1			36
9	14															23		14	1		308

REPORT FROM LABORATORIES OF THE PROVINCIAL BOARD OF HEALTH OF

Municipalities	Diphtheritic Swabs				Tuberculosis Sputa		Typhoid Bloods		Syphilis						
	Release		Diagnosis							Wassermann Reaction				Spirochaeta Pallida	
	+	−	+	−	+	−	+	−	Colloidal Gold Reaction	Very Strongly Positive	Strongly Positive	+	−	+	−
Simcoe—Con.															
Cookstown	....	....	1	2	1	6	1	4	....	....	....	....	1	....	....
Craigvale	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Creemore	....	....	....	4	2	11	....	1	....	....	..	....	1	....	....
Elmvale	....	1	1	3	....	7	....	4	....	....	....	....	1	....	....
Everett	....	....	....	1	....	3	....	....	....	....	....	....	1	....	....
Foxmead	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Hawkestone	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Lefroy	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Midhurst	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Midland	....	....	....	1	2	11	4	2	....	2	3	1	36	....	....
New Lowell	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Nottawa	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Orillia	28	19	23	44	1	14	6	22	....	6	1	1	58	....	....
Penetanguishene	9	19	15	13	....	20	1	5	....	1	....	1	4	....	....
Phelpstone	....	....	....	1	....	....	....	....	....	....	....	....	....	....	....
Port McNicoll	....	....	....	2	....	....	1	3	....	....	....	....	1	....	....
Stayner	8	13	4	10	1	6	....	4	....	....	....	....	3	....	....
Stroud	....	....	....	....	....	....	....	4	....	....	....	....	....	....	....
Thornton	1	....	1	5	....	....	5	4	....	....	....	....	....	....	....
Tottenham	....	....	2	3	....	1	....	....	....	....	....	....	....	....	....
Victoria Harbour	2	....	1	5	3	10	1	5	....	....	....	....	2	....	....
Washago	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Waubaushene	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Stormont—															
Aultsville	....	....	....	....	....	6	....	....	....	....	....	....	....	....	....
Avonmore	....	....	....	....	....	....	....	1	....	....	....	....	....	....	....
Cornwall	....	3	4	4	7	22	1	3	....	2	1	1	7	....	....
Crysler	....	....	....	....	....	1	....	....	....	....	....	....	....	....	....
Finch	....	1	1	....	....	2	....	1	....	....	....	....	....	....	....
Mille Roches	....	....	....	....	....	2	....	....	....	....	....	....	....	....	....
Monklands	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Moose Creek	....	....	....	....	....	1	....	....	....	....	....	....	....	....	....
Sudbury—															
Burwash	5	150	16	291	....	5	....	....	....	31	16	34	494	....	....
Chapleau	....	....	....	....	....	1	....	....	....	....	....	....	....	....	....
Chelmsford	....	....	....	....	....	....	....	....	....	4	....	1	1	....	....
Coniston	....	....	1	....	....	....	....	....	....	....	....	....	1	....	....
Copper Cliff	....	....	....	5	1	5	....	1	....	....	....	....	4	....	....
Creighton Mine	25	20	31	264	1	8	....	1	....	1	....	....	9	....	....
Espanola	....	....	....	....	....	5	....	....	....	2	....	1	....	....	....
Massey	....	....	....	1	....	2	....	....	....	....	....	....	....	....	....
Sudbury	....	....	1	1	1	3	2	2	....	....	....	1	2	....	....
Webbwood	....	....	....	....	....	....	....	....	....	....	....	....	2	....	....
Thunder Bay—															
Dorion	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Fort William	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Grant	....	....	....	....	....	....	....	....	....	2	....	....	1	....	....
Hydro	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Port Arthur	....	....	....	....	....	....	....	....	....	1	....	....	....	....	....
Timiskaming—															
Ansonville	....	....	....	....	....	5	2	....	....	1	....	....	14	....	....
Brower	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Cobalt	....	....	....	1	....	1	2	1	....	....	....	....	....	....	....
Cochrane	....	1	2	....	....	8	1	1	....	1	....	1	24	....	....
Elk Lake	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Englehart	....	....	....	1	....	....	1	1	....	1	....	....	5	....	....
Fauquier	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....

ONTARIO AT TORONTO FOR THE YEAR 1923.—SPECIMENS EXAMINED.

Gonorrhœa		Rabies Diagnosis				Milk										Waters				
			Negri Bodies			Food Content		Preservatives		Bacteriological										
										Tubercle Bac.		Pus Cells								
+	—	Animal	+	—	Animal Inoculations	Fats	Total Solids	+	—	+	—	+	—	Count	Extraneous Matter	Number of Milk Samples	Chemical	Bacterial	Liquors for License Department	Miscellaneous Specimens	Total for Year
1	3	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	8	....	....	28
....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	....	1
....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	2	5	....	....	26
....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	....	18
....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	3	....	1	9
....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	....	1
....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	2	....	....	2
....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	....	1
....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	....	1
1	2	....	....	....	....	....	....	....	....	....	....	....	....	....	....	2	....	4	....	2	73
....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	....	1
....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	2	....	....	2
....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	155	7	3	388
7	1	Coal	sam	ples	—1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	97
....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1
....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	8
....	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	50
....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	4
....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	3	....	....	19
....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	6
....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	10	....	1	40
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....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	6
....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1
....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	5	2	1	63
....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1
....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	5
....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	2
....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	....	1
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4	40	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	6	....	1	1,093
....	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	15	....	18
....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	7
2	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	5	....	9
....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	5	....	21
....	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	361
2	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	13	2	25
....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	3	....	6
....	2	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	46	2	63
....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	2
....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	....	1
....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	2	2	17	....	21
....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	3
....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	2	....	....	2
....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	111	1	113
1	2	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	2	4	....	31
....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	....	1
....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	5	27	....	37
....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	15	21	2	77
....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	....	1
1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	4	....	14
....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	....	....	....	1

REPORT FROM LABORATORIES OF THE PROVINCIAL BOARD OF HEALTH OF

Municipalities	Diphtheritic Swabs				Tuberculosis Sputa		Typhoid Bloods		Syphilis							
	Release		Diagnosis							Wassermann Reaction					Spirochaeta Pallida	
	+	−	+	−	+	−	+	−	Colloidal Gold Reaction	Very Strongly Positive	Strongly Positive	+	−		+	−
Timiskaming—Con.																
Haileybury	....	....	....	1	....	1	....	1	....	....	....	1	1		....	....
Hearst	....	....	....	....	....	....	4	3	....	....	....	....	.....		....	....
Iroquois Falls	....	....	....	....	....	1	....	....	....	....	....	....	.....		....	....
Kapuskasing	....	....	....	2	....	23	3	13	....	....	....	....	1		....	....
Kirkland Lake	....	....	....	....	....	....	....	....	....	....	....	....	.....		....	....
Larder Lake	....	....	....	1	....	....	....	....	....	....	....	....	1		....	....
Monteith	....	....	....	....	....	....	....	....	....	....	....	....	.....		....	....
Moonbeam	....	....	....	....	....	....	....	....	....	....	....	....	.....		....	....
New Liskeard	....	....	....	....	1	....	2	6	....	....	....	....	.....		....	....
Schumacher	....	....	....	....	....	....	....	....	....	....	....	....	1		....	....
Silver Centre	....	....	....	....	....	....	....	....	....	....	....	....	.....		....	....
Smooth Rock Falls	....	....	....	....	....	....	6	5	....	....	....	....	2		....	....
South Porcupine	1	....	....	....	1	2	....	....	....	3	....	4	20		....	....
Sutton Bay	....	....	....	....	....	....	....	....	....	....	....	....	.....		....	....
Timmins	....	....	....	2	1	4	6	8	....	3	2	2	19		....	....
Victoria—																
Bobcaygeon	....	1	....	2	1	....	....	....	....	....	....	....	.....		....	....
Coboconk	....	....	....	1	....	2	3	7	....	....	....	....	.....		....	....
Fenelon Falls	....	....	....	....	....	....	....	....	....	....	....	....	.....		....	....
Kinmount	....	....	1	6	....	....	....	....	....	....	....	....	.....		....	....
Kirkfield	....	....	....	....	....	....	....	....	....	....	....	....	.....		....	....
Lindsay	....	....	1	2	....	3	1	3	....	....	....	....	1		....	....
Little Britain	....	....	....	....	....	1	....	....	....	....	....	....	.....		....	....
Lorneville	....	....	....	....	....	....	....	....	....	....	....	....	.....		....	....
Omemee	....	....	....	....	....	1	....	....	....	....	....	....	.....		....	....
Pleasant Point	....	....	....	....	....	....	....	....	....	....	....	....	.....		....	....
Woodville	....	....	....	....	1	2	....	....	....	....	....	....	1		....	....
Waterloo—																
Ayr	....	....	....	2	1	8	....	4	....	....	....	....	2		....	....
Baden	....	....	....	....	....	....	....	3	....	....	....	....	.....		....	....
Bridgeport	....	....	....	....	....	....	....	....	....	....	....	....	.....		....	....
Elmira	36	32	7	24	3	10	....	2	....	....	....	....	.....		....	....
Freeport	....	....	....	....	....	12	....	....	....	1	....	....	1		....	....
Galt	9	9	5	15	9	33	1	8	....	2	2	5	44		....	....
Hespeler	....	....	....	1	2	5	1	1	....	3	....	2	4		....	....
Kitchener	45	80	18	77	8	104	5	6	....	5	3	2	169		....	....
Linwood	1	....	1	....	1	1	....	....	....	....	....	....	.....		....	....
New Dundee	....	....	....	....	....	2	....	....	....	....	....	....	.....		....	....
New Hamburg	....	....	2	4	1	2	....	....	....	....	....	....	.....		....	....
Preston	....	....	....	2	....	4	2	1	....	2	....	....	4		....	....
St. Jacobs	2	....	....	....	....	....	....	....	....	....	....	....	.....		....	....
Waterloo	46	30	20	42	1	21	....	3	....	2	1	1	27		....	....
Welland—																
Bridgeburg	8	7	4	5	1	5	4	7	....	....	1	....	6		....	....
Chippawa	1	2	....	2	1	2	2	6	....	....	....	....	.....		....	....
Fonthill	....	....	....	....	....	....	....	1	....	....	....	....	.....		....	....
Fort Erie	....	....	....	1	....	....	....	....	....	....	....	....	.....		....	....
Humberstone	....	....	....	....	....	....	....	....	....	....	....	....	.....		....	....
Niagara Falls	2	6	2	5	5	23	7	25	....	34	4	15	185		....	....
Port Colborne	1	1	3	2	....	4	2	5	....	3	1	2	7		....	....
Ridgeway	2	2	3	7	....	4	2	3	....	1	....	1	9		....	....
South End	....	....	....	2	....	1	4	3	....	....	....	....	1		....	....
Stevensville	....	....	....	2	....	....	....	....	....	....	....	....	.....		....	....
Thorold	....	....	....	....	....	2	....	....	....	1	....	2	21		....	....
Wainfleet	....	....	....	....	....	1	....	....	....	....	....	....	1		....	....
Welland	17	20	5	5	3	20	5	15	....	13	6	4	109		....	....

ONTARIO AT TORONTO FOR THE YEAR 1923.—SPECIMENS EXAMINED.

Gonorrhea		Rabies Diagnosis				Milk										Waters				
			Negri Bodies			Food Content		Preservatives		Bacteriological										
										Tubercle Bac.		Pus Cells								
+	—	Animal	+	—	Animal Inoculations	Fats	Total Solids	+	—	+	—	+	—	Count	Extraneous Matter	Number of Milk Samples	Chemical	Bacterial	Liquors for License Department	Miscellaneous Specimens	Total for Year
2																				7
																		8	4	19
																				1
3																		1	1	47
																			5	5
	1																			3
																		4		4
																		1		1
																				9
																				1
																	2	2		4
																		2		16
2	2																1	1	1	38
																		3		3
7	12																		2	3	71
																		7			11
																					13
																		9			9
																		1			8
																		15			15
																		3	10	1	25
																					1
																		1			1
																					1
																		4			4
																					4
	3																	7			27
																				1	4
																		1			1
1																				2	117
																					14
1	1																3	20	3		170
																					19
25	51																8	22	159	9	796
																					4
																		1			3
																		3			12
																		34	1		50
																		4			6
5	6																			2	207
																		6			54
																		101			117
																		4	1		6
																			2		3
																		1			1
15	34															2		21	20	3	408
1	1																	18	4		55
	7																	30			71
1																		1			13
																					2
																	1	27	26		80
																		1			3
2	10															2		17	24	1	278

REPORT FROM LABORATORIES OF THE PROVINCIAL BOARD OF HEALTH OF

Municipalities	Diphtheritic Swabs				Tuberculosis Sputa		Typhoid Bloods		Syphilis							
	Release		Diagnosis							Wassermann Reaction					Spirochaeta Pallida	
	+	−	+	−	+	−	+	−	Colloidal Gold Reaction	Very Strongly Positive	Strongly Positive	+	−		+	−
Wellington—																
Alma						2		1								
Arthur					1	2		1					1			
Belwood								1								
Clifford						1							1			
Conn				1												
Drayton								1		4			4			
Elora				1		1										
Erin	2	1	4	3		3		3								
Fergus						1							3			
Guelph	19	26	7	35	5	14		10		54	23	59	618			
Harriston				1							1					
Hillsburg			2	2		3		2								
Moorefield			1	2												
Morriston					1											
Mount Forest	1			4	2	2	2	6								
Palmerston				3		2				1			7			
Rockwood				2	1	1										
Wentworth—																
Aldershot																
Ancaster																
Bartonville																
Dundas																
Freelton				1												
Fruitland																
Hamilton			1							10	1		42			
Lynden				1												
Stoney Creek																
Winona				4				1		3			10			
York—																
Agincourt	18	96	92	460		10				5			19			
Aurora		1		3		6		1		1			1			
Birchcliff	3	2	2	18						2						
Concord																
Eglinton																
Fairbank				1												
Gormley																
Humber Bay																
Islington	1		2	13	1	7		2					2			
Keswick								2					3			
King							1	2								
Lambton's Mills				1		2										
Langstaff							1									
Lansing						2										
Long Branch	4	7	5	4				1					3			
Maple				1									2			
Markham					2	3		1					1			
Mimico	5	15	30	181	1	6	3	3		6	1	7	64			
Mimico Beach	1	6		5		4	1	1					6			
Mount Albert				4		16		2					3			
Mount Dennis	4	6	14	35		8	1	4					6			
Newmarket	2	9	2	13	1	4	1	2		4	2	5	19			
Newtonbrook																
New Toronto	12	29	16	45		5		4			1	1	1			
Oak Ridges																
Orchard Beach																
Pefferlaw				1				1								
Queensville				3			2	2								

ONTARIO AT TORONTO FOR THE YEAR 1923.—SPECIMENS EXAMINED.

Gonorrhea		Rabies Diagnosis				Milk									Waters				
			Negri Bodies			Food Content		Preservatives	Bacteriological										
									Tubercle Bac.		Pus Cells								
+	—	Animal	+	—	Animal Inoculations	Fats	Total Solids	+ —	+	—	+	—	Count	Extraneous Matter	Number of Milk Samples	Chemical	Bacterial	Liquors for License Department	Miscellaneous Specimens	Total for Year
																	3		1	7
																	1			6
																	1			2
																				2
																			2	3
																	2			11
															1		5			8
	1																5			22
																1	1			6
	9																	48	8	935
																				2
																	3			12
																	6			9
																				1
																	3		1	21
																			1	14
																				4
																	1			1
																	2			2
																	5			5
																	3	13		16
																				1
																	3			3
		1 dg.				Coal sample—4											11	123		193
																				1
																	14			14
3	6																			27
	3	1 dg.															4			708
	5																1		4	23
	2																24			53
																	4			4
																	1			1
																				1
																	3			3
																	6			6
1	2																3			34
																	4			9
																				3
																	6			9
																	1			2
																	24			26
1																	15			40
1																				4
2															1		5			15
	1																74			397
																		1		25
																				25
																				78
																			1	65
																	1			1
4															2			2	3	124
																	5			5
																	1			1
																				5
																				7

REPORT FROM LABORATORIES OF THE PROVINCIAL BOARD OF HEALTH OF

Municipalities	Diphtheritic Swabs				Tuberculosis Sputa		Typhoid Bloods		Syphilis						
	Release		Diagnosis							Wassermann Reaction				Spirochaeta Pallida	
	+	—	+	—	+	—	+	—	Colloidal Gold Reaction	Very Strongly Positive	Strongly Positive	+	—	+	—
York—Cont.															
Richmond Hill	....	....	....	5	....	5	1	6	....	2	....	....	9	....	...
Roches Point	....	....	....	....	....	....	....	....	....	....	....	....	....	....	...
Scarboro	....	....	....	1	1	2	....	....	....	1	....	....	2	....	...
Schomberg	1	2	....	....	....	1	....	....	....	1	....	....	....	....	...
Sharon	....	....	....	....	....	....	....	....	....	....	....	....	....	....	...
Stouffville	....	11	2	6	....	2	4	5	....	....	....	1	2	....	...
Sutton West	....	2	1	12	....	....	....	....	....	....	....	....	....	....	...
Swansea	1	7	2	1	....	....	....	....	....	....	....	....	....	....	...
Thornhill	....	....	1	8	4	12	1	4	....	59	18	51	1123	....	...
Toronto	247	192	101	313	31	186	11	40	324	595	181	557	5188	....	...
Unionville	....	....	....	....	2	2	....	....	....	....	....	....	....	....	...
Weston	24	36	10	43	1	4	....	1	....	1	....	....	4	....	...
Woodbridge	....	....	....	....	....	....	....	3	....	....	....	....	....	....	...
York Mills	....	....	....	....	....	....	....	....	....	....	....	....	....	....	...
Totals	848	1291	680	2861	260	1664	232	733	324	1437	397	1104	12561	....	...

Grand Total—32,675.

ONTARIO AT TORONTO FOR THE YEAR 1923.—SPECIMENS EXAMINED.

Gonorrhea		Rabies Diagnosis				Milk									Waters		Liquors for License Department	Miscellaneous Specimens	Total for Year
			Negri Bodies			Food Content		Preservatives		Bacteriological									
										Tubercle Bac.		Pus Cells							
+	—	Animal	+	—	Animal Inoculations	Fats	Total Solids	+	—	+	—	+	—	Count	Extraneous Matter	Number of Milk Samples	Chemical	Bacterial			
2	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	13	....	....	44
....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	3	....	....	3
3	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	24	....	1	37
....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	5
....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	....	1
....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	17	....	....	50
4	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	3	....	....	22
....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	11
1	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	11	....	....	1,294
189	1771	1dg.	....	....	....	Coal samples—9								....	....	43	10	423	976	79	10767
....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	2	....	....	6
2	3	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	29	....	2	160
....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	7	....	....	10
....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	3	....	....	3
420	2179	....	....	....	....	Coal samples—201								....	....	185	43	2582	2430	238	32675

FORT WILLIAM.

Laboratories, Fort William, January 5th, 1924.

To the Chairman and Members of the Provincial Board of Health.

Sirs,—I have the honour to submit my annual report in connection with the work of this laboratory for the year 1923.

Diphtheria

A marked increase in bacteriological work over any previous year is noted. This is largely due to our efforts in epidemiological work for the city of Fort William during the months of June, October, November and December. In these four months we examined about 1,500 nose and throat swabs, covering some forty cases of diphtheria. Most of these swabs were from school contacts. All positive contacts were isolated by the local Medical Officer of Health, and kept out of school until negative reports were received from us. We think this method of control, the most efficient in the prevention of epidemic diphtheria. We are now distributing toxin-antitoxin mixture and the local Medical Officer of Health, of this city as a start has already inoculated some 200 children. During the year 3,775,000 units of diphtheria antitoxin have been distributed throughout the district from this laboratory.

Typhoid Fever

Many of these cases occurring locally were taken off steamships plying into these ports. In each case blood cultures were taken by myself and positive results were obtained; this left no doubt as to the nature of the infection. Forty-five samples of drinking water taken from various vessels using these habours were analyzed here and reports sent to the Federal Department of Health.

Syphilis

The amount of work has kept close to the level obtained last year. The local physicians continue to use the Wassermann test not only as a means of diagnosis but in following up treatment. The greatest of care in the technique in performing this test is used. We continue to follow the method recommended by the Medical Research Council of the United Kingdom; we believe it is good policy to stick to the same method, always providing it is a good one.

Twenty-seven primary sores were examined by the dark field method during the year; seven of these were positive, and six before the Wassermann reaction howed anything. These six cases received prompt and efficient treatment.

Considerable work has been done here in the examination of spinal fluids. During the year I read a paper to the local Medical Society, emphasizing the value of spinal fluid examinations in the differential diagnosis of lesions of the central nervous system. Many colloidal gold tests were made on spinal fluids during the year.

Milk

We are, I think, giving every assistance to the local health officers in impressing on the public the value of a wholesome and clean milk supply. We have done considerable work in the matter of bacterial counts on plated samples—carefully planned work—during the course of the past two years for both the municipalities of Port Arthur and Fort William. We believe this is a step in the right direction; and there is a long way to go before we can realize a clean milk supply. The bulk of the work on milk continues to be the control of the fat content.

Water Analysis

Although the total number of analyses made is not quite as high as for 1922, yet it will be noted that the municipalities as a whole have responded much better in sending samples for analysis than heretofore. Last year (1922) the Sanitary Survey provided about 50 per cent. of the total samples analyzed. This year the municipalities themselves supplied over 90 per cent. of the samples analyzed.

Miscellaneous Specimens

Under this head is included all pathological specimens, viz: tumours, blood counts and groupings, lumbar punctures, autogenous vaccines, analyses of stomach contents, etc.

In conclusion permit me to state that 1923 has been a good year for this laboratory. We have exceeded any previous record in the total analyses made by 15 per cent. This, I think, indicates something of the service we are giving the public through the physicians of this district as well as the local health officers.

I have the honour to be, Sir,

Your obedient servant,

N. O. Thomas, M.B.

Director Branch Laboratory, Fort William.

REPORT FROM LABORATORIES OF THE PROVINCIAL BOARD OF HEALTH OF

Municipalities	Diphtheritic Swabs				Tuberculosis Sputa		Typhoid Bloods		Syphilis						
	Release		Diagnosis							Wassermann Reaction				Spirochaeta Pallida	
	+	—	+	—	+	—	+	—	Colloidal Gold Reaction	Very Strongly Positive	Strongly Positive	+	—	+	—
Atikokan	....	....	....	....	....	....	....	....	....	....	....	....	.....	....	...
Cameron Falls	....	....	....	....	....	....	....	....	....	....	....	....	.....	....	...
Chapleau	....	....	....	....	....	5	....	....	....	....	....	1	.....	....	...
Conmee	....	....	....	....	....	....	....	....	....	....	....	....	.....	....	...
Dryden	....	....	2	2	....	....	....	....	....	1	....	....	2	....	...
Emo	....	....	....	....	2	4	....	....	....	....	....	....	1	....	...
Foleyet	....	....	....	1	....	....	....	....	....	....	....	....	.....	....	...
Fort Frances	....	4	5	11	3	7	....	1	....	3	1	....	19	....	...
Fort William	303	1454	48	113	21	124	25	54	39	90	26	36	559	3	13
Hornepayne	7	20	....	3	....	....	....	....	....	....	....	....	.....	....	...
Ignace	....	....	....	....	....	....	....	....	....	....	....	....	.....	....	...
Jellicoe	....	....	....	....	....	....	....	....	....	....	....	....	.....	....	...
Kashabowie	....	....	....	....	2	....	....	....	....	....	....	....	.....	....	...
Keewatin	1	5	3	9	1	20	6	6	....	....	....	....	6	....	...
Kenora	....	....	....	....	2	6	1	4	....	....	....	....	1	....	...
Long Lac	....	....	....	2	....	3	1	2	....	1	....	....	6	....	...
Loon	....	....	....	....	....	....	....	....	....	....	....	....	.....	....	...
Neebing	....	....	....	....	....	....	....	....	....	....	....	....	.....	....	...
Nipigon	....	....	....	3	....	....	....	....	....	....	....	....	.....	....	...
O'Connor	....	....	....	....	....	....	....	....	....	....	....	....	.....	....	...
Paipoonge	....	....	....	....	....	....	....	....	....	....	....	....	.....	....	...
Port Arthur	1	5	14	19	4	27	13	21	4	15	1	9	126	4	7
Rainy River	....	....	....	1	....	....	....	....	....	....	....	....	1	....	...
Redditt	....	....	....	....	....	....	....	....	....	....	....	....	.....	....	...
Rossport	....	....	....	....	....	....	....	....	....	....	....	....	.....	....	...
Schreiber	....	....	2	2	3	2	....	2	....	2	....	1	5	....	...
Silver Islet	6	25	....	....	....	....	....	....	....	....	....	....	.....	....	...
Sioux Lookout	....	....	....	6	....	1	....	2	....	6	....	....	33	....	...
Steamships	....	....	....	....	....	....	....	....	....	....	....	....	.....	....	...
Stratton	....	....	....	....	....	....	....	....	....	....	....	....	.....	....	...
Unorganized	....	....	....	....	....	....	....	....	....	....	....	....	.....	....	...
Totals	318	1513	74	172	38	199	46	92	43	118	28	47	759	7	20

ONTARIO AT FORT WILLIAM FOR THE YEAR 1923.—SPECIMENS EXAMINED.

Gonorrhea		Rabies Diagnosis				Milk										Waters				
			Negri Bodies			Food Content		Preserv-atives		Bacteriological										
										Tuber-cle Bac.		Pus Cells								
+	—	Animal	+	—	Animal Inoculations	Fats	Total Solids	+	—	+	—	+	—	Count	Extraneous Matter	Number of Milk Samples	Chemical	Bacterial	Liquors for License Department	Miscellaneous Specimens	Total for Year
...	...	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	2	....	....	2
...	...	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	....	1
...	...	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	6
...	...	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	3	....	....	3
...	...	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	5	....	2	14
1	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	9	....	2	20
...	...	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1
...	...	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	30	....	2	86
74	213	....	....	....	....	380	....	18	....	2	....	....	....	18	241	399	....	37	....	299	3930
...	...	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	12	....	....	42
...	...	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	6	....	....	6
...	...	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	....	1
...	...	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	2
1	...	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	28	....	1	87
2	3	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	88	....	....	107
...	...	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	6	....	....	21
...	...	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	23	....	....	23
...	...	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	6	....	....	6
...	...	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	34	....	....	37
...	...	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	....	1
...	...	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	7	....	....	7
6	17	....	....	....	....	456	....	35	....	....	....	....	....	34	456	491	....	211	....	135	1130
...	...	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	41	....	2	45
...	...	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	7	....	....	7
...	...	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	25	....	....	25
1	3	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	38	....	2	63
...	...	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	12	....	....	43
...	3	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	42	....	4	97
...	...	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	45	....	....	45
...	...	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	2	....	....	2
...	...	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	92	....	....	92
85	240	....	....	....	....	836	....	53	....	2	....	....	....	52	697	890	....	814	....	449	5952

N. O. THOMAS, M.B.

SUMMARY OF YEAR'S WORK

Branch Laboratory at Fort William for the Years 1922-23

Specimens Examined

Type of Specimen	Number of Positive Negative		Total Specimens	
	1922	1923	1922	1923
Diphtheria (Swabs)	.....	.....	1,129	2,077
Diagnosis				
Positive	50	74	.....	.....
Negative	320	172	.....	.....
Release from quarantine				
Positive	216	318		
Negative	543	1,513		
Tuberculosis	.....	.....	255	237
Positive	40	38		
Negative	215	199		
Typhoid	.....	.....	91	237
Positive	37	46		
Negative	54	92		
Syphilis:—				
Colloidal gold test	.....	.....	45	43
Wassermann test	.....	.....	1,141	952
Very strongly positive	231	118		
Strongly positive	20	28		
Positive	90	47		
Negative	800	759		
Test for Treponema pallidum (dark field exam.)	.....	.....	28	27
Positive	13	7		
Negative	15	20		
Gonorrhea	.....	.....	392	325
Positive	107	85		
Negative	285	240		
Milk Analyses	.....	.....	530	890
Chemical	530	836		
Bacteriological	42	54		
Water Analyses	.....	.....	992	814
Chemical	0	0		
Bacteriological	992	814		
Miscellaneous Specimens	.....	.....	540	449
Total for year	5,197		5,952	

Outfits Distributed, Year 1923

Bacterial water	Diphtheria	Typhoid	Tuberculosis	Wassermann	Gonorrhoea
850	2,100	155	245	980	315

Biological and Chemical Products Distributed, Year 1923

Typhoid No. of C.C.	Pertussis No. of C.C.	Silver Nitrate Ampoules	Diphtheria antitoxin units	Small-pox vaccine points
750	275	740	3,775,000	9,485

KINGSTON

Kingston, Ont., January 31st, 1924.

To the Chairman and Members of the Provincial Board of Health.

The salient feature of the years' work is increase in the usefulness of the Kingston branch laboratory in spite of the establishment of new centres in Eastern Ontario. A notable addition to the work has been the distribution of free insulin to poor diabetic patients. This distribution began in September, 1923 and is steadily on the increase.

A satisfactory and striking fact has been the reduction in the number of diphtheria swabs submitted. This undoubtedly shows a diminution in the prevalence of the disease in this part of Ontario.

The number of bloods submitted for the Wassermann test steadily rises. For nearly a year I have carried out parallel tests with the Kahn precipitation method and have found the latter to give results nearly identical with the Wassermann. The Kahn test has distinct advantages over the Wassermann in the matter of simplicity and with more experience it, or some similar test, may eventually replace the more complex and expensive complement deviation reaction. A large proportion of the bloods sent in (513) come from the Kingston Penitentiary.

During the very cold and very hot weather we have had trouble with haemolysis in the blood specimens submitted. To obviate this it is advisable that practitioners should study postal and railway facilities in order that the shortest possible time may elapse between drawing the blood from the patient and the examination in the laboratory.

The increase in the water examinations is in large part due to the carrying out, at the instance of the Dominion Government, of tests on the drinking water of the various passenger and freight steamers.

JAMES MILLER, M.D.,
Director Branch Laboratory, Kingston.

SUMMARY OF DIAGNOSTIC WORK
Year 1923

	Release		Diagnosis		Totals
SWABS	+	−	+	−	
	20	84	56	409	569
SPUTUMS	+	−			
	102	682			784
WIDALS	+	−			
	86	377			463
WASSERMANNS	Vsp	sp	+	−	
	300	70	65	1,649	2,084
	G.C.				
	+	−			
	46	98			144
WATER					
	702				702
MISCELLANEOUS					
	180				180
					4,926

REPORT FROM LABORATORIES OF THE PROVINCIAL BOARD OF HEALTH OF

Municipalities	Diphtheritic Swabs				Tuberculosis Sputa		Typhoid Bloods		Syphilis						
	Release		Diagnosis							Wassermann Reaction				Spirochaeta Pallida	
	+	—	+	—	+	—	+	—	Colloidal Gold Reaction	Very Strongly Positive	Strongly Positive	+	—	+	—
Bruce—															
Paisley								2							
Carleton—															
Ottawa						1				37	6	13	186		
Stittsville					1	3							1		
Richmond						1									
Dundas—															
Chesterville			1	1		2				2			8		
Iroquois					1	3	4	4		4			5		
Morrisburg							1	3							
Winchester					2	4		2		1			3		
Essex—															
Essex				1				1							
Frontenac—															
Battersea															
Harrowsmith				1		5									
Inverary						1	1								
Kingston	11	59	13	246	51	397	17	157		125	21	35	659		
Portsmouth	1			10	1	11	4	14		85	34	14	644		
Sharbot Lake			1	1		5		2					2		
Sydenham				1		5	1	1							
Verona				8		6		2							
Wolfe Island						2		1							
Glengarry—															
Lancaster						2									
Grenville—															
Cardinal		1		4		4	3	9		3			6		
Jasper	1	1	2	2				2							
Kemptville		1	4	4	1	4		1							
North Augusta	1	1	1	2		1									
Prescott						2	1						2		
Hastings—															
Belleville	1		6	20	3	35	8	29		10			24		
Deseronto				4		2									
Eldorado						1	1	11					1		
Foxboro		1	1	7		4	2	4							
Lindsay													1		
Marlbank								3							
Shannonville					1	1	1	1							
Trenton						1							1		
Tweed						7		2					2		
Lennox and Addington—															
Adolphustown				1											
Bath	1	7	4	3		2									
Flinton					1	3	1	2							
Napanee		1	3	13	2	17	2	35		1			6		
Newburgh															
Odessa			2	3		9		4					2		
Seeley's Bay					2	6		2					2		
Tamworth								1					1		
Yarker			1	4		2									
Leeds—															
Brockville		1		5		10	7	10		4			21		
Delta						1									
Gananoque	1	2	1	2	1	6	2	10		1		1	3		
Lansdowne				2		4	4	3							
Lyn				1											

ONTARIO AT KINGSTON FOR THE YEAR 1923.—SPECIMENS EXAMINED.

Gonorrhea		Rabies Diagnosis				Milk									Waters		Liquors for License Department	Miscellaneous Specimens	Total for Year
			Negri Bodies			Food Content		Preserv-atives		Bacteriological									
										Tuber-cle Bac.		Pus Cells							
+	—	Animal	+	—	Animal Inoculations	Fats	Total Solids	+	—	+	—	+	—	Count	Extraneous Matter	Number of Milk Samples	Chemical	Bacterial			
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2
8	16	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2	...	7	276
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	5
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	15
3	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	25
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	4
...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	13
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	1
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	5	...	...	11
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	1	4
19	47	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	384	...	149	2390
...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	61	...	...	880
...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	11
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	4	...	1	14
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	16
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	3
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	3	...	...	33
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	9
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	11	...	...	26
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	6
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	15	...	...	20
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	11	148
...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	3	...	...	10
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	4	...	...	18
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	19
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1
...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	4
...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	5
1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	4
...	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	18	...	...	33
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	10	...	...	27
2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	5	...	...	14
...	3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	2	90
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	21	...	...	21
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	18	...	...	38
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	12
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	7
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	47	...	...	105
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	31
2	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	5	...	1	23
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	31	...	...	32

REPORT FROM LABORATORIES OF THE PROVINCIAL BOARD OF HEALTH OF

Municipalities	Diphtheritic Swabs				Tuberculosis Sputa		Typhoid Bloods		Syphilis						
	Release		Diagnosis							Wassermann Reaction				Spirochaeta Pallida	
	+	—	+	—	+	—	+	—	Colloidal Gold Reaction	Very Strongly Positive	Strongly Positive	+	—	+	—
Leeds—Con.															
Mallorytown				3		3									
Newboro					1	3									
Westport				1		2		2		1	1		1		
Lanark—															
Almonte								1							
Carleton Place		4	3	9		5	6	11					5		
Lanark								2							
McDonald Crs.						2									
Perth				7	2	4	1	5					3		
Smith's Falls	2	2	2	10	1	18	8	17		4		1	14		
Northumberland—															
Campbellford		1		1	3	1									
Cobourg				1		1	1	3		3	1		2		
Colborne						1	3			4			2		
Renfrew—															
Arnprior				3	5	8	2	2		1			4		
Calabogie										2			1		
Cobden		2	1	4		2		1							
Pembroke				1	4	11	2	5					6		
Renfrew				1	5	8	1				2		9		
Westmeath				2		2	1						2		
Stormont—															
Cornwall			8	4	12	32	1	4		12	4	1	18		
Finch						2									
Moose Creek															
Newington						1									
Prince Edward—															
Picton	1		2	16		6		2					2		
Totals for the year	20	84	56	409	102	682	86	377		300	70	65	1649		

Grand Total, 4926.

ONTARIO AT KINGSTON FOR THE YEAR 1923.—SPECIMENS EXAMINED.

Gonorrhœa		Rabies Diagnosis				Milk											Waters				
			Negri Bodies			Food Content		Preservatives		Bacteriological											
										Tubercle Bac.		Pus Cells									
+	—	Animal	+	—	Animal Inoculations	Fats	Total Solids	+	—	+	—	+	—	Count	Extraneous Matter	Number of Milk Samples	Chemical	Bacterial	Liquors for License Department	Miscellaneous Specimens	Total for Year
...	...	....	....	....	...	...	...	...	...	...	...	...	...	...	....	....	....	....	....	....	6
...	...	....	....	....	...	...	...	...	...	...	...	...	...	...	....	....	....	....	....	....	6
...	...	....	....	....	...	...	...	...	...	...	...	...	...	...	....	....	....	2	....	....	10
...	...	....	....	....	...	...	...	...	...	...	...	...	...	...	....	....	....	....	....	....	1
...	1	....	....	....	...	...	...	...	...	...	...	...	...	...	....	....	....	....	....	....	44
...	...	....	....	....	...	...	...	...	...	...	...	...	...	...	....	....	....	....	....	....	2
...	...	....	....	....	...	...	...	...	...	...	...	...	...	...	....	....	....	....	....	....	2
...	1	....	....	....	...	...	...	...	...	...	...	...	...	...	....	....	....	....	....	2	25
5	4	....	....	....	...	...	...	...	...	...	...	...	...	...	....	....	....	26	....	2	120
...	...	....	....	....	...	...	...	...	...	...	...	...	...	...	....	....	....	....	....	....	6
...	...	....	....	....	...	...	...	...	...	...	...	...	...	...	....	....	....	....	....	....	12
...	...	....	....	....	...	...	...	...	...	...	...	...	...	...	....	....	....	....	....	....	10
1	1	....	....	....	...	...	...	...	...	...	...	...	...	...	....	....	....	18	....	1	46
...	...	....	....	....	...	...	...	...	...	...	...	...	...	...	....	....	....	....	....	....	3
...	...	....	....	....	...	...	...	...	...	...	...	...	...	...	....	....	....	1	....	....	11
...	3	....	....	....	...	...	...	...	...	...	...	...	...	...	....	....	....	....	....	1	33
...	1	....	....	....	...	...	...	...	...	...	...	...	...	...	....	....	....	....	....	....	27
...	...	....	....	....	...	...	...	...	...	...	...	...	...	...	....	....	....	....	....	....	7
1	5	....	....	....	...	...	...	...	...	...	...	...	...	...	....	....	....	....	....	....	102
...	...	....	....	....	...	...	...	...	...	...	...	...	...	...	....	....	....	....	....	....	2
...	...	....	....	....	...	...	...	...	...	...	...	...	...	...	....	....	....	....	....	....	2
...	...	....	....	....	...	...	...	...	...	...	...	...	...	...	....	....	....	....	....	....	1
...	...	....	....	....	...	...	...	...	...	...	...	...	...	...	....	....	....	4	....	....	33
46	98	....	....	....	...	...	...	...	...	...	...	...	...	...	....	....	....	702	....	180	4926

LONDON

Branch Laboratory, Provincial Board of Health,
London, January 31st, 1924.

The Chairman and Members of the Provincial Board of Health.

Sirs,—I have the honour to submit herewith the annual report of all specimens examined in my laboratory during the year 1923.

I have the honour to be, Sir,

Yours obedient servant,

H. W. HILL, M.D.,
Director, Institute of Public Health, and
Branch Laboratory, London.

REPORT FROM LABORATORIES OF THE PROVINCIAL BOARD OF HEALTH OF

Municipalities	Diphtheritic Swabs				Tuberculosis Sputa		Typhoid Bloods		Syphilis							
	Release		Diagnosis							Wassermann Reaction				Spirochaeta Pallida	
	+	—	+	—	+	—	+	—	Colloidal Gold Reaction	Very Strongly Positive	Strongly Positive	+	—	+	—
Brant—															
Brantford	....	1	....	1	....	2	4	9	4	57	18	6	224 (19)	....	...
Burford	....	....	....	....	....	4	....	....	....	....	....	....	....	....	...
Cainsville	....	....	....	1	....	....	....	....	....	....	....	....	1	....	...
Mt. Pleasant	....	....	....	....	....	....	....	1	....	2	....	....	4	....	...
Paris	....	....	....	....	....	1	1	2	....	....	....	....	....	....	...
Bruce—															
Cargill	....	....	....	....	....	2	....	....	....	....	....	....	....	....	...
Lucknow	....	....	....	....	....	....	....	....	....	....	....	....	....	....	...
Mildmay	....	....	....	....	....	....	....	1	....	....	....	....	1	....	...
Walkerton	....	....	....	....	....	1	....	....	....	....	....	....	1	....	...
Carleton—															
Ottawa	....	....	....	....	....	....	....	....	27	7	2	....	26 (5)	....	...
Durham—															
Bethany	....	....	....	....	....	....	....	....	....	....	....	....	....	....	...
Millbrook	....	....	....	....	....	....	....	....	....	....	....	....	1	....	...
Elgin—															
Aylmer	....	....	....	1	....	3	....	....	....	2	....	....	3 (1)	....	...
Bayham	....	....	....	....	....	....	....	....	....	....	....	....	1	....	...
Dutton	....	....	....	....	....	1	....	....	....	....	....	....	....	....	...
Harrietsville	....	....	....	....	....	....	....	....	....	....	....	....	....	....	...
Lawrence St.	....	3	....	3	1	1	1	1	....	1	1	....	....	....	...
Port Burwell	....	....	....	....	....	1	....	....	....	....	....	....	....	....	...
Port Stanley	....	....	....	....	....	1	....	....	....	3	....	....	1	....	...
Rodney	....	....	....	....	....	1	....	....	....	....	....	....	....	....	...
Shedden	....	....	....	2	....	....	1	....	....	....	....	....	....	....	...
Sparta	....	....	....	....	....	6	....	....	....	....	....	....	4	....	...
Springfield	....	....	....	....	....	....	....	....	....	....	....	....	1	....	...
St. Thomas	....	....	....	....	1	17	....	....	1	18	....	....	43 (1)	....	...
Wallacetown	....	....	1	1	....	1	....	1	....	....	....	....	....	....	...
West Lorne	....	....	....	3	....	....	....	....	....	1	....	....	1 (1)	....	...
Essex—															
Amherstburg	....	....	....	2	....	....	....	....	....	....	....	....	4	....	...
Belle River	....	....	....	....	....	1	....	....	....	....	....	....	6	....	...
Comber	....	....	....	3	1	1	1	2	....	....	1	....	....	....	...
Essex	....	....	....	....	1	....	....	2	....	1	....	....	3	....	...
Ford	....	....	....	....	....	....	....	....	....	1	....	....	(1)	....	...
Kingsville	....	1	1	2	....	1	....	2	....	....	....	....	1	....	...
Leamington	....	....	....	5	....	5	....	2	....	3	2	....	5 (1)	....	...
Pelee Island	....	....	....	....	....	....	....	....	....	....	....	....	....	....	...
Sandwich	....	....	....	....	....	....	....	....	....	1	....	....	9	....	...
Stoney Point	....	....	....	....	....	1	....	....	....	....	....	....	....	....	...
Tilbury	....	1	3	52	....	1	....	....	....	....	....	....	....	....	...
Walkerville	....	....	....	....	....	2	....	....	....	5	3	....	43 (5)	....	...
Windsor	....	....	....	....	....	....	....	....	6	200	48	6	481 (35)	....	...
Frontenac—															
Kingston	....	....	....	....	....	....	....	....	....	....	....	....	....	....	...
Grey—															
Hanover	....	....	....	....	....	....	....	....	....	....	....	....	....	....	...
Haldimand—															
Dunnville	....	5	....	4	....	....	....	1	....	....	....	....	....	....	...

ONTARIO AT LONDON FOR THE YEAR 1923.—SPECIMENS EXAMINED.

Gonorrhœa		Rabies Diagnosis				Milk										Waters		Liquors for License Department	Miscellaneous Specimens	Total for Year
			Negri Bodies			Food Content		Preservatives		Bacteriological										
										Tubercle Bac.		Pus Cells								
+	—	Animal	+	—	Animal Inoculations	Fats	Total Solids	+	—	+	—	+	—	Count	Extraneous Matter	Number of Milk Samples	Chemical	Bacterial			
2	6	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	7	360
....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	4
....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	2
1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	8
....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	4
....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	2
....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	6	6	....	1	13
....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	2
....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	2
....	4	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	5	76
....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	1
....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	7	8
....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	33	32	....	....	75
....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1
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....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	1	....	....	2
....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	12
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....	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	7	6	....	....	24
1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	4	4	....	1	11
3	7	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	3	3	....	9	106
....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	2	2	....	....	8
1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	4	11
....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	6
....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	8
....	1	....	....	....	....	1	....	....	....	....	....	....	....	1	....	....	7	7	....	....	25
....	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	43	43	....	....	94
....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	2
....	3	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	7	7	....	....	25
1	4	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	6	34
....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	5	5	....	....	10
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....	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	4	4	....	....	66
....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	58
....	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	3	780
....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	1
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....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	10

REPORT FROM LABORATORIES OF THE PROVINCIAL BOARD OF HEALTH OF

Municipalities	Diphtheritic Swabs				Tuberculosis Sputa		Typhoid Bloods		Syphilis							
	Release		Diagnosis							Wassermann Reaction				Spirochaeta Pallida	
	+	−	+	−	+	−	+	−	Colloidal Gold Reaction	Very Strongly Positive	Strongly Positive	+	−	+	−
Huron—															
Bayfield													1		
Clinton						1		2					1		
Crediton				1		1									
Dashwood						1							1 (2)		
Ethel						1									
Exeter				8		2									
Fordwich						2									
Goderich				4		5	2 (1)	4		1			3		
Hensall				6		4									
Kirkton				2											
Seaforth		4	1	4	1		1	3		4					
Wingham				5	2	3	1	1					2		
Zurich				3	1	12				1			4		
Kent—															
Blenheim					3	16	3	7		2			8		
Chatham		1	1	19	2	23	3	16	3	37	6		74 (6)		
Dresden			1	3	2	3	1	5					1		
Duart		3	1	26	1	7		1							
Highgate		26	4	37									2		
Merlin			2	10	1	4		2					13 (2)		
Ridgetown	2	1	2	15	1	7	1	17		1			4 (1)		
Thamesville			1	7		10		2		1	1		6 (1)		
Tupperville										1	1				
Wallaceburg						2	1	9		3			11 (1)		
Wheatley						1	1	1					2		
Timiskaming															
S. R. Falls															
Lambton—															
Alviston				10	2	1	2			1			1 (1)		
Arkona													1		
Brigden						1		1							
Camlachie				3		2		1							
Courtright															
Florence							2	2							
Forest				9	2	7		6		1			2		
Inwood				1	1	3							2		
Oil Springs	1	12	9	17		2		1		1	1		2		
Petrolia				5	4	5	2	6		2			2		
Port Lambton								1					1		
Sarnia		3	3	21	6	30		5	1	28	3		52 (7)		
Thedford						2		1					1		
Watford				3		6		2					4		
Wyoming				1		2		2							
Lanark—															
Perth					1										
Lincoln—															
Niagara-on-Lake													3		
St. Catharines															

ONTARIO AT LONDON FOR THE YEAR 1923.—SPECIMENS EXAMINED.

Gonorrhea		Rabies Diagnosis				Milk										Waters		Liquors for License Department	Miscellaneous Specimens	Total for Year
			Negri Bodies			Food Content		Preservatives		Bacteriological										
										Tubercle Bac.		Pus Cells								
+	—	Animal	+	—	Animal Inoculations	Fats	Total Solids	+	—	+	—	+	—	Count	Extraneous Matter	Number of Milk Samples	Chemical	Bacterial		
...	...	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1
...	2	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	1	....	8
...	...	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	2
...	...	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	4
...	...	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1
...	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	6	6	1	24
...	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	2	5
1	4	....	....	....	95	....	....	....	....	....	....	....	....	94	....	....	31	22	9	276
...	...	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	2	12
...	...	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	1	....	4
...	...	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	1	2	22
...	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	2	17
1	...	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	22
...	...	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	13	13	1	66
7	8	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	143	31	380
...	...	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	2	2	1	21
...	...	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	9	9	2	59
...	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	1	1	73
...	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	35
1	5	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	18	19	11	106
3	6	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	1	....	40
...	...	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	2
...	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	29	30	2	89
...	...	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	5
...	...	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	3	3
...	...	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	2	2	1	23
...	...	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1
...	...	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	1	....	4
...	...	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	6
...	...	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	4	4	1	9
...	...	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	4	4	1	13
...	...	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	3	30
...	...	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	2	2	....	11
...	...	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	46
...	...	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	1	....	28
...	...	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	2
7	12	....	....	....	....	30	....	....	....	....	....	....	....	30	....	....	25	27	11	301
...	...	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	4
...	...	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	14	14	2	45
...	...	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	6
...	...	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1
...	...	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	3
...	...	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	1

REPORT FROM LABORATORIES OF THE PROVINCIAL BOARD OF HEALTH OF

Municipalities	Diphtheritic Swabs				Tuberculosis Sputa		Typhoid Bloods		Syphilis						
	Release		Diagnosis							Wassermann Reaction				Spirochaeta Pallida	
	+	−	+	−	+	−	+	−	Colloidal Gold Reaction	Very Strongly Positive	Strongly Positive	+	−	+	−
Middlesex															
Adelaide													3		
Ailsa Craig						1									
Appin															
Belmont				3				2							
Byron						1				7	1		8		
Delaware				1											
Dorchester						9	1	1					1		
Glencoe						1							1		
Granton	2	9	3	15	3	9		1							
Hyde Park										1			9		
Ilderton				6		3							2		
Lambeth					1	10		1					3		
London	77	121 (8)	38	518	49	273	2 (8)	para 76	187	403	66	22	1456 (182)		
Lucan				1											
Melbourne				2	2	3		2							
Mt. Brydges	1	9	2	8		8		2					3		
Newbury					1	3		3							
Parkhill	1	3	2	4									1		
St. John's				4		3	(2)			1					
Strathroy				2	3	6	2	6		2			9		
Thorndale			1	3	1	4		3							
Muskoka—															
Severn Brydge						1									
Norfolk—															
Delhi				1											
Simcoe				1											
Ontario—															
Brechin				1											
Whitby				1	1		2	2	64	70	10	2	132 (19)		
Oxford—															
Beachville				1			1								
Burgessville															
Ingersoll				6	1	10	1	2		1			10		
Innerkip					1										
Lakeside				1		2		2							
Mt. Elgin						3							1		
Norwich															
Oxford—															
Princeton						1									
Port Elgin															
Tavistock				3	2	4		1					1		
Thamesford				1				1					1		
Tillsonburg		1	1	4	1			2		1			7		
Woodstock			1	4	6	45		2		7	1	1	58 (3)		
Peel—															
Brampton				1											
Perth—															
Atwood				1											
Dublin						1		(1) 2							
Listowell				2		1		2							
Milverton					1	4									
Mitchell		2		3	2	7	para 3	15		1			1		

ONTARIO AT LONDON FOR THE YEAR 1923.—SPECIMENS EXAMINED.

Gonorrhea		Rabies Diagnosis				Milk									Waters		Liquors for License Department	Miscellaneous Specimens	Total for Year
			Negri Bodies			Food Content		Preservatives		Bacteriological									
										Tubercle Bac.		Pus Cells							
+	—	Animal	+	—	Animal Inoculations	Fats	Total Solids	+	—	+	—	+	—	Count	Extraneous Matter	Number of Milk Samples	Chemical	Bacterial			
...	...	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	4
...	...	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1
...	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1
...	...	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	5
...	...	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	7	24
...	...	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	6	6	....	1	14
...	...	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	3	15
...	...	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	2
...	...	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	42
...	2	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	7	7	....	....	26
...	...	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	2	2	....	1	16
1	...	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	2	19
84	238	....	....	....	....	706	....	....	....	....	....	....	....	1035	....	....	57	339	19	606	6484
...	...	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1
...	...	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	10	10	....	3	32
...	...	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	33
...	...	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	4	4	....	....	15
...	...	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	6	6	....	6	29
1	7	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	2	20
...	...	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	10	40
...	2	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	1	....	1	17
...	...	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1
...	...	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1
...	...	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	1	....	....	3
...	...	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1
...	...	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	6	309
...	...	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	2
...	...	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	6	6	....	....	12
...	...	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	5	5	....	1	42
...	...	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1
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...	...	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	2	2	....	....	4
...	...	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	2
...	...	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	2	2
...	...	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	12
...	...	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	3
1	6	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	6	6	....	1	37
...	2	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	13	13	....	10	166
...	...	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1
...	...	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1
...	...	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	5
...	...	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	18	18	....	4	45
...	...	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	2	2	....	....	9
...	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	3	3	....	....	42

REPORT FROM LABORATORIES OF THE PROVINCIAL BOARD OF HEALTH OF

Municipalities	Diphtheritic Swabs				Tuberculosis Sputa		Typhoid Bloods		Syphilis							
	Release		Diagnosis							Wassermann Reaction				Spirochaeta Pallida	
	+	—	+	—	+	—	+	—	Colloidal Gold Reaction	Very Strongly Positive	Strongly Positive	+	—	+	—
Perth—Con.															
Monkton	....	....	....	....	....	....	....	....	....	....	....	....	.....	....	...
Sebringville	....	....	....	4	....	1	....	....	....	....	....	....	.....	....	...
Stratford	1	10	5	27	11	28	1	4	4	15	1	1	57 (6)	....	...
Shakespeare	....	....	....	....	....	....	....	....	....	....	....	....	.....	....	...
St. Mary's	....	....	....	3	6	6	....	3	....	....	....	....	2	....	...
Renfrew—															
Golden Lake	....	....	....	....	....	1	....	....	....	....	....	....	.....	....	...
Simcoe—															
Collingwood	....	3	2	....	....	....	....	....	....	....	....	....	.....	....	...
Orillia	....	3	....	7	....	....	....	....	....	....	....	....	.....	....	...
Waterloo—															
Ayr	....	....	....	4	....	....	....	(1)		....	....	....	.....	....	...
Baden	....	....	....	2	....	3	....	2	....	....	....	....	.....	....	...
Galt	....	1	....	....	....	....	1	9	....	3	....	....	2 (3)	....	...
Kitchener	....	1	....	10	....	1	....	3	1	9	4	2	47 (12)	....	...
New Hamburg	....	....	....	5	....	....	....	....	....	....	....	....	.....	....	...
New Dundee	....	1	1	2	....	....	....	1	....	....	....	....	3	....	...
Preston	....	....	....	....	2	5	....	1	1	....	....	....	.....	....	...
St. Jacob's	....	....	....	....	....	....	....	....	....	....	....	....	.....	....	...
Waterloo	1	1	1	3	1	3	....	....	....	....	....	....	.....	....	...
Wellesley	....	2	1	4	....	10	1	4	....	....	....	....	.....	....	...
						1	para								
Welland—															
Niagara Falls	....	....	....	....	....	....	....	....	....	....	....	....	.....	....	...
Wellington—															
Conn	....	....	....	1	....	....	....	3	....	....	....	....	1	....	...
Fergus	....	....	....	1	....	....	....	....	....	....	....	....	.....	....	...
Glenallan	....	....	....	....	....	1	....	....	....	....	....	....	.....	....	...
Guelph	....	....	....	....	....	1	....	(1) 1	49	61	4	....	(4) 178	....	...
Harriston	....	....	....	8	....	3	1	1	....	....	....	....	1	....	...
						1	para								
Mt. Forest	....	....	....	2	....	....	2	4	1	....	....	....	3	....	...
Wentworth—															
Lynden	....	....	....	....	....	1	....	....	....	1	....	....	1	....	...
Sheffield	....	....	....	....	....	....	....	1	....	....	....	....	.....	....	...
York—															
Toronto	....	1	....	....	....	....	(5	....	....	....	....	....	.....	....	...
							para)								
Totals	86	229 (8)	88	981	129	697	58 (13)	287	349	969	174	40	3070 (219)	....	...

Under Diphtheria Swabs, numbers in parenthesis indicated suspicious specimens, contaminated specimens or no growth.

Under Typhoid Bloods, numbers in parenthesis indicate atypical reactions.

Under Wassermann Reaction, numbers in parenthesis indicated doubtful or anti-complementary reaction.

Numbers in Miscellaneous column include:—Free urines and chemical miscellaneous by Division of Chemistry and blood counts, blood cultures, blood groupings, blood coagulations, vaccines, exudates, free tissues and animal experiments, by the Division of Pathology.

ONTARIO AT LONDON FOR THE YEAR 1923.—SPECIMENS EXAMINED.

Gonorrhea		Rabies Diagnosis				Milk										Waters				
			Negri Bodies			Food Content		Preservatives		Bacteriological										
										Tubercle Bac.		Pus Cells								
+	—	Animal	+	—	Animal Inoculations	Fats	Total Solids	+	—	+	—	+	—	Count	Extraneous Matter	Number of Milk Samples	Chemical	Bacterial	Liquors for License Department	Miscellaneous Specimens	Total for Year
																				2	2
																	3	2			10
12	21					1														22	227
																				2	2
																				6	26
																					1
																					5
																					10
																					5
																				2	9
																				5	24
	14																			8	112
																	7	7			19
																					8
																				2	11
																	2	2			4
																	1	1		1	13
																				2	25
																				3	3
																	1	1		1	8
																					1
																	1	1		3	6
																	4	8		4	315
																	13	15		1	42
														3			6	6		6	34
																	7	7		2	19
																	1	1		1	4
																					1
128	366					833								1163			492	915	19	885	12198

Approved
H. W. Hill, M.D.
Director.

Feb. 2, 1924

NORTH BAY.

North Bay, January 31st, 1924.

To the Chairman and Members of the Provincial Board of Health.

Sirs,—I have the honour to submit herewith the annual report of all specimens examined in this laboratory during the year 1923.

I have the honour to be, Sir,

Your obedient servant,

JOHN DOUGLAS, M.B.,
Director Branch Laboratory, North Bay.

REPORT FROM LABORATORIES OF THE PROVINCIAL BOARD OF HEALTH OF

Municipalities	Diphtheritic Swabs				Tuberculosis Sputa		Typhoid Bloods		Syphilis							
	Release		Diagnosis							Wassermann Reaction				Spirochaeta Pallida	
	+	—	+	—	+	—	+	—	Colloidal Gold Reaction	Very Strongly Positive	Strongly Positive	+	—	+	—
Ansonville				1			2			1			18		
Burk's Falls				3		13	5	3					1		
Burwash										1					
Callander		7	6	19	1	1							1		
Capreol				1		2				2	2	1	11		
Chapleau				1		1									
Chelmsford				1											
Cobalt			1	4		2	3	1		8	2	1	16		
Cochrane		1	3	2		11	20	19		2	3		25		
Coniston	40	28	19	86	4	7	1	1					2		
Connaught			1			1		1							
Copper Cliff		2	1	6		4							6		
Creighton Mines		7		6		3									
Dane															
Daventry	8	23													
Elsas															
Englehart	1		1	3		10	3	2				1	8		
Espanola															
Field						1							2		
Gowganda													1		
Grant						1									
Haileybury			2		5	13	5	4		4		1	16		
Hearst		2	1	1			1								
Iroquois Falls				2		4	5	6		3			14		
Kapuskasing				1			6	6		1			2		
Kirkland Lake				2		1	4	17		3			6		
Larder Lake															
Levack	2	16	3	3											
Little Current	2	2	2	37		2	2			1			2		
Magnetawan															
Manitowaning															
Matheson			1	3		1	3	4							
Mattawa															
Milner										1			3		
Monteith			1	12		1		1					1		
Moonbeam															
New Liskeard	3	4	1	7	1	15	8	7		3	1	1	20		
Nickleton															
North Bay	99	102	49	194	9	69	17	26		40	16	8	139		
North Cobalt															
North Temiskaming															
Powassan	2	7	11	15	3	10	1	1					1		
Sellwood															
Schumacher				1	1	2	1			1	1	1	1		
Silver Centre															
Smooth Rock Falls	6	4	2	2			11	13			1				
South Porcupine		1	1	5	5	15	3	9		4	5		45		
South River				4											
Sprucedale							2	1							
Sturgeon Falls	7	37	9	7	4	5	1	6		3	1	1	9		
Sudbury			3	10	7	21	5	4		24	15	7	101		
Sundridge	10	14	4	15	1	12	2	11							
Swastika							1	3							
Thornloe						1	1						1		
Timmins		3	2	10	6	25	16	11		16	9	4	70		
Tomstown															

ONTARIO AT NORTH BAY FOR THE YEAR 1923.—SPECIMENS EXAMINED.

Gonorrhœa		Rabies Diagnosis				Milk									Waters		Liquors for License Department	Miscellaneous Specimens	Total for Year
			Negri Bodies			Food Content		Preservatives		Bacteriological									
										Tubercle Bac.		Pus Cells							
+	—	Animal	+	—	Animal Inoculations	Fats	Total Solids	+	—	+	—	+	—	Count	Extraneous Matter	Number of Milk Samples	Chemical	Bacterial			
1	4	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	27
....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	16	....	....	41
....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1
....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	18	....	....	53
....	3	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	27	....	....	49
1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	3	....	....	6
....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1
3	14	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	32	....	....	87
3	6	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	130	....	1	226
....	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	189
....	3	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	19	....	....	25
....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	23	....	....	42
....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	16
....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	....	1
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....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	6	....	....	6
3	7	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	39
....	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	....	2
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....	3	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	13	....	....	17
....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	4	....	....	5
11	11	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	78	....	....	150
....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	27	....	....	32
9	18	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	1	....	....	63
....	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	10	....	1	28
1	15	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	51	....	....	100
....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	3	....	....	3
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....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	12	....	....	12
....	2	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	14
....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	....	1
....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	12	....	....	16
....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	7	....	....	23
....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	....	1
3	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	2	....	1	77
....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	2	....	....	2
47	106	....	....	....	....	....	....	....	....	....	....	....	....	....	....	35	....	333	....	3	1292
....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	2	....	....	2
....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	10	....	....	10
....	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	52
....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1
....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	10	....	....	19
....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	9	....	....	9
....	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	40	....	4	84
13	48	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	69	....	2	225
....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	....	5
....	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	4
8	20	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	5	....	....	124
8	20	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	57	....	2	284
....	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	3	....	....	73
....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	8	....	....	13
....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	3
15	22	....	....	....	....	....	....	....	....	....	....	....	....	....	....	33	....	52	....	....	294
....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	....	1

REPORT FROM LABORATORIES OF THE PROVINCIAL BOARD OF HEALTH OF

Municipalities	Diphtheritic Swabs				Tuberculosis Sputa		Typhoid Bloods		Syphilis						
	Release		Diagnosis							Wassermann Reaction				Spirochaeta Pallida	
	+	—	+	—	+	—	+	—	Colloidal Gold Reaction	Very Strongly Positive	Strongly Positive	+	—	+	—
Trout Creek	....	....	....	1	....	....	....	....	....	....	....	....	1	....	....
Whitney	....	....	....	....	....	....	....	....	....	....	....	....	.....	....	....
Worthington	4	2	1	5	....	....	....	....	....	....	....	....	.....	....	....
	184	262	125	470	47	254	129	157	....	118	57	25	524	....	....

ONTARIO AT NORTH BAY FOR THE YEAR 1923.—SPECIMENS EXAMINED.

Gonorrhea		Rabies Diagnosis				Milk										Waters				
			Negri Bodies			Food Content		Preservatives		Bacteriological										
+	—	Animal	+	—	Animal Inoculations	Fats	Total Solids	+	—	Tubercle Bac. +	Tubercle Bac. —	Pus Cells +	Pus Cells —	Count	Extraneous Matter	Number of Milk Samples	Chemical	Bacterial	Liquors for License Department	Miscellaneous Specimens	Total for Year
...	1	....	....	....	...	...	...	..	..	...	...	...	...	...	....	....	....	....	....	....	3
1	1	....	....	....	...	...	...	..	..	...	...	...	...	...	....	....	....	....	....	....	2
...	...	....	....	....	...	...	...	..	..	...	...	...	...	...	....	....	....	....	....	....	12
127	311	....	....	....	...	...	...	..	..	...	...	...	...	...	....	71	....	1129	....	14	4004

OTTAWA

Branch Laboratory, 428 Slater Street,
Ottawa, Ontario, January 21st, 1924.

To the Chairman and Members of the Provincial Board of Health.

Sirs,—I have the honour to submit herewith a report of all specimens examined at this laboratory during the year ending December 31st, 1923.

The large number of miscellaneous noted under Ottawa consist chiefly of daily tests of the chlorinated lime and ammonia used in the purification of the city water supply.

I have the honour to be, Sirs,

Your obedient servant,

FRANK L. LETTS, M.B.
Director Branch Laboratory, Ottawa, Ont.

REPORT FROM LABORATORIES OF THE PROVINCIAL BOARD OF HEALTH OF

Municipalities	Diphtheritic Swabs				Tuberculosis Sputa		Typhoid Bloods		Syphilis						
	Release		Diagnosis							Wassermann Reaction				Spirochaeta Pallida	
	+	—	+	—	+	—	+	—	Colloidal Gold Reaction	Very Strongly Positive	Strongly Positive	+	—	+	—
Carleton—															
Ashton					1	1									
Britannia															
Carp	4	9	1	2		1									
Gloucester Twp															
Manotick		6	2	11		6		5							
Metcalfe			2			4	1								
North Gower							1								
Osgoode															
Ottawa	138	1039	538	3495	73	307	17	58						2	
Richmond						1									
Rockcliffe															
South March															
Stittsville															
Westboro	1	20	14	7	1	3	3	5							
Dundas—															
Aultsville					1	1									
Chesterville	2	1	6	67		1		2							
Crysler						1									
Finch						1									
Iroquois					1	3	1								
Morrisburg					1	2	2								
Newington					2	6	1	1							
Winchester			1	2	4	5									
Glengarry—															
Apple Hill							1	1							
Dalhousie Mills					1	1		1							
Lancaster			2			1									
Martintown	3	8	4	2											
Maxville						3		5							
Williamstown		2			1	1		1							
Grenville—															
Kemptville	1	9	10	12	1		1	1							
Merrickville															
North Augusta				2											
Prescott						1									
Lanark—															
Almonte						2		1							
Carleton Place		4	4	4		1									
Lanark								2							
Pakenham		2	1	2		3									
Perth			1	4	1	2	1	3							
Smith's Falls	1	2	1	5	1		4	4							
Leeds—															
Gananoque							2								
Prescott—															
Alfred	1	1													
Hawkesbury						2	1	5							
L'Orignal															
Plantagenet				1		1									
Riceville				1											
St. Eugene						2									
St. Isidore					1										
Vankleek Hill						1		2							
Renfrew—															
Arnprior			1	1		2	1	4							
Barry's Bay								1							
Beachburg								1							

ONTARIO AT OTTAWA FOR THE YEAR 1923—SPECIMENS EXAMINED.

Gonorrhea		Rabies Diagnosis				Milk									Waters		Liquors for License Department	Miscellaneous Specimens	Total for Year
			Negri Bodies			Food Content		Preservatives		Bacteriological									
										Tubercle Bac.		Pus Cells							
+	—	Animal	+	—	Animal Inoculations	Fats	Total Solids	+	—	+	—	+	—	Count	Extraneous Matter	Number of Milk Samples	Chemical	Bacterial			
...	...	....	....	....	....	...	...	..	..	...	...	...	...	...	....	....	....	....	....	....	2
...	...	....	....	....	....	...	...	..	..	...	...	...	...	...	....	....	....	8	....	....	8
...	...	....	....	....	....	...	...	..	..	...	...	...	...	...	....	....	....	....	....	....	17
...	...	....	....	....	....	...	...	..	..	...	...	...	...	...	....	....	....	30	....	....	30
1	...	....	....	....	....	...	...	..	..	...	...	...	...	...	....	....	....	6	....	....	37
...	...	....	....	....	....	...	...	..	..	...	...	...	...	...	....	....	....	....	....	....	7
...	...	....	....	....	....	...	...	..	..	...	...	...	...	...	....	....	....	....	....	....	1
...	...	....	....	....	....	...	...	..	..	...	...	...	...	...	....	....	....	1	....	....	1
251	351	....	....	(1	097	100	8	..	..	...	...	...	...	109	7)	1097	37	2405	....	1300	11008
...	...	....	....	....	....	...	...	..	..	...	...	...	...	...	....	....	....	....	....	....	1
...	...	....	....	....	....	...	...	..	..	...	...	...	...	...	....	....	....	1	....	....	1
...	...	....	....	....	....	...	...	..	..	...	...	...	...	...	....	....	....	19	....	....	19
...	...	....	....	....	....	...	...	..	..	...	...	...	...	...	....	....	....	1	....	....	1
...	...	....	....	....	....	...	...	..	..	...	...	...	...	...	....	....	1	31	....	....	86
...	...	....	....	....	....	...	...	..	..	...	...	...	...	...	....	....	....	....	....	....	2
...	...	....	....	....	....	...	...	..	..	...	...	...	...	...	....	....	....	1	....	2	82
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...	1	....	....	....	....	...	...	..	..	...	...	...	...	...	....	....	....	....	....	....	2
2	...	....	....	....	....	...	...	..	..	...	...	...	...	...	....	....	....	....	....	....	7
1	...	....	....	....	....	...	...	..	..	...	...	...	...	...	....	....	....	....	....	1	7
1	1	....	....	....	....	...	...	..	..	...	...	...	...	...	....	....	....	....	....	....	12
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1	...	....	....	....	....	...	...	..	..	...	...	...	...	...	....	....	....	5	....	....	14
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...	2	....	....	....	....	...	...	..	..	...	...	...	...	...	....	....	....	23	....	....	38
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8	3	....	....	....	....	...	...	..	..	...	...	...	...	...	....	....	....	8	....	....	37
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1	2	....	....	....	....	...	...	..	..	...	...	...	...	...	....	....	....	6	....	....	17
...	...	....	....	....	....	...	...	..	..	...	...	...	...	...	....	....	....	1	....	....	1
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...	...	....	....	....	....	...	...	..	..	...	...	...	...	...	....	....	....	15	....	2	20
...	...	....	....	....	....	...	...	..	..	...	...	...	...	...	....	....	....	7	....	1	17
...	...	....	....	....	....	...	...	..	..	...	...	...	...	...	....	....	....	....	....	....	1
...	...	....	....	....	....	...	...	..	..	...	...	...	...	...	....	....	....	....	....	....	1

REPORT FROM LABORATORIES OF THE PROVINCIAL BOARD OF HEALTH OF

Municipalities	Diphtheritic Swabs				Tuberculosis Sputa		Typhoid Bloods		Syphilis						
	Release		Diagnosis							Wassermann Reaction				Spirochaeta Pallida	
	+	—	+	—	+	—	+	—	Colloidal Gold Reaction	Very Strongly Positive	Strongly Positive	+	—	+	—
Renfrew—Con.															
Cobden	....	....	2	2	....	10	1	7	....	....	....	....	.....	....	...
Eganville	....	3	2	3	2	5	....	2	....	....	....	....	.....	....	...
Pembroke	....	....	5	5	5	13	1	5	....	....	....	....	.....	....	...
Renfrew	....	....	....	....	1	3	1	2	....	....	....	....	.....	....	...
Westmeath	1	2	3	4	....	1	....	3	....	....	....	....	.....	....	...
Russell—															
Bourget	....	1	2	....	2	2	....	....	....	....	....	....	.....	....	...
Casselman	....	....	....	....	....	1	....	....	....	....	....	....	.....	....	...
Clarence Creek	1	7	....	1	....	....	....	....	....	....	....	....	.....	....	...
Embrun	....	....	....	....	....	2	....	....	....	....	....	....	.....	....	...
Rockland	....	....	....	3	4	3	1	1	....	....	....	....	.....	....	...
Russell	....	....	....	....	2	4	....	1	....	....	....	....	.....	....	...
Stormont—															
Avonmore	....	....	....	....	....	....	....	....	....	....	....	....	.....	....	...
Cornwall	....	....	1	....	1	7	4	1	....	....	....	....	.....	....	...
Moose Creek	....	....	....	1	....	1	....	2	....	....	....	....	.....	....	...
Newington	....	....	1	2	....	....	....	....	....	....	....	....	.....	....	...
Timiskaming—															
Monteith	....	....	....	3	....	2	....	1	....	....	....	....	.....	....	...
Totals	153	1116	604	3642	107	420	45	128	....	....	....	....	.....	2	...

ONTARIO AT OTTAWA FOR THE YEAR 1923.—SPECIMENS EXAMINED.

Gonorrhea		Rabies Diagnosis				Milk									Waters		Liquors for License Department	Miscellaneous Specimens	Total for Year
			Negri Bodies			Food Content		Preservatives		Bacteriological									
										Tubercle Bac.		Pus Cells							
+	—	Animal	+	—	Animal Inoculations	Fats	Total Solids	+	—	+	—	+	—	Count	Extraneous Matter	Number of Milk Samples	Chemical	Bacterial			
...	...	....	....	....	....	...	...	..	..	...	...	...	...	...	....	....	....	1	....	....	23
1	...	....	....	....	....	...	...	..	..	...	...	...	...	...	....	....	....	...	....	....	18
...	...	....	....	....	....	...	...	..	..	...	...	...	...	...	....	....	....	33	....	1	68
...	...	....	....	....	....	...	...	..	..	...	...	...	...	...	....	....	....	....	....	2	9
...	...	....	....	....	....	...	...	..	..	...	...	...	...	...	....	....	....	....	....	3	17
1	1	....	....	....	....	...	...	..	..	...	...	...	...	...	....	....	....	2	....	....	11
1	...	....	....	....	....	...	...	..	..	...	...	...	...	...	....	....	....	....	....	....	2
...	...	....	....	....	....	...	...	..	..	...	...	...	...	...	....	....	....	....	....	....	9
...	...	....	....	....	....	...	...	..	..	...	...	...	...	...	....	....	....	8	....	....	10
1	...	....	....	....	....	...	...	..	..	...	...	...	...	...	....	....	....	....	....	....	13
...	...	....	....	....	....	...	...	..	..	...	...	...	...	...	....	....	....	13	....	....	20
3	9	....	....	....	....	...	...	..	..	...	...	...	...	...	....	....	....	....	....	....	12
...	...	....	....	....	....	...	...	..	..	...	...	...	...	...	....	....	....	....	....	....	14
1	...	....	....	....	....	...	...	..	..	...	...	...	...	...	....	....	....	....	....	1	6
...	...	....	....	....	....	...	...	..	..	...	...	...	...	...	....	....	....	....	....	....	3
1	...	....	....	....	....	...	...	..	..	...	...	...	...	...	....	....	....	....	....	....	7
275	370	....	....	....	....	...	...	..	..	...	...	...	...	...	....	1097	38	2696	....	1314	12007

OWEN SOUND.

Branch Laboratory, Owen Sound, Ont.,
January 31st, 1924.

To the Chairman and Members of the Provincial Board of Health:—

Sirs,—I have the honour to submit herewith the annual report of all specimens examined in this laboratory during the year 1923.

I have the honour to be, Sirs,

Your obedient servant,

G. M. Fraser, M.B.,
Director of Branch Laboratory, Owen Sound.

REPORT FROM LABORATORIES OF THE PROVINCIAL BOARD OF HEALTH OF

Municipalities	Diphtheritic Swabs				Tuberculosis Sputa		Typhoid Bloods		Syphilis						
	Release		Diagnosis							Wassermann Reaction				Spirochaeta Pallida	
	+	−	+	−	+	−	+	−	Colloidal Gold Reaction	Very Strongly Positive	Strongly Positive	+	−	+	−
Bruce—															
Cargill	....	....	....	1	....	1	....	....	....	....	....	....	.....	....	...
Chesley	....	....	....	1	....	4	1	2	....	....	....	....	.....	....	...
Hanover	5	10	8	10	1	1	1	8	....	....	....	....	1	....	...
Hepworth	1	2	1	3	....	2	....	2	....	....	....	....	2	....	...
Kincardine	....	....	....	1	4	10	1	3	....	....	....	....	1	....	...
Lion's Head	....	....	....	1	....	....	....	....	....	....	....	....	.....	....	...
Lucknow	....	....	....	....	....	1	....	2	....	....	....	....	.....	....	...
Mildmay	....	....	....	....	....	1	....	5	....	....	....	....	.....	....	...
Paisley	....	....	....	....	....	1	....	6	....	....	....	....	.....	....	...
Port Elgin	....	3	1	5	1	9	....	....	....	....	....	....	.....	....	...
Red Bay	....	....	....	....	....	....	....	....	....	....	....	....	.....	....	...
Ripley	....	2	1	....	....	....	....	1	....	....	....	....	.....	....	...
Sauble Beach	....	....	....	....	....	....	....	....	....	....	....	....	.....	....	...
Southampton	2	1	....	1	3	2	....	1	....	....	....	....	.....	....	...
Tara	....	....	....	3	2	4	....	....	....	....	....	....	.....	....	...
Teeswater	....	....	....	1	1	4	....	1	....	....	....	....	.....	....	...
Tiverton	....	....	....	....	....	1	....	1	....	....	....	....	1	....	...
Tobermory	....	....	....	2	....	....	....	....	....	....	....	....	.....	....	...
Walkerton	....	....	....	3	3	2	....	2	....	....	....	....	.....	....	...
Wiarton	....	....	2	8	5	14	....	....	....	....	....	....	1	....	...
Dufferin—															
Grand Valley	....	....	....	....	....	1	....	2	....	....	....	....	.....	....	...
Shelburne	....	....	....	4	....	2	....	....	....	....	....	....	.....	....	...
Grey—															
Ayton	....	....	....	....	....	4	....	....	....	....	....	....	.....	....	...
Chatsworth	....	....	....	6	2	6	....	1	....	....	....	....	1	....	...
Clarksburg	....	1	1	1	....	2	....	1	....	....	....	....	.....	....	...
Clavering	....	....	....	....	....	....	....	....	....	....	....	....	.....	....	...
Desboro	....	....	....	2	....	3	....	....	....	....	....	....	.....	....	...
Dromore	....	....	....	1	....	....	....	....	....	....	....	....	.....	....	...
Dundalk	....	1	1	5	....	5	....	6	....	....	....	....	2	....	...
Durham	....	....	....	4	....	7	....	....	....	....	....	....	.....	....	...
Flesherton	....	....	....	....	....	4	....	....	....	....	....	....	5	....	...
Holland Centre	....	....	....	....	1	1	....	....	....	....	....	....	.....	....	...
Kilsyth	....	....	....	....	....	....	....	....	....	....	....	....	.....	....	...
Markdale	....	....	....	1	2	5	....	2	....	....	....	....	.....	....	...
Maxwell	....	....	....	....	1	....	....	1	....	....	....	....	.....	....	...
Meaford	....	2	1	3	4	5	1	5	....	1	....	....	2	....	...
Owen Sound	....	....	....	38	53	157	7	33	....	12	12	2	96	....	1
Priceville	....	....	....	4	....	9	....	1	....	....	....	....	1	....	...
Rocklyn	....	....	....	....	1	....	....	....	....	....	....	....	.....	....	...
Thornbury	....	....	....	....	....	1	....	1	....	....	....	....	.....	....	...
Manitoulin—															
Fitzwilliam Island	....	....	....	....	....	....	....	....	....	....	....	....	.....	....	...
Waterloo—															
Kitchener	....	....	....	....	....	....	....	....	....	....	....	....	.....	....	...
Waterloo	....	....	....	....	....	1	....	1	....	....	....	....	1	....	...
	8	22	16	109	84	270	11	88	....	13	12	2	14	....	1

Total for Year 1923, 2052.

ONTARIO AT OWEN SOUND FOR THE YEAR 1923.—SPECIMENS EXAMINED.

Gonorrhea		Rabies Diagnosis				Milk									Waters		Liquors for License Department	Miscellaneous Specimens	Total for Year
			Negri Bodies			Food Content		Preservatives	Bacteriological										
									Tubercle Bac.		Pus Cells								
+	—	Animal	+	—	Animal Inoculations	Fats	Total Solids	+ —	+	—	+	—	Count	Extraneous Matter	Number of Milk Samples	Chemical	Bacterial			
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	7	...	2	17
1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	4	...	...	50
2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	8	...	7	30
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	20
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	3
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	20	...	...	26
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	8
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	10	...	1	30
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2	...	...	2
...	4	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	8
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...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	4	...	2	...	1	17
...	3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	13	...	3	28
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	7
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	3
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2
...	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	12
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2	...	1	...	1	34
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	3
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	6
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	5
...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2	...	...	19
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	4	...	...	10
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	1
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	9	...	2	16
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1
...	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	23
...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	13
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	27	...	...	36
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	1
...	3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2	15
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	11	...	...	36
51	237	...	...	...	...	...	...	...	...	...	...	...	...	...	179	...	264	...	374	1516
...	4	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	13	32
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	3
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	4	...	...	4
...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	3
54	258	...	...	...	...	...	...	...	...	...	...	...	...	...	186	...	395	...	409	2052

G. M. Fraser, M.B.

PETERBORO.

Peterboro, January 3rd, 1923.

To the Chairman and Members of the Provincial Board of Health.

Sirs,—I have the honour to submit report of work done in Provincial Board of Health laboratories, Peterboro, for the year 1923.

The total number of specimens examined was 3,682, as compared to 4,197 in 1922, which shows a decrease of 535 specimens. However, it is also of interest to note that our total number of diphtheria swabs examined shows a decrease from 1,723 in 1922, to 522 in 1923, or a decrease of 1,201 specimens.

There has been a great increase in the number of Wassermann tests made and the work is steadily growing. It has been gratifying in many ways to see the facilities, provided by these laboratories here, being used more by this district as a whole, the area being covered being a very large one, and the number of physicians being served having also increased very materially.

There has been considerable activity along the lines of diphtheria immunization with toxin-antitoxin, and there have been a large number of Schick tests carried out and those susceptible, immunized.

The problem of venereal disease is one to which we have endeavoured to give a great deal of attention during the last year, and I am pleased to state that physicians are using laboratory facilities here very much more than during the preceding year.

The control of our city milk supply has not been carried out regularly during the year, 112 samples having been examined and they show a very great improvement, particularly in cleanliness.

The work of the venereal disease clinic, which is run in connection with the laboratories, has been greatly facilitated by being able to follow each case individually, and in carrying out the necessary control tests.

This immediate locality has been almost free from typhoid this year and there have been a great number of samples of water examined, both from the city and from the surrounding country. This has been largely due to the activity of Dr. N. H. Sutton, District Officer of Health, in his consistent efforts, as far as possible, to maintain a safe supply of drinking water in the various municipalities throughout this district.

Typhoid fever has been much more prevalent this year in other parts of the district having a very wide distribution. We have endeavoured to give, as far as possible, every available assistance in the control of the spread of this disease.

I am pleased to state that the free distribution of Insulin in these laboratories, has been steadily increasing and has been a great boon to many unfortunates, to whom treatment with insulin would otherwise be denied.

I have the honour to be, Sir,

Your obedient servant,

A. Y. McNair, M.B.,
Director of Branch Laboratories.

REPORT FROM LABORATORIES OF THE PROVINCIAL BOARD OF HEALTH OF

Municipalities	Diphtheritic Swabs				Tuberculosis Sputa		Typhoid Bloods		Syphilis							
	Release		Diagnosis							Wassermann Reaction				Spirochaeta Pallida	
	+	—	+	—	+	—	+	—	Colloidal Gold Reaction	Very Strongly Positive	Strongly Positive	+	—	+	—
Peterboro—															
Peterboro	23	46	16	113	25	173	15	38	....	20	4	16	255	1	2
Warsaw	....	1	1	....	1	1	....	....	....	....	....	....	....	....	....
Lakefield	....	....	....	5	1	4	2	2	....	....	....	....	....	....	....
Indian River	....	....	....	2	....	....	....	....	....	....	....	....	....	....	....
Havelock	21	72	6	27	1	1	....	....	....	....	....	....	....	....	....
Keene	....	....	....	5	4	....	....	9	....	1	....	1	1	....	....
Bridgenorth	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Burleigh Falls	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Mount Julian	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Norwood	....	....	....	....	....	1	....	....	....	....	....	....	....	....	....
Durham—															
Port Hope	....	....	....	6	8	12	2	5	....	2	1	....	2	....	....
Pontypool	1	4	1	7	....	4	....	1	....	....	....	....	....	....	....
Millbrook	....	....	1	10	2	6	1	9	....	....	....	....	9	....	....
Bethany	....	....	....	....	3	1	....	5	....	1	....	....	....	....	....
Bowmanville	2	1	3	2	....	21	2	1	....	....	....	....	8	....	....
Northumberland—															
Colborne	....	....	1	....	1	1	1	1	....	....	....	....	....	....	....
Bailieboro	1	5	3	4	....	3	1	3	....	....	....	....	....	....	....
Warkworth	....	....	....	....	....	1	....	....	....	....	....	....	....	....	....
Cobourg	1	4	5	8	....	....	5	5	....	....	....	7	40	....	....
Trenton	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Hastings	....	....	....	1	....	....	....	....	....	....	....	....	....	....	....
Brighton	....	1	2	1	....	2	....	3	....	....	....	....	2	....	....
Roseneath	....	....	....	2	1	1	....	2	....	....	....	....	....	....	....
Campbellford	....	....	....	....	5	....	1	1	....	4	1	1	2	....	....
Victoria—															
Lindsay	8	23	8	22	5	23	28	29	....	2	1	1	13	....	....
Bobcaygeon	....	....	....	6	2	4	3	1	....	....	....	....	2	....	....
Omemee	....	....	....	4	....	4	2	7	....	....	....	....	2	....	....
Fenelon Falls	....	....	....	3	1	3	....	2	....	....	....	....	....	....	....
Little Britain	....	....	....	....	....	4	....	....	....	....	....	....	....	....	....
Coboconk	....	....	....	1	....	1	1	1	....	....	....	....	....	....	....
Dunsford	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Manilla	....	1	....	2	....	....	....	....	....	....	....	....	....	....	....
Marlbank	....	....	....	....	....	....	....	1	....	....	....	....	....	....	....
Cambray	....	....	....	....	....	....	....	2	....	....	....	....	1	....	....
Haliburton—															
Haliburton	....	....	....	1	....	....	....	7	....	....	....	....	5	....	....
Minden	....	....	....	....	....	....	2	2	....	....	....	....	....	....	....
Hastings—															
Bancroft	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Marmora	1	7	6	6	....	7	4	4	....	....	....	....	....	....	....
Delora	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Madoc	....	....	....	....	6	2	....	2	....	....	....	....	....	....	....
Frankford	....	....	2	2	....	1	2	2	....	....	....	....	....	....	....
Tweed	....	....	....	2	1	....	....	....	....	1	....	....	1	....	....
Stirling	....	....	....	1	1	1	....	3	....	2	1	....	....	....	....
Belleville	....	....	....	1	....	....	....	....	....	....	....	1	2	....	....
Eldorado	....	....	....	....	....	1	....	....	....	....	....	1	1	....	....
Prince Edward—															
Consecon	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Totals	58	165	55	244	68	282	72	149	....	33	8	28	346	1	2

ONTARIO AT PETERBORO FOR THE YEAR 1923.—SPECIMENS EXAMINED.

Gonorrhea		Rabies Diagnosis				Milk										Waters				
			Negri Bodies			Food Content		Preservatives		Bacteriological										
										Tubercle Bac.		Pus Cells								
+	—	Animal	+	—	Animal Inoculations	Fats	Total Solids	+	—	+	—	+	—	Count	Extraneous Matter	Number of Milk Samples	Chemical	Bacterial	Liquors for License Department	Miscellaneous Specimens	Total for Year
57	52	....	....	....	....	112	112	..	18	...	25	3	22	112	112	112	....	584	....	790	2342
...	...	....	....	....	....	...	...	..	..	...	...	...	...	...	....	....	....	....	....	....	4
3	1	....	....	....	....	...	...	..	..	...	...	...	...	...	....	....	....	....	....	....	18
...	...	....	....	....	....	...	...	..	..	...	...	...	...	...	....	....	....	....	....	....	2
1	0	....	....	....	....	...	...	..	..	...	...	...	...	...	....	....	....	....	....	....	129
...	...	....	....	....	....	...	...	..	..	...	...	...	...	...	....	....	....	....	....	....	21
...	...	....	....	....	....	...	...	..	..	...	...	...	...	...	....	....	....	1	....	....	1
...	...	....	....	....	....	...	...	..	..	...	...	...	...	...	....	....	....	1	....	....	1
...	...	....	....	....	....	...	...	..	..	...	...	...	...	...	....	....	....	4	....	....	4
...	...	....	....	....	....	...	...	..	..	...	...	...	...	...	....	....	....	....	....	....	1
12	0	....	....	....	....	...	...	..	..	...	...	...	...	...	....	....	....	83	....	....	133
1	...	....	....	....	....	...	...	..	..	...	...	...	...	...	....	....	....	....	....	....	19
2	...	....	....	....	....	...	...	..	..	...	...	...	...	...	....	1	....	18	....	....	59
...	...	....	....	....	....	...	...	..	..	...	...	...	...	...	....	....	....	4	....	....	14
...	3	....	....	....	....	...	...	..	..	...	...	...	...	...	....	....	....	....	....	....	43
...	...	....	....	....	....	...	...	..	..	...	...	...	...	...	....	....	....	1	....	....	6
...	...	....	....	....	....	...	...	..	..	...	...	...	...	...	....	....	....	5	....	....	25
...	...	....	....	....	....	...	...	..	..	...	...	...	...	...	....	....	....	1	....	....	2
16	9	....	....	....	....	...	...	..	..	...	...	...	...	...	....	....	....	2	....	....	102
...	...	....	....	....	....	...	...	..	..	...	...	...	...	...	....	....	....	1	....	....	1
...	...	....	....	....	....	...	...	..	..	...	...	...	...	...	....	....	....	1	....	....	2
15	...	....	....	....	....	...	...	..	..	...	...	...	...	...	....	....	....	1	....	....	27
...	...	....	....	....	....	...	...	..	..	...	...	...	...	...	....	....	....	1	....	....	7
...	...	....	....	....	....	...	...	..	..	...	...	...	...	...	....	....	....	....	....	....	15
20	9	....	....	....	....	11	11	..	..	...	...	...	4	11	11	11	....	180	....	....	383
...	...	....	....	....	....	...	...	..	..	...	...	...	...	...	....	....	....	9	....	....	27
...	...	....	....	....	....	...	...	..	..	...	...	...	...	...	....	....	....	3	....	....	22
...	...	....	....	....	....	...	...	..	..	...	...	...	...	...	....	....	....	3	....	....	12
...	...	....	....	....	....	...	...	..	..	...	...	...	...	...	....	....	....	2	....	....	6
...	...	....	....	....	....	...	...	..	..	...	...	...	...	...	....	....	....	8	....	....	12
...	...	....	....	....	....	...	...	..	..	...	...	...	...	...	....	....	....	1	....	....	1
...	...	....	....	....	....	...	...	..	..	...	...	...	...	...	....	....	....	....	....	....	3
...	...	....	....	....	....	...	...	..	..	...	...	...	...	...	....	....	....	....	....	....	1
...	...	....	....	....	....	...	...	..	..	...	...	...	...	...	....	....	....	....	....	....	3
8	4	....	....	....	....	...	...	..	..	...	...	...	...	...	....	....	....	....	....	....	25
2	...	....	....	....	....	...	...	..	..	...	...	...	...	...	....	....	....	1	....	....	7
...	...	....	....	....	....	1	1	..	..	...	...	...	...	1	1	1	....	....	....	....	1
2	...	....	....	....	....	...	...	..	..	...	...	...	...	...	....	....	....	80	....	....	117
...	...	....	....	....	....	...	...	..	..	...	...	...	...	...	....	....	....	30	....	....	30
...	...	....	....	....	....	...	...	..	..	...	...	...	...	...	....	....	....	4	....	....	14
...	...	....	....	....	....	...	...	..	..	...	...	...	...	...	....	....	....	2	....	....	11
...	2	....	....	....	....	...	...	..	..	...	...	...	...	...	....	....	....	....	....	....	7
1	...	....	....	....	....	...	...	..	..	...	...	...	...	...	....	....	....	....	....	....	10
...	...	....	....	....	....	...	...	..	..	...	...	...	...	...	....	....	....	....	....	....	4
...	...	....	....	....	....	...	...	..	..	...	...	...	...	...	....	....	....	....	....	....	3
...	...	....	....	....	....	...	...	..	..	...	...	...	...	...	....	....	....	5	....	....	5
140	80	....	....	....	....	124	124	..	18	...	25	3	22	124	124	124	....	1037	....	790	3682

SAULT STE. MARIE.

Branch Laboratories,
Sault Ste. Marie, Ont., January 3rd, 1924.

To the Chairman and Members of the Provincial Board of Health.

Sirs,—Enclosed please find yearly report on all specimens examined in this laboratory for the year 1923.

I have the honour to be, Sirs,

Your obedient servant,

N. F. W. GRAHAM, M.B.,
Director.

REPORT FROM LABORATORIES OF THE PROVINCIAL BOARD OF HEALTH OF

Municipalities	Diphtheritic Swabs				Tuberculosis Sputa		Typhoid Bloods		Syphilis						
	Release		Diagnosis							Wassermann Reaction				Spirochaeta Pallida	
	+	—	+	—	+	—	+	—	Colloidal Gold Reaction	Very Strongly Positive	Strongly Positive	+	—	+	—
Algoma—															
Sault Ste. Marie	26	45	55	188	14	97	5	8	....	63	35	17	216	....	...
Echo Bay	....	....	....	....	....	....	....	....	....	....	....	....	1	....	...
Bar River	....	....	....	....	....	....	....	....	....	....	....	....	....	....	...
Portlock	....	....	....	....	....	....	....	....	....	....	1	....	....	....	...
Desbarats	....	....	....	....	....	....	....	....	....	....	....	....	....	....	...
Bruce Mines	....	....	....	1	1	1	....	....	....	....	....	....	1	....	...
Nesterville	....	....	....	....	....	....	....	....	....	....	....	....	....	....	...
Thessalon	....	....	....	....	....	1	....	1	....	....	....	....	7	....	...
Blind River	....	....	....	....	....	10	....	....	....	6	1	1	5	....	...
Espanola	....	....	3	12	3	22	....	....	....	1	....	....	....	....	...
Spanish	....	....	....	....	....	....	....	....	....	....	....	....	....	....	...
Massey	1	2	....	4	....	2	....	....	....	2	1	....	4	....	...
Collin's Inlet	....	....	....	....	....	....	....	....	....	....	....	....	....	....	...
Gore Bay	....	....	....	....	....	3	....	....	....	....	....	....	....	....	...
Mindemoya	....	....	....	....	....	1	....	....	....	2	....	....	....	....	...
Chapleau	....	....	....	....	....	....	....	....	....	....	1	....	1	....	...
Goulais Bay	....	....	....	....	....	....	....	....	....	....	....	....	....	....	...
Puckasaw	....	....	....	....	....	....	....	....	....	....	....	....	2	....	...
Goudreau	....	....	....	....	....	....	....	....	....	....	....	....	....	....	...
Neebish	....	....	....	....	....	....	....	....	....	....	....	....	....	....	...
Richard's Landing	....	....	2	2	....	1	....	....	....	....	....	....	....	....	...
Totals	27	47	60	207	18	138	5	9	....	74	39	18	237	....	...

ONTARIO AT SAULT STE. MARIE FOR THE YEAR 1923.—SPECIMENS EXAMINED

Gonorrhea		Rabies Diagnosis				Milk										Waters		Liquors for License Department	Miscellaneous Specimens	Total for Year
			Negri Bodies			Food Content		Preservatives		Bacteriological										
										Tubercle Bac.		Pus Cells								
+	—	Animal	+	—	Animal Inoculations	Fats	Total Solids	+	—	+	—	+	—	Count	Extraneous Matter	Number of Milk Samples	Chemical	Bacterial			
21	44	....	....	....	....	400	....	....	....	....	....	....	....	392	....	....	2	2295	....	219	4142
....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	....	2
....	....	....	....	....	....	2	....	....	....	....	....	....	....	2	....	....	....	....	....	....	4
....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1
....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	....	1
....	....	....	....	....	....	1	....	....	....	....	....	....	....	1	....	....	....	5	....	1	12
....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	6	....	....	6
....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	10
1	4	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	28
....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	....	4	28	....	....	74
....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	4	....	....	4
4	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	....	....	1	....	2	29
....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	1
....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	3
....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	7	....	....	10
....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	2
....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	9	....	....	9
....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	2
....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	2	3	....	....	5
....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	2	....	....	2
....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	1	7
26	48	....	....	....	....	403	....	....	....	....	....	....	....	397	....	....	8	2363	....	225	4349

N. F. W. Graham, M.B.

STATEMENT OF BIOLOGICAL PRODUCTS

NOVEMBER 1ST, 1922, TO OCTOBER 31ST, 1923.

TABLE I.

Month	Smallpox Vaccine	Cost	Diphtheria Antitoxin	Cost	Syringes	Cost	Schick Test Outfits	Cost	Toxin Antitoxin in boxes.	Cost	Toxin Antitoxin 25 cc.	Cost	Anti-Meningitis Serum.	Cost.
		$ c		$ c		$ c		$ c		$ c		$ c		$ c
November...	8,415	336 60	37,958,000	5,693 70	2,210	442 00	89	13 35	102	14 28	35	35 00	80	80 00
December....	9,675	387 00	21,676,000	3,251 40	1,307	261 40	114	17 10	.....	.....	35	35 00	49	49 00
January.....	5,590	223 60	29,661,000	4,449 15	1,657	331 40	9	1 35	.....	.....	78	78 00	82	82 00
February....	5,500	220 00	12,883,000	1,932 45	257	51 40	62	9 30	3	42	50	50 00	111	111 00
March.....	4,945	197 80	12,513,000	1,876 95	730	146 00	87	13 05	30	4 20	12	12 00	44	44 00
April.....	9,505	380 20	11,380,000	1,707 00	1,043	208 60	14	2 10	75	10 50	.....	.....	82	82 00
May.....	4,425	177 00	14,320,000	2,148 00	930	186 00	54	8 10	39	5 46	10	10 00	117	117 00
June.....	5,710	228 40	13,610,000	2,041 50	820	164 00	37	5 55	.....	.....	3	3 00	105	105 00
July.....	5,155	206 20	14,420,000	2,163 00	648	129 60	58	8 70	40	5 60	28	28 00	207	207 00
August.....	7,140	285 60	20,007,000	3,001 05	961	192 20	25	3 75	40	5 60	2	2 00	78	78 00
September...	6,364	286 38	16,982,000	2,377 48	583	116 60	7	1 40	61	12 20	12	12 00	34	34 00
October.....	6,984	314 28	25,068,000	3,509 52	1,665	333 00	159	31 80	75	15 00	98	98 00	181	181 00
	79,408	$3,243 06	230,478,000	$34,151 20	$12,811	$2,562 20	715	$115 55	465	$73 26	363	$363 00	1,170	$1,170 00

TABLE II.

Month	Intraspinal Outfits	Cost	Tetanus Antitoxin Units	Cost	Tetanus Outfits	Cost	Syringes	Cost	Pasteur Treatment	Cost	Pertussis cc.	Typhoid cc.	Silver Nitrate Ampules	Insulin	Cost	Total Cost
		$ c.		$ c.		$ c.		$ c.		$ c.					$ c.	$ c.
November	16	7 20	659,500	197 85	4	1 80	36	7 20	....	.....	240	1,070	1,305	.....	.....	6,828 98
December	6	2 70	499,000	149 70	....	.....	51	10 20	....	.....	3,990	1,580	1,125	.....	.....	4,163 50
January	14	6 30	400,500	120 15	....	.....	12	2 40	1	15 00	4,000	1,560	1,510	.....	.....	5,309 35
February	34	15 30	647,500	194 25	1	45	49	9 80	....	.....	2,050	1,020	1,595	.....	.....	2,594 37
March	1	45	349,500	104 85	1	45	11	2 20	....	.....	3,870	7,160	1,876	.....	.....	2,401 95
April	33	14 85	641,000	192 30	1	45	48	9 60	....	.....	3,520	3,700	2,310	.....	.....	2,607 60
May	12	5 40	962,500	288 75	17	7 65	76	15 20	....	.....	3,760	2,147	2,575	.....	.....	2,968 56
June	11	4 95	945,000	283 50	1	45	74	14 80	1	15 00	3,300	1,530	1,255	.....	.....	2,866 15
July	55	24 75	994,000	298 20	27	12 15	37	7 40	....	.....	3,140	2,690	2,100	.....	.....	3,090 60
August	10	4 50	1,882,000	564 60	1	45	47	9 40	1	15 00	2,910	1,705	2,080	.....	.....	4,162 15
September	10	4 50	828,000	248 40	....	.....	14	2 80	2	30 00	2,900	2,270	2,480	157,400	3,148 00	6,273 76
October	54	24 30	942,000	282 60	....	.....	10	2 00	....	.....	3,710	2,270	1,590	180,950	3,619 00	8,410 50
	256	$115 20	9,750,500	$2,925 15	53	$23 85	465	$93 00	5	$75 00	37,390	28,702	21,801	338,350	$6,767 00	$51,677 47

Anti-pneumococcus serum	$2 50
Total	51,677 47
Grand Total	$51,679 97

	Diphtheria Antitoxin Syringes	Intra-spinal Outfits	Tetanus Antitoxin Syringes	Tetanus Antitoxin Outfits	Revenue
November	$442 00	$7 20	$7 20	$1 80	.....
December	261 40	2 70	10 20	.....	.....
January	331 40	6 30	2 40	.....	.....
February	51 40	15 30	9 80	45	.....
March	146 00	45	2 20	45	.....
April	208 60	14 85	9 60	45	.....
May	186 00	5 40	15 20	7 65	.....
June	164 00	4 95	14 80	45	.....
July	129 60	24 75	7 40	12 15	.....
August	192 20	4 50	9 40	45	.....
September	116 60	4 50	2 80	.....	.....
October	333 00	24 30	2 00	.....	.....
	$2,562 20	$115 20	$93 00	$23 85	$2,794 25

Total cost	$51,679 97
Revenue	2,794 25
Net	$48,885 72

ANNUAL REPORT FOR 1923 OF DISTRICT No. 1.

To the Provincial Board of Health, Ontario:

I have the honour to submit the report for this district composed of the six western counties of the Province, and comprising a settled and fully organized area of 5,265 square miles, supporting a population of about 325,000. This area is subdivided into 117 municipalities, each presided over in regard to public health and sanitary affairs by a local board of health constituted as required by The Public Health Act.

Each of these municipalities has been visited by me during the year, and the local board or its executive officer interviewed in regard to the local sanitary conditions and public health activities of the Board; a survey made and such advice given as local conditions required.

Many of the townships and smaller villages have been reviewed a second time and all the larger towns and cities have received several visits.

These personal contacts of your district officer, I believe, have had more influence in bringing about a better understanding of present day methods of guarding public health by the local authorities than any other single agency, and the frequency of these interviews have been materially augmented by the use of the motor car supplied by the Department.

In this district 16,000 miles have been thus travelled, and when you consider that the motor makes it possible frequently to call upon several municipalities during the course of a day's driving it is easily apparent that your officer's efficiency is much enhanced by this method of travel.

Public Health Nursing.

During the year I arranged in this district for your Division of Maternal and Child Welfare to make an intensive demonstration of their work in Leamington, Essex, Kingsville and Tillsonburg and in the townships of Delaware and Westminster as well as to hold clinics at Tilbury, Belle River, Leiscelleville, Stoney Point, St. Jochim, Tecumseh and McGregor in conjunction with a course put on by the Agricultural Department representative. They also at each of these points organized and held classes of instruction in home nursing.

I also arranged for them to hold a clinic at each of the school fairs in Essex county. At all of these demonstrations and clinics, Dr. Bell, of the Department, was in charge of the medical examinations and so discharged the duties as to secure the entire confidence of the profession and the public. In the towns of Leamington, Kingsville and Essex I made earnest efforts to have a local public health nurse appointed, but the expense proved a barrier in each case.

Factories, Canning and Milk Products.

Sanitary conditions about these plants were closely checked up so that with the exception of a couple of cases there was not any cause for complaint by the public; it demands constant supervision on my part to maintain satisfactory conditions and have installed necessary improvements at these factories.

Nuisances.

I am pleased to report that local boards are largely taking up this phase of the work so that outside of my regular inspections of the municipalities I have only been called upon to make about a dozen special visits in connection with such conditions as become objectionable at fox farms, slaughter houses, laundries, piggeries, fair grounds, etc.

Milk Supplies.

Local authorities are now constantly supervising these supplies in regard to methods of production and distribution and each year sees pasteurization being more generally applied and the matter of tuberculin testing of dairy herds being given earnest consideration by urban municipalities and local boards of health.

Meat Supplies.

Slaughter houses are being kept in fairly satisfactory condition by the local boards and conditions of handling meat are being gradually improved under constant inspection. Scientific systematic examination of meat for local consumption is yet a vision of the future, although such inspection is carried out in all abattoirs, slaughtering for export from the Province, by the Dominion authorities.

Some such system of inspection of locally used meat, by the Dominion Pure Food Section as they employ for inspection of butter and cheese, by experts acting in conjunction with provincial and local board of health would materially improve conditions, and this appears to me both a practicable and fairly efficient method of control.

Rural Schools.

The inspection of the sanitary condition of these institutions by the local medical officer of health as now carried out in this district has very materially improved their sanitation, though through the exercise of false economy, indifference or neglect some trustees have failed to respond to our efforts up to the present.

The following quotation from a local medical officer of health's letter to me very fairly illustrates the effort being made and one of the methods being adopted:—"You remember suggesting to me a couple of years ago that once a year Mr. B. (the sanitary inspector) and I should personally meet at each school the trustees of the school section and go over the school situation together. This we have done each fall and arranged to have the report discussed at the next annual meeting of each school section

"This has worked out very fine, the trustees are each year taking more interest in the work: out of ten schools in 1923 we had installed three new heating and ventilating systems of the 'Waterbury' type, some new blackboards, some new water closets, one new-drilled well and many minor improvements. We made our last inspection in December, 1923, and arranged for further work for 1924 which Mr. B. was to oversee. For instance one school has fairly good closets but to remodel them to have them fly proof and ventilated, etc., they agreed to supply a carpenter to do it if Mr. B. would come and see that it was done properly."

Definite results as shown in the above quotation are not of infrequent occurrence so that while conditions are yet far from ideal there is encouragement in the progress being made from year to year and I believe this progress is the direct result of the personal contact of the district officer with the local authorities and his direction of their efforts so as to get action rather than official reports.

Educational.

It is very gratifying to find that the local officers of health are giving more attention to developing an intelligent interest in public health among the laity by giving addresses to local societies and to the pupils in the schools on their official visits.

On every possible occasion where I meet councils, boards of health or other official bodies an effort has been made to develop in them a true conception of the efforts being made to foster public health and prevent the occurrence of disease by the health department, and the duty of the individual to guard his health by at least annual medical examination by his family physician. This effort has been supplemented by several addresses given on invitation to social and other organizations.

Communicable Diseases.

Smallpox.—The incidence of this disease is more frequent than it should be considering the sure prevention available to all in vaccination. I was called upon to make four special visits to different municipalities to assist in control of outbreaks of the disease, though in only one case, that of Sombra, was the condition serious.

In this instance a maid at the hotel carried on her duties while suffering from the disease, she also attended a social gathering of about 150 persons, and, as though this was not sufficient damage, she took the morning train to Wallaceburg where she came under the notice of the health authorities who at once sent her back to the Sombra hotel by taxi, and notified the health officer there.

As a result of these contacts about thirty cases developed so far as known to me in the territory extending from Wallaceburg to Windsor, through quarantine and vaccination were applied as promptly as cases or contacts became known.

From investigation it appears that the girl referred to as spreading the disease contracted it from a visitor hailing from Detroit.

It appears to me that the time has arrived for the Provincial Board to adopt such measures as will curtail or stop this constant menace and financial loss from this disease. How? By insisting that each pupil before entering a public school or other institution of learning, receiving financial support from the Government, must present a certificate of successful vaccination satisfactory to he Department of Health.

We would thus soon have an immune population without inflicting any undue or unfair hardship on any person as the Vaccination Act already provides for the free vaccination of those unable to pay for this operation.

Diphtheria.—This, the most fatal of our acute communicable diseases, continues to claim its victims by the score, notwithstanding the generous supplying of free antitoxin to rich and poor both for threatment and prevention by your Board. While the death rate has been materially reduced its incidence and morbidity is practically unreduced. This being the case in spite of all our endeavours to educate the public to consult their family physicians immediately in every case of "sore throat," we are constrained to cast about to find some other practicable method for the control of its incidence.

I am of the opinion that if you required each local board to administer the toxin-antitoxin for immunization free to all those applying for this treatment, and our Department all along the line emphasized the protection thus given, that we would be making some progress towards solving the problem.

Venereal Diseases.—From enquiry and observation I am convinced that these diseases are not being as fully reported by the profession as their menace to the community demands. The system of clinics as established by your Board has materially improved conditions amongst those they are intended

to reach; they have also proven a large educative factor amongst the same class of the community as well as in a large measure removing the cloak of secrecy that formerly veiled the danger from them.

Scarlet Fever.—The type of this disease where it has appeared in this district during the year has been mild and its control by the local boards has been very satisfactory. I have been called upon in a few instances to support them in insisting on quarantine for the full period in all cases, even when mild.

Measles.—The local authorities are now insisting on quarantine of all known cases and most of the local medical officers are keeping a close watch for hidden cases or those missed.

Tuberculosis.—During the year I have succeeded in establishing consultation clinics in four centres, each presided over by an expert diagnostician and clinician in this disease.

These services are conducted and patients introduced by the medical men of the centre for early diagnosis in suspected cases of the disease, but recognized cases are also given free examination by the expert and his advice and outline of treatment furnished to the physician bringing the case.

In cases of those unable to pay, all service is free including X-ray, if required, but those in a position to do so are expected to pay their family physician for his examination of their case as well as for the X-ray. The expert's services are free to all. Where agreeable to the patient the family physician is expected to extend to one or more of his confreres the courtesy of examining the patient with the expert without extra cost to the patient.

The local physicians of the centre are expected to arrange for and bear the cost of providing suitable rooms and the services of a stenographer as well as the use of the X-ray where one is available.

The expert's service and his expenses being borne by The Ontario Red Cross has made the work possible. I was not aware that this opportunity was available until a few months ago, so that these centres have been opened very recently. They are very popular where established and I am hopeful for good results in an educative way and especially in the bringing of cases under early observation and treatment.

Typhoid Fever.—This disease, through your control of the water supply of urban municipalities, has, to a large extent, disappeared in this district.

Its appearance has been mostly in isolated cases and in rural and semi-urban localities where it has been difficult or impossible to locate the origin or source of infection.

The cases in Windsor, arising apparently from the Michigan Central Railway's private water supply in East Sandwich and Windsor as already reported upon, is the only condition so far as I am aware demanding your immediate attention.

Water Supplies.

I appreciate very much your action in requiring your laboratories to furnish me with a copy of all examinations of water for municipalities in this district as it enables me to check up conditions more closely, and thus assist in guarding against water-borne diseases.

If you would require all municipalities having a public supply to make periodic examination by your laboratories, in addition to their own private or local tests, it would add very materially to the efficiency of the safeguarding of supplies.

Summer Resorts.

It seems apparent to me that proper sanitary conditions and safe water supply in these communities will not be provided until some system of control, such as registration and licensing is required by your Board of those establishing or carrying on such places.

A Kaustine public system of conveniences, such as provided at the Government Rondeau Park, and a water supply approved by the department should be the minimum required.

The size of the systems should be governed by the number of people present at such resort on the day of their largest attendance during the previous season or as deemed sufficient by the department.

So as to have personal knowledge of conditions at these resorts during days of large attendances I made inspection of several of them on holidays and Sundays; the opinion stated above was formed after and founded on these inspections.

T. J. McNALLY,
District Officer of Health.

ANNUAL REPORT FOR 1923 OF DISTRICT No. 2.

To the Provincial Board of Health:

Gentlemen:

I beg to submit report of Public Health activities in this District for 1923.

Among the advances made the past year may be stated the free distribution of Insulin by the Provincial Board. As pneumonia is often the terminal disease of diabetes as in other diseases it will be interesting to note if the death rate from pneumonia decreases.

The better reporting of communicable diseases, which is the first step toward better control. This is due to feeling of the physicians as to the need of it, the work of the Public Health nurses, and to the card system introduced by the Provincial Board whereby the district officer is notified at once of positive cases of diphtheria, typhoid and tuberculosis.

The low mortality from diphtheria. In the district there were recorded only six deaths, in a population of nearly 450,000. The free distribution of antitoxin deserves a large share of credit for this.

Water and Sewage.

Seventeen places took out permits for extensions and improvements to their water systems at a cost of nearly $500,000. Twelve places for their sewerage systems at a cost of nearly $400,000.

The bacteriological reports sent from the laboratories to the district officers are proving useful. In one town I was able to advise the local board of health before they were aware of any pollution of their water supply. They immediately saw the need of repairs to their reservoir. They are also useful as tangible evidence to show school trustees that the water from the school well is not fit for drinking.

The disposal of sewage in growing towns is still a vexed problem. Those places that made a beginning a few years ago are fortunate, when costs were more reasonable.

Assistance was asked for by the local board of health regarding drainage in the following places:—Meaford, Coldwater, Beeton, Everett, Kitchener, New Hamburg, Hanover, St. Clements. In these places the council needed the moral support of the local board of health before doing anything to correct the nuisance.

Special Visits.

Besides the special visits made *re* drainage, others were made *re* plumbing at Galt and Collingwood, garbage at Listowel and Guelph, water supply at Port Elgin, public schools at Wallace Township, Stanley Township, Morris Township, and Brussels, slaughter houses at Ayr, Meaford, Galt, and Wingham, cemetery in Bentinck Township, church shed at Wingham, butter factory at Grand Valley, livery stable at Orillia. Reports of these were sent to the Provincial Board.

Communicable Diseases.

Smallpox.—While a great deal of new work is being done in Public Health, the work done in communicable diseases like smallpox and typhoid must not be neglected. These two diseases can be brought down to the irreducible

minimum, but both show a slight increase over last year. The benefits of vaccination and inoculation must be kept constantly before the public. The only offender in smallpox was threatened with discontinuance of its train service if it did not enforce the Vaccination Act. The only town where typhoid assumed epidemic proportions installed a new system of water-works under pressure of the Provincial Board.

Measles.—There were 1,650 cases of measles reported in the District. This large number is undoubtedly due to better reporting of the disease. Parents are beginning to realize the after effects of "only measles", but the greatest share of better reporting must go to the Public Health nurses.

Diphtheria.—Showed only 0.3 cases per 1,000 population, which is very low. There should be no such diagnosis as simple sore throat in children. The first case of diphtheria is quarantined and the contracts immunized. If this could be done in measles for example the number of cases could be immeasurably lessened.

Tuberculosis.—The cards sent by the branch laboratories of positive cases should result in better reporting in tuberculosis. Of the fifty-eight deaths in the district, fifty-three, or ninety per cent. of them were in sanatoria. The health officers throughout the district report a decrease in the number of cases. The travelling clinic being organized should further reduce these by getting early cases and contacts. The doctors interviewed regarding it are all enthusiastic.

Small outbreaks of communicable diseases were investigated at follows:—Investigation following request from the M.O.H. and from information supplied by the cards; smallpox at Palmerston, Brussels, Ethel, and Listowel; diphtheria at Waterloo and Greenock Township; scarlet fever at Linwood and Wallace Township; typhoid at Hanover; mumps at Guelph.

Schools.

Sanitary conditions in rural schools continue to improve, slowly, but surely. The health officers are doing their part. School trustees do what they are forced to do. If the teacher has a good idea of cleanliness and hygiene the school is all right. Some schools I have visited are very dirty, and around the teacher's desk is the worst. If the teacher is not imbued with a sense of hygiene and sanitation then parents should step in and see that where their children's characters are being formed, right habits should be taught by example as well as by precept. The school is the logical place to teach health habits.

Summer Resorts.

During July and August I inspected the summer resorts. These include Lakes Muskoka, Joseph and Rosseau, Lake of Bays, Fairy and Peninsular Lakes, Sparrow and Koshee Lakes, Georgian Bay and Lake Huron. Thousands of tourists visit these resorts every summer, more now than ever on account of the heavy motor traffic. Many expressions of appreciation are heard of the regulations enforced by the Provincial Board. The Board is ably assisted in these regulations by the Municipal Association of Muskoka and the Muskoka Lakes Association.

I was asked by the Association to investigate the sanitary condition of the cottages around Beaumaris. These are owned mostly by Americans, and they all seemed anxious that no pollution of the waters should occur. Some of them had spent large sums of money on their sewage disposal plants.

Public Health Nursing.

The nurses have been doing Public Health work in Dufferin County as a unit. Dufferin County is made up of six townships, one town and two villages, and has a total assessment of $1,649,285. Valuable data will be available if the scheme of county health organization ever materializes.

Intensive work has been done in some of the townships. The schools have been visited and the pupils examined for defects. Many defects were found, so many, that in Orangeville, for example, a request was made that the report be published in the town papers to call attention to the need of the work.

Child Welfare Clinics were held in Orangeville and in Grand Valley, which were well attended and greatly appreciated. Classes in home nursing have been carried on at the same time and have been largely attended.

A survey of Waterloo County was made by Miss Campbell which brought out some interesting facts. There are Victorian Order nurses, Public Health nurses and school nurses all doing child welfare work there, though in different places.

Milk and Dairies.—

The most advance in pure milk supply seems to have been made from the producers' end. More herds are being tuberculin tested, stables are receiving more attention as regards light and ventilation. Dairymen are beginning to realize the importance of well ventilated stables for their herds.

The pasteurization of milk in small towns needs to be carefully watched, to see that the plants are kept clean.

More towns are paying attention to the inspection of stables, the Babcock test and the sedimentation test.

A mere list of what the Provincial Board is doing for the public shows its many-sided activities. One phase that is beginning to press for attention is the care of mental defectives. The statement has been made on good authority that between the ages of eight and fourteen, ten per cent. of children are mentally abnormal. The mentally abnormal child is of two types—the dull and backward, and the feeble-minded. A good beginning in the institutional care of these children has been made at the Ontario Hospital at Orillia. There the children are placed in graded classes and taught useful manual training. Instead of being a burden on the state they are learning something useful, and appear to be happy and contented.

All of which is respectfully submitted.

J. J. FRASER,
District Officer of Health, District No. 2.

ANNUAL REPORT FOR 1923 FOR DISTRICT No. 3.

To the Provincial Board of Health.

Gentlemen:

During the year 1923 epidemiological work loomed large in the activities of the District Officers of Health. The prevention of the spread of communicable diseases is very important. I shall take up the principal infectious diseases and give an idea of the incidence and the mortality of each one.

Smallpox.

There were 376 cases of smallpox reported in District No. 3, and no deaths. The city of Niagara Falls was responsible for 114 of the cases, and the City of Brantford twenty-six. Quite a number of people in Niagara Falls are opposed to vaccination and this I think acccounts for the large number of cases in that city. With proper vaccination of children as the Public Health Act requires, smallpox becomes a negligible quantity, the methods taken for the control of smallpox are prompt isolation of patient, quarantine for fourteen days of all unvaccinated contacts, and the vaccination of all children in the community who have not been vaccinated within the legal time which is seven years,. I am of the opinion that certificates of successful vaccination, or of insusceptibility to vaccination should be required of all children when they begin school life.

Such a procedure would, I think, practically eliminate smallpox. Some interesting situations developed out of some of the large number of cases of smallpox seen during 1923. The district officer is called to make a diagnosis when the local M.O.H. does not care to take the responsibility of saying that the disease is smallpox or there is a doubt as to the nature of the infection.

In April there was an outbreak of smallpox at Jordan, in the township of South-Lincoln County. There were about ten cases in all. I saw them with Dr. Addy, M.O.H., and confirmed the diagnosis.

Upon my recommendation he notified the teacher in the school to require certificates of successful vaccination. The Board of Education ordered the teacher to pay no attention to the notice. Dr. Addy telephoned me as to the situation. I went to Jordan and, with Dr. Addy, met the Board of Education and listened to what they had to say. I pointed out to them that they had no authority to back up their action in the matter. The Board of Health remained firm and the order was obeyed.

In August my attention was called to the fact that there were a number of cases of so-called chickenpox in Paris, in Brant County. Dr. Logie, M.O.H., assured me that they were chickenpox. On investigation, I found they were well-marked cases of smallpox. I think all the physicians in Paris, with the exception of Dr. Logie, thought they were smallpox. Dr. Logie, though not agreeing with the diagnosis, treated the epidemic thereafter as though it were smallpox and the epidemic was soon stamped out. There were about twenty-five cases in all. Earlier recognition of the disease as smallpox would have prevented, no doubt, a number of cases.

Scarlet Fever.

There were 137 cases of scarlet fever reported in District No. 3, and five deaths. In November there was an outbreak of this disease in the Institute for the Blind at Brantford. There were six cases in all. Five cases had been

taken from the Institute and sent to Brantford Isolation Hospital before I was called to consult with Dr. Hutton about the epidemic. The cases were all among the boys of the Institution.

Dr. Marquis of Brantford was the attending physician. I suggested that the top floor of the building should be used as a temporary hospital for the cases having the disease. An extra nurse was obtained and the pupils gone over every morning; those having a temperature or inflamed throat were put in a room by themselves as suspects. They were isolated there for ten days.

Classes were broken up so that the boys and girls did not mingle with each other and strict quarantine was put upon the inmates of the building. Utensils were sterilized. Dr. Hutton informed me that only one case supervened subsequent to my visit. This was rather an unexpected result, but was none the less gratifying.

I recommended in my report to the Provincial Board of Health that the Board of Education be asked to establish and equip a small building which might be used as an emergency hospital. Also that a mechanical dish-washer be procured.

Epidemics of scarlet fever occured in December in Waterford, Simcoe and Brampton. At Waterford Dr. Alway, at my suggestion, recommended that a nurse should be placed temporarily in the school and the children examined every morning and those having a temperature, sore throat, or any indisposition should be sent home and quarantined after being seen by the M.O.H. This speedily ended the epidemic.

At Simcoe the epidemic was not so well handled and consequently more cases developed.

At Brampton Dr. Sharpe, M.O.H., used the nurse in the school and the disease was soon stamped out.

In December, also, I was called up by a citizen of Hamilton, who said he had information that a number of children at Millgrove in the Township of West Flamboro, Wentworth County, had suffered from a rash and sore throat. I went with Dr. McLean, M.O.H., to the school and examined the children. We found two peeling and came to the conclusion they were all cases of mild scarlet fever. A large number of the pupils had been affected. No doctor had been called as the children were not very ill, being only out of school about three days. The pupils who had been ill were quarantined and the houses placarded.

Diphtheria.

During the year 1923 there were 1,958 cases of diphtheria and ninety-seven deaths. I have included in these reports the cities of Hamilton and Toronto. Excluding these two cities there were 136 cases and twenty-one deaths. In Hamilton there were 585 cases and twenty-six deaths. In Toronto 1,237 cases and fifty deaths. Twenty-one deaths and 136 cases shows a very heavy death rate. The explanation is, I think, that all the cases were not reported while the deaths were.

Diphtheria should now be one of the easiest of diseases to control. The worst epidemic we had in my district of this disease during 1923 was at Agincourt. Dr. Farquharson of that place, M.O.H., handled the epidemic well. He visited the schools and with the assistance of nurses took swabs of the throats and noses of the children, and had them examined at the Provincial Laboratory. Those that were positive had the virulence test done.

If this was positive the cases were treated the same as regular diphtheria cases with symptoms. The prompt and vigorous measures taken by the M.O.H. were, I believe, instrumental in curtailing the epidemic and finally stamping it out.

The Schick test and in positive cases toxin-antitoxin injection should, I think, be used in all the larger centres.

Typhoid Fever.

In 1923 there were 132 cases of typhoid and thirty-five deaths. There were fifty-four cases and seven deaths in Toronto, and eleven cases and four deaths in Hamilton—leaving sixty-seven cases and twenty-four deaths. This again, I think, proves the lack of proper reporting.

We still have too many cases of typhoid fever, and we still have too many epidemics of typhoid.

In April an epidemic of typhoid occurred at Chippewa. In my opinion it was due to the water supplied to its employees by the Norton Mfg. Co. The water supply is taken from the Chippewa river. It is filtered and chlorinated.

The plant had been closed down for some time, and when it was reopened and resumed operations the chlorination through some oversight was not started. The epidemic was due, in my opinion, to lack of chlorination of the water. We got the chlorination plant in operation at once and the epidemic disappeared. There were ten cases in all, and two deaths. Here was a case where these two deaths and also much sickness and suffering might have been prevented if only proper precautions had been taken.

In July we had some cases of typhoid among the employees of the Ontario Paper Mill just outside of Thorold. The cause here was also the water supply. The water is taken from the canal and is, of course, grossly polluted.

Mr. Dallyn's department co-operated and a chlorinating plant was put in and the epidemic disappeared. Similar conditions existed at the Pilkington Glass Works and also at the Beaver Board Factory. These plants are quite near the Ontario Paper Mill. Chlorination plants were also put in at these two factories.

An interesting epidemic of typhoid occurred at Stouffville in September. A number of cases of continued fever had occurred and there was a difference of opinion as to their nature. Dr. Freel made the diagnosis of typhoid. I saw a number of the cases with Dr. Freel and Dr. Ball, M.O.H.

As the cases were a week or more old I took samples of the blood, and on examination at the Provincial Laboratory they all proved positive. The first case although attended by a physician had not been diagnosed as typhoid. The man affected was one who supplied milk to the milk vendor in Stouffville. He had handled the milk and assisted in milking right up to the time he went to bed. Milk was being sent for that three weeks, while his wife nursed him and also assisted in the milking.

The secondary cases occurred about the same time beginning about three weeks after the milk producer was stricken with the disease. There was also sickness in the milk vendor's house in Stouffville.

I made the following recommendations to the Board of Health in the village:—

1. Since there is sickness in the house of the milk vendor which may be typhoid, I would recommend that no one from his house be allowed to handle the milk, bottles, or cans. Some outside person should be pressed into service.

2. I would also recommend that milk bottles be sterilized. The cans should also be sterilized.

3. Careful supervision of the water supply.

4. The passing of a milk by-law by the Council.

5. Care must be taken to see that urine, fæces and bath water of the patients be properly disinfected with lime, carbolic acid, or bichloride of mercury. Bedding should also be disinfected before it is washed; soaking in carbolic solution will do very well. Portions of food left by patients should be destroyed and dishes boiled.

6. No milk bottles should be taken from houses where typhoid prevails.

7. The above precautions should be taken in all cases of continued fever which have occurred in Stouffville whether confirmed by the Widal test or not.

In this investigation I received the heartiest co-operation from the M.O.H., all the medical men, the Board of Health, and the public in general.

Great credit is due Dr. Freel for his astuteness in making the diagnosis, and to Dr. Ball, M.O.H. for his promptness in stamping out the epidemic. There were thirteen cases in all and no deaths.

Measles.

There occurred in my district during 1923, 6,395 cases and twenty-eight deaths from measles. In Toronto there were 5,008 and twenty deaths. In Hamilton 584 cases and one death. In Brantford 533 cases and two deaths. This leaves in the rest of the district 285 cases and six deaths.

Measles is a difficult disease to control because it is very infectious. Then again often times a doctor is not called and no report is received, the householder not realizing his responsibility.

In some municipalities the M.O.H. does not placard for measles or German measles as required by law.

Tuberculosis.

In 1923 there were reported in my district 823 cases of T.B. and 490 deaths. Of these Hamilton had seventy-two cases and seventy-two deaths, and Toronto 513 cases and 236 deaths, leaving 238 cases and 182 deaths for the rest of the district.

Tuberculosis still continues to be a scourge. In my district there are two excellent institutions for the care of the tubercular, one at Weston and the other at the Mountain Sanatorium at Hamilton. In addition there are smaller institutions, one at Brantford and one at St. Catharines.

There are also clinics held twice a month at Brantford and St. Catharines. Dr. Holbrook is the physician in attendance.

I expect to have inaugurated three other chest clinics under the supervision of Dr. Brink. The locations have not yet been definitely settled, but one will probably be at Welland.

A very extensive survey of children in the Town of Dundas and Township of West Flamboro was made during the year. Special attention was paid to the incidence of tuberculosis among children. The statistics of the survey have not yet all been compiled, but when completed the results should be very valuable. The survey was made by the co-operation of the Canadian Tuberculosis Association, the Canadian Red Cross Society, the Hamilton Medical Society, Hamilton Health Association, Local Board of Education, Provincial Education Department, and the Provincial Board of Health.

To obtain the full results of the survey a follow-up through the local health departments concerned should be carried out.

The co-operation of the local medical men of the district was excellent, and without this the survey could not have been made.

Money appropriated for sewers in my district for 1923 was as follows:—

Brantford	$48,733 45
Chippawa	56,385 00
Dunnville	2,184 45
Hamilton	992,468 47
Leaside	45,918 85
Niagara Falls	49,682 88
Newmarket	5,363 93
Oakville	2,899 93
Port Dalhousie	38,658 47
Port Dover	30,000 00
Simcoe	10,647 26
St. Catharines	6,322 45
Thorold	750 00
Toronto	1,196,246 00
Welland	4,768 15
Weston	91,538 50
A total of	$2,536,702 78

Money appropriated for water-works and purification during 1923 in District No. 3:—

Acton	$2,300 00
Burlington	10,674 32
Chippawa	74,359 00
Grimsby	16,351 53
Hamilton	82,266 00
Leaside	12,253 77
Mimico	1,660 24
Newmarket	25,037 50
New Toronto	52,741 07
Niagara Falls	18,768 51
Oakville	1,400 00
Port Credit	33,800 75
Port Dover	29,790 00
Richmond Hill	35,000 00
Toronto	1,548,134 43
Weston	27,189 00
Woodbridge	22,000 00
A total of	$1,998,726 12

Milk Supplies.

A number of municipalities in my District have not taken the necessary precautions for the safeguarding of the milk supplied to the citizens. Some of them have no milk by-law. I have always recommended that milk should be collected in as cleanly a manner as possible and then pasteurized. If the municipality is a small village and no one cares to install a pasteurization plant, then they should have a milk by-law and inspect the dairies supplying milk, and have the milk tested for butter-fat.

An interesting case in connection with milk supplies occurred at Oakville during May, 1923. The driver for the Calder dairy was charged with putting dirt in the milk of a rival dairy after it had been delivered. The case came before Magistrate Shields. The accused pleaded guilty and was fined $50 and costs.

I recommended to the local board of health that this driver should not be allowed to deliver milk again, and that the owner be given a reasonable time to dispose of his business.

The Board gave effect to this recommendation.

Industrial Hygiene.

An interesting experiment was conducted in the town of Thorold. The town itself and a number of the industries combined and engaged a public health nurse. The nurse did school work, child welfare work among those of pre-school age, industrial work at the several industries, and general public health work. The plan seemed to work very well until Pilkington's Glass Works signified their intention of dropping out of the agreement. This was largely due to the policy of the Home Office in England.

At the same time the School Board appointed a nurse of its own, so that affairs at Thorold are in rather a muddle. We are hopeful of a readjustment in the near future.

At Simcoe, in Norfolk County, a number of cases of benzol poisoning were investigated by Dr. Cunningham, director of Industrial Hygiene. The cases occurred in a canning factory. Suggestions were made to try to prevent benzol poisoning and also that of lead. The appointment of a plant nurse was recommended, but no action has yet been taken.

At Niagara Falls a storage battery plant was investigated, also by Dr. Cunningham, following a number of cases of lead poisoning. The matter was finally referred to the Factory Inspection Department on account of the conditions being very bad.

Nuisances.

As in previous years a large part of the time of the D.O.H. is taken up with the investigation of nuisances. In my report of 1920 I pointed out the fallacy of allowing this work still to remain under the various Boards of Health. I am still of the same opinion and think that the so-called nuisances might be divided up between the Police Department and the Engineering Department. This would give health officials more time to devote to true public health work.

Child Welfare.

During the year the Public Health Nurses in District No. 3 were sent for duty to the Northern fire area, and Miss Smith only returned to her own district in the month of March. The Town of New Toronto was given a demonstration upon the request of the health authorities, with the result that a permanent local nurse has been appointed. Miss Smith later assisted in the survey of tuberculosis among children in the Town of Dundas and vicinity, which work lasted for three months. The balance of the year was spent in making a survey of the County of Wentworth.

York Township has received a great deal of attention as previously reported. Demonstrations of public health nursing (including schools) were carried on in several sections of the municipality, as a result of which the following appointments were made during the months of January and February, 1923.

Miss E. Willison, Municipal Public Health Nurse for the Township of York (this service includes schools where no local work has been arranged for).

Miss B. Lousley as Public Health Nurse for the Village of Swansea (school included in this service.)

Miss J. Y. Farquharson, Public Health Nurse, S.S. No. 7, York Township. (Schools are included in this.)

Miss Penneck came on the staff in the month of May, following which she spent five months in the Town of Paris, giving demonstrations of Public Health

nursing including schools. The next point of demonstration was the Town of Simcoe, which work is still in progress. In addition Miss Penneck completed a survey of Brant County, including the City of Brantford.

General.

I desire to express appreciation for the support of the Department at Spadina House, and also that of the various Directors of branches under the Provincial Board of Health. On my own part I promise if possible to enhance my co-operation with these departments in the ensuing year, 1924.

D. A. McCLENAHAN,
District Officer of Health

ANNUAL REPORT FOR 1923 OF DISTRICT No. 4.

To the Provincial Board of Health of Ontario.

Gentlemen:

I have the honour to submit my annual report covering my work in this District for the year 1923.

Communicable Diseases.

The following statistics compiled from the weekly report cards for my District.

	No. of cases	No. of deaths
Diphtheria	185	8
Measles	1,012	8
Tuberculosis	12	7
Pulmonary tuberculosis	...	5
Influenza	58	28
Acute infantile pneumonia	16	29
Typhoid fever	43	10
Smallpox	13	1
Infantile paralysis	2	1
Acute primary pneumonia	12	22
Pneumonia	3	8
Whooping cough	61	4
Whooping cough and measles	...	1
Tubercular meningitis	1	2
Broncho-pneumonia	5	16
Mumps	33	..
Cerebral spinal meningitis	6	7
Pleural pneumonia	...	1
Sleeping sickness	1	..
Chickenpox	88	..
Actinomycosis	1	0
German measles	1	..
Gonorrhœa	23	..
Syphilis	10	..
Scarlet fever	280	5
Rocky Mountain scarlet fever	1	..

These figures show on the face of them that they are in the main of little value, as to the prevalence of this class of disease. Only diphtheria, measles and scarlet fever, and possibly typhoid, bear evidence of any approach to thoroughness in reporting. Certain of the diseases show more deaths than cases reported, while in the case of tuberculosis, there have been since the 1st of August, when laboratory reports were commenced to be sent the D.O.H's., nearly twice as many positive findings for diagnoses, than there were cases reported all year. The reporting of the venereal diseases is practically a dead letter in this district. The reasons for this general condition are many, but I doubt if this is the proper place to discuss them. In passing, I must commend the Health Department of Oshawa for its example in this, as in many other aspects of Public Health work.

Subsequent to my appointment late in February, my work in the district commenced with an outbreak of typhoid in Coboconk, among the players of the hockey team, who had taken part in a tournament at Bobcaygeon. The team had stayed at the hotel for some two days and had apparently not at all strictly obeyed the instructions placed over all the taps, that that water was not for drinking purposes. In due course three of these young men were down with typhoid and one of them died. The other members of the team had been overseas and well inoculated. This is most interesting, as the protection had lasted well over four years in their case, with no apparent diminution. It goes

to prove the hope expressed to me while in France by a prominent bacteriologist, that three or four annual inoculations would be found to confer in most cases, a permanent immunity.

The hockey team from Havelock also engaged in the tournament, but were careful to drink only the water provided for drinking purposes, and no cases developed. There had been a case of typhoid develop in Bobcaygeon prior to this, and occasional cases continued to crop up for months there and in the Township surrounding it. This village is built on an island in and upon the north shore of a rapidly falling river. The rock beneath the fairly shallow layer of soil is limestone, the strata of which is honeycombed by the action of water so that wells sunk into it are apt to be subject to pollution from an unknown distance in various directions. They have had no typhoid for many years previously, when an epidemic was stamped out by a very painstaking and capable campaign, carried out by the M.O.H., who has now this year's outbreak apparently well in hand.

Cases of this disease cropping up widely throughout the district caused me to predict to many M.O.H's. that this would be a typhoid year—a prediction which unfortunately proved correct. Investigation during the spring of the year showed almost all of the larger centres and many small ones throughout the district to have had one or more cases of this disease which had fled from Cochrane. Later in the season, further cases cropped up. Such of these as I was able to investigate could not be at all connected, thus the most of these cases were too widely scattered to permit of my investigating them, and I adopted a form of questionnaire which I sent to the M.O.H. of each municipality, where a case was reported by the laboratories. The replies did not in any case go farther than wells, showing pollution or tainted food. In none was the search for possible carriers productive, and in some cases we seemed to be able definitely to rule out that source of contagion.

Measles and scarlet fever have shown brisk epidemics in many municipalities, during the winter and spring, but have been of a mild type, with low mortality and consequent difficult of control.

Diphtheria is always with us and maintains its characteristic of a "killer." In this disease, I think, the role played by the carrier is not sufficiently appreciated, nor the importance of taking release swabs from all the members of the family and from close contacts, before lifting quarantine. An instance shows this. A child on a farm in a part of the district where this disease is fairly frequently present, developed diphtheria and in a short time recovered. All the family had been given protective doses. After a negative swab from the patient, disinfection was carried out and they were released. The mother then made a deferred visit and left two of her children with a sister, one of whose children developed the disease. Here again general antitoxin and recovery of patient. Mother No. 1 returned from her visit before quarantine was lifted from her sister's house and removed her children, thus breaking quarantine and I was called in. I directed that they be again quarantined and that swabs be sent in from all children of each family. These showed another child in each family to be carrying the germs and I directed that quarantine be maintained in each case until these should be cleared up, by proper treatment of the noses and throats. The first was clear in a week, but the carrier in No. 2 family showed increased virulence of the germs and in the second week, virulent germs in pure culture. Painting the nose and throat with tincture of iodine, finally cleared it up. This was a lad of twelve years, who would have been going to school with probably dire results.

The use of the Schick test and toxin antitoxin is not too generally appreciated in the district. In Peterboro a campaign was started by the school physician, during the autumn, to interest the parents of school children in this procedure and leaflets, with consent slips, were distributed in one of the larger schools. This has met with considerable success, despite the opposition encountered from the anti-vaccination League, who put up a very active propaganda against toxin antitoxin. We were able, by spreading the real facts, to tear to pieces their tissue of falsehood and so counteract their interested efforts. So far, over one hundred children have been Schick-tested and some 86 per cent. of these have been found susceptible. None of these children have lost as much as one hour from school, as result of the Schick test. This work will be continued during the winter and spring terms and will succeed increasingly by its success.

Milk.

The nature of the milk supply is in the smaller municipalities in this district, a matter of individual concern, municipal control being not desired or thought of. Even in the towns and cities, it is very rare to have the boards of health give any adequate thought to this matter. Some have by-laws of their own, some depend on Schedule B of the Act. In few, is there anything like adequate enforcement of either. Vendors' license are issued in many places without question, and with no inspection of source of supply or methods of production or sale. In one case I found that a man, whose milk had been refused by a pasteurization plant, because of its dirty character, at once bought a vehicle, procured a license without question and proceeded to sell direct to the householders. On the other hand, I found two pasteurizing plants, whose product showed a higher bacterial count than that of any vendor in the town. I regard it as one of the important duties of the Department of Health in conjunction with the medical officer of health to show all municipal councils that they are as much responsible for the quality of the food supply, as they are for that of the water supply. I would recommend to the Provincial Board that some means be devised for adequate control of pasteurizing plants. In this way we can secure properly produced milk, rendered free from disease and sold in a sanitary manner.

Water Supplies.

Practically all the municipal supplies in the district are fairly well looked after, and laboratory control is to some extent maintained. In many of these a misguided fondness for well water keeps up a danger to the public health. Nearly all wells in cities, towns and villages are subject to constant or periodical pollution. The sanitary surveys, conducted by the Sanitary Engineering Division, are doing a very valuable work in bringing this fact home to the public. I have been taking, or having taken, samples from various supplies all over the district where these surveys have not yet been made, and the amount of contamination shown has been having a very appreciable effect. It has led to closing of wells where good supplies are available; to connections being made and demands for waterworks extensions to new areas, and to agitations for municipal supplies where not already existing. Coupled with this, is the increase in sewer connections and the removal of outdoor privies.

A cognate problem, the treatment of municipal sewage, has not had much attention, the pollution of streams in this way being very massive in many cases. All municipalities on the Trent water system pass their raw sewage into the stream. This includes the Bay of Quinte. That more disease has not been had from this source is due to the fact that the municipalities are far

enough apart to allow of the natural purification of running water. The conditions in Peterboro are especially bad, as the sewage from some large industrial concerns is allowed to pass directly into the river throughout its course through the city, and the city sewer system enters below the city where, for the next mile or so, there is a fairly dense summer population. Two municipal bathing beaches are maintained on the river as it passes through, and several cases of skin diseases and diarrhœa have been reported to me by physicians as, in their opinion, originating at the lower of these beaches. I do not see how the city can evade responsibility for these, and the townships below the city would seem to have exercised much forbearance in not pushing more vigorously for the carrying out of the order of the Provincial Board for the construction of a sewage disposal plant.

Summer Resorts.

These are very numerous and scattered all over the district, but those which present the greatest problem are on the Trent waterway. I selected for study the densest of them, Stoney Lake and Chemong Park. I spent five days surveying the former, as to sanitation; the hotels and cottages on islands especially. I found many things needing attention about the hotels and issued some very definite orders, failure to comply with which by next season would mean not being allowed to open for business. Several cottages on small and rocky islands were ordered to put in chemical closets before they could be allowed to be occupied next year. This will mean an inspection just before the season opens next year. Chemong Park is a resort of totally difficult character, and I was not able to arrive at a definite policy for it as yet.

School Inspections.

Throughout the district I was often met by complaints from the medical officers of health of rural municipalities, that they had turned in reports to the Board, year after year, and yet the same unsanitary closets, etc., continued without change. About the middle of school summer vacation I received from Dr. Middleton's division, digests of several of these reports. After studying these, I wrote to the medical officer of health who had sent them in, that the remedy seemed to be in their own hands and advised them, where conditions were bad to notify the school boards concerned that they were maintaining a nuisance by allowing such unsanitary conditions to exist, and that they must abate the same, or the schools would not be allowed to reopen in September. Those medical officers of health who adopted this procedure have nearly all reported universal success, and are much cheered and heartened in their work.

Child Welfare.

After demonstration by a provincial nurse in Cobourg, the question of a health nurse appointment was placed before the people at New Year's and defeated by a fairly narrow vote. Opposition to this appointment, due apparently to certain misunderstandings, was encountered where it would be least expected to be found, but some private organizations stepped into the breach and a very capable nurse was employed, and has done very good work during the year. Child Welfare Clinic established there, has been visited by me on two occasions during the summer and found it to be working smoothly and well. The work in general seems to be commending itself to the town and a better understanding is becoming established. The Child Welfare Clinic in Peterboro has been doing a great deal of work and with the wider experience, gained by

the nurse employed, is becoming steadily useful and the follow-up work and home visiting is becoming broader based and more effective. This clinic is under the auspices of the Local Council of Women. A baby contest was held in connection with the Exhibition this fall, which served its purpose of bringing the clinic more prominently before the public. The real work is, of course, done in the weekly clinics.

After visiting the Lindsay Board of Health and the representatives of the women's organizations there in the spring, a request was sent for a demonstration by a provincial nurse to start with September. Miss McEwen, who had been doing some work in the county of Northumberland, went to Lindsay at that time and this demonstration is now proceeding; is being well supported and, I think, commending itself most thoroughly to the public. Miss Edna Moore spent two days in Peterboro with the films, which she has shown to some of the groups of women.

The work of the Venereal Disease Clinic at Peterboro has shown a steady, if slow, growth and a good foundation is being laid. It is perhaps well to make haste slowly, but at times, one doubts if haste is being made at all. Looking at this and largely throughout my district, I am convinced that the medical profession is more responsible for this, than any other class of the community. Where there should be universal and active support, the amount of ignorance, indifference or even opposition encountered, is rather amazing. The profession must be educated in the importance of these diseases and the working of the Act, before any progress can be made with any rapidity. In only a very few municipalities in my district, is any attempt made to report these diseases. In only one place, is any adequate attempt made to follow up the contacts. The medical men are ignoring the Act as it applies to them, unless brought directly to their notice. Some medical officers of health made some attempts to carry out the provisions of the act, but met with no support from their brother practitioners and have given it up. These say the Act is unworkable; the others say they do not know how it can be worked. My experience of the past summer, leads me to believe that a great many medical men know little and care less about the diagnosis and treatment of venereal diseases by modern methods. During the autumn every physician appears to have received a copy of the pamphlet, dealing with venereal diseases diagnosis and treatment issued under Dr. Hegarty's name. I am sure that at least half of these have been put into the waste paper basket, often unread. I could wish that these pamphlets had been preceded by letters a week ahead, pointing out their importance and exceeding value. Certainly the facilities of the branch laboratory are not used at all to the extent they might be, nor is the use made of them, always intelligent. I would suggest that consideration be given to a system of rewards and punishments in the matter of reporting these cases, as tending to increase efficiency. These diseases are of such peculiar importance to the health of the public as to be worthy of a special effort on the part of all health officials and I purpose, during the coming year to keep this problem in all its aspects before the medical officers of health, local boards and medical societies.

In talking to the medical officers of health I find considerable support for the idea of county or area full time medical officers of health and sanitary inspectors. Most of these medical men feel that they are not getting the support and results that they would like, and antagonisms are created by this part of their work, which adversely effect their private practices so that it scarcely pays them from a monetary standpoint. From these two standpoints, therefore, they see that much good would come from the change.

In conclusion, I may say that my work so far has enabled me to get at a fair, general idea of the problems of the public health in the district; the great possibilities of the work and some fairly definite ideas and plans of how to go about it. In getting this far, I have been able to do a good deal of concrete work, some of which has already borne really good fruit.

All of which is respectfully submitted.

I have the honour to be, Sir,

Your obedient servant,

N. W. SUTTON,
District Officer of Health, District No. 4.

ANNUAL REPORT FOR 1923 OF DISTRICT No. 5.

DR. J. W. S. MCCULLOUGH,
Chief Officer of Health,
Toronto, Ont.

301 First Avenue, Ottawa, Ont.,

December 31st, 1923.

Dear Sir,

Annual Report for 1923 of District No. 5 to the Provincial Board of Health.

I have the honour herewith to submit my annual report for 1923. District No. 5 is made up of the Counties of Dundas, Stormont, and Glengarry, Leeds and Grenville, Frontenac, Lennox and Addington, Lanark, Renfrew, Carleton, Prescott and Russell and the City of Kingston.

The District has been thoroughly inspected in a routine manner during the year and a detailed report of the result of these inspections and also of the results of special inspections have been sent in monthly to the Department in Toronto. Much of the detail is omitted for the sake of brevity in the Annual Report. All the public institutions, thirty-four in number, have been inspected as to their sanitary conditions and reports sent to the Provincial Board and where indicated to the governing bodies. The request for the elimination of unsanitary conditions or for the installing of needed improvements have generally been promptly met by those in charge of the management. Calls for the investigation of special conditions arising at different localities in the district have been promptly responded to when at all possible and vigorous action taken if found necessary.

I wish to record the hearty co-operation and valuable assistance received from the Inspectors of the Ontario Department of Labour, the Provincial Public Health Nurses, the Mothers' Allowance Board, the Veterinary General's Department, the anti-Tuberculosis Association and the Departments under the control of the Provincial Board of Health.

Communicable Diseases.

This district during the year has had less disease epidemics than in any other for the last ten years.

Smallpox.—Except for a few sporadic cases the only outbreaks approaching an epidemic were at Vankleek Hill, Newington and Kemptville. These were all of minor dimensions and were abated by the usual methods without much trouble.

The local officers, I think, are becoming more expert in controlling this disease and act now more vigorously than formerly at the beginning of the outbreak.

Diphtheria.—Besides the usual sporadic cases there was a persistent outbreak at Chesterville. I personally examined three hundred school children in this village and had seventy swabs examined from the suspects by the Laboratory at Ottawa, which latter is proving a great convenience to the Ottawa Valley municipalities.

Scarlet Fever.—The only persistent outbreak was at Arnprior which was not finally abated for about five months. Most of the cases were very mild but a few were severe and several deaths resulted. Every assistance was rendered the local medical officer and one of the Public Health Nurses was placed in this field for some time with this special object.

Typhoid Fever.—This disease except for a very few cases was confined to an outbreak at Arnprior and several cases in municipalities using the St. Lawrence River as a water supply. In Ottawa City I think there was a slight increase in the number of cases although the typhoid incidence in this city is now very good. In every outbreak we were able to discover the source of the outbreak with reasonable certainty.

In Arnprior we had seven cases. Mr. Berry of the Sanitary Engineers Staff, Miss Squires, Public Health Nurse, and the local authorities ably aided in a careful and thorough survey to discover the source of the outbreak. The water, although testing badly, was eliminated by a sanitary survey. All the cases were, however, found to be using the milk from one dairy. Careful inquiry, however, failed to discover any case in this family or those handling the milk. On questioning them, however, it was admitted that this man had typhoid many years ago and a blood test showed that he was at present a carrier. This milk supply was rigidly excluded from the town and no new cases developed.

At Cornwall a number of cases occurred among the employees of the paper mill. The company have a connection with the town water supply for drinking purposes, but use the canal water for commercial use. It was discovered on enquiry that the men used the canal water in the different rooms for drinking purposes and that every case could be traced to this practice. A complete and convenient system of cold drinking water, at an expense of three thousand dollars, was installed by the company and posters were set up throughout the mill warning the employees against drinking canal water. There were no cases since.

At Iroquois there were eight cases. This was evidently caused by the town pumping water for a period from the canal owing to some trouble with the intake pipe. All the cases synchronized with this period of use of the canal water. After the intake was repaired and the usual source of supply used there were no new cases.

Public Health Nurses.

The Public Health Nurses of the Department of Maternity and Child Welfare, Miss Mary Power, Director, have done exceedingly good work in this district during the year. The two nurses, Miss Squires and Mrs. Bricker, who have been here during the whole of the year and Miss Carr-Harris, who gave her services part of the time, have received well merited praise from the people in every locality in which they gave demonstrations of Public Health Nursing, especially from the more well informed and progressive in the communities. From my own observation I think there is no one arm of the service that can bring better and more immediate results, than this division. I would advise that the number of nurses be increased and to some extent that the district officer be made officially responsible for the success of their work.

During the winter season the two permanent nurses were engaged at their work in Hawksbury and Vankleek Hill. In the former town, owing to the depression caused by the closing down of the Riordan Company's mills, they found it imperative to do a good deal of bedside nursing as well as their regular work. A baby clinic was established with the active co-operation of the local physicians. Dr. W. J. Bell of the Department, gave his assistance and his work extending beyond the usual scope of a clinic was exceedingly valuable to the local physicians who so expressed themselves. This town was badly in need of Public Health Education and for this reason the results of the nurses' work were more evident. A pronounced decrease in the infant death rate for the period bore eloquent evidence of the success of their work.

In Vankleek Hill the work was not carried on so extensively, but Mrs. Bricker was able along with her other work to give assistance to the local authorities in abating a smallpox outbreak. Several of the surrounding schools and those of one whole township, Caledonia, were inspected.

In Arnprior Miss Squires gave valuable aid to the local Medical Officer in abating an obstinate epidemic of scarlet fever and also aided in discovering the source of an epidemic of typhoid fever referred to elsewhere.

The remainder of the year was spent by Mrs. Bricker in Morrisburg and Miss Squires in Lancaster Village. In connection with this latter field a large number of schools in Lancaster township and also in Williamstown were inspected. It is the intention to cover the whole of Glengarry County before leaving the field. Miss Squires is now in Alexandria and Mrs. Bricker in Prescott. Miss Carr-Harris has inaugurated a Public Health campaign at Sydenham, Frontenac County, and will extend her work to Harrowsmith and Verona later.

Public Institutions.

Two new hospitals have been completed during the year.

The Pembroke Cottage Hospital, in the Town of Pembroke, and the Great War Memorial Hospital at Perth. They are both well constructed and equipped with all modern appliances for the care and treatment of the sick. Extensive additions have been made to the Kingston General Hospital including a new isolation hospital. When the contemplated remodelling of the old buildings is carried out this institution should rank among the best of the large hospitals of the Province.

Among the other institutions which have made improvements and additions the most important is the Hotel Dieu Hospital, Kingston, which has added a splendid new nurses' home in connection with the main building.

Summer Resorts.

The following summer resorts have been thoroughly inspected and where required nuisances abated and sanitary improvements ordered or suggested: Rideau Lakes, Thousand Islands, Stanley Island, Hamilton's Island and Chaffie's Locks. I have encouraged the local health and sanitary officers to make more frequent and thorough inspections with good results. The summer residents usually welcome the visits of the sanitary officers and marked change in the attitude is now everywhere evident in this regard.

I have also impressed on municipal councils that this sanitary service is often the only return these summer residents receive from the taxes they pay to the different townships.

Milk.

During the year an active campaign was carried on to improve the milk supply of the urban centres. A special effort was made in regard to the Town of Cornwall.

The Council appointed an energetic veterinary surgeon as Milk Inspector and enacted an approved milk by-law. The actions of the Inspector has caused a good deal of friction with the dealers as this was the first genuine effort made in this town to control the milk supply in an effective manner. The results are very promising, however, as already one up-to-date plant has been erected and another in course of construction, where milk will be properly clarified, pasteurized and bottled. Competition has been developed among the farmers to supply clean milk by the public placarding of the results of the sedimentation tests.

Farmers have been encouraged to have their herds tested and those that have done so have received recognition in the press. I think during the coming year Cornwall will rank as a model town as far as milk supply is concerned.

Slaughter Houses.

A great difficulty exists in controlling the sanitary distribution of meat in the country surrounding Ottawa City. Many farmers are also butchers in a small and generally irregular way, and it is almost impossible to apply the Regulations to every case. With the co-operation of the city food inspector, and the appointment of some more reliable men as sanitary inspectors, by the township councils, considerable headway was made this year especially in the County of Russell in controlling the trade. The Boards of Health of Smith Falls and Perth have both decided to enforce the Provincial Regulations and this leaves all the towns in the Ottawa Valley with fairly sanitary slaughter houses.

Among Other Matters of Special Importance Noted During the Year.

Subdivision around Cornwall: A land boom has been going on around this town and a great number of sub-divisions are springing up outside the corporation without regard to future sanitary conditions. By consultation with the Councils of the town and township and with the advice of the Provincial Sanitary Engineer a town planning expert was procured to examine the whole area and report. I expect some action will be taken by the 1924 Councils to regulate building activities in the areas mentioned.

Change of Health Officers: One court decision was rendered fixing the salary of a township health officer, Township of Alfred, $350.00. Also two health officers were removed by the Provincial Board on the petition of the local councils, Township of Alfred and Township of Caledonia.

The automobile supplied by the department has continued to be of very great service in my work and enabled me to accomplish much more than formerly when dependence was largely on train service. The total distance travelled (by auto) was 6,948 miles. Besides the visits made in the routine inspection of the different municipalities and institutions at least one visit was made and in some cases as many as ten to the following localities at the request of the local authorities or for special reasons; Kemptville, Smith Falls, Perth, Cardinal, Prescott, Brockville, Kingston, Gananoque, Odessa, Napanee, Merrickville, Lansdowne, Newington, Finch, Chesterville, Winchester, Morrisburg, Brinston, Westboro, Carleton Place, Almonte, Arnprior, Renfrew, Pembroke, Denbigh, Lancaster, Alexandria, Rockland, Plantagenet, Hawkesbury, Vankleek Hill, Caledonia, Alfred, L'Orignal, Russell, Embrun, Clarence Creek, Fournier, Avonmore, Jones' Falls, Yarker, Williamstown, Maxville and Eastview.

Obituary:

I regret to record the death of two very well-known physicians, who were also Officers of Health of District No. 5 for many years, Drs. McLaughlin and Vrooman.

Dr. McLaughlin was Officer of Health of Morrisburg for over twenty years. He was an efficient official and was of the better class family physician of the old school.

Dr. Vrooman, M.P.P. for Lennox, whose death occurred so unexpectedly, was one of the most prominent physicians of Napanee and vicinity. He died before Parliament assembled after the recent elections. The largest and most representative funeral ever seen in Napanee bore evidence of the high regard in which he was held.

P. J. MOLONEY,
District Officer of Health.

ANNUAL REPORT FOR 1923 OF DISTRICT No. 6

North Bay, Ont., January 1st, 1924.

To the Provincial Board of Health Ontario:

I have the honour to submit herewith the eleventh annual report of District No. 6.

At the beginning I would like to express my appreciation of the Standard Annual Report Forms provided by the Department. These forms permit ample scope for the exercise of the individuality of the medical officer and at the same time make necessary the supplying of information on the basal matters that are of interest to every health department. The interest of neighbouring municipalities in each other's annual reports will in this way be enhanced. It is a publicity move, the benefits of which will be far-reaching and cannot be entirely foreseen. The principle can be carried far enough to aid the Department in collecting data for drafting new legislation. There are certain other questions which could with profit be added to the present form, but no doubt these will come in time. I cannot, however, too strongly recommend that all annual reports be sent to the Provincial Board through the district officer (first to the district officer, thence to the Board) so that the Department's officials will have the use of these statistics for the checking up, previous to the drafting of their annual reports.

Another matter which is deserving of mention and commendation is the arrangement which the Department has made with the laboratories to supply us with returns of water analysis as well as those of typhoid, diphtheria and tuberculosis. They have added considerably to the effectiveness of this office.

Communicable Diseases

I am pleased to report an increase in the frequency with which cases of communicable diseases in camps are being brought to the attention of the district officer by contracting physicians. We are looking forward with hope to the coming year for a still greater improvement in this direction and that ultimately all infections will be brought promptly and directly to the attention of this official.

The necessity for some one to supervise the recommendations of the district officer for the quarantining of such cases in unorganized territory is a further argument for co-ordinating the two offices of sanitary inspector and district officer under the direction of the district officer. The argument presented by the chief officer in support of the principle of this arrangement indicates that he is about to inaugurate this principle.

The inadvisability of the Provincial Board of Health allowing the lay officials of the Department to supervise camp physicians in their professional conduct to patients suffering from communicable diseases was brought to the attention of that body by this office early in the year.

My experience in this district during the past twelve months has increased my conviction that efficiency demands that all public health matters pertaining to the respective districts should be referred to the district officer before any action is taken at the Toronto office.

Below are the returns of communicable diseases for the district during the past year, made by the secretaries of local boards of health. It is very evident that this does not cover all the cases that have occurred as a very large part of

the northern districts is unorganized and therefore without boards of health and their secretaries. We are for this reason without statistical returns for communicable diseases for those sections without municipal organization. Although most outbreaks receive our personal attention, occasionally we have no intimation of an outbreak or receive the notice after the disease has run its course and all non-immune have been attacked.

Disease	Cases	Deaths
Smallpox	5	0
Scarlet fever	142	2
Diphtheria	139	14
Measles	62	1
Whooping cough	325	15
Typhoid	1,008	77
Tuberculosis	18	23
Infantile paralysis	5	0
Cerebro-spinal meningitis	1	1
Influenza	287	14
Acute influenzal-pneumonia or broncho-pneumonia	14	4
Acute primary-pneumonia	23	10
Chickenpox	33	0
Gonorrhœa	4	0
Septic sore throat	3	0
Mumps	1	0
German measles	2	0

Until secretaries of local boards of health discontinue the use of the old forms of return cards, we cannot hope to obtain satisfactory information regarding the large number of additional communicable diseases about which the Department is seeking data. Indeed, the information specified in the forms is conflicting when one form is compared with the other; for example I would mention pneumonia. The problem is a disappearing one as the percentage of old forms in use diminishes.

In the first month of the year two epidemics had their origin: whooping cough at Sudbury and typhoid at Smooth Rock Falls.

January.

The whooping cough was not typical, as a large proportion did not have more than a spasmodic cough. Quite a number of adults were attacked, but practically none of them developed a whoop. Because of the number of adults affected it is probable that there were two infections running concurrently, and that the situation was complicated by a bronchitis which attacked adults and produced a cough which simulated pertussis.

The typhoid epidemic began in Smooth Rock Falls shortly after the New Year and continued into March. The origin of the outbreak was thought by the medical officer, Dr. Clarence F. Wright, to be the sewerage of Timmins, which empties into the Mattagami River seventy-five miles above Smooth Rock Falls. Upon investigation, however, it was found that there had been no typhoid in Timmins, but that there had been an outbreak of typhoid among the working men on the power dam at Sandy Falls during December, the previous month. The occurrence of the disease two or three weeks later at Smooth Rock Falls and in the camps along the river between these two points appeared to your district officer and to Mr. Dallyn of the Sanitary Engineering Division to point overwhelmingly to Sandy Falls as the origin of the trouble. It was well known to your officials from the previous history that the Mattagami Power and Paper Company, who own the town of Smooth Rock Falls, had received an order from the Provincial Board of Health some two years in advance of the outbreak

to chlorinate their domestic supply of water and to separate it from the mill supply in order to save the excessive cost of chlorination. The neglect on the part of the responsible officials of the company to give effect to this order undoubtedly made them answerable for this neglect, if not entirely for its results. When the neglect was brought to their attention after the start of the epidemic the changes were promptly made with decisive effects on the termination. Because of the imputed responsibility of Timmins' sewerage as the cause of the epidemic, it is only fair to say that Timmins has shown a disposition to meet every suggestion of the Provincial Board of Health in the treatment of its sewerage. They have adopted the newest principles of sewerage treatment. When it was pointed out that a certain type of porous plate in use in their disposal plant would likely be a source of repeated trouble, they immediately discarded these and installed the best our engineering division could recommend. Altogether their attitude has been one of compliance, which was noticeably different to that of Smooth Rock Falls. The total number of cases was twenty-eight, with five deaths, which is distinctly different to the impression which the Department received from the returns, as these were made in an incorrect way due to a misunderstanding as to the intention of the forms.

February.

During February a form of influenza became prevalent at certain points. Gowganda reported the largest number of cases, although many places where the disease was prevalent reported none. Deaths that were ascribed to the disease were in nearly every instance due to complications.

March.

March made its contribution to history as far as communicable diseases in Ontario are concerned, because during this month there occurred the most severe outbreak of typhoid at Cochrane that has darkened the horizon of preventable disease control in this Province in many years. The epidemic continued to the end of May. The cause was found to be typhoid laden sewerage getting into the water supply. The sewerage could not have reached the lake, from which a large part of the water supply was taken, under ordinary conditions without accomplishing the impossible, namely, flowing uphill. The conditions, however, were exceptional. There had not been one day's thaw from the first of the year to the last day of February. The weather had been steady and cold, requiring from 33 to 50 per cent. increase in pumpage to supply waste necessary to prevent the freezing of water pipes. The result of the lake's share of this excessive demand was a drop in level of about five feet, so that instead of being two and a half feet above the outlet it fell actually two and a half feet below it, causing a reverse flow from Junction Lake which also received the run off from the lake that received the sewerage. One good day's thaw would have corrected the water levels. There was nothing in the previous history of the lake or of the springs that could have been a warning to the many engineers who have studied the problems. The number of engineers who have given consideration to this matter without once pointing out the menace indicated the elusiveness of the contributing causes. The municipality has had four engineers at different times acting for them, while the Provincial Board of Health has had three or four of its sanitary engineering staff on the ground. It is my opinion that the sanitary engineers of the Provincial Board of Health are second to none in Canada or the United States, and yet although several of them had gone over the levels or were familiar with them, the margin of safety was thought to be ample. The

Provincial Board was, therefore, as much without information as to this danger as was the town. It is only fair to the officials of the Provincial Board to point this out since many of the citizens of the town reached conclusions from statements in the press, purported to have come from those in a position to know, that the Department was aware of the danger and had neglected to force action. It is true that the chief officer of the Board had strongly recommended a chlorine plant for other reasons, but these did not appear to him of sufficient menace to require a compulsory order. To suggest that this Department was cognizant and forewarned of the danger and took insufficient action is as inconceivable as it should be from a consideration of the facts. The municipality was also free from warning so that the blame cannot be left at its door. It is entirely begging the question to hold the officials of the town responsible for such a catastrophe just because they had not immediately installed a chlorine plant which was recommended to them by the Board for the correction of another matter such as the pollution that would come from the banks and watershed of the lake. The town had not been neglectful of the recommendations, for they had gone some distance to implement them and had provided in a by-law for the extension of their water service funds for a chlorine plant. These money by-laws for the expenditure of large sums are not put through without careful consideration of the specifications in order to prevent waste in the quality and efficiency of the installations. They will, therefore, necessarily take time. Before the by-law was finally settled, the epidemic about which the town had no warning burst upon the municipality like a conflagration. The sewerage in itself could not act as a cause of typhoid without some direct infection from some source. The epidemic was preceded by a severe outbreak of dysentery without any cases of typhoid. The source of the typhoid organisms was carefully investigated and this office is of the opinion that several cases of typhoid from Smooth Rock Falls, which were treated in Cochrane, was most probably the source of the infection of the sewerage which ultimately reached the public water supply.

Up to Sunday, March 11th, there were 15 cases all told. On Sunday, March 25th, two weeks later there were 380 cases. The total number of cases of which the municipal officials had record was 835, with 57 deaths. We have been able to obtain information from many outside points which indicate that there were 13 deaths and 100 cases who got their infection in Cochrane and carried it to other places where they became ill. The grand total was, therefore, in the neighbourhood of 935 cases and 70 deaths. Because our statistical survey of the town was intentionally left until the close of the epidemic, we were unable to obtain records of many who had left for their homes in other places immediately upon convalescence. Below are the totals which were obtained from this survey:

Number of typhoids	792
Number of deaths	56
Number of secondary cases	217
Number inoculated only once	207
Number inoculated twice	777
Cases developing after first inoculation	99
Cases developing after second inoculation	75
Number inoculated where typhoid did not develop	810

One of the most frequent accusations made in regard to the control of the epidemic was that it dragged along unnecessarily. Let us consider the figures. The incubation period is usually stated from five to forty days, with the average being two weeks. In the outbreak in Cochrane we have evidence in one or two cases where the incubation was at least twenty-eight days. For example a school teacher who teaches in New Liskeard, but who lives in Cochrane, had

been away from Cochrane twenty-eight days when she showed the first symptoms of the disease. In company with Mr. Dallyn of the Sanitary Engineering Division, I visited the town on March 11th, where there had been up to that time fifteen cases all told. On the 12th, Mr. Dallyn wired to one of his staff to bring a chlorinating plant to Cochrane. The chlorine plant was in operation at Cochrane on the 15th. Now if the average incubation is two weeks, we are safe in saying that all the cases that occurred in the fourteen or fifteen days following the 15th likely had their infection prior to the starting of the chlorine plant. Now on the thirtieth day of the month there had occurred 505 cases, which, if added to the number of secondaries obtained in our statistical survey 217, gives a total of 722 cases. If these are deducted from the total of 835 cases reported in Cochrane, which includes the countryside about the town, we have only 113 cases to account for. The evidence from the weekly reports would indicate that the incubation period in the Cochrane epidemic probably averaged three weeks. In confirmation of this I give the weekly reports for those weeks which are affected by the deduction.

Total cases up to March 10th	15
New cases for week March 17th	50
" " " 24th	301
" " " 31st	152
" " April 7th	142
" " " 14th	90
" " " 21st	35

If three weeks was taken as the incubation, it would bring us to the 5th of April, upon which date the total number of cases reported was 621, which if added to the total secondary cases, 217, would amount to 638 cases. Because of the explosiveness of the epidemic, we were on this date ahead of nearly all secondaries while those few which may have been included in our figures would be to some degree balanced by cases with a longer incubation than three weeks and omitted from the numbers given. Our returns were collected daily and were recorded by days and weeks from March 24th until April 24th, when the daily incidence began to show frequent returns.

March	24	366	April	4	597	April	14	750
"	25	380	"	5	621	"	15	755
"	26	401	"	6	643	"	16	759
"	27	427	"	7	660	"	17	766
"	28	448	"	8	677	"	18	775
"	29	477	"	9	693	"	19	776
"	30	505	"	10	713	"	20	783
"	31	518	"	11	723	"	21	785
April	2	564	"	12	727	"	22	786
"	3	580	"	13	739	"	23	787
						"	24	788

The many large families living in three or four rooms added difficulties which were insurmountable with present legislation. As it was found impossible to get a mother to allow her child to be taken to a hospital until she herself became ill by infection from the child, the difficulties in the way of preventing secondary cases became apparent. Under the circumstances it does not appear to your official that the number of secondary cases was excessive, although it is recognized that his opinion is at variance to some others. If we had enabling legislation, which upon the recommendation of the local board of health would force those who become infected with typhoid to go to an isolation hospital, a very large proportion of secondary cases could be prevented. I would strongly recommend such legislation as the most important means of preventing secondary

cases. Many would suggest that vaccination is the most important preventative against both primary and secondary cases, and I have some sympathy with the suggestion, but when considered from the standpoint of an explosive outbreak such as that in Cochrane because of the fact that it takes from four to six weeks for the immunity to rise to its height after inoculation, it is quite impossible even with the most aggressive measures to establish immunity before the end of the incubation period. You will note from the records of our statistical survey that seventy-five who had two inoculations came down with the disease. There were a great many more inoculated than are given in these figures, but they were temporary dwellers and were not to be found in the town at the time of the survey. Let me state here the measures that were adopted for the general vaccination of the public in Cochrane. Not only was a station opened for free inoculation, but a house to house canvass was made by a nurse and a returned soldier who had experience over-seas offering free vaccination in their homes to all who would accept. Unfortunately in the beginning the medical officer of health did not support this procedure, but he finally came around after our capable epidemiologist, Dr. Roy McClenahan, had exercised his powers of persuasion. Of course, there is not legal authority to compel vaccination for typhoid. Dr. McClenahan, who came to Cochrane at my invitation, for the purpose of giving us the benefit of his expert opinion in the way of measures for control and also in order to correlate statistics, strongly urged a supreme effort to get a great many more vaccinated. It was unfortunate that he was prevented from coming, through illness, until the epidemic was about ended. In this programme he was successful in obtaining the assistance of the medical officer of health, who put a statement in the press over his signature recommending vaccination to all those who had not already been done. Although a house to house canvass was made by our nursing staff, and the public vaccinators started out again, thirty-seven only were inoculated after this effort.

Early in the epidemic Miss Power, Director of the Division of Maternal and Child Welfare for the Provincial Board of Health, came to our assistance by borrowing from other districts eight public health nurses for duty in Cochrane. These were Miss Hally, Miss Heeley, Miss McEwen, Miss Veitch, Miss Squires, Miss Bowman and two emergency nurses secured for the epidemic only. Miss Hally and Miss Heeley are permanently attached to this health district. Their first efforts were directed toward making a complete sociological survey of the town. We obtained records of every home which were filed at the town hall according to streets and were available to the chairman of the Board of Health and to the mayor. These records gave information regarding number and age of members of household, number of patients, if any, physician, public health nurse in attendance on that street, occupation of the householder, his income, whether out of work or not, sanitary condition and if assistance was being supplied a record of what these consisted. There was also space for recording the nurses' visits. The public health nurses were responsible for seeing that these family records were kept complete. When a new case occurred in a family not previously affected the officials by reference to this file knew immediately the necessity, or otherwise, of help. Our nurses gave special attention to the homes of the sick, advising and supervising the disinfection of excreta and bed linen, also regarding the use of disinfectants for the hands. The attendants were warned of the danger of the children of the household coming in contact with the patient. The public health nurses confined their energies to matters which could properly be classed as preventive, only varying from this rule to deal with an emergency which did not present a solution in any other way.

Miss Hally gave her attention to follow-up work after the conclusion of the epidemic and continued the educational programme to the end of the year.

By a study of the completed records of the sociological survey certain important facts come to light. If we classify all families in groups according to the number in the family and indicate the total number of typhoids occurring in each group, we obtain a comparative table revealing the increase in incidence according to the increase in the number in the household. This, of course, is what might be expected and illustrates an important cause of secondary cases. It is unfortunate that our records were not sufficiently complete to enable me to further analyze the groups according to incidence per number of rooms in which the families lived. But the incomplete records available indicate that the larger the families and the fewer the rooms in their dwellings the higher the rate of incidence of typhoid.

Families of	Number	Total number of people	Number of cases
2	67	134	38
3	78	234	68
4	69	276	100
5	69	345	96
6	58	348	110
7	42	294	104
8	24	192	72
9	20	180	60
10	11	110	34
11	4	44	17
12	0	0	9
13	1	13	5

Spring Lake as a source of water supply was immediately discontinued as soon as the variation of the levels became known. The water from the springs was continued with efficient chlorination. What additional water was necessary to meet the town's requirements was obtained from Norman Lake and heavily chlorinated. Norman Lake receives no sewerage, but its water was known to show high bacterial counts.

Milk bottles were found in frequent use as drinking utensils by typhoid patients and for this reason, as well as the fact that the dairies have no mechanical appliance for the sterilization of bottles, dairymen were forbidden to allow bottles to enter houses. They were required to pour the milk into a container at the consumer's door.

Although one of their number was lying very ill, in the hospital with typhoid, the Provincial Police, Mr. Andrews, Mr. Fenwick and Mr. Bush, offered their services in any capacity. They came to us with a suggestion that we use them as sanitary officers. This was a splendid solution of a very difficult problem, as it was felt that it was necessary to have certain ones doing this work who would create the favourable impression of the police uniform. Their efforts are witnesses to the valuable co-operation we are consistently receiving from the Inspectors of the Provincial Police and their men. House to house visits were made by them and written instructions given for the correction of unsanitary conditions and for the collection into receptacles of frozen garbage and filth. Where typhoid existed in a house the excreta was ordered to be placed in water-tight containers to be removed within forty-eight hours by the municipal scavenger service, which was reorganized for the purpose. Particular attention was given to that portion of the town outside the sewer area. Every privy was thoroughly cleaned and disinfected with chloride of lime. I accompanied the police officers for the first day in order to see the difficulties which they would likely encounter and to assist them in adopting uniform and efficient measures for dealing with these difficulties.

The emergency hospital was established on March 19th. Mayor Russell in casting about for a suitable building for the purpose was met by a most generous offer from the Knights of Columbus in which Lake View Hall, with any part or all of its equipment that would be of service, was placed at the disposal of the Board of Health. Such an act is deserving of special mention and is worthy of the widest publicity and commendation. Their kind offer was promptly accepted. This institution at the high tide of the epidemic contained eighty-seven beds and a staff of twenty-two nurses. The work entailed in obtaining on short notice sufficient equipment and staff for an emergency hospital of these dimensions was a herculean task exceptionally well performed and entirely to the credit of the mayor, John Russell. Mr. Russell's devotion to duty for eighteen to twenty hours a day made very satisfactory provision for large numbers of typhoid cases which the following five weeks were to provide. He was the only functioning member of the local board of health and because this work rapidly increased daily it took most of his time. The medical officer of health was more than occupied professionally, while the third member of the Board of Health had not been appointed for the year 1923. The council and public utilities made increased demands on his consideration until finally his health broke down under the strain. For the balance of the year Mr. Russell was unable to follow his business as railroad engineer, and I am afraid but little thanks has been accorded him even by those who profited most from his wisdom, energy and efforts. This office is most grateful to him for courtesy and the prompt and effective manner in which recommendations were put into action. On March 27th, Mr. J. M. Beemans was appointed member of the local board of health, whereupon he was elected chairman. From this date to the end of the epidemic, Mr. Beemans assumed a man's share of the responsibilities connected with the control of the municipal health machinery. The business methods which were promptly introduced and the ability displayed in systematizing and correlating the records was striking confirmation that the council recognized the calibre of the man, and that their choice was made with due regard to the magnitude of the work which such a position entailed. Beside efficiency, Mr. Beemans brought with him a congenial temperament which made for confidence and security. Indeed, there promptly developed between all those connected with health effort in the municipality a feeling of stability based on mutual trust and understanding. Below is a list of a few of the many matters which occupied the constant attention of the Board of Health.

1. Maintenance of a bureau for securing private or district nurses.
2. Supervision of emergency hospital supplies.
3. Administration of municipal assistance to needy cases.
4. Direction of a sanitary squad, including night soil and garbage collection.
5. Control of the water supply including chlorination and careful bacteriological supervision of water carts which obtained their supply from artesian wells outside the town.
6. Protection of the milk supply from typhoid handlers.
7. Inspection of dining rooms, restaurants and refreshment parlours in order to prevent those who had typhoid from handling or preparing food.
8. Inspection of bakeries both from the standpoint of protection and delivery.

9. Provision of personnel and supplies for vaccinators.
10. Direction of the public health nurses.
11. Direction of the sanitary inspectors.

Early in the epidemic an arrangement was entered into between the physicians of the town and the council in which the physicians were to give prompt attention to all cases whether able to pay or not, for which the council agreed to come good for all accounts not collectible after sixty days. Certain other matters tended to influence this arrangement. The imposition which would have been placed on the Board of Health had they imported doctors at the time of emergency helped to decide them to encourage the local physicians to assume full responsibility for the medical service. There were two physicians in the town at the time, Dr. Biron, the medical officer of health, and Dr. Fraser. Dr. Biron imported one assistant and Dr. Fraser, five. Besides these another physician, Dr. Fortin, came to Cochrane and located during the height of the epidemic. As a large number of citizens were unable to pay for the service of a private nurses, each physician secured twelve to fifteen nurses, to each of which were assigned four to ten patients.

In concluding this reference to the Cochrane outbreak, it is necessary to explain that the Provincial Board of Health were granted authority by the Government to use $20,000 of its appropriation for the purpose of assisting the town to meet some of the obligations which were directly attributable to the epidemic. The value of this help can hardly be estimated, but it most certainly relieved the town of the overwhelming responsibilities which would have blocked all progress until they were removed. The opinion has frequently been expressed that Government funds rarely are directed into channels that give more promise of large returns than obtained from the $20,000 spent in preventing Cochrane being engulfed financially after the physical torture which it had endured. The money was placed in the bank to my order, and the responsibility for the supervision of its expenditure was placed on my shoulders. I may say that I appreciate the compliment suggested by this confidence. But from the standpoint of public health, when my whole attention and energies were being devoted and taxed in providing measures aimed at the speedy control of the outbreak, with sickness and death on every hand, with new problems coming before me every minute, to find it necessary to neglect these important considerations in order to superintend financial matters appears to this office to have been a serious mistake and one about which I feel it my duty, in view of this experience, to strongly caution the Department.

Regarding the bequest of $20,000, allow me to say that $16,518.63 was paid for emergency hospital nurses, orderlies, cooks and maids, also for district nurses and doctors, sanitary squad and bank credit. There were in the emergency hospital 22 nurses, 7 orderlies and 6 other help, while there were 24 district nurses and 5 doctors. There were 22 in the sanitary squad. No accounts were paid until the amount was checked and passed by the advisory committee. The balance of the bequest was used for incidentals such as drugs, supplies for the hospital, etc.

There was a small outbreak of scarlet fever in the township of Armour. The disease showed the usual characteristics of the mild type so prevalent in Northern Ontario since 1917. No doubt the prevalence is due to the difficulty of having the cases reported. There were no deaths.

Influenza was very prevalent in Parry Sound during this month. In fact, so many people were ill at one time that it became impossible to have each case properly reported. There were no deaths.

About the same time as influenza broke out in Parry Sound, it also became prevalent in the township of Hagerman. It was most probably an extension of the Parry Sound epidemic. There were no deaths.

Influenza of a rather severe type also broke out in New Liskeard. There were sixty-five cases reported with no deaths.

April.

During this month an epidemic of whooping cough began in Parry Sound, which extended into the month of July. There was one or two deaths. There were thirty-five cases reported, which was but a fraction of the total number.

September.

A number of cases of typhoid were reported from Timmins about the middle of September. Information regarding the outbreak came to me from several sources so that I had made arrangements to spend some days at Timmins at an early date. On the 1st day of October these arrangements were put into immediate action by a notice from the Department that fourteen cases had been reported from Timmins. I arrived in Timmins on the 2nd, where I found that a large proportion of the cases had not been reported by the physicians. Personal inquiry brought to light a list of eighty-four cases. In each case the water and milk supply was investigated and the wells and privies carefully inspected in those sections of the town not provided with sewer and water. Thirty homes, in which there was typhoid, were found to depend on the municipal system for their water supply, while eighteen homes had private wells. The investigation revealed further that most of these homes with private supplies had also access to town water either in the school or in the mine.

The mile as a factor in the cause of the epidemic was easily eliminated as there were twenty-one separate producers serving the typhoid population. No further evidence was necessary.

An investigation at the pumphouse, outside of revealing some carelessness in the operation of the pumps during the changing of the chlorine tanks, gave little information which could condemn the water.

A joint meeting of the Board of Health and council was called, at which the evidence collected in the house-to-house investigation was presented to them. Finally they were told that their municipal water supply was the cause of the epidemic and the reasons were advanced for this conclusion. The town engineer then informed us that there had been a break down in the water system of the Hollinger mill early in August and that the municipality was asked to help them out by supplying their needs from the town mains. In order to do this two fire pumps were started which, when added to the delivery of the domestic pump, was more than could be chlorinated by the type of apparatus the town possessed. The municipality continued to supply the mine from the 5th to the 28th of August. On the latter date the Hollinger system was again put into operation and the fire pumps stopped. The explanation given by the engineer completely vindicated the conclusions of this office, which were formed entirely without any information but the epidemiological evidence. The engineer

promptly put into action recommendations aimed at preventing any operation of the pumps without the introduction of chlorine. The judgment of this office was promptly rewarded by the termination of the outbreak.

Water Supplies

It will be seen from the unenviable reputation of this district during the past year, because of typhoid fever connected with certain municipal water supplies, that the water problems are still far from solution. But, although the price has been excessive to Cochrane, Smooth Rock Falls and Timmins, the educational effect was not lost on these municipalities, and, indeed, other towns have been so impressed as a result of these lessons on unpreparedness that chlorinating plants have been installed as a form of cheap insurance against such catastrophes. In confirmation of these statements, let me present the evidence. Cochrane has discontinued the use of lake water and has obtained an abundant supply for all purposes from two large wells. These wells under test have given a steady run after eighteen hours of 370 and 480 gallons per minute, respectively. In the first, it is 90 feet to the turbine pump, while in the second, it is 176 feet. It will be seen, therefore, that the municipality has a safe and ample supply to permit of a good margin for growth and expansion. The chlorine plants installed at the time of the epidemic are still in use and will continue in use until bacteriological control indicates that chlorine is no longer necessary and until the wells alone constitute their entire supply. It is hoped that the council during the coming year will provide more than one electric wire route between their power plant and the pump house at Spring Lake in order to permit the complete elimination of Norman Lake as a source of water for fire purposes. I understand that the underwriters are opposed to this pump being dismantled under present conditions, since there is only one line of wire between the power plant at Norman Lake and the pump house. You will note the proximity of the power plant to the Norman Lake pump house is considered by them of great importance in case of fire, of which the town has had three serious experiences. The town pins its faith to the promise of abundance of cheap power from the Hollinger plant building at Island Falls. The transmission of the new power to the town will demand sufficient alternative wire routes to the pumping station to guard against fire hazards. I may say that there are over four hundred men on the Hollinger plant construction, so that the work is being rushed as rapidly as possible. Cochrane has, therefore, taken proper steps to protect herself against a repetition of her water troubles. These measures consist of a new ground water supply and two chlorinating plants of approved size and design.

Smooth Rock Falls came into disrepute in regard to its water supply earlier in the year than did Cochrane, but since the damage done was of such secondary importance I have chosen to place it in its relative position. Immediately upon the outbreak of typhoid measures were undertaken to correct the danger to their domestic water supply by complying with the recommendations of the Provincial Board of Health which had been issued to them two years previously. In short, these amounted to separation of the domestic from the mill supply and the provision of effective chlorination. To understand this point it is well to keep in mind that Smooth Rock Falls is a paper company's town. The prompt, though belated, effect given to the recommendations has placed the Smooth Rock Falls water supply among the safe ones of the district.

Timmins has been placed third on the list because their troubles have been entirely abuses of privilege, which were recognized at the time their type of chlorinating plant was approved. Let it first be known that Timmins has chlorine equipment. The criticism from the standpoint of safety rests in the fact that the capacity of the chlorine apparatus is insufficient to meet the demands which it is possible to put upon it, and which were actually demanded of it during an emergency at the Hollinger mine, whose interests are so inseparably connected with those of the town. The relief from the danger was obtained by the disappearance of the emergency and when the diminished quantity being pumped returned to proportions within the effective capacity of the chlorinator. The town has entered into agreement with the Hollinger Mine to take water from them as soon as their new water system can be completed, and the necessary connections made to the town service. The Hollinger has agreed to chlorinate the total output of their pumps. As soon as the connections are made to the municipal system and the chlorinating apparatus installed, the difficulties arising from the Timmins water should be at an end.

Cobalt, learning the havoc experienced by Cochrane because of inefficient protection against polluted water, decided that the warning issued by the Medical Officer of Health, Dr. Mitchell, could not be ignored with impunity. I am pleased to have had the opportunity of supporting his recommendation, and that Cobalt now has an approved insurance against water hazard.

North Bay has had for two years bacteriological evidence that their water supply is seriously polluted. The source of the pollution is not entirely apparent since water samples taken out of the lake opposite their intake pipe do not correspond, on analysis, with samples from the tap. This is sufficient evidence to suspect a break in the intake at a point that would permit of the admission of highly contaminated shore water. An investigation by a diver, upon the recommendation of the Medical Officer of Health, Dr. Brandon, corroborated this suspicion. A large break was found about sixty feet from shore. An attempt was made to patch it with concrete, but the work was either not effectively done or there was a break not located as the bacterial counts did not drop to the previously low records.

The municipality received a notice over a year ago from the Provincial Board of Health requiring chlorination of their water supply. The notice was ignored for some time, until the municipality required the approval of the board for the extension of their sewer system. The town found it impossible to obtain the approval until effect was given to the board's notice. This difficulty, along with the warning of the Cochrane epidemic, was successful in obtaining a much needed safety appliance in the form of a chlorinator for North Bay.

Sewers and Sewage Disposal.

A new sewage disposal plant has been built at Cochrane which is intended to protect those who depend for a water supply on the creek through which the sewage of the town drains north to the Abitibi River. This protection will have more than ordinary value because of the large number of typhoid carriers which contribute to the Cochrane sewage.

The extension of the sewer systems at Timmins, Sturgeon Falls, Sudbury and North Bay is worthy of mention since it means a reduction of the number of outside privies with the consequent diminution of the fly nuisance and of

infantile disturbances. The rapid rebuilding of Haileybury has conformed mainly to the area supplied with sewers and for this reason the danger of the outside privy will not be the troublesome factor of former years. There has been no typhoid traceable to the municipality since the fire. This point is a distinct improvement in the history of the municipality.

Public Health Nurses

Undoubtedly the best medium of public health education is the public health nurse. This district has been peculiarly blessed during the past year as we had the services of five nurses for several months in the fire area. We also had eight nurses to assist in the problems of the great typhoid epidemic in Cochrane.

In the fire area the time of the nurse was taken up in making a survey of the children in order to protect them from the spread of communicable diseases, made more accessible by the unavoidable overcrowding, also to discover their physical defects and if possible have them corrected. I may say that never have the efforts of the Provincial Board been so appreciated by the various municipalities in this district. Cobalt was particularly impressed with the efforts of Miss Corbman. Indeed, so effective were her efforts in that municipality that they decided that a public health nurse was a necessity and made the appointment accordingly, selecting their nurse from the recommendations of the Provincial Board of Health.

In Englehart and Charlton the people were greatly pleased with the efforts of the nurse. The physicians informed me that they were almost overwhelmed by the number of children referred to them for nose and throat troubles, bad teeth, defective vision, malnutrition, etc.

In the other areas the demonstrations were equally praiseworthy, but the response of the people was neutralized by the crushing effect of the fire.

In Cochrane during the epidemic the public health nurses were occupied in the investigation of household conditions, and in giving instructions for the prevention of the extention of typhoid in the home. The conditions referred to sociological matters as well as to those of prevention.

When the epidemic had terminated, Miss Hally, who is permanently connected to this district, continued her efforts in order to bring assistance to the defective child. Some idea of the difficulties with which she had to meet will be understood when I say that the people were sick and tired of nurses and doctors, although the necessities of the child life of the community were never so great. She held a clinic at which she had the expert assistance of our pediatrician, Dr. W. J. Bell. A diagnosis made by a skilled physician with special qualifications for the work is of the greatest help to the nurse when a effort is made in the home to persuade the parents of the serious consequences often resulting from prolonged delay. Over three hundred children attended the clinic. The prevalence of defects among children who had typhoid is almost double what it is in those who did not. Miss Hally, through the generosity of the Elks at Cochrane, has obtained a supply of milk for three months for the schools equal to a pint per pupil per day. The nurse expects a great improvement in the undernourished.

A clinic was also held in Cobalt by Dr. Bell, under the direction of the local public health nurse, Miss Campbell. The number who turned out was most encouraging and gave the nurse a quantity of follow-up work which should get results.

Miss Heeley, who is attached to the southern half of the district, has been carrying on a demonstration in Parry Sound. During the autumn, Miss Heeley put on a series of exhibits of public health nursing at the local fall fairs. These were the centres of a great deal of interest and have been the cause of invitations to revisit the towns and villages and make a general survey of the municipalities including the schools. With Parry Sound as a centre, it is possible to give attention to a large area in which the villages are small, and the work mostly rural. The work is not nearly so spectacular as in the larger towns, but is real public health work as it brings instruction and advice to those in greatest need and farthest from reliable sources of information. Miss Heeley is operating in a most difficult section and under a great many discouragements, but so many expressions of appreciation have come to me that I feel that her sacrifices have been made with the larger interests in view.

Besides our two Provincial Public Health Nurses, we now have four whole time municipal public health nurses in District No. 6. We hope that the coming year will add to this number as we have the assurance that the addition of every properly qualified whole-time official assists the work and strengthens the hands of each one.

Laboratory

A description of the increasing value of the laboratory is worthy of note. During the year with the help of the branch at North Bay we were assisted in the control of diphtheria outbreaks by the discovery of carriers at Grand Desert, Coniston and North Bay. There was an increase in the water samples partly due to the educational effect of the Cochrane epidemic. The co-operation of the laboratory in keeping the district officer posted on the bacteriological analysis of water samples, together with information regarding the indications of all Widal tests, of tubercular sputum and diphtheria swabs has established a grasp of the epidemiology of the district not previously had. The appreciation of the public of Northern Ontario is indicated in the great general increase in the business handled at the North Bay branch. There was approximately 50 per cent. increase over the previous year.

Thr Venereal Diseases Clinic

The clinic which it was proposed to establish in North Bay finally got into operation early in the year. There has been a gradual increase in the number of patients presenting. The clinic has been under the capable control of Dr. J. S. Douglas and nurse, Vera Lindsay.

One of the difficulties of a free clinic for venereal diseases is to obtain not so much the transportation of the patient to the clinic, but rather the maintenance while there taking treatment.

Conclusions

Legislation is required providing for compulsory isolation of typhoid cases, with removal to hospital where advisable.

The Division of Public Health Education should have such additions to its staff as will permit assistance in the field when important problems are receiving the personal supervision of officers of the board. I believe that a great deal of

public support was lost to the Department by not having a publicity agent on the ground to present the views and describe the importance of the efforts which were made both in the fire area and in Cochrane.

Too much importance cannot be placed upon the fact that service to the people and protection of the interests of the Department are the main duties of the district officer. For this reason, efficiency demands the elimination of all direct measures taken in the field without his knowledge or consent.

Respectfully submitted,

W. Egerton George,
District Officer of Health, District No. 6.

ANNUAL REPORT FOR 1923 OF DISTRICT No. 7.

City Hall, Fort William, Ontario,
January 15th, 1924.

To the Provincial Board of Health:

Gentlemen:

I have the honour to submit the following report of work done during 1923 in District No. 7 which includes the Districts of Thunder Bay, Rainy River, Kenora, and Patricia.

Conferences.

The following visits were made to Toronto:—

1. District Officers' Conference, during month of March.
2. Annual Meeting Ontario Health Officers' Association, during month of May.
3. Course of instruction *re* "Insulin" treatment, during month of August.

Sanitary Inspections.

Routine sanitary inspections were carried on in municipalities and reports submitted to the Provincial Board of Health as follows:—

Municipality.	Dates of Inspections	Dates of Reports
(1) Fort William	April 18th-19th	April 20th
(2) Neebing	May 30th	June 1st
	June 13th	
	June 18th	June 8th
	July 5th	
	June 13th	June 16th
	June 15th	
(3) Nipigon	June 11th	June 14th
(4) Dryden	June 29th	July 4th
(5) Shuniah	August 16th, 17th and 20th	September 4th
		October 18th
(6) Kenora	September 4th-6th	September 20th
(7) Keewatin	September 6th	September 18th
(8) Fort Frances	September 11th-13th	September 24th
(9) Emo	September 13th	October 3rd
(10) Chapple	September 13th	October 3rd
(11) Rainy River Town	September 14th-15th	October 3rd
(12) Schreiber	October 16th	October 18th
(13) Ignace	October 22nd	November 28th
(14) Port Arthur Dairies (McIntyre Twp.)	November 1st	.....
(15) Sioux Lookout	November 7th-10th	November 14th

The following is a list of special visits and inspections made during the year, with dates of reports to the Provincial Board of Health:

Community	Dates of Inspections	Dates of Reports
(1) Nipigon Village	January 5th *re* village water supply	January 10th
		January 11th
(2) C. W. Cox Lumber Camp, near Silver Mountain (unorganized)	January 20th	January 31st
(3) Gillies Township	February 5th	February 8th
(4) Long Lac-Nakina Cut-off, C.N.R. (unorganized)	April 11th-12th	April 16th
(5) Sioux Lookout	April 26th	May 7th
(6) Grant (unorganized)	April 27th	May 7th
(7) Armstrong (unorganized)	April 28th	May 8th
(8) Redditt (unorganized)	April 30th	May 11th
(9) Minaki (unorganized)	April 29th	May 10th
(10) Long Lac (unorganized)	May 14th	May 18th
(11) Conmee Township	June 7th	June 8th

(12) Long Lac—Nakina Cut-off, C.N.R. (unorganized) and Nakina Yard Construction Camp	June 19th-23rd	June 27th June 27th
(13) Marks Township (unorganized)	June 25th	June 28th
(14) Fort William City Abattoir and Fort William "Coal-Dock" Area	July 3rd	.....
(15) Chippewa Park (unorganized)	July 5th	.....
(16) Silver Islet (unorganized)	July 5th	.....
(17) Fort William "Coal-Dock" Area	July 7th (with Provincial Sanitary Engineer).	
(18) Provincial Industrial Farm, Neebing Township	July 7th (with Provincial Sanitary Engineer).	
(19) Port Arthur Waterworks Pumping-Station	July 12th (with Provincial Sanitary Engineer).	
(20) Chippewa Park (unorganized	July 9th (with Chief Sanitary Inspector).	
(21) Port Arthur Waterworks Pumping Station	July 12th (with Sanitary Engineer).	
(22) Atikokan (unorganized)	July 13th-14th (with Sanitary Engineer).	
(23) Neebing Municipality *re* "J. I. Case" Nuisance	July 31st August 13th August 28th August 30th September 20th September 24th September 26th	October 1st
(24) Port Arthur Waterworks Pumping Station	September 29th (with Sanitary Engineer).	
(25) Neebing Municipality *re* "J. I. Case" Nuisance	October 2nd October 4th October 8th October 9th October 23rd November 3rd November 15th	October 10th November 16th
(26) Chippewa Park (unorganized)	November 5th (with Provincial Sanitary Inspector).	

It is to be regretted that a reasonable enforcement of those sections of the Public Health Act dealing with "Nuisances" should have made it necessary for me to visit the Municipality of Neebing fourteen times during the year. A sheep-feeding ranch—where 15,000 sheep were fed on elevator-screenings during the winter of 1922-1923—had been left in an unsanitary condition; and after considerable difficulty the property was finally cleaned up.

Dairies.

Forty-two dairies (including four milk-pasteurization plants) were inspected:

Port Arthur (McIntyre Township)	4	
Fort William	9	(including 3 pasteurizing plants).
Fort Frances	15	
Kenora	10	(including 1 pasteurizing plant).
Keewatin	2	
Sioux Lookout	2	
Total	42	

Sanitary conditions in the above-mentioned dairies varied to a considerable degree and were described in detail in the reports submitted to the Provincial Board of Health. The supervision over the sanitary quality of municipal milk supplies leaves much to be desired. It is a question whether some of the time spent by local health officials in attempting to maintain the required percentage of butter-fat might not better be utilized in efforts to improve the sanitary quality of the milk. The selling of milk below the required percentage of butter-fat appears to me to be largely a question of fraud and a logical problem for license inspectors and police departments. Except for the sediment test, and a few bacterial counts at intervals, no routine laboratory supervision has

been maintained during the year over the sanitary quality of municipal milk supplies in District No. 7. Fort William and Port Arthur at least have laboratory facilities available at the Provincial Board of Health Branch Laboratory in Fort William to enable the local authorities of these two cities to adopt some permanent system of bacterial counts. No system of milk-grading (as to sanitary quality) has been in use during the year in either city so far as I am aware. However, it is to be noted that recording thermometers have been installed during the year in connection with two milk-pasteurization plants in Fort William and one milk-pasteurization plant in Port Arthur. In my two previous annual reports I have specified what I believe should be the legal requirements governing the sale of pasteurized milk. The 1923 annual reports of the medical officer of health of the Town of Keewatin and the medical officer of health of the City of Fort William indicate what has been accomplished with a view to tuberculin testing of cattle from which the milk supplies of these two municipalities are obtained.

Water Supplies and Water Purification.

During the year the Department supplied a special mailing-tube and container for the purpose of facilitating the sending of water samples for bacteriological analysis. The next logical step is action by the Department to require the sending at stated intervals of samples from municipal water purification plants so that some degree of uniform bacteriological control may be maintained over the efficiency of such plants. The immediate supervision over the mechanical efficiency of water purification plants is a matter for the Division of Sanitary Engineering. Visits to municipal water-chlorination plants in District No. 7 have been made at intervals during the year by Sanitary engineers from the above-named division; but I believe these visits are not being made with sufficient frequency. I would recommend that every municipal water-chlorination plant in District No. 7 be inspected at least once every two months by a sanitary engineer from the Division of Sanitary Engineering.

Sewage Disposal.

Whatever may be the correct interpretation of Section 91 of the Public Health Act, the wording of that particular section is unfortunate if municipalities are "within the law" while discharging their sewerage without preliminary treatment directly into near-by streams, lakes or other waters. Possibly some solution of the sewerage-disposal problem may be arrived at in the course of time; but raw sewerage from a number of municipalities in District No. 7 is being discharged into near-by waters—some of which are sources of public water supply.

Nightsoil, Manure and Garbage Disposal.

I have endeavoured to impress upon local health authorities the importance of constant effort to keep municipalities free from uncovered heaps of manure and garbage, especially during the warmer months of the year. The maps prepared by the Division of Sanitary Engineering show the locations of outside privies in the municipalities surveyed during 1922 by the field party from that division. Inspections have shown that in some municipalities the local health authorities have not required householders to maintain their outside privies in proper sanitary condition.

Summer Resorts.

During the summer season, inspections were made of six summer resorts in the Municipality of Shuniah. I was accompanied on these inspections by Dr. C. N. Laurie, M.O.H., Shuniah, and by Mr. W. C. Millar, Prov. Sanitary Inspector. I also accompanied Mr. Millar during his inspections of the Chippewa Park and Silver Islet Summer Resorts situated in territory without municipal organization. Sanitary conditions at the Loon Lake and Ishkabibble Beach summer resorts in the Municipality of Shuniah were found to be bad. Ishkabibble Beach is situated on the shore of Thunder Bay a mile or so north of the Port Arthur Waterworks pumping-station. Temporary tents were found scattered along the shore for a distance of at least one mile; and many tents were crowded so closely together as to approximate temporary slum conditions. A few yards behind the line of tents was found a row of privies many of which were in a disgusting condition. This summer resort is difficult to control owing to many of the campers being here to-day and away to-morrow; but at a meeting of the local board of health of the municipality—held August 20th—the local authorities were notified as to the necessity of maintaining closer supervision over sanitary conditions at all summer resorts in the municipality. A revision of the Provincial Board's "Regulations Respecting Sewage Disposal in Summer Resorts" would appear to be desirable so as to permit or specifically forbid the construction and use of pit-privies. The present regulations are difficult of application, especially in summer resorts situated in territory without municipal organization; and a properly constructed pit-privy may be less of a menace to health than a carelessly-tended dry-earth closet.

Schools in Territory Without Municipal Organization.

During the year I was able to make sanitary inspections of six schools situated in territory without municipal organization. As there are more than sixty school sections in territory without municipal organization in District No. 7 it is evident that there is inadequate sanitary supervision over these particular schools. However, under present conditions it is a physical impossibility for me to personally inspect every school in territory without municipal organization, especially those schools in the unorganized agricultural townships thrown open for settlement. If adequate local health machinery existed for the supervision of the unorganized agricultural townships thrown open for settlement, there would remain about eighteen or twenty schools in organized communities along the railways; and an attempt could be made to annually inspect these eighteen or twenty schools. Otherwise a feasible plan to secure an annual supervision over sanitary conditions in the above-named schools would be: "That the School Board of each school in territory without municipal organization be required once yearly to employ a legally qualified medical practitioner to make a sanitary inspection of the school and school premises, and to send to the Provincial Board of Health a report of each inspection."

Communicable Diseases.

The following table has been compiled from the weekly returns of communicable diseases sent to this office as having been received by the Department from the secretaries of local boards of health in District No. 7 during the year 1923. The figures are not to be taken as the exact number of cases and deaths from communicable diseases, but they may have some value as an index of the communicable diseases reported from municipalities in the District:—

Disease	Cases	Deaths
Diphtheria	81 (one suspect)	8
Measles	296	0
Whooping Cough	48	1
Smallpox	34	0
Scarlet Fever	77	0
Typhoid Fever	46	1
Tuberculosis	21	12
Infantile Paralysis	1	1
Acute Lobar Pneumonia	46	8
Rubella	1	0
Gonorrhoea	1	0
Encephalitis Lethargica	1	0
Mumps	3	0
Chickenpox	117	2

The above table does not include communicable diseases reported from territory without municipal organization, except where cases may be included in reports from municipalities.

The following visits were made during the year in connection with the direct control of communicable diseases:—

Disease and Community	Dates of Visits	Dates of Reports
(1) Smallpox case in Fort William	January 3rd	.....
(2) Smallpox case in Fort William	January 13th	.....
(3) Atikokan (unorganized) *re* Scabies in School	March 21st	March 23rd
(4) Hillsport (unorganized) *re* V.D. case	April 12th	April 17th
(5) Marks Township (unorganized) *re* Scarlet Fever	May 31st	June 1st
(6) Marks Township (unorganized) *re* Scarlet Fever	June 25th	June 28th
(7) Silver Islet (unorganized) *re* Diphtheria	June 29th-30th	August 13th
(8) Silver Islet (unorganized) *re* Diphtheria	August 1st and 2nd	August 13th
(9) Silver Islet (unorganized) *re* Diphtheria	August 5th and 8th	August 13th
(10) Lybster Township (unorganized) *re* Scarlet Fever	August 14th	August 15th
(11) Lybster Township (unorganized) *re* Scarlet Fever	September 7th	September 18th
(12) Dorion (unorganized) *re* Measles	September 25th	October 11th
(13) Macdiarmid (unorganized) *re* Scarlet Fever	September 27th	October 11th
(14) Rossport (unorganized) *re* Typhoid Fever	October 5th	October 11th October 18th November 10th
(15) Lybster Township (unorganized) *re* suspect Measles	October 26th	October 30th
(16) Kenora Town *re* Smallpox	November 20th-23rd	November 24th
(17) Dryden Town *re* Smallpox	December 7th-8th	December 14th
(18) Kenora Town *re* Smallpox	December 10th-13th	December 15th
(19) Keewatin Town *re* prevention Smallpox	December 12th	December 15th
(20) Smallpox case in Fort William	December 14th	January 3rd, 1924
(21) Smallpox case in Fort William	December 21st	January 3rd, 1924
(22) Kenora Town *re* Smallpox	December 21st-23rd	January 3rd, 1924
(23) Ignace *re* prevention Smallpox	December 23rd	January 4th, 1924
(24) Kashabowie (unorganized) *re* removal Tuberculosis patient to Sanatorium (indigent patient)	December 30th-31st	January 2nd, 1924
(25) Fort Frances *re* removal two indigent Tuberculosis patients to Sanatorium; and *re* Smallpox in Shelvin-Clarke Company Camps south of Flanders (unorganized)	December 30th-31st	January 2nd, 1924 January 4th, 1924

Many of the visits listed above were made to deal directly with communicable diseases occurring in territory without municipal organization. Until adequate local health machinery is created in territory without municipal organization—or at least in the unorganized agricultural townships thrown open for settlement—the direct control from this office over communicable

diseases occurring in territory without municipal organization will of necessity be more or less incomplete. However, I have endeavoured during the year to see that the Regulations have been complied with whenever information has reached this office of communicable diseases occurring in the above-mentioned unorganized territory.

An outbreak of smallpox occurred during November and December in the Town of Kenora; and I found it necessary to make three visits to Kenora in connection with this outbreak. Section 12 of the Vaccination Act was brought into force by proclamation dated November 21st, 1923, issued by the mayor of Kenora. I also visited the municipalities of Keewatin, Dryden and Ignace in an endeavour to prevent the spread of smallpox infection; and at the time of writing it is hoped that the further spread of the disease has been prevented. I would say that Dr. A. D. Ferguson, M.O.H., Kenora, took every possible action to limit the spread of smallpox in the town, and the citizens of Kenora may be thankful for the efficient services rendered by their local medical officer of health. As long as the Vaccination Act remains upon the statute books of this Province, municipal authorities possess a weapon of defence that may be utilized even in the *absence* of smallpox; and will go far towards preventing outbreaks such as has recently occurred in Kenora. It is encouraging to note the smallpox prevention work done during the year by Dr. C. N. Laurie, M.O.H., Port Arthur, Dr. R. A. Caldwell, M.O.H., Gillies Township, and Dr. E. C. Arseneau, M.O.H., Conmee Township. I understand that during the spring of 1923 Dr. Laurie successfully vaccinated more than 2,000 children in the City of Port Arthur. Dr. Arseneau made a special trip into the Township of Conmee for the purpose of vaccinating the school children; and Dr. Caldwell made a similar trip into the Township of Gillies. All this was done in the *absence* of smallpox in the three municipalities.

Regarding the prevention of diphtheria, Dr. R. M. Boyd, M.O.H., Fort William, has been endeavouring to use the toxin-antitoxin mixture; and I understand that he has already given the complete series of toxin-antitoxin inoculations to approximately 250 Fort William children. Although the child population of Fort William is said to be between two and three thousand, Dr. Boyd's work is a good beginning at an attempt to utilize all our resources in an endeavour to prevent the occurrence of a preventable disease.

Isolated outbreaks of typhoid fever occurred at various points during the year. The total of cases reported from Fort William is due to the fact that a number of patients came from steamboats plying the Great Lakes; and other patients were brought into the city for treatment. During the month of October I visited the unorganized village of Rossport in an endeavour to trace the source of infection of two cases of typhoid fever occurring at that place. The infection could not be definitely traced to the water or milk supplies; and the most probable explanation is that the infection was contracted from a "carrier." Earlier in this report I have mentioned the necessity for closer supervision over uncovered manure heaps, garbage piles and outside privies; and the conditions observed in many communities are sufficient to warrant the supposition that sporadic outbreaks of typhoid fever during the late summer and early fall may be due to "fly-infection" from unsanitary outside privies used by typhoid "carriers."

During the spring and early summer I visited the railway construction camps (operated by Foley Bros. & Hervey) on the "Long Lac-Nakina Cut-off" in an effort to institute a system of anti-typhoid inoculation of all men applying for work at the camps. This company's officials and contracting physicians endeavouring to carry out the plan; and I was given to understand that between

two and three hundred employees received the anti-typhoid inoculations. It is impossible to state definitely that this measure had any appreciable effect in preventing the occurrence of typhoid fever in the camps on the Long Lac-Nakina Cut-off, as Mr. W. C. Millar, Provincial Sanitary Inspector, maintained strict supervision; and the standard of sanitation in these camps was very good. However, the season passed without an outbreak of typhoid fever on the Long Lac-Nakina Cut-off—with the exception of two or three cases who probably contracted their infection before coming to the camps.

The incidence of scarlet fever and measles in the district was not alarming during the year.

The need of a sanatorium in District No. 7 for cases of tuberculosis has been recently emphasized by the sending of three indigent patients to the Toronto Free Hospital for Consumptives. The three patients came from territory without municipal organization; and the expenses of their removal and maintenance are a charge upon the Department. Miss E. Corbman, Provincial District Health Nurse, had charge of the patients during their removal to the Sanatorium.

Provincial Sanitary Inspector

Mr. W. C. Millar, Provincial Sanitary Inspector, has at all times co-operated with me in sanitary work in the municipalities visited during the year. I also accompanied Mr. Millar during some of his inspections of summer resorts in territory without municipal organization. Mr. Millar's annual report for 1923 indicates the extent of his work in connection with the sanitary supervision over the unorganized areas in District No. 7. Sanitary supervision over territory without municipal organization is an important feature of the public health work in the district.

Public Health Nursing

During the year Miss Carr Harris, Provincial District Health Nurse,—assisted by Provincial Public Health Nurses: Miss Riddle, Miss Murphy and Miss Douglas—continued the work instituted last season in the "outlying" areas of that part of District No. 7 assigned to Miss Carr Harris. The result of this year's endeavour to give a minimum service of one yearly visit to each family in the "outlying" areas is well shown in the report submitted by Miss Carr Harris. Miss E. Corbman, Provincial District Health Nurse, carried on her work most efficiently in her division of the district which presents its peculiar problems and difficulties.

Provincial Branch Laboratory

The 1923 annual report submitted by Dr. N. O. Thomas, Director of the Provincial Board of Health Branch Laboratory in Fort William, indicates the importance of the laboratory in the public health work throughout the district.

Inspections by Director, Sanitary Engineering Division

On July 7th I accompanied Mr. F. A. Dallyn, Director of the Provincial Board's Sanitary Engineering Division, during his inspection of the Fort William "Coal Dock Area"; also during his inspection at the Provincial Industrial Farm in the municipality of Neebing. On July 8th I accompanied Mr. Dallyn during his inspection of the chlorination plant at the Port Arthur Waterworks

Pumping Station. Mr. Dallyn then proceeded to Sioux Lookout for the purpose of inspecting the Canadian National Railway's water supply and sewage disposal systems in that town; and I understand that a similar inspection was made at Nakina. On July 13th I accompanied Mr. E. W. Johnston, sanitary engineer, during his inspection of the Canadian National Railway's water supply and sewage disposal systems at Atikokan; and Mr. Johnston then proceeded to Redditt for the purpose of making a similar inspection.

Inspections of the Fort William "Coal Dock Area" and above-mentioned Canadian National Railways' water supply and sewage disposal systems by technical experts from the Division of Sanitary Engineering have been greatly appreciated by me as district officer. It is my opinion that action should be taken by the Provincial Board of Health to require the Canadian National Railways to obtain a water supply at Sioux Lookout that is at all times free from pollution, or else to instal an efficient chlorination plant in connection with their present water supply in that town. There is also a crying need for proper sewerage facilities in the Fort William "Coal Dock Area" so as to eliminate the present system of outside closets in a thickly inhabitated area. I would recommend that the Division of Sanitary Engineering be instructed to send a field party into District No. 7 during the season of 1924 for the purpose of making a sanitary survey of the municipality of Nipigon in the district of Thunder Bay, and the municipality of Ignace in the district of Kenora, as the water supplies in each of the above-named municipalities should be inspected by expert sanitary engineers.

I have the honour to be, Sir,
Your obedient servant,

G. L. SPARKS,
District Officer of Health, District No. 7.

ANNUAL REPORT FOR 1923 OF DISTRICT No. 8

Sault Ste. Marie, Ont., January 7th, 1924.

To the Provincial Board of Health, Ontario:

Sir,—

I beg to submit for your consideration the following report of public health activities in this district for the year 1923.

Owing to the fact that there is no unit of municipal or government organization corresponding to a health district in Northern Ontario, it is not possible to present a statement of vital statistics for the year which might be used to indicate the sickness or morality incidence for comparison with previous years or for comparison with other similar areas. The only figures available are those of reported cases of communicable disease requiring weekly returns from each municipality. These figures are only approximately correct even though each year indicates more careful attention from the responsible officers of the local boards of health and valuable assistance, voluntarily given, by physicians in reporting and supervising cases which come to their attention in unorganized places having no local health officer. A number of physicians in Northern Ontario have been willing to accept, without remuneration, appointments as medical officer of health for unorganized townships. Very valuable service has been rendered in this way.

The figures for communicable disease in District No. 8 as shown below are valuable in indicating the absence of any serious epidemic during the year 1923. The cases reported have been distributed over the whole of the large area of the district and the satisfactory control has been made possible by the regular assistance and co-operation of the physicians. Compared with previous years the following figures indicated about 30 per cent. decrease even though the reports have been more complete. These show a very decided improvement in nearly every instance.

Disease	Cases	Deaths
Cerebro-Spinal Meningitis	3	1
Chickenpox	31	0
Diphtheria	63	3
Measles	40	0
Scarlet Fever	53	1
Smallpox	2	0
Tuberculosis	10	4
Typhoid Fever	12	0
Whooping Cough	5	3

For several months the provincial laboratories have been forwarding copies of all positive reports on diagnosis of communicable disease, direct to the district officer of health. I very much appreciate this service and have found it valuable in bringing early information where previously reports would not have been received soon enough to allow of early precautions being taken. They have also been valuable in providing another means of checking cases which should be reported weekly by the local board of health.

During the year special attention has been required for investigation of communicable disease throughout the district as follows:

Typhoid Fever at Sandlake, Hearst, Little Current, Tehkummah, Manitowaning and Levack.

Scarlet Fever at Cutler, Biscotasing, Massey, Walford.

Suspected Smallpox in Serpent River Indian Reserve.

Diphtheria at St. Joseph's Island, Creighton Mines, Worthington.

Tuberculosis at Michipicoten, Goulais Bay and Espanola. These were cases in unorganized districts which required investigations and two were given government assistance in securing sanitorium treatment.

Venereal Disease Control

During the past year we have been able to make some progress through propaganda and educational work on this subject. A treatment clinic was opened in Sault Ste. Marie for treatment of cases from the city and surrounding territory. Arrangements for the opening of this clinic had been delayed on account of difficulty in securing a suitable location until Dr. Graham, Director of the Provincial Laboratory, volunteered to provide space in the laboratory building at considerable inconvenience to himself and his work. He also took charge of the treatment and Miss Way accepted appointment as clinic nurse. Since the opening of the clinic excellent work has been done in providing treatment for many unable to pay for it in the usual way.

In connection with educational propaganda, a very successful public meeting was held on the occasion of a visit from Mrs. Pankhurst and her party during their motor trip to New Ontario. On this occasion a local branch of the Social Welfare Council was organized.

There is still a very difficult situation to be met in control of venereal disease in unorganized territory. Each season, large numbers of men come through employment bureaus in eastern cities to the lumber camps in the north. Many of these are chronic venereal cases and others are infected shortly before leaving the larger centres for the woods and become acute cases requiring treatment after arriving in camp. They are also the means of spreading infection at the towns along the line where they leave the railway to go back into the camps. When requiring treatment they are usually without funds and consequently try to get along without treatment or else come out to the towns on the line or railway. Frequently they are not within reach of a clinic even then, and the local physicians are obliged to treat them without remuneration. The situation is partly met by the Provincial Board of Health lending outfits, and supplying medicines for treatment to local medical officers of health. This service would be very much more valuable if a nominal fee were available for payment to physicians treating cases from unorganized territory when the patients are unable to meet the expense. This would also apply to cases that require further treatment after discharge from government institutions.

In the endeavour to carry out the regulations of the Provincial Board, difficulty is frequently encountered in connection with Indian reserves. In a general epidemic of any acute contagious disease it is possible to have the whole reserve under quarantine if required, but the difficulty arises with tuberculosis and venereal disease which are so prevalent among these people. There is no means for providing preventive measures or for carrying on general treatment. They are employed mostly in mills and camps and increase the difficulty of control of these two conditions particularly.

Efforts have so far failed to secure general co-operation of physicians and local medical officers in reporting the number of venereal disease cases coming under their care. With the better facilities for treatment available it may be less difficult to show the need for systematic reporting of cases and control of those cases where treatment is discontinued before completion.

During the year, cases reported as requiring treatment were investigated at the following points: Blind River, Thessalon, Cutler, Espanola, White Fish Falls, Korah Township, Dean Lake, Iron Bridge and Tarentorus.

Public Health Nursing

During the year, Public Health Nursing, Maternal and Child Welfare, Industrial Nursing and School Nursing service has been demonstrated by Miss Grenville at the following places in Southern Algoma and Sudbury: Bruce Mines, the rural municipalities of Plummer, and Plummer additional, Iron Bridge, Parkinson, Thompson, Spragge, Cutler, Massey, Espanola and Thessalon.

In connection with this nursing service school clinics were held at each school fair throughout the district of Algoma. By the joint co-operation of the Provincial Board of Health Nurse, the Department of Agriculture representative and the district officer of health, it was possible to attend nine school fairs, representing forty-five schools and some twelve hundred pupils. This was probably one of the best opportunities we have had for health education propaganda, and it was satisfactory to note that after these demonstrations inquiries were made by teachers for literature and information for further use with their classes.

The number of places reached by the nursing service during the year has been much less than was planned for, owing to the fact that only one nurse has been available for the whole field. Two nurses were previously assigned to District No. 8 but since Miss Bagshaw resigned in April, 1922, no appointment has been made to fill the vacancy. The need for a more extensive demonstration service is very urgent. Points where demonstrations already have been made should now be reached a second time. It is over three years since this programme was started and many places have not yet been reached for the first time. As an example of the need for maternal and child welfare education, it was found in one divisional registration area, that in one year there were reported six births and seven deaths under one year of age, and the people were unaware that there was anything to be alarmed about. This is, of course, an unusual and extreme case. It is encouraging on the other hand to note that in the town of Blind River, where a Public Health Nurse was employed, the infant mortality rate was decidedly reduced during the first year of the service.

Industrial Hygiene

In the town of Espanola and surrounding unorganized townships a general public health programme has been carried out by the Spanish River Pulp and Paper Company with assistance from the Provincial Board of Health. There is now established an excellent health service which includes an industrial nurse, a public health nurse, who also does maternal and child welfare and school nursing. A School Dental Clinic provides free dental treatment for all school children. These various branches co-operate with the company physician and the labour supervisor of the plant.

Very early in this demonstration, some valuable and interesting statistics were secured to show how labour turnover could be reduced through prevention of sickness among employees and their families.

Espanola was particularly fortunate in securing two most efficient nurses. Miss McLeod had formerly been on the staff of the City of Toronto Board of Health, and Mrs. Oliver was Provincial Board of Health Nurse in District No. 7 when the service was first inaugurated in Ontario.

Summer Camps

An endeavour has been made during the summer to inspect the tourist camps throughout the district and visits were made to the following places: Bruce Mines, Thessalon, Algoma Mills, Richard's Landing, Hilton Beach, Pine Island, McGregor Bay, Campement D'Ours, Kensington, Island Lake, Point Aux Pins and Killarney. Sanitary conditions at these camps are mostly satisfactory. The most frequent cause of pollution of water supplies is boat traffic on the St. Mary's River and larger lakes and the discharge of sewage by cities and towns on the main waterways. In international waters this difficulty at present is not possible to control. Hotels providing accommodation for summer visitors are improving where it is possible to give proper sanitary supervision.

Milk Supplies

Dairies have been inspected in company with local health officer of Sault Ste. Marie and Espanola. Improvement is usually noted but in some cases no effort is made to improve conditions until the dairyman is forbidden to sell milk. Improvement is then usually rapid, and the effect is not limited to the one individual.

Early in the year the municipal council of Sault Ste. Marie decided to ask for the assistance of the Federal Department of Agriculture for tuberculosis testing of all herds supplying milk to the city. Unfortunately the regulations relating to this service were being altered by the Department and the work is deferred until a new policy is presented. In the meantime the local Board of Health of the city continues to stress the need for general pasteurization.

Sanitation

Inspections were made in connection with complaints regarding sanitary conditions or assistance given on request to municipalities throughout the district, among them the following:

Hearst.—Garbage disposal, water supply and dairy inspection.
Goudreau.—Contamination of lake from which drinking water was taken.
Goulais Bay—School sanitation and water supply.
Thessalon—Slaughter houses.
Levack—Water and milk supplies.
Richard's Landing—Public school sanitation.
Desbarats.—Slaughter house location, and hotel sewage disposal.

During the month of May, Mr. R. B. McCauley assumed the duties of Provincial Sanitary Inspector for the area corresponding to District No. 8, which may be reached from the Soo branch of the C.P.R. and the Algoma Central Railway. I wish to express my appreciation of Mr. McCauley's assistance on all occasions when our work called for co-operation.

Public Health Education

Advantage has been taken of frequent opportunities for public health education by means of talks on health subjects. Included in the list are municipal councils, school boards, public schools, boys' and girls' organizations, city community centre, summer camps, Rotary, men's civic club, women's institute meetings and farmers' club.

The Sault Ste. Marie Engineering Society very much appreciated an address given by Mr. Dallyn on "Sanitary Engineering."

By means of health films it was possible to reach a large number of people, and during the past winter arrangements were made for showing pictures weekly at three different points in the vicinity of Sault Ste. Marie, having the use of a picture machine loaned by the Provincial Boys' Work Board of the city. Films were also provided by the Provincial Board of Health for showing at school fairs in the district of Algoma.

The prompt action of the Government in providing for distribution of Insulin through the branch laboratories has been thoroughly appreciated by the public. This service has been so definite and the immediate value so obvious, that it has stimulated interest in other branches of health activities as well and consequently made it less difficult to interest the public in securing general health information.

In conclusion, I want to refer to Dr. Spark's reports of 1921 and 1922, where he states the physical impossibility of one officer being able to cover the very large territory assigned in New Ontario. The use of a motor car assists very much in this district, but there are very extensive areas which can only be reached by train or boat. In order to reach these outlying places long distances must be travelled, and the district officer, having to assume also the duties of a municipal health officer, is only able to touch superficially the requirements of his district. I am convinced that a district officer of health cannot properly attend to the necessary work in a district much larger than an average provincial judicial district, and that a health administration unit comprised of a medical officer of health, two public health nurses and one sanitary inspector in each judicial district of New Ontario, might be able to provide a fairly satisfactory public health service.

I have appreciated throughout the year the assistance which has been extended from every division of the Provincial Board. Personal visits to the district by the executive officers from the various divisions has provided first-hand information regarding our local conditions and requirements.

I have the honour to be, Sir,

Your obedient servant,

H. W. Johnston,

District Officer of Health, District No. 8.

REPORT OF CHIEF SANITARY INSPECTOR

January 18th, 1924.

To the Provincial Board of Health, Ontario.

Gentlemen,—

I have the honour to submit for your consideration my seventh annual report showing work performed by your sanitary inspectors, together with such conclusions as may have been formed, during the year 1923.

It is perhaps proper to mention at the outset the nature of work to be performed and the responsibility carried by your group of inspectors in order that there be no overlapping with the work of other divisions.

The work carried on by your inspectors is chiefly among the industries of Northern Ontario and may be cited as elementary industrial hygiene.

These industries comprise lumbering, mining, construction, saw milling and paper-making. Other public health work is, of course, undertaken among the small towns and villages. We recognize, however, as our special responsibility, the care of the industries mentioned above.

The success which has attended our efforts and which has increased from year to year, still continues. Our services are sought eagerly by the contract physician, the employer and the employee alike. Industry seems to have awakened to a new sense of responsibility for we find competitive rivalry making its appearance particularly in camp building. I have had requests during the year for information concerning electric lighting systems to replace the oil lamp, and for some cheap chemical closet to replace the oftentimes unsanitary outdoor privy. These I contend are hopeful signs and should be fostered.

I contend it is not only the environment of the labourer in these camps which requires to be supervised, and protection increased for this or that particular industry, but that only by the painstaking supervision which is being provided against the pollution of our great rivers at their source, are epidemics of typhoid and dysentery headed off in towns and cities drawing their supply of water from the lower reaches of these same rivers. This one factor, aside from all other matters undertaken, is sufficient justification for the existence of your group of inspectors.

It is with regret I mention the death of our director, Dr. R. W. Bell, who passed away on June 8th last, having been in poor health for a considerable time.

Dr. Bell was regarded as the pioneer officer among the industries which we are discussing, and is frequently spoken of by captains of industry as a man who had a peculiar aptitude for undertaking the problems presented, and appreciated the difficulties which surround the pioneer. Perhaps the greatest service was in controlling outbreaks of smallpox so very prevalent ten years ago, particularly among lumber camps. I find many physicians scattered over the province and practising industrial medicine, who have many kind words to say regarding the doctor, and who claim the assistance and advice given them in connection with this disease have been of great lasting benefit.

We, the staff of inspectors, over whom he presided, recognize the loss of a friend who was ever patient, and willing to help us.

During the year steady progress has been made with no particular outstanding feature save the typhoid epidemic at Smooth Rock Falls, and which will be dealt with under the head of communicable diseases. Since the death

of Dr. R. W. Bell the inspectors have now been included in the Division of Industrial Hygiene of which Dr. J. G. Cunningham is the director. This change I believe to be justified, as it brings all public health industrial interests within one group, and therefore, prevents overlapping.

The work carried on by the division and that of your inspectors should link together admirably, the force of inspectors carrying on and improving sanitary conditions, making needed improvement in housing and living conditions and with the assistance of the contract physician (if present) dealing with such communicable diseases as may arise.

All of these matters dealt with, however, and which include the care of water supplies, the outside conveniences, ventilation of buildings, the milk supply, living accommodation, together with the food supplied and the collection and disposal of garbage, might be regarded as basic public health endeavour, and while considerable success has attended our efforts in standardizing these very important matters, yet there are other problems to be dealt with which, if solved, in whole or in part, would be welcomed gratefully by industry—for example, the labour turnover in logging camps is said to be almost 20 per cent. This may be due to a number of reasons, some of which when due study of the question is made, may be found curable. Lost time from sickness should have some attention and some attempt made at reduction. A careful study should be made to determine the extent of occupational disease and some determined effort made to reduce our very considerable losses from dysentery during the fall months. These matters should have the attention of the division and provide ample opportunity for profitable study.

Information supplied through the various Crown timber agents and by employers of labour, show a total of 172 lumbering companies in operation. These control together with the jobber and sub-jobber 751 camps and provide employment for 28,595 men.

In addition we have:—

50 mining companies with 2,700 men.
4 paper mills with 2,775 men.
55 sawmills with 3,657 men.
18 construction companies with 5,550 men and 82 camps.
26 road camps with 875 men.
2 fishing companies with 175 men.

We have, therefore, a grand total of 243 companies, operating 960 camps and employing 44,327 men.

These industries, together with the small villages, which as a rule spring up near by, and for which a direct responsibility is carried, and with the addition of our northern summer resorts, comprise approximately 100,000 people.

Of the companies mentioned above, 217 have contracted with a qualified physician in the manner provided by our regulations.

These physicians who visit the camps or works monthly as a routine, I find have made 414 inspections and have forwarded 414 reports to the Board, and have also provided 252 sketches of camp sites. It is to be understood these monthly reports sometimes embrace the examination of as many as 30 camps being operated by one company, in connection with which 1,000 men may be seen.

It should be noted that statistics herein shown cover a period from May 1st, 1923, to December 31st. Therefore, as the lumbering industry is a winter

operation and the present season does not expire until May, 1924, complete statistics will not be available until that date.

Your inspectors have made 482 camp inspections during the year, and in addition have visited 79 small towns and villages giving the district officer in each instance whatever assistance was necessary. Thus we have a grand total of visits made by contract physicians added to those of your inspectorate of 965 for the year.

In the total number of visits made your inspectors are well over the total visits made last year even with full consideration of the fact that 75 per cent. of my time is taken up with office duties here.

The total number of visits made by physicians are slightly greater than that of last year. The quality of monthly statements from these physicians has, however, increased very materially and signs are not wanting to prove that the advent of younger men who have a liking as well as a suitable physique for such strenuous work, will bring the solution we seek.

Communicable Diseases

Our case record for communicable diseases would appear to be much higher than that of last year. However, after reviewing the facts I find that aside from the serious epidemic of typhoid fever which occurred in the town of Smooth Rock Falls early in the year and in the bush camps near by, our record of last year has been easily surpassed.

The following diseases occurred in the camps and in one of our industrial centres:—

	Cases	Deaths
Typhoid Fever	53	4
Smallpox	5	0
Scarlet Fever	9	0
Diphtheria	3	0
Chickenpox	4	0
Totals	74	4

Thirty-one of the fifty-three cases of typhoid occurred in connection with the operation of the Mattagami Pulp and Paper Mills at Smooth Rock Falls, the cases being divided equally between the mill town and the woods camps up stream. Thorough investigation of the outbreak proved as far as is possible the town of Timmins to be the cause thereof. Previous to the outbreak at Smooth Rock Falls the disease was prevalent in Timmins and along the Mattagami River below the town. It is believed that as the disposal plant was not at this time functioning properly, untreated discharges from typhoid cases gained entrance to the river and the disease developed among the camps and at Smooth Rock Falls as a consequence. Effective chlorination of the water supply together with the liberal use of vaccine, quickly brought relief. In the meantime some thousands of dollars were lost to this company through no fault of its own.

Among the camps of the Abitibi Power and Paper Company we had eleven cases. Most of these, however, occurred in men within two weeks after employment, proving that they had been infected before coming to the neighbourhood and occurred during fall. When the camps congregate such cases are difficult to trace and do not present any particular problem. The balance of the cases occurred sporadically and did not develop beyond the initial case.

One of our chief sources of worry in connection with temporary camps, is the prevalence of dysentery during August, September and the early part of October (recognized as our fly months). Reference to the reports of industrial physicians during this period invariably show, that while the camps or works are apparently in reasonable sanitary condition, yet diarrhœa and dysentery are causing considerable sickness and therefore a great deal of lost time.

The physician in his report, places the reason for these epidemics on a number of causes. Some imagine that meat has been served which is partially spoiled. Others speak of some strong soap being used for dish washing purposes, and the utensils being left to dry, considerable soap adheres to the plates, etc. The water supply is also frequently blamed for the trouble. Considerable thought has been given this question and a great many investigations made and while in some few instances the water supply we believe has been the source of infection, we find that in the majority of cases it is a question of too many flies.

These flies, of course, breed in the heap of horse manure usually to be found outside the stable—visit the public closet which is oftentimes little better than a shelter, in the middle of the day when the sun is warm, and in the evening when the fall nights begin to get chilly, invade the cook-house and dining-room attracted by the heat and the smell of cooking food, depositing fecal matter, which they have carried in with them, upon the evening meal set out upon the table. I am convinced most of our dysentery and a proportion of our sporadic outbreaks of typhoid arise from this source.

Your inspectors have, of course, been discussing this matter with industry for some years, but with varying success. The management seem to have contented themselves with the purchase of reams of tanglefoot and almost every chemical and insect powder obtainable to exterminate the fly, but only after gaining access to the buildings, no thought being given to destroying the breeding places or to the removal of manure at stated intervals. To deal with the question, in a more practical way, we have changed our tactics somewhat, and now demonstrate to the management on every possible occasion as near as possible just what happens. This is not difficult, as fly larvae and pupae are easily noted in millions by reference to almost any heap of manure. After finding the breeding places we now visit the open closet also swarming with flies—then proceed to the unscreened kitchen, with the same result.

I am reasonably sure this procedure will, to a great extent, eliminate much of these annoying and dangerous attacks of both diarrhoea and dysentery and should reduce much of the present preventable lost time.

Since my removal to Toronto and with the burden of carrying on office duties in connection with the group, my activities in the field are, of course, lessened. This, to some extent, will reflect upon the total inspections made annually. However, I find to administer the office and do justice to the correspondence, which is enormous, as well as to keep the necessary statistics, seventy-five per cent. of my time is taken up with office work.

And while I can usually find time to visit some of the fields near by, I cannot visit all the divisions oftener than twice each year. However, this would seem to be sufficient. I have called attention a number of times to the Division of Cochrane. This is presided over by our Mr. Richardson who is resident at North Bay. The Cochrane area, as has been amply proved by statistics, requires a great deal more attention than it is receiving. It is my opinion that if possible the Board must place a resident inspector there. Fifty per cent. of our time is lost travelling to and from the work at present. Moreover it is sometimes necessary to make quick visits when outbreaks occur.

It is also necessary that industry visit the office (if near by) and consult with your officials on many matters before spending money, often in the wrong direction. We have had many instances of such happenings during the last two years. It is not my desire to unduly hasten this adjustment, but rather as your presiding inspector to point out the weakness of our present arrangement and to provide a remedy.

Through each of your inspectors' reports may be found the spirit of co-operation and good fellowship. All are convinced that excellent progress is being made and that the Regulations which govern are sufficient for our present needs at least.

It is true we have had complaints during the year, some of which were quite justifiable. Others might be regarded as petty spite after being dismissed from service. The receiving of complaints might easily be regarded as a desire on the part of the individual for something better—something which we have long tried to foster in the minds of the shantymen.

In conclusion let me again say the old unsanitary industrial camp is rapidly passing and that this should have been accomplished with the co-operation of industry, is commendable. The absence of sickness or other labour troubles in connection with these great Northern industries is a tribute to both capital and labour alike.

Many such cordial relations continue. Much of our success is due to the increased interest of the contract physician who at times has his patience severely tried. I also wish to thank each of your divisional inspectors for the pains-taking manner in which he has discharged his many duties during the year, and in concluding would say the interest shown by the Board through our chief officer leaves nothing to be desired.

ALEX R. WHITE,
Chief Sanitary Inspector.

SANITARY INSPECTOR'S REPORT

Fort William, Ontario,
December 31st, 1923.

To the Provincial Board of Health, Toronto, Ont.

Gentlemen:

I have the honour to submit for your consideration my annual report for the year ending December 31st, 1923, as Sanitary Inspector of unorganized territory in District No. 7.

With the various industrial operations, summer resorts and towns in unorganized territory in this district stretching over seventeen railroad divisions, it has been impossible for me to inspect every summer resort, camp and town. Points where unsanitary conditions prevailed being visited first, the balance of my time being taken up on routine inspections.

I have endeavoured to have your regulations complied with by advising those responsible for same, showing them where it was to their own advantage to do so. At no time in the past year have I had the necessity to call on the assistance of the law.

The following is a list of summer resorts, unorganized towns and operations in District No. 7, where labour is engaged, with a report of my work on same.—

15	Summer Resorts, with a four-month population of	5,000
10	Provincial Government Road Camps, employing, for five months	275
7	Construction companies with 28 camps, employing, for nine months	2,000
18	Right-of-way gangs on the Grand Trunk, Canadian National, Canadian Pacific, Trans-Continental and Port Arthur and Duluth Railways, employing for five months	1,000
7	Towns in unorganized territory, with a population of	1,100
26	Gold and silver mines, employing for nine months	500
2	Fishing stations, employing for six months	175
5	Saw mills, employing for five months	350
12	River drivers' camps, employing for five months	250
44	Lumber companies with 144 camps, employing for five months	6,600

Summer Resorts.

Owing to the unusual length of the warm weather which prevailed in this district in 1923, the summer resorts were visited by twenty-five per cent. more people than usual. Conditions in most of these were good, the exception being in the camping grounds on the shore of Lake Superior, east of Port Arthur. Out of the seven summer resorts there, only two were found reasonably sanitary. The others were filthy and a grave danger to the health of those who visited them. Owing to the fact that the campers were squatters on property owned by people in distant parts, great difficulty was found in enforcing your regulations. I was accompanied on those inspections by our Dr. Sparks, D.H.O., and the M.H.O. of the township in which the camps were built. We met the local Board of Health for this township and laid the whole matter before them, the result being that a plan to overcome the above conditions was devised, namely: the township to charge each camper a nominal fee for rent, this fee to go to pay the services of a sanitary policeman and scavenger during the months the particular five summer camps are being used.

Chippewa Park.—This park is owned by the City of Fort William and is patronized by most of the people of the twin cities as well as American tourists. Conditions are now of the best, sanitary latrines having been installed and good wells dug, which give a plentiful supply of pure water.

Silver Islet.—Sanitary conditions at this resort show a slight improvement. The hotel, which is run on a community style, is, in my opinion, a danger point, as with about six families all cooking and dining in the same combined kitchen and dining room, disease is readily spread. This was shown by the epidemic of diphtheria which developed amongst the children at this hotel this past summer. Sanitary conveniences have not yet been installed at this hotel, although I have endeavoured by talking with and writing to the tenant to have same installed. I intend next season to take other means.

Fort Frances Summer Resort.—This resort was closing down when I made my inspection. It is a new resort built on the Rainy River, two miles east of the town. I found that a mile above the point where the water supply is taken, the sewage of the Indian school was emptied, with the additional danger from the American town of Renier across the river. I have made the necessary recommendation, which I shall see carried out next season.

Canadian Pacific Railway Camps at Nipigon and Lake of the Woods.

These camps were built this past summer. Everything in connection with them was of the best with the exception of the sewage disposal which was intended to empty into the Nipigon River and Lake of the Woods without being treated. As both camps are built in a district where a great many private summer homes are, the danger to their occupants was obvious. Septic tanks and disposal areas were installed in both cases when the matter was pointed out to those in charge of the erection of the camps.

Canadian National Summer Resort, Minaki Inn.

With the development of the pulp and paper industry at the Town of Kenora and the natural increase of its population from same, the water supply for this hotel is in great danger, as are also the hundreds of private summer homes built on the English River, from the raw sewage which empties into the river. This matter is being taken up by Dr. Sparks, D.H.O. and myself and the Division of Sanitary Engineering. Our Mr. White, Chief Sanitary Inspector, accompanied me on my inspection of the above resort.

All other summer resorts in this district show a steady improvement in their sanitary conditions.

Provincial Government Road Camps.

The Provincial Government road camps in the Thunder Bay District are in the same first-class condition as reported in my 1922 report, but very little improvement is noticeable in the Dryden and Kenora districts. In the latter district in particular, the camps were found in a filthy and dilapidated condition. I was under the necessity on the occasion of my inspection there, of having to notify the Department responsible that I would have to shut down their camps should conditions not be changed. Mr. Sinton, of the Northern Development Company, has since that date visited this district and made many necessary changes, and I expect that in the future, conditions will be good all over the Government road camps.

Railroad Construction Camps.

This has been a busy year in this district in railroad construction work with the National Railroad's new cut-off at Long Lac and Rowan being put through.

The Long Lac cut-off had on an average of 1,000 men for nine months in their 17 camps. This contract was done by the Foley, Lock and Harvey Company of Minneapolis. I had a meeting with the Superintendents of this firm before operations began and laid out their camps, water supplies and the necessary sanitary conveniences. Dr. Sparks, D.H.O., accompanied me twice to Long Lac, at one time going over the 17 camps. He initiated a system of inoculation against typhoid fever, with the resident physician, Dr. Eyman, of all men as they entered the camp. This very necessary precaution was particularly needed at Long Lac in view of the Cochrane typhoid epidemic then raging three divisions farther down the line.

I gave the company a sketch of a latrine which I have found most suitable for summer construction work. This class of latrine was installed all along the line. It is to the above preventive means taken on this construction work, along with the great co-operation given your Department by the contractor's staff that I credit the fact that the whole operation was put through without one case of typhoid fever developing amongst any of the workmen.

I am attaching a copy of the above-mentioned latrine which I would recommend be taken as a standard for latrines on summer operations. The use of this class of latrine would go a long way to checking the fly-borne sporadic cases of typhoid fever which crop up every summer.

Right-of-Way Railroad Gangs.

I spent considerable time supervising right-of-way gangs in the past summer. Owing to the temporary nature of their work, they were hard to keep check upon, but with the list of foremen and their gangs which were supplied to me by the railroad companies, I had considerable success, particularly in educating the different foremen to the fact that they could be held personally responsible for the complying with of your regulations.

Only one case of typhoid fever developed amongst this class of work. This occured in the camp of a foreman who had been warned the month before of the danger of not installing a latrine for his men. The latrine already mentioned in my report would be an ideal one for "extra gang" work and has been favourably commented upon by one of the National Railroad Superintendents who has promised to have same supplied next season. I would strongly recommend that Section No. 2 of the Regulations be enforced on all railroad extra gang work.

Towns in Unorganized Territory.

I made an inspection of all towns in unorganized territory, accompanied by Dr. Sparks, D.H.O., in most cases.

At the town of Redditt, where the water supply was being grossly polluted, the necessary recommendations were put in by Dr. Sparks and myself.

Conditions are very poor in most of these towns, the menace of the open privy being always present. It will take considerable time to have these conditions changed.

Mining Camps.

Very little has been done in mining operations in this district other than improvement work. A great many small mines have been opened all over the district. The Lake of the Woods and Schreiber District are expected to have a busy time in the coming year. Five mines of known value are to be developed on a big scale there. I have written the different owners enclosing regulation pamphlets.

Fishing Stations.

The Fishing Stations of McDermid and Rossport are in a fairly good condition, McDermid in particular being good, since the very necessary water supply was installed and the intake pipe lengthened.

Rossport Fishing Station, where two cases of typhoid fever developed this summer, could be improved upon, the drinking of water from out of the bay being highly dangerous. Notices warning the public against this were posted up this summer. The privies at this station are all open to flies and to this source I think can be traced the outbreak of typhoid referred to.

Sawmills.

All sawmills in this district have now been brought up to a good standard and with a certain amount of routine inspection will, I am sure, remain so.

River Drivers' Camps.

As mentioned in my 1922 report, I intended to look into the cause of the yearly outbreak of typhoid fever which has been in the Keewatin Lumber Company's log-driving camps. I had a consultation this spring with the superintendent of the above company and their contracting physician. An examination of the time books of the company showed that one cook in particular had worked in camps where typhoid fever had broken out five times, both in summer and winter. This man had had typhoid fever seven years ago. As he was an old employee of the firm, they were loath to discharge him. I recommended the inoculating of all river-drivers against typhoid fever before going out and this was done. No case developed this season.

Lumber Camps.

The lumber camps in this district show a steady improvement. Owing to the poor quality of the timber stand in some parts of this district, I have used my discretion in enforcing some of the regulations bearing on the camp building as long as the health and comfort of the men were adequately protected. This applied to some parts where old camps were and where this was the last year on the limit. I have had the very best of co-operation from contracting physicians with one exception, the same thing applying to lumber operators, who now look upon your inspector more as a sanitary advisor than inspector.

Twenty-two new camps after "B" class have been built; ten after "C" and ten with a little of each class. The ventilating system which is, in my opinion, one of the best points in the new regulations have been overlooked in most cases. This is the floor part. Next year I intend to enforce this regulation to the letter. Owing to the open nature of the season, this fall, very few camp inspections have been made to date, owing to the dangerous condition of the ice.

Communicable Diseases.

In the past year there has been a considerable increase in communicable diseases in the camps in this district. The following have come under my notice:—

	Cases
Smallpox	
Backus-Brooks Camp, Kenora	10
Shevlin-Clarke Camp, Flanders	2
S. Swanson, Dinorwic	1
Typhoid Fever.	
Laroche Camp, Yonde	1
C.N.R. Extra Gang, Mabella	1
Long Lac Headquarters Camp (from Cochrane)	2
A. Shaw Camp, Glenorchy	1
Scarlet Fever.	
Foley, Lock and Harvey	1

Any matters regarding communicable diseases which have come to my attention have been at once reported to Dr. Sparks, D.H.O., who has in every case given them his immediate attention. In most cases I accompanied him.

Inspections Made.

In the past eleven months, I have made 144 inspections, of lumber camps, construction works, summer resorts, and towns. I have also accompanied Dr. Sparks, D.H.O., on his inspection of Ignace, Dryden, Fort Frances, Emo, Rainy River, and Nipigon.

Plumbing Inspections.

In the past year I made six inspections of the plumbing work and sewage disposal being installed at the Mount Yards Terminal for the National Railways. Those inspections were made at the request of the works superintendent. A first-class system was installed at this terminal. I also inspected the plumbing of the Red Cross Hospital at Dryden. This work was installed in a crude and poor manner and will cause great inconvenience to those in charge of this hospital at some future date. In all public buildings where a Government grant has been given, all sanitary conveniences should, in my opinion, be passed upon by qualified inspectors, this inspection to be made before the piping is covered up.

Dr. Sparks also accompanied me on many of my inspections where certain difficulties had arisen. In my opinion, without the D.H.O.'s co-operation and assistance, the Sanitary Inspector's work, especially in a district as large as this, could not be done justice to.

I have the honour to be,

Sir,

Your obedient servant,

W. C. MILLAR.

Provincial Sanitary Inspector.

Room No. 4, City Hall,
Fort William, Ontario.

SANITARY INSPECTOR'S REPORT.

Sudbury, Ont., January 12th, 1924.

To Provincial Board of Health, Ontario.

Gentlemen:

I have the honour to submit my third annual report for you consideration, for the year 1923.

The year which has just closed has shown an extraordinary reform in industrial operations in the unorganized territory throughout this district. This might be said more especially of the lumbering industry which has steadily increased during the past twelve months. While a considerable portion of my time was chiefly directed to this industry alone, I was compelled to visit the gold, nickel, and feldspar mining camps, along with the several small towns and communities in the unorganized territory during the year.

Lumbering Statistics.

During the past year in this District, which now includes the Parry Sound District Crown Timber Agency, we had 45 different companies operating. From their information sheets forwarded through this office to the Board, and from the monthly reports of their contract physicians, I find we have a total of 237 bush camps operating in the unorganized territory, employing on an average, 32 men in each camp, approximately 7,584 men throughout the lumbering season. Out of the 45 companies operating, 44 have supplied the Board with a copy of their Medical Agreement, conforming to Section No. 2 of the Camp Regulations, and 22 companies have sent in their information sheets conforming to Section No. 1. The latter information was not sent in till such times as each company received a letter from me demanding this information to be sent in to the Board, complying with the law in this respect. While these information sheets sent in by the different companies might have fallen a little short of what your Regulations demand in Section No. 1, there is a vast improvement this season over that of 1922, and I feel assured that these reports from the several companies operating can be brought up to 100 per cent. efficiency during the next year. As it is most important that this information should reach your Board during the early part of the lumbering season, I have made a point where possible, to have the companies forward this information to the Board, along with a copy of their Medical Agreement on the commencement of the season's operations. I am of the opinion that if a definite information sheet or form could be drawn up by the Board with the information required specifically stated thereon, these could be sent out to each company to be completed and returned to the Board on the commencement of operations. The sending out of these forms alone would be considered as a notice and would also place in the hands of the operator just what information is required in detail, leaving no omissions for not complying therewith immediately, this, in my opinion, would eliminate the usual excuse "we have lost the copy of your Regulations." "What information does the Board require?" Throughout this District in the unorganized territory we had a total of 24 mill camps operating from around May 1st up to September 30th, employing approximately 2,000 men during the summer months.

Camp Statistics.

The number of camp inspections made by me during 1923 were 132, which includes lumber, mining, construction, and summer mill camps. The lumber

camps visited were located at such points as Elsas, and along the Kapuskasing and Chapleau Rivers, Argolis, Foleyet, and along the Pishkonagami River, Gogama, Stackpool, Tionaga, Nicholson, Dalton, Biscotasing, Metagama; and in the Chapleau District, Nemegos, Sultan, Devon, Pardee, Balkow; and along the Windermere and Jackpine Rivers, Benny and the pulp camps located on the Onaping Lake, White River, Foote's Bay, Bala, and several other points along the C.N. and C.P. Railways, which are usually known as mileage points. I was also compelled during the early part of the year to spend a considerable portion of my time investigating complaints and routine inspections in the Sault Ste. Marie District, pending the appointment of your Inspector, Mr. R. McCauley, during which time I visited the McFadden and Malloy's camps along the Clear Lake and White River sections, fifty-four miles north of the railway, Dean Lake, also the camps operating in from Nairn, Whitefish, Webbwood, and the Manitoulin Islands. During the month of March I was compelled to visit lumber camps being operated on Fitz William Island by the John Harris Co., without a contract physician. Typhoid fever was apparent at one of these camps, and the patients were allowed to drift throughout the country to their respective homes, etc., without medical attention. I made arrangements with the Company to have Dr. R. W. Shaw, of Manitowaning, appointed contracting physician. With very close co-operation and the doctor's very able assistance by rendering free use of vaccine, the disease apparently was checked. The mining camps visited during the year were at Shiningtree, Creighton, Garson, Nickelton, and Wanapitei, also the Wanapitei Power Company's construction camps, and railway and road improvement camps. Taking on the whole throughout the District I find most of the Lumber Companies have adopted either one of your standard plans when constructing new camps, and I feel assured that most of these operators now realize the benefit derived from your revised Regulations, which illustrates plans and specifications for all operators, small or large. These plans give the operator something to work from, conforming to Health Regulations, eliminating sickness of employees; more efficient work is turned out by the employee, while the operator is conforming to law, and, what is most important to the average operator, a financial economy is derived. Up to the present date I cannot give the exact number of new camps constructed this season, conforming to either of the standard plans, as we are now in the middle of the lumbering season, and there are several companies I have not visited yet. From what companies I have already visited up to date, 37 new camps were constructed, reasonably conforming to Regulations, and exceptionally well constructed over that of past years. Only 3 new camps were constructed which I was compelled to condemn as not conforming to either of your standard plans, and owing to location and construction of the buildings and the condition of the interior, were a menace to the health of employees and the general public. I advised the operators, of which two were contractors and one subcontractor that these camps would have to be closed down immediately and re-constructed to conform to your Regulations.

Re *Contracting Physicians.*

During the past year a total of 49 Medical Agreements were either renewed or drawn up between physicians and operators, copies of same being forwarded through this office to your Board and apparently all conforming to the Regulations. The services rendered to the employee and employer by the average contracting Physician cannot be overestimated by the Board, both from a medical and a sanitary standpoint. Having in view the point of keep-

ing down disease, especially such as typhoid and other epidemics, he is thus curtailing his hospital expenses, and reaping a financial benefit. The co-operation of the contract physician should be highly appraised in his endeavour to improve sanitary and living conditions for employees in bush camps, and I feel assured an earnest endeavour is being put forth to comply to your Regulations under the difficult and hazardous conditions in which some of the monthly visits have to be made. While there are still grounds for improvement in the monthly reports received from the physician under contract there is a very satisfactory improvement over that of last year, both in the number of reports to the Board and the nature of the reports. During the year a total of 114 monthly reports on the different companies were received by me and forwarded to your Board. This does not include the number sent in direct by the physicians under contract throughout the District to your Board. This shows a great improvement over that of past years. Where a company has drawn up a contract with a qualified physician this contract should cover all their contractors' and sub-contractors' camps, more especially when operating in the same district. This, in my opinion, would have a tendency to improve medical and sanitary supervision of these small jobbers' camps, which are so often overlooked, and operating under very unhealthy conditions, it would also curtail a considerable amount of correspondence if the company was held responsible in this respect.

Communicable Diseases.

In the camps in the unorganized territory in this district, there was only 1 case of communicable disease, which had my attention during the past year.

An employee at August Daoust's camp at Mileage No. 81, Ruel Sub-Division, C.N.R., developed typhoid fever, this patient being taken into hospital by the contracting physician immediately, and a sanitary survey made of the camp surroundings. Apparently the disease developed from drinking polluted water from a well close to the camp. This well was closed down and a fresh water supply located, with apparently no further development of the disease.

Inspection of Small Towns and Communities.

From my sanitary survey during the past two years of small towns up to 1,000 population, I found sanitary conditions very poor indeed and in many places sanitary conditions existed which would not be tolerated in our bush camps, sometimes located fifty miles from the railway. This might be said especially concerning public places such as hotels, boarding-houses, and restaurants, and I regret to say worse still at our public and separate schools, where the child receives the first lesson on hygiene and sanitation. I have endeavoured with a considerable amount of success throughout the summer months to have these conditions improved by getting in touch with the different School Boards, and others responsible for the healthfulness of these different institutions. While a start has only been made at this work with very satisfactory results, and the co-operation of the public, there is still a lot to be done and a broad field for this end of Public Health Work. During the year I visited such places as Hornpayne, Foleyet, Gogama, Laforest, Selwood, Coniston, Creighton, Garson, White River, Chapleau, Benny, Biscotasing, Cartier and Chelmsford, sometimes being compelled to visit some of these points two or three times, either by request of the inhabitants or routine inspection.

Re *Railway Improvement Temporary Camps.*

As stated in my annual report of last year, the sanitary condition of these camps is far from satisfactory from a health point of view. The improvement

in this type of camp life, if any, has been achieved only by a personal visit, and the improvements only of a temporary measure owing to the short life of these camps in one location, as there is no standard definitely laid down which these camps must be operated under. This might also be said of the road construction camps which are very often operated regardless of health laws, while a temporary improvement may be made in one location, on the removal of a camp to a new location, the sanitary conveniences and healthfulness of the camp is often overlooked.

In concluding I would suggest that the Board come to a satisfactory understanding with the different railway authorities, also the Northern Development Branch of Road Construction, and in that way come to a more satisfactory conclusion whereby these camps could be operated under more sanitary conditions and thus afford further protection against disease both for employees and the public.

All of which is respectfully submitted,

DAVID MCKEE,
Provincial Sanitary Inspector.

SANITARY INSPECTOR'S REPORT

North Bay, January 14th, 1924.

To the Provincial Board of Health of Ontario.

Gentlemen:

I beg to submit herewith for your consideration my third annual report, for the year ending December 31st, 1923.

In the first place, I wish to express my sincere regret in bringing to your notice the death of Dr. R. W. Bell, Provincial Medical Inspector, which occurred early this summer. I feel sure that I am voicing the sentiments of the Inspectors that not only have the Board lost a valuable official, but that we have lost a true and faithful friend. In spite of indifferent health and growing weakness during the last three years of service, he never faltered in his fidelity to duty, never lost interest in his work, and as an official of the Board he knew instinctively what pertains to the position of an official of the Board and filled that position with a dignity and efficiency all his own.

Lumbering Statistics.

From the reports of the Crown Timber Agents of South Porcupine and Cochrane, the territory over which my jurisdiction extends gives a return of 12 companies with 112 camps, giving employment to approximately 3,500 men. During the year I have made over 125 camp inspections.

The camps built this year, while not complying with the standard plans "to the last nail," show a marked improvement over those of other years and can reasonably be classed as follows:—Plan A, 1; Plan B, 20; Plan C, 25; Combination Plan, 20.

Mattagami Pulp & Paper Co., Smooth Rock Falls.

The camps of this company are located on the Mattagami River and the east and west branches of the Muskego River. The number of camps in operation is 28. I am very much pleased with the great improvement shown by this company in camp construction. Much more attention has been paid in regard to the locating of camps on suitable sites. Cleanliness and general sanitation are also well maintained and credit must be given to the company, who have endeavoured to comply with the Board's Regulations in so far as what is reasonable and practicable.

Abitibi Power & Paper Co., Iroquois Falls.

The number of camps in operation by this company totals twenty-six, ten of which are located on the company's railroad between Iroquois Falls and Stimson on the Grand Trunk Pacific Railway. Eight are located on the Abitibi River and Edwards Creek, and eight on Abitibi Lake, Lightning River and Rabbit Creek. The camps constructed by this company are far in advance of those built in the past and can comply reasonably with the standard plans. Mr. Schanche, the woods manager, has co-operated with your Inspector in every way, and in conjunction with Dr. R. D. Menzies has spent considerable time and trouble to bring the camps of the woods department up to their present standard.

Following is a list of communicable diseases which occurred in the camps of the company during the year:—

Typhoid	11
LaGrippe	7
Meningitis	1
Conjunctivitis	1

No deaths.

Diseases other than communicable:

Pleurisy	3
Pneumonia	4
Furuncle	1
Abscess	1
Herpes Zoster	1
Rheumatism	1
Myalgia	1
Cystitis	1
Tonsillitis	1
Quinsy	1
Bronchitis	1
Diarrhœa	1
Enteritis	1

No deaths.

Spruce Falls Pulp & Paper Co., Kapuskasing.

This company is operating six camps, which are located on the Kapuskasing and Woman Rivers.

I am pleased to state that much more attention has been paid to the locating and construction of camps by this company in comparison with last year's operations. All camps are built to comply as closely as possible to Plan B.

New Ontario Colonization Company, Jacksonboro.

The number of camps operated in the woods by this company totals seven. I am very much disappointed with the camps of this company and with one exception they do not come anywhere near the requirements of our standard plans either in construction or location. The chief reason for the indifference shown to the health regulations is the lack of co-operation in this respect by certain officials of the company. At the time of my inspection of the camps it became necessary for me to issue orders to close one of the camps down and also to advise the carrying out of necessary improvements on other of the camps.

Summer Camps and Construction.

During the summer and fall I have made a number of inspections of sawmills and rossing plants. Speaking generally, I find that there is much improvement in sanitary conditions and the various companies show more inclination to follow out the advice and instruction of your officials in regard to sanitary measures than in former years.

Reconstruction.

The past year in the North Country has been a very busy one. The T. & N.O. extension was still being carried on and it is gratifying to note that only two cases of a communicable disease occured, viz.: one case of typhoid and one of diphtheria. Owing to the death of the senior member of the company, Mr. Grant Smith, in the latter part of October, and under whose personal supervision this work was carried on, the contractors decided to discontinue this work. The construction of the extension has been taken over by the T. & N.O. Commission and the work will be carried on early in the spring.

The Northern Canada Power Company are constructing a dam and power plant at Des Quince Falls in Quebec. This work is for the purpose of supplying the mines of the Porcupine District with power and necessitates the building of a transmission line from that point to Timmins, a distance of over 125 miles, of which eighty or ninety miles are in Ontario. I have inspected the camps of the company, over which our jurisdiction extends. The camps consist of tents and are provided with board walls and floors, and single bunks. The water supply is from a flowing well. General sanitation of the camps is well looked after. A resident physician is engaged on this work.

I have also inspected the camps of the Sinclair Construction Company, who are the contractors of the branch line of the T & N.O. Railway from Swastika to the Kirkland and Larder Lake Mining areas. The camps are fairly well located and constructed. The supervision of which is ably looked after by the contracting physician, Dr. G. M. Cameron, of Kirkland Lake.

Sir Wm. Arrol & Company, St. Catharines.

Contractors for the Hollinger Mine power construction on the Abitibi River, three miles east of Mileage 43 on the T. & N.O. extension. The camps of this company are built according to our Plans A and B. Strict attention is paid to sanitation, a man and team being specially engaged on this work and makes a daily round of all camps and removes all garbage and other refuse, which is burnt. A physician is resident at the camp. In the fall a case of smallpox was reported to me. Immediate instructions were given to have the patient isolated and all contacts vaccinated and the camp placed under quarantine. My instructions were so effectively carried out that no other case of this disease developed. This I consider a most satisfactory performance.

Northern Ontario Developing Branch.

I have made a number of inspections of the camps of the above Division and regret to report that with very few exceptions I found that the same care and attention is not paid to the locating, construction and sanitation as that of other concerns operating in unorganized districts. On pointing out this fact to the engineer in charge he promised to give more attention to the camps of this department on future work.

Mining Companies.

Throughout the year I have made a number of inspections of the mining companies' camps located in the Porcupine, Kirkland Lake and Gowganda Mining districts. The camps in the mining districts are in most instances well constructed and located, and I see no reason why it should be otherwise. Unlike the pulp wood jobber, whose camp is only in use from five to six months at the most throughout the year and in all probability never occupied again, the mining camp is looked upon more or less as a permanent building. Sanitary measures are reasonably well carried out.

Following is a list of communicable diseases brought to my notice in the unorganized districts:—

	Cases	Deaths
Typhoid Fever	45	4
Scarlet Fever	7	0
Diphtheria	3	0
Smallpox	1	0
Chickenpox	numerous	0
Whooping Cough	"	0
Totals	56	4

Out of the total of 45 cases of typhoid fever, 31 cases with 4 deaths occurred in the bush camps and town of the Mattagami Pulp & Paper Company at Smooth Rock Falls. As I am largely responsible for the sanitary conditions and the health of the people in lumber and construction camps and unorganized towns in the District under my supervision, I was greatly concerned in the epidemic in the camps and town of Smooth Rock Falls and made a reinspection of the town and bush camps, but did not find conditions such as to warrant the placing of the epidemic to this source. My attention was then drawn to the camps of the Northern Canada Power Company at Sturgeon Falls and Sandy Falls on the Mattagami River. My inspection eliminated both places as being the cause of the trouble. Following up stream and carefully noting the information which I had previously gathered in the town of Timmins, as to the number of cases, and the location of same, treated in the town from September, 1922, to February, 1923, I found that thirty cases, with eight deaths, had occurred during the above mentioned dates. Practically all the cases were treated in the hospital at Timmins. My attention was then drawn to the activated sludge disposal plant, which I had previously stated on more than one occasion as not functioning properly, I made a further examination of this plant on February 10th, 1923, and collected two samples of the effluent, the bacteriological examination of which is as follows:—Samples 1 and 2, B. Coli present in 1/10,000 c.c. On March 26th, 1923, I made a further examination of the plant and collected two more samples, one from the sewer inlet and one from the sewer outlet. The bacteriological examination showed colon bacilli present in 1/10,000 c.c. in each instance. This I considered to be sufficient proof that the activated sludge disposal plant at Timmins was by no means working satisfactorily, and in view of the fact that practically all the cases of typhoid fever originated from four to twenty miles down the river, below the disposal plant, among the people who were in the habit of using the raw river water for domestic purposes, I am of the opinion that the unsatisfactory working of the plant was the cause of the epidemic. I may say that the first case to come under observation in the town of Smooth Rock Falls occurred on the 6th of January, 1923, and continued intermittently until the end of March, 1923.

During the year I have also visited the following places:

Cochrane	4 visits
Iroquois Falls	3 "
Smooth Rock Falls	4 "
Kapuskasing	4 "
Kirkland Lake	3 "
Timmins	3 "
Porquois Junction	3 "
Dane	2 "
Daventry	1 "
Cobalt	1 "
Monteith	1 "

The following is a list of the approximate number of men employed in the various operations under my supervision:—

Bush camps	3,500
Sawmills and Rossing plants	700
Mines	1,000

Railroad construction	1,200
Power construction and transmission line	1,000
Grand total	7,400

Contracting Physicians and Reports.

As stated in my annual report for the year 1921, the reports and contracts of this official, according to the regulations, should be forwarded direct to the Board. I again reiterate that this is a mistake. Much better service and the more complete computing of statistics would be obtained if all documents from the physicians and companies in connection with the industries in the unorganized territories were handled in the first instance by the inspectors in their respective districts, as under the present arrangements I find that much time and trouble and unnecessary travelling expenses could be avoided by having these matters dealt with by the inspectors in the first instance, when all data could be noted and first-hand information obtained, thus eliminating the necessity of having to wait for this information from our head office, or to make special trips to obtain this information. This is becoming more and more apparent each season.

There is also another matter on which I wish to touch, and that is the salary of the inspectors. I find that it is impossible, and I am sure that the other inspectors will agree with me, to clothe, maintain and educate a family on the present rate of salary. I trust that the Board will bring this matter to the notice of the powers that be, and use their best endeavours to obtain for us a substantial increase or at least a living allowance.

In conclusion, I wish to tender my sincere thanks to the other members of the staff for their unfailing support and co-operation.

Respectfully submitted,

JOHN RICHARDSON,
Provincial Sanitary Inspector.

SANITARY INSPECTOR'S REPORT FOR 1923 OF DISTRICT No. 8

Sault Ste. Marie, Ont., December 31st, 1923.

To the Provincial Board of Health, Ontario:

Gentlemen,—

I have the honour to submit to you my first annual report as your inspector for District No. 8.

I took charge of this district on June 1st, 1923, after spending three months working out of the North Bay office where I had an opportunity of visiting and inspecting a number of lumber and mining camps in company with Inspector Richardson from Cochrane District. The time I spent in North Bay familiarizing myself with the nature of the work in the field and usual office routine work, I found was of great benefit to me after returning to my own district.

Number of Camps and other Inspections Made.

During the time I have been on your staff I have visited and inspected sixty camps, this is including lumber, mining and construction camps. A large number of these camps were located as far as twenty-five and sixty miles from the railroad, which means a lot of walking and driving, and very often several days to inspect one or more camps.

Along with camp inspections I visited forty-three small towns and villages in connection with reports I received of unsanitary conditions, In a good many places it was necessary to make several visits before any very promising results were obtained.

I also accompanied Dr. Johnston, the district officer of health, on an inspection tour of the dairies supplying milk and cream to the town of Espanola. I visited these dairies again on two different occasions and found that they had made very extensive improvements and on my last visit I was pleased to find all these dairies in good sanitary condition.

Lumber Camps.

During the season I find we have had 27 lumber companies carrying on operations in the district. This number of companies have in connection with these operations 137 camps, which employ 6,604 men. In addition we have 18 sawmills, employing 507 men, as well as the paper mill at Espanola, where 575 men are employed.

Thus it may be seen the total number of men employed by industry in the unorganized portion of my district is 7,686. This total I imagine is greater this year than in former years.

Summer Sawmills.

The sawmills in this district are on the whole in fairly good shape, with the exception of the Bishop Lumber Company's mill at Nesterville on the C.P.R. I spent considerable time in trying to get conditions improved at this mill, but did not meet with much success. This town has lately been incorporated, and I am hoping that the new council will have the sanitary conditions of the town much improved this coming season.

Mining Camps.

The mining industry has not been carried on to any great extent the past season in this district. The greater part of the work going on was small prospecting parties.

Railway Right-of-Way Extra Gangs.

I inspected a few of the extra gang boarding cars the past season, and I found that latrines were not generally provided. I also found that the sleeping quarters were overcrowded and poorly ventilated. I hope to be able to give more time to this class of work next season.

Provincial Government Road Camps.

During the summer I made a number of inspections of these small road camps and gave instructions to the different overseers in regards to the disposal of garbage and night soil. Owing to the small amount of money spent in each place and the temporary nature of the road camp it is difficult to get the same results as we expect in lumber camps. However, I found the district engineer willing to co-operate in bringing the camps up to a better standard.

Communicable Diseases.

During this season in the unorganized territory very little communicable disease was brought to my attention. Three cases of typhoid fever developed at one of the Beck Lumber Company's camps near Collins Inlet. Dr. C. R. McLean, of Collins Inlet, the contract physician, dealt with these cases, checking the disease before a serious epidemic might have developed. No further development of this disease was reported.

Contract Physicians' Reports.

As requested in section 1 of the regulations it is necessary that the contract physician send to the head office at Toronto, a monthly report of sketches of camps, also date of visit. I believe if the sanitary inspector was allowed to receive these reports he would be better able to know exactly what condition the camps were in at the time of the physician's last visit. These reports would then be forwarded on to the Toronto office. There are a great number of camps that the inspector is not able to visit in each season and by having these reports come to the inspector he could arrange to visit where he was most needed.

If the Provincial Board of Health saw fit to have more inspectors in the field, I believe we would get much better results, as it is often necessary for an inspector to make two or more visits to different camps. The result is that a large number of camps have to be overlooked and not much follow-up work done.

In conclusion, I wish to point out that while the number of inspections made may not seem to be large, it should be borne in mind that owing to the long illness and death of the late inspector, Mr. Taylor, the district had been neglected in a sense. There are even yet considerable arrears of work to be caught up with and this I hope to do during the coming year.

I wish to express my sincere thanks to the many contracting physicians with whom I am associated and who carry out suggestions made from time to time with commendable speed.

I am also indebted to the members of our staff of inspectors and the district officer of health for the many hints and valuable advice given me when required and who have made possible the writing of this report.

Respectfully submitted,

REUBEN B. MCCAULEY,
Provincial Sanitary Inspector.

BRANTFORD

Annual Report of Medical Officer of Health, 1923

To be presented to Local Board of Health before 15th November, annually.

(Schedule B, Clause 1, Public Health Act)

Municipality, Brantford. County, Brant.
Name and address of M.O.H., W. L. Hutton.
Date, November 15th, 1923.
Estimated population, 29,148.
Number of births per annum (exclude "still births"), 672.
Number of still births, 32.
Number of infant deaths under one year, 56.
Infant mortality rate per 1,000 living births, 82.9.
Number of deaths from all causes, 324.
Death rate per 1,000 of the population, 11.1.

COMMUNICABLE DISEASES

Disease	No. of cases	No. of deaths
Scarlet fever	23	0
Diphtheria	15	0
Typhoid	9	0
Measles	534	1
Chickenpox	141	0
Smallpox	67	1
Tuberculosis	40	11
Whooping cough	31	4
Influenza	5	5

Any special outbreak of communicable disease during the year?
Measles and chickenpox were epidemic.
Considerable smallpox.
Methods adopted to combat the outbreaks?
Quarantine of cases and contacts.
Six hundred people were vaccinated against smallpox.

MILK SUPPLY

(a) Source, 114 farms surrounding Brantford.
(b) Character, exceptionally clean.
(c) Is supply pasteurized? 86 per cent. is pasteurized. The remainder is from tuberculosis-free cattle under the Dominion Government scheme.

WATER SUPPLY

(a) Source, Grand River.
(b) Character, fairly clean.
(c) How purified? Filtration and chlorination.
Any special public health work carried on, such as child welfare, ante-natal clinics, tuberculosis clinics, venereal disease clinics, etc.?
Child welfare clinic conducted through Social Service League.
Tuberculosis clinic conducted by Board of Health.
Venereal disease clinic at Brantford General Hospital.
Any public health education by M.O.H.?
Public addresses.
Newspaper articles.
Did M.O.H. carry out sanitary inspection of schools during the year and make report?
Yes.

EXPENDITURE FOR PUBLIC HEALTH PURPOSES

(a) Salary or other remuneration of M.O.H., $3,600.
(b) Expenditure for other Public Health work, $17,000.
Total expenditure for public health, $21,000.
N.B.—School medical inspection under M.O.H. as chief School Medical Officer.

GENERAL REMARKS

Brief outline of activities of M.O.H. and local Board of Health. (Additional sheets or printed report may be attached.)

BRANTFORD

BRANTFORD, ONT., Nov. 15th, 1923.

To the Chairman and Members of the Brantford Board of Health.

GENTLEMEN:

In accordance with the Public Health Act, I beg to submit my Annual Report for the year ending October 31st, 1923, upon the Sanitary and Health conditions of the City of Brantford.

We have had a birth rate of twenty-three per thousand, the lowest in four years and the very low death rate of eleven per thousand, which is one point lower than the death rate last year. This low death rate, a generation ago, would have been considered absolutely unattainable. Frederick L. Hoffman has said: "During the early 90's it was an assumed basis of sanitary argument that a crude death-rate of eighteen per thousand of population might safely be relied upon as an index of physical well-being approached by few communities." The most sanguine never contemplated a death rate as low as eleven per thousand of population. Cancer and pneumonia have maintained their prominent position as causes of death. Poisonous alcohol appears as the cause of death in three cases.

DIPHTHERIA

We have passed through a whole twelve months without a single death from diphtheria. As far as my records go, this is the first time in the history of Brantford City that there have been no deaths from diphtheria. This is the result which the Provincial Board of Health aimed at, when in the year 1914 they started the policy of the free distribution of diphtheria antitoxin through the local Boards of Health to qualified physicians. Since that date there has been a progressive decline in diphtheria mortality. In order to successfully and continuously combat diphtheria the co-operation of the public is essential. Any sore throat may be diphtheria, and it is only by the early reporting of the disease and the early administration of anti-toxin that the disease may be controlled and deaths eliminated.

TYPHOID FEVER

For the second consecutive year I beg to report a record of no deaths from typhoid fever and of the nine reported cases of this disease three were definitely known to have been contracted while away from this city. One case was contracted through drinking unpasteurized milk obtained from a private source just outside the city limits where one of the members of the family suffered from typhoid fever. As soon as it was reported that typhoid existed in the family and that milk was being supplied to parties in the city, Dr. Cutcliffe at once investigated. He found that Brantford citizens living near by were going to the above premises to obtain their milk. Dr. Cutcliffe had no power to prevent their obtaining their milk in this manner but through the co-operation of the township M.O.H., Dr. C. D. Chapin, the supply was stopped but unfortunately not in time to prevent infection in the family of one of the consumers. Had the milk from this source been pasteurized this infection would have been prevented.

Infant Mortality

Our infant mortality rate this year is 82.9, that is to say, that for every one thousand births eighty-two died before reaching their first birthday. Last year our infant mortality rate was only sixty-three and it therefore becomes of extreme interest to discover if possible the explanation for the increased number of baby deaths for the year 1923. During the year there were 672 births and fifty-six deaths of children under one year of age.

Analyzing these births and deaths we find that 371 children were born to fathers of Canadian nativity and twenty-three of these infants died. The infant mortality rated in this group is therefore sixty-two.

Two hundred children were born to fathers of English, Irish and Scottish nativity and fifteen of these infants died. The infant mortality rate in this group is therefore seventy-five.

The third largest group is composed of children whose fathers came from Poland, Armenia, Italy, Hungaria, Greece, Malta, Rumania, China, Russia and Austria, *i.e.*, from either Eastern Europe, Southern Europe or Asia and in this group seventy-eight children were born and seventeen of these infants died. The infant mortality rate is this group is therefore 218. In other words one out of every sixteen in group I died; one out of every thirteen in group II died; and one out of every four in group III died.

These figures are illuminating. They undoubtedly indicate that the foreigner in our midst has not become Canadianized, and they point to the obvious necessity for education, if these people are to become real assets to our community.

New Zealand has the lowest infant mortality rate for any country in the world. In 1919 only forty-five babies died for every thousand births, and the rate is still lower now. New Zealand has been described as more English than the English, and undoubtedly one of the reasons for their splendid health record lies in the fact that the Health and Educational authorities have a pure Anglo-Saxon stock to deal with.

Dr. Emmett Holt says the preventable causes of infant mortality may be grouped as follows:—

I. Those but little influenced by treatment.

Malformation.

Extreme feebleness or prematurity (before the seventh month).

Certain accidents during birth.

II. Those capable of considerable reduction, chiefly through proper hygiene, sanitary isolation and medical treatment.

Tuberculosis, syphilis.

Acute respiratory diseases.

Acute contagious diseases—whooping cough, measles, etc.

III. Those capable of a very great reduction through proper feeding and care.

Acute gastro-intestinal diseases.

Marasmus and inanition.

Prematurity, after the seventh month.

Analysing the infant deaths in Brantford during the year we find that thirty-seven or sixty-six per cent. belong to class I; ten or eighteen per cent. belong to class II; and nine or sixteen per cent. belong to class III. The causes of death as given in the Death register record only the last thing which happened to the child. More important than the final cause of death, is the conditions

which led to the final result. If malnutrition and marasmus can be overcome and if ignorance and neglect can be wiped away, then as certain as day follows night the infant mortality rate will fall and the lives of children will be saved. The Department of Public Health's booklet "The care of the Infant and the Young Child" has been sent into every home where a child has been born during the year, but unfortunately where the mother is foreign born and unable to read English no good is accomplished. The Social Service League have continued to conduct their Baby Clinic; their two nurses Mrs. Anguish and Miss Griffiths have paid over four thousand social service visits in follow-up work. Educational work of this nature is essential if diseases and death are to be kept within bounds for it is in the education of the mothers that the hope of the future lies.

Smallpox

We have had sixty-seven cases of smallpox during the year. Fifty-six of these cases had never previously been vaccinated. Four were vaccinated during the incubation period of smallpox; that is to say after they had been infected with smallpox and when it was too late to prevent the disease fro m developing. Five cases had been vaccinated forty or more years ago, but not since, and two had been vaccinated twenty years ago, but not since.

Since becoming Health Officer of Brantford I have seen 606 cases of smallpox and only one of this large number had been successfully vaccinated within ten years, previous to infection with smallpox. This experience has convinced me that any city may remain free from smallpox, provided its citizens do not neglect vaccination and I am certain of this that in the future as in the past smallpox in Brantford will continue to search out those who through prejudice or indifference have neglected vaccination.

Smallpox Hospital

This building is located in the grounds of Mount Hope Cemetery. It is a well constructed brick cottage but it is not built as a hospital should be. There is no provision for separating the males from the females and there is only one toilet. The City Council have promised to provide additional toilet facilities but before this is done I would recommend that a committee of the Council and the Board of Health view the building and decide as to its suitability as a smallpox hospital.

Diagnostic Chest Clinic

The outstanding development in the Public Health sphere during the year was the establishment of a Diagnostic Chest Clinic with Dr. J. H. Holbrook, Superintendent of the Mountain Sanatorium, Hamilton, as clinician-in-charge. The clinic was declared open on Friday, September 14th by Ald. W. H. Freeborn, acting in the place of Mayor Fred Billo who was absent on holidays. The establishment of this clinic was unanimously supported by the City Council, the Board of Health and the physicians of the city, and is an outstanding development in the progressive health conserving and life-saving work of a public health nature in Brantford. That the clinic has filled a long needed want is evidenced by the fact that the number of applicants for admission has always exceeded the capacity of the clinic to handle, and that the clinic is serving its rightful purpose is assured by the fact that patients are only admitted by order

of the family physician. We hope and believe that these activities will in the future materially reduce the amount of tuberculosis in Brantford. Already several early cases have been discovered, and through the co-operation of the physicians and nurses follow-up work is being carried on.

The Swimming Pool

One of the outstanding achievements of the 1923 City Council has been the construction of a public swimming pool on the banks of the Grand River. The sanitary conditions of the pool were excellent, thanks to the constant supervision of the responsible Council Committee. Thousands of people availed themselves of the facilities offered. The development of a green algae in the water was overcome by the addition of approximately ten pounds of copper sulphate each week and by the frequent changing of the water, and the water was kept pure by the daily addition of bleaching powder in doses of ten pounds.

A public swimming pool is a good example of an institution designed to improve hygienic conditions which itself may become a hygienic menace. If the water is not changed frequently; if chemicals to check the growth of germs and vegetation are not added regularly, and if dirty or diseased persons are permitted to use the pool, then instead of a hygienic asset we may quickly have a health menace of the first order. I, therefore, beg to recommend that in the future the pool should be completely emptied, at least, once every two weeks and once a week for preference, and that when emptied the tank be scrubbed, flushed, aired and dried before refilling; that a system of continuous dilution of the pool with fresh water be installed; that ten pounds of copper sulphate be added each week and ten pounds of bleaching powder be added each day; that the supervisors be given authority to exclude from the pool any person showing signs of skin diseases, running ears, ulcers, sore eyes or common colds and finally that shower baths for males and females be erected, and that every person using the pool be required to take a shower bath with the liberal use of soap before entering the tank. Without these safeguards I am of the opinion that there will be always an element of danger in the operation of this public utility.

Conclusion

In concluding this report I wish to thank the Board of Health, the members of the department, the staff of the School Medical Department, the Social Service nurses, Mr. F. W. Thompson and the physicans of the city for their unfailing help and co-operation during a very busy year.

I remain,

Your obedient servant,

W. L. Hutton,
Medical Officer of Health.

BRANTFORD, ONT., Oct. 26th, 1923.

To the Chairman and Members of the Brantford Board of Health.

GENTLEMEN:

I herewith submit for your consideration a report on my work during the past year.

The inspection of the milk supply has been carried on under similar lines as last year. A great improvement has been found in the cleanliness of the milk produced during this year which is shown in the comparison between the amount refused at the dairies during the present year and the amount refused during the previous year. Cooling quickly and to the proper temperature is improving, although a small percentage of the producers require to be more particular in this respect. Six hundred and twelve gallons of dirty milk has been refused as against eleven hundred and ninety-two gallons last year. Nine hundred and fifty-eight gallons not properly cooled have been refused. The total last year was ten hundred and fifty-six gallons.

The licenses of three producers have been suspended on account of low butter fat content and the license of one producer for want of cleanliness and proper cooling.

The total number of vendors of milk and cream is nine. One of these retails cream only and two live outside the city limits and retail their own production.

The number of producers total one hundred, and one thousand three hundred and thirty-eight cows produce, approximately, nine thousand two hundred and ninety-six quarts, daily, for sale in the city.

Six hundred and ninety-two tests for butter fat and regular tests for sediment and temperature have been made during the year.

The premises of the producers have been well kept during the year. General cleaning and whitewashing the stables being done more frequently than formerly. With the exceptions of two or three premises very little fault can be found. The premises of these two or three are being repaired and put in better sanitary condition.

BUTCHER SHOPS AND RESTAURANTS

Restaurants have been well kept and two that were carried on in buildings that were hard to keep sanitary have given up business during the year. The remainder are in premises in good repair and well lighted.

Butcher shops are also well kept and premises in good repair.

Inspections at irregular intervals have been made of restaurants and butcher shops during the year.

Fourteen hundred and ninety-two pounds of beef, five hundred and ninety-six pounds of pork, one hundred and four pounds of mutton, and ninety-six pounds of veal have been condemned and destroyed, unfit for human consumption. Sixteen rolls of butter, short weight, were confiscated and given to the City Relief Officer for disposal. Eleven dogs that have bitten persons have been inspected and quarantined when necessary.

I remain,

Your obedient servant,

A. B. CUTCLIFFE, V.S.,

Inspector.

BRANTFORD, ONT., Nov. 7th, 1923.

To the Medical Officer of Health of the City of Brantford.

DEAR SIR:—

I beg to report the facts of work carried on against venereal disease in Brantford during the past year:

Patients continuing treatment from last year	67
Patients referred to clinic by doctors	16
Patients referred to clinic through hospital wards	4
Patients who came to clinic of their own accord	13
Patients referred by Police Department	1
Patients referred by the Department of Health	27
Total	128
Patients dismissed as cured	10
Patients dismissed for treatment elsewhere	24
Patients left town	31
Patients unable to locate	15
Total number of patients taking treatment Nov. 1st, 1923	48
Total	128
Source of infection placed under treatment	32
Number of patients referred to private doctors	35
Total number of hours outdoor clinic open	261
Average attendance at each clinic	12
Calls made by Social Service nurse	725

One child taken to the Government School for Feeble-minded at Orillia.

Total number of treatments at the out-door clinic during the past year:

Male syphilis	252
Male syphilis children	80
Female syphilis	339
Female syphilis children	42
Male gonorrhea	205
Female gonorrhea	510
Female gonorrhea children	190
Total	1,618

Total number of days patients in General Hospital wards for treatment:

Male syphilis	94
Female syphilis	53
Male syphilis children	48
Male gonorrhea	191
Female gonorrhea	115
Ophthalmia neonatorum	72
Total	573 days

The Out-door Clinic was closed for two weeks during the year while the General Hospital was under quarantine. With the assistance of a few interested friends and the help of the Dorcas Society, we have been able to assist a few who were out of work and needed clothes.

The constant changing of boarding and rooming houses at times makes the visiting of patients in their homes difficult as they are frequently very hard to find and keep under treatment.

Doctors attending the clinic regularly three months at a time are E. R. Secord, M.D., L. Coates, M.D., R. W. Digby, M.D. and D. A. Morrison, M.D. These doctors not only give of their time, two evenings and one afternoon a

week, but care for the patients who are sent to the hospital wards from the clinic, and at all hours have helped me with the work answering many calls in their offices and by telephone.

Faithfully yours,

FERN L. KEEFER,
Social Service Nurse,
Department of Public Health.

VITAL STATISTICS YEAR ENDING OCTOBER 31ST, 1923

Population (Assessor's figures), 29,148

	1923
Births	672
Birth rate	23
Deaths	324
Death rate	11.1
Marriages	308
Infant mortality rate	82.9

COMPARATIVE RATES

	1918	1919	1920	1921	1922	1923
Births	24	20.36	25.31	25.63	26	23
Deaths	27.7	14.5	12.78	10.42	12.28	11.1
Infant mortality	128.6	106.1	90.4	64.67	63.85	82.9

NOTES.—1. Stillbirths were excluded in compiling the above figures.
2. Two deaths that took place outside of the Municipality of Brantford were excluded.
3. No reductions were made of deaths that took place in the Brantford General Hospital where homes were outside of the city of Brantford.

DEATHS AT VARIOUS AGE PERIODS

	1922	1923
Still-born	37	32
Under 1 year	50	56
One year and over and under 5 years	13	13
Five years and over and under 15 years	14	8
Fifteen years and over and under 25 years	14	10
Twenty-five years and over and under 45 years	43	41
Forty-five years and over and under 65 years	85	90
Sixty-five years and over	151	106
Age not reported	0	0
Totals	370	324

DEATHS GROUPED ACCORDING TO INTERNATIONAL LIST OF CAUSES

	1922	1923
Group 1—General diseases	79	76
2—Nervous system, etc	16	10
3—Circulatory system	71	64
4—Respiratory system	51	43
5—Digestive system	31	33
6—Genito-urinary system	18	14
7—Puerperal state	5	3
8—Skin and cellular	3	0
9—Bones, etc	1	3
10—Malformation	1	5
11—Early infancy	31	18
12—Old age	34	31
13—External causes	26	13
14—111 defined	3	11
Totals	370	324

AMONG THE SPECIFIC CAUSES OF DEATH NOT REPORTABLE ARE THE FOLLOWING

	1922	1923		1922	1923
Cancer	29	23	Old age	34	31
Apoplexy	7	5	Pneumonia	39	29
Heart affections	30	44	Bronchitis	3	4
Nephritis	9	8	Premature births	5	13
			External causes	26	13

STATISTICS OF CONTAGIOUS DISEASES—CASES REPORTED YEAR ENDING OCTOBER 31ST, 1923

	1920	1921	1922	1923
Scarlet fever	52	114	10	23
Diphtheria	103	65	90	15
Typhoid	19	5	8	9
Measles	249	12	3	534
Chickenpox	29	134	50	141
Smallpox	73	214	..	67
Tuberculosis	12	32	47	40
Whooping cough	51	28	8	31
Mumps	3	189	3	..
Cerebro spinal meningitis	1	1	1	1
Influenza	366	..	..	5
Venereal diseases	48	100	167	128
Infantile paralysis	..	..	17	..
	1,006	894	404	994

DEATHS FROM REPORTABLE DISEASES

	1919	1920	1921	1922	1923
Diphtheria	8	10	5	6	..
Typhoid fever	1	1	1	..	..
Measles	..	3	1	..	1
Whooping cough	2	3	4	..	4
Meningitis	4	4	5	2	1
Tuberculosis	26	18	19	6	11
Infant paralysis	..	..	..	1	..
Influenza	89	34	..	8	5
	130	73	35	23	22

RECORD OF WORK ACCOMPLISHED

Water samples examined—58, as follows:—		
City water o.k.		50
Private wells o.k.		5
Private wells polluted		3
Milk samples examined		692
Diphtheria swab examined		212
Results positive	12	
Results negative	200	
T.B. slides examined		20
Results positive	12	
Results negative	8	
V.D.G. slides examined		42
Results positive	22	
Results negative	20	
Urine slides examined		20
Urine for albumen		12
Vaccinations, office		600
Schick test performed		20
Positive for diphtheria	12	
Negative for diphtheria	8	
Toxin-antitoxin administered		10

HOUSES PLACARDED, FUMIGATED AND RELEASED

23 for scarlet fever.
15 " diphtheria.
141 " chickenpox.
534 " measles.

Exclusion notices and release certifications issued to cover 600 school children.

Notices to abate nuisances (all complied with)	41
Notices to make sewer connection	40
Complied with	35
Number of earth closets inspected	462
Earth closets reduced during year 1922	111

All laundries periodically inspected—conditions normal.
All stables periodically inspected—conditions normal.
All alleyways and lanes frequently inspected—in good condition.
Prosecutions, 4; convictions, 4.

As usual many hundred complaints have been received and the necessary investigations and adjustments made. These complaints come by phone, personal interview and by letter.

Free bacteriological supplies in the nature of serums, anti-toxins, and the various test outfits have been kept on hand and given to the medical profession and hospital on request.

Seven houses were closed as unfit for human habitation. Three of these were finally demolished. The others were subsequently repaired or remain closed.

CARLETON PLACE

Annual Report of Medical Officer of Health, 1924

To be presented to Local Board of Health before 15th November, annually.
(Schedule B, Clause 1, Public Health Act)

Municipality, Carleton Place. County, Lanark.
Name and address of M.O.H., D. H. McIntosh.
Date, December 1st, 1923.
Estimated population, 4,323.
Number of births per annum (exclude "still-births"), 81.
Number of still-births, 4.
Number of infant deaths under one year, 2.
Infant mortality rate per 1,000 living births, 24.7.
Number of deaths from all causes, 46.
Death rate per 1,000 of the population, 10.64.

COMMUNICABLE DISEASES

Disease	No. of cases	No. of deaths
Scarlet fever	7	None
Diphtheria	13	None
Typhoid fever	1	None
Measles	103	None
Chickenpox	1	None
Tuberculosis	2	Two
Venereal disease	6	

Any special outbreak of communicable disease during the year?
Measles.
Methods adopted to combat the outbreaks?
Usual method.

MILK SUPPLY

(a) Source, licensed dairies.
(b) Character, clean.
(c) Is supply pasteurized? No.

WATER SUPPLY

(a) Source, tap and spring.
(b) Character, varies.
(c) How purified– Not.
Any special Public Health work carried on, such as Child Welfare?
No.
Ante-natal clinics, tuberculosis clinics, venereal disease clinics, etc.?
None.
Any public health education by M.O.H.?
Attempting to enforce Venereal Act.
Did M.O.H. carry out sanitary inspection of schools during the year and make report?
Yes.

EXPENDITURE FOR PUBLIC HEALTH PURPOSES

(a) Salary or other remuneration of M.O.H., $300 salary.
(b) Expenditure for other public health work, $40.
Total expenditure for public health, $387.

GENERAL REMARKS

Brief outline of activities of M.O.H. and local Board of Health. (Additional sheets or printed report may be attached.)

Venereal Diseases

I regret to be compelled to report that venereal disease has been on the increase, judging from the number reported; four summonses were issued

under Venereal Disease Act, reports showing that three out of four were suffering from venereal disease, and I am compelled to believe that cases are not reported. Should information be received to this effect I will have no hesitation in putting Act into force.

Efforts are being made to organize a Social Service Council, and I trust this may be accomplished, and a strong effort made to educate the public.

Re Tuberculosis

Two cases were reported and two deaths recorded. If cases were reported, early measures might be taken to secure safety of household. Much would be accomplished to retard the spread of this dread disease.

Milk

Four licensed dealers are supplying milk. All local dairies have been inspected and with one exception, conditions were found satisfactory, and after notice of cancellation of license the owner made such a decided improvement that the license was continued. Samples of milk, as to cleanliness and butter fats for one week, were shown in window for information of the public.

Slaughter Houses

Were inspected and after some slight improvement were found fairly satisfactory.

The butcher shops were kept clean and meat handled in fairly sanitary manner.

Some measure should be enacted to examine meat sold by pedlars in town and that it is handled in a sanitary manner.

Typhoid Fever

Only one case was reported this year. This was a decided change from last year.

Measles

An epidemic of measles, 103 cases being reported, originated from pupils attending high school from municipalities where measles were prevalent, and were not discovered until many cases had developed symptoms.

Water Supply

Samples of tap and well water were sent for examination and reported to Public Utilities, and I again strongly recommend that a chlorinating system be installed.

The Provincial Board of Health sent inspectors to collect samples from town wells and to make a sanitary survey of the town.

Schools

These were visited and report of same with recommendations sent to School Board, to receive the usual fate—"Placed on File". When will the health of our children receive the attention it should from School Boards, Sanitary Schools with proper ventilation and lighting. The health of our future citizens should be considered above money. When?

Public Health Nurses

Again I would strongly urge the necessity of engaging a Public Health Nurse. What service will they render? Let me quote the following: The Public Health Nurses are pre-eminently the educators in any department of health. Their entire chain of activities is largely of an educative character in the instruction they give to the expectant mother, to the mother as regards the care of the new born infant; to the parents in regard to the care of their children before they enter school, to the homes in which tuberculosis exists. As regards the ways and means of preventing the spread of this disease and to afford the individual affected with the best possible opportunity for recovery. The instruction to the children as they come in contact with them in the public schools, and in their follow up work in the house. The nurses entering dozens of homes each week, convey valuable messages along these lines of hygiene and preventive medicine.

Thousands of dollars are spent in this town each year to educate the minds. The Board of Health, outside of paying salary of M.O.H., practically spend nothing to educate the public regarding health. Why? Cannot we employ a Public Health Nurse?

Yours respectfully,

D. H. McIntosh,
Medical Officer of Health.

CHARLOTTEVILLE

Annual Report of Medical Officer of Health, 1923

To be presented to Local Board of Health before 15th November, annually
(Schedule B, Clause 1, Public Health Act)

Municipality, Charlotteville. County, Norfolk.
Name and address of M.O.H., E. W. Zumstein, Delhi.
Date, November 15th, 1923.
Estimated population, 2,500.
Number of births per annum (exclude "still-births"), 41.
Number of stillbirths, 2.
Number of infant deaths under one year, 4.
Infant mortality per 1,000 living births, 146.34.
Number of deaths from all causes, 47.
Death rate per 1,000 of the population, 18.8.

COMMUNICABLE DISEASES

Disease	No. of cases	No. of deaths
Diphtheria	6	0
Typhoid	6	1
Syphilis	reported 2	0
Measles	Uncertain	0

and many others not reported—possibly of minor nature.

Any special outbreak of communicable disease during the year?

Most interesting was typhoid in the village of Normandale. This is second or third outbreak within past five years in that village.

Methods adopted to combat the outbreaks?

Schools closed, infected people isolated and placarded, premises disinfected after disease.

MILK SUPPLY

(a) Source—None.
(b) Character—.
(c) Is supply pasteurized?—

WATER SUPPLY

(a) Source—None.
(b) Character—.
(c) How purified?—

Any special Public Health work carried on, such as child welfare, ante-natal clinics, tuberculosis clinics, venereal disease clinics, etc.?

Unfortunately, the M.O.H. was unable to carry on any special Public Health work the other than Public Health education to the school children.

Any Public Health education by M.O.H.?

Yes. Every school was given one-half hour's talk on "How disease travels."

Did M.O.H. carry out sanitary inspection of schools during the year and make report?

Yes.

EXPENDITURE FOR PUBLIC HEALTH PURPOSES

(a) Fees of M.O.H.	$340 00
(b) Expenditure for other Public Health work	47 00
Total expenditure for Public Health	$387 00

GENERAL REMARKS

Brief outline of activities of M.O.H. and local Board of Health. (Additional sheets or printed report may be attached.)

Appended to this report will be found a brief outline of the activities of the M.O.H. and the local Board of Health.

E. W. Zumstein, M.D.

DELHI

DELHI, ONT., Nov. 14th, 1923.

To the Board of Health,
Township of Charlotteville, Vittoria, Ont.

GENTLEMEN:

REPORT FROM DEC. 15th, 1922 TO NOV. 14TH, 1923.

During the current year all the public schools of the municipality were visited by the Medical Health Officer and in addition to the ordinary medical inspection on the premises, an educational feature was carried out.

This was in the nature of a lecture in simple language to the children on "How Diseases Travels". It has long been the opinion of the M.O.H. that a golden opportunity was being allowed to slip away when children of the public school age do not receive adequate public health instruction. The lectures included descriptions of the spread of typhoid, diphtheria, scarlet fever, small-pox, scabies, influenza and other diseases. The importance of fingers, food and flies as carriers was emphasized. The ease with which streams might bear infection was noted, and the old idea of air-borne infections was discouraged and it is now quite generally discarded by the foremost workers in Public Health lines. An attempt was made to encourage the co-operation of the children in matters such as placarding, vaccination, and reporting contagious diseases so that they might be more in sympathy with these unpopular proceedings than some of the past generation. The illustration of fire, the comparison of disease to fire was used to draw out the truths: first, prevention is better than cure; secondly, a little disease like a little fire, if neglected on the start, may cause untold damage. Public Health work in the Panama zone against yellow fever and malaria, as well as other brilliant triumphs along this line, were pointed out. This plan has been carried out for five years with very gratifying results. The present generations will know more about the prevention of disease than did their fathers and mothers.

No ante-natal or baby clinics were held. No lectures on venereal disease were given. No public lectures on public health were given by the M.O.H.

Dr. McClenahan, Provincial Medical Officer of Health, visited the municipality once during the year. Four meetings of the local Board of Health were held. During the year, outside of routine work three incipient epidemics were called to our attention; first, an outbreak of diphtheria, S.S. No. 7, with one death—Master Kohl died very suddenly under the care of Drs. McGilvery and Bowlby. The Medical Officer of Health inspected and disinfected the premises of the school-house and thoroughly fumigated same on January 10th. On January 19th, he swabbed the throats of the pupils in attendance, and on January 21st, swabbed the throats of those not present on the 19th. Two diphtheria carriers were located. In the meantime, two other families, Kuchar and White, were stricken with diphtheria. These yielded readily to treatment and no fatalities occurred, and the epidemic was at an end.

Venereal disease was reported by Dr. Boyd among certain Polish residents on the 9th Concession. These either took treatment or left the municipality.

Typhoid again made its appearance in Normandale with at least six cases, and one fatality. The Board held a meeting and energetic measures were taken to restrict the extent of the outbreak with satisfactory results.

I was requested on several occasions by the Provincial Board to make blood examinations of the relatives of children dying of syphilis. This was done and the expense charged to the municipality, according to the Public Health regulations. It is the hope of the Medical Officer of Health that in spite of the scattered nature of this municipality that the educational campaign may be extended to include Public Health lectures, pre-natal and baby clinics, venereal disease clinics, and many others, as these undoubtedly are the order of the day.

The Medical Officer of Health wishes to express his thanks for the co-operation extended to him by the other members of the Board, and to the energetic work of Mr. R. W. McCall, who has assisted the Board in every possible way in carrying out the work of the local Board of Health.

E. W. Zumstein,
Medical Officer of Health.

DERBY

Annual Report of Medical Officer of Health, 1923

To be presented to Local Board of Health before 15th November, annually.
(Schedule B, Clause 1, Public Health Act)

Municipality, Derby. County, Grey.
Name and address of M.O.H., Dr. A. B. Rutherford, Owen Sound.
Date, October 15th, 1923.
Estimated population, 1,530.
Number of births per annum (exclude "stillbirths"), 31
Number of stillbirths, 2.
Number of infant deaths under one year, 4.
Infant mortality rate per 1,000 living births, 130.
Number of deaths from all causes, 18.
Death rate per 1,000 of the population, 12.

COMMUNICABLE DISEASES

Disease	No. of cases	No. of deaths
Measles	13	None
Scarlet fever	1	None

Any special outbreak of communicable disease during the year?
Measles in the spring.

Methods adopted to combat the outbreaks?
Isolation and quarantine.

MILK SUPPLY

(a) Source, all home supply.
(b) Character, strictly a rural Municipality.
(c) Is supply pasteurized?

WATER SUPPLY

(a) Source, all wells.
(b) Character—.
(c) How purified?—

Any special Public Health work carried on, such as child welfare?
No.

Ante-natal clinics, tuberculosis clinics, venereal disease clinics, etc.?
No.

Any Public Health education by M.O.H.?
Talks in schools during the annual inspection.

Did M.O.H. carry out sanitary inspection of schools during the year and make report?
Yes.

EXPENDITURE FOR PUBLIC HEALTH PURPOSES

(a) Salary or other remuneration of M.O.H.	$125 00
(b) Expenditure for other Public Health work	175 50
Total expenditure for Public Health	300 50

GENERAL REMARKS

Brief outline of activities of M.O.H. and local Board of Health. (Additional sheets or printed report may be attached.)

After spring inspection of the schools and reports sent to School Boards with recommendations, a second inspection is made in the fall by the sanitary inspector. The Board deals with this report and makes further effort if necessary to have requests carried out by School Boards.

A. B. Rutherford, M.O.H.

FORT WILLIAM

Annual Report of Medical Officer of Health, 1923

To be presented to Local Board of Health before 15th November, annually.
(Schedule B. Clause 1, Public Health Act)

Municipality, Fort William. District, Thunder Bay.
Name and address of M.O.H., R. M. Boyd, M.D., 178 East Amelia Street.
Date, November 1st.
Estimated population, 21,000.
Number of births per annum (exclude "still-births"), 777.
Number of still-births, 32.
Number of infant deaths under one year, 59.
Infant mortality rate per 1,000 living births, 75.93.
Number of deaths from all causes: Resident in Fort William, 182; non-resident, 19.
Death rate per 1,000 of the population of all deaths registered, 9.57.
Death rate, excluding non-residents and out-of-town deaths, 8.66.

COMMUNICABLE DISEASES

Disease	No. of cases	No. of deaths
Chickenpox	51	0
Diphtheria	46	2
Erysipelas	9	0
Measles	133	0
Mumps	2	0
Pneumonia	71	13
Puerperal septicaemia	1	1
Rubella	35	0
Scarlet fever	9	0
Typhoid fever	27	1
Tuberculosis	19	7
Whooping cough	5	0

Any special outbreak of communicable disease during the year?
No.
Methods adopted to combat the outbreaks?

MILK SUPPLY

(a) Source, Districts of Slate River and Murillo.
(b) Character, good.
(c) Is supply pasteurized? Over 50 per cent.

WATER SUPPLY

(a) Source, Loch Lomond.
(b) Character, good.
(c) How purified? No purification necessary.

Any special Public Health work carried on, such as Child Welfare, ante-natal clinics, tuberculosis clinics, venereal disease clinics, etc.?
Child Welfare, yes.
Ante-natal clinic, yes.
V.D. clinic, yes.
Tuberculosis clinic, no.

Any Public Health education by M.O.H.?
Yes.

Did M.O.H. carry out sanitary inspection of schools during the year and make report?
Yes.

EXPENDITURE FOR PUBLIC HEALTH PURPOSES

(a) Salary or other remuneration of M.O.H.	$3,000 00
(b) Expenditure for other Public Health work	9,209 88
Total expenditure for Public Health	$12,209 88

GENERAL REMARKS

Brief outline of activities of M.O.H. and local Board of Health. (Additional sheets or printed report may be attached.)

Fort William, Ont., November 1st, 1923.

To the Chairman and Members of the Local Board of Health,
Fort William, Ont.

GENTLEMEN:

I have the honour of presenting to you for your consideration and approval my first Annual Report of the Department of Health of your city.

I took charge of your department on October 15th, 1922, and owing to the high standard of efficiency which had been obtained by my predecessor, the late Dr. Oliver, particularly in respect to the mechanism, so to speak, of the machinery of the department, I found no difficulty in keeping the different parts in unison all working towards the one end—the keeping under control of all communicable diseases, the betterment of sanitary conditions and the education of your people in matters pertaining to the general health of the community. I am pleased to be able to state that the machinery has not broken down during the past twelve months, though at times it needed, as all good machinery does, some oiling and cleaning. Absolute co-ordination exists at present not only among the different parts of your department, but also in its relationship to the other departments of your municipal government. I wish to mention that since my tenure of office I have received the greatest assistance in the performance of my duties not only from the Provincial Board of Health directly from Toronto, but also from its efficient staff, Dr. N. O. Thomas and Dr. Sparks their local representatives.

Early last winter a survey of the milk production of the city was made and in due course completed. We found that at that time some 1,052 gallons of milk were being consumed daily, of which some 623 gallons were pasteurized or supposed to be pasteurized. Steps were taken at once to see that the necessary recording thermometers were installed by the firms pasteurizing, and since then a daily chart is obtained from the different plants operating.

In connection with the milk supply I wish to call your attention to the facts given by your sanitary inspector in his report. Owing to the intensive campaign carried on, satisfactory results were obtained and the dairy barns have been limewashed, the cattle kept cleaner and the butter-fat increased from 3.22% to 3.56% during the year. The dairy firms have been advised to buy milk on a butter-fat basis. In October, your department was successful in having the new milk by-law passed by the council of the municipality and later the same was ratified by the Department of Agriculture and the pasteurization clause in particular approved of by the Provincial Board of Health. This by-law calls for either (*a*) raw milk being from tuberculin tested cattle or (*b*) milk being scientifically pasteurized.

It also calls for the testing of privately owned cattle within the limits of your municipality. I consider this by-law one of the most important measures passed by your municipality in recent years, ensuring as it does the positive elimination of tubercular milk, the consuming of which is so detrimental to the welfare and health of our infantile life, especially those who may be ill nourished or not having good resisting powers.

We had the pleasure of having Dr. Monahan, Veterinary Inspector of the Department of Agriculture of Ottawa and also Miss Campbell, Milk Expert of Ottawa with us during the season, who rendered valuable aid to your executive officers in their work.

Toxin-Antitoxin and its Prevention of Diphtheria:

Early in January I gave an address to the Local Medical Society on the above subject, calling their attention to its efficacy and asking for their co-operation.

Early in the year all the children in the Children's Shelter were protected against diphtheria. During the three series of inoculations there was no local or constitutional reactions and no school time lost. I am pleased to say that not one child has ever developed a sore throat since. I have lately been granted permission to protect all the children of our other charitable institution in this city, the St. Joseph's Orphanage, and this will be done at once. I hope to see the time when all our children will be so protected. Dr. Osler once stated that the intelligence of a community can well be judged by the percentage of typhoid it has in its midst and I will state to your Board that the intelligence can now well be judged by the percentage of typhoid, smallpox and diphtheria it has in its midst, because we have the absolute means without doubt or suspicion, while causing little or no constitutional disturbance, of preventing these three diseases. Diphtheria should not exist any more than smallpox or typhoid, and it only remains for the education of the public to the efficacy of the use of toxin-antitoxin, when they will demand that their children be protected from this horrible disease.

During the spring months a survey was made, through the kindness of the Board of Education, of the cases of hyper-thyroidism in the schools and some 950 cases were reported; added to this some 200 cases in separate schools making a total of 1,150 cases existing within your public schools. Definite steps are being taken to have the school children placed under the influence of idostarine, a preparation of iodine (taricic acid diodide), which will prevent the hypertrophy of the thyroid gland. Its efficacy is undoubted and has proven itself repeatedly, one instance being in Switzerland where the percentage of goitre in school children was as high as 97, and where it has been reduced to 27.5 within three years. I strongly advocate its use and the results obtained would a hundred times compensate any financial outlay.

The V.D. Clinic has been doing excellent work throughout the year under the guidance of Dr. W. P. Hogarth, whose standing is unquestioned in this work. The city is indeed to be congratulated not only in having such a clinic, but in having a man of Dr. Hogarth's ability at its command. In May, we had a special visit from Mrs. E. Pankhurst and Dr. Gordon Bates, both of whom gave excellent addresses on the Social Evil, and as a result, a committee of citizens was appointed to work in accordance with their views.

I am pleased to report to your Board that no diseases were traced to any contamination at any of your public parks. Chippewa Park, however, must be safeguarded continually and steps taken to see that sanitary measures be enforced in every respect.

I attended the M.O.H. Convention in May in Toronto and received many benefits from the different papers which were presented, those of special interest being those on milk, Toxin-Antitoxin, and Insulin in Diabetes.

The sanitary condition of the east end coal dock section received much attention in the early summer, and until such time as it is possible to install a pumping sewer system, I would recommend that a special sanitary officer be employed every year for two or three months, devoting his entire time to the inspection of the privies, etc. However, we succeeded in having many made fly proof this year. Our infantile death rate this year is so much lower in this section that I may safely say that it is partly due to improvements in this district.

During the year many addresses were given to various organizations amongst which were the Ministerial Association, Women's Institute, Kiwanis Club and others, all pertaining to matters of public interest in health work.

Your death rate per thousand in your municipality is 8.66 which is the lowest in the city records. Your infantile death rate is 75.93 per thousand living births, last year being 89.6, a decrease of nearly 14%. I wish to call your attention to the gradual elimination of the gastro-enteritis mortality rate in the past few years; in 1920 there were forty-two deaths from this cause; in 1921, thirteen; 1922, twelve and 1923, four. This is due to the gradual absorbtion of the necessary knowledge imparted in matters pertaining to the care of infants by your public health nurse, and also to the cool summer months as well as to improved sanitary conditions. These are the lowest records in your city.

In 1913-14, one hundred and three plumbing installations were made; in 1922-1923, fifty-five, there is no doubt that there are many residents of your city who could afford to put in such installations and these should be put in, especially in those streets where there are already sewers, and the owners of the property had petitioned to have the sewers placed in the said streets.

The abattoir, which is under your department's jurisdiction, has been greatly improved during the year, a refrigerator plant having been installed and other sanitary measures adopted, making it a fully modern plant.

Your water supply has been safely guarded throughout the year, many samples being taken directly by Dr. Thomas, the results being to show that Loch Lomond water cannot be excelled. With regard to the installation of the double check valve system, which system is necessary by order in council of Provincial Government, connecting our municipal and other waters, to be used in cases of fire emergency, I am pleased to say that all connections with the exception of one have been made and inspected and found satisfactory. I have assurance that the last one will be installed this month.

During the year an inspection was made of all the public buildings, schools, hospitals, charitable institutions, etc., and they were all found to be in a good sanitary condition. In connection with the Children's Shelter, however, I found it overcrowded and the Board of Directors were notified of this condition. Steps were taken to see that this condition was rectified, but up to the present no definite results have been obtained.

Child welfare work has been excellently done under the auspices of the Wesley Institute who have confined their attention principally to that part of the city where it was most needed, namely, in what is known as the Coal Dock Section. This institution is deserving of the highest commendation as is also such bodies as the Women's Institute and Willing Workers, the value of whose work is not sufficiently recognized by the general public. I have made fifty indigent calls and ten consultations during the year.

During three months our Isolation Hospital was empty of patients and the nursing staff was at that time placed on the general staff doing work where it was mostly needed, however, it has been occupied ever since. Your Isolation Hospital maintenance account is $5,550 yearly, a big overhead expense and I have advocated the placing of it upon the McKellar Hospital site, but this plan does not seem feasible at the present time, though I am hoping to see some plan adopted whereby this large expenditure can be reduced materially and the efficiency of the service not lowered.

It will be seen by the 1921-1922 Annual Report of the Provincial Board of Health just received that the eight cities of Ontario with a full time service, average in public health expenditure $1.25 per head of the population. For the same year the per capita cost was 68.9 cents in Fort William.

The per capita cost for the City of Fort William for the year just ended was 58.13 cents, which taking into consideration with the amount of work done and the service rendered is very low, this of course includes the maintenance of the Isolation Hospital.

The introduction of milk into your schools by the I.O.D.E. is a step in the right direction provided that the system is efficiently carried out from a sanitary point of view and is properly supervised. The ingestion of poor milk or impure contaminated milk to an ill-nourished child would defeat the object sought and would only be detrimental to the child whose resisting power is already lowered. I am heartily in accord with the aims and objectives sought, as no stone should be left unturned in seeking to develop and to maintain that physique of our rising generation which is characteristic generally speaking of our young national life.

In conclusion, I wish to take this opportunity of publicly expressing my appreciation of the interest shown, and the support given by the chairman and members of your Board. I sincerely hope that such interest and support shall in the future be as great as it was during the past twelve months.

SMALLPOX

There were no cases of this disease reported. Statistics follow:

Year	Cases	Deaths
1919	0	0
1920	24	0
1921	10	0
1922	6	0
1923	0	0

SCARLET FEVER

There were nine cases of this disease reported as compared to 105 cases last year.

Cases	M.	F.	Under 5 years	5–9 years	10–14 years
9	3	6	3	5	1

DIPHTHERIA

There were forty-six cases of diphtheria reported with two deaths.

Year	Cases	Deaths
1919	22	1
1920	22	1
1921	54	2
1922	23	1
1923	46	2

MEASLES

There were 133 cases of measles reported.

1919	0	0
1920	384	5
1921	662	7
1922	0	0
1923	133	0

WHOOPING COUGH

There were five cases of this disease reported as compared to twenty-one cases last year with one death.

Year	Cases	Deaths
1919	0	0
1920	60	3
1921	104	3
1922	21	1
1923	5	0

ERYSIPELAS

There were nine cases of this disease reported.

1919	1	0
1920	19	0
1921	16	0
1922	7	0
1923	9	0

CHICKENPOX

1920	72	0
1921	193	0
1922	86	0
1923	51	0

MUMPS

1920	0	0
1921	5	0
1922	28	0
1923	2	0

PULMONARY TUBERCULOSIS

There were nineteen cases of tuberculosis, of which four cases came from other municipalities There were seven deaths.

There were no cases of influenza reported. There were three deaths.

There were no cases of poliomyelitis reported.

TYPHOID FEVER

There were twenty-seven cases of this disease reported with one death. The source of these cases were:

	Cases		Cases
Schreiber	3	S.S. Assiniboia	1
Port Arthur	1	S.S. Harmonic	1
Nurses' Home	2	S.S. Canadian Engineer	2
Cochrane	1	S.S. Canadian Sailor	2
Winnipeg	1	S.S. Berryton	4
S.S. Devereux	1	Slate River	1

The source of infection were traced in the other seven cases. The case which came from Winnipeg died.

CEREBROSPINAL MENINGITIS

There were no cases of this disease reported.

PRIMARY PNEUMONIA

There were seventy-one cases of this disease reported with thirteen deaths.

PUERPERAL SEPTICAEMIA

There was one case of this disease reported, which proved fatal.

Fort William, Ont, November 1st, 1923.

Dr. R. M. Boyd, Medical Health Officer,
Fort William, Ont.

DEAR DOCTOR:

I beg to report as follows on the work of the venereal clinic for the year. As you know the clinic receives cases not only from Fort William but the whole district.

New patients admitted November 1st, 1922 to October 31st, 1923:

Male	27
Female	14
Boy	1
Girl	0
	42

Syphilis	11
Gonorrhoea	16
Double infection	5
Non-venereal	10
	42

Resident in:

Fort William	7
Port Arthur	25
District	9
Indian	1
	42

Disease contracted in :

Port Arthur	13
Winnipeg	5
Montreal	2
Hurkett	1
Port Colborne	1
Sudbury	1
Nipigon	1
Kabeka Falls	1
Ottawa	1
North Bay	1
Duluth	1
Boston	1
Italy	1
Russia	2
Fort William	0
	32

During the year we have discharged:

For treatment elsewhere	14
Cured	6
Died	1
Lost	9

Patients who have been discharged as lost are those who have failed to continue treatment until such time as they can be pronounced cured. The Social Service nurse has been unable to locate them and their names have been reported to the respective medical officers of health.

During the year we have given the following treatments:

For syphilis	647
For gonorrhoea	310
Hospital in patient days	492
Treatments of phenarsenamine	325

On roll October 31st, 1923—

Syphilis—Male	32
Female	27
Boy	2
Girl	1
Gonorrhoea—Male	4
Female	5
Double infection—Male	1

Of the patients on the roll for syphilis, twenty-seven have negative Wassermanns, and are being held for observation and repeated Wassermanns before being discharged as cured.

We have found it a little easier to keep infected persons coming regular for treatment. Our greatest difficulty is with the transient male patient who comes regular until comfortable and then disappears. The Indians are also very irregular in reporting.

WALTER P. HOGARTH.

ISOLATION HOSPITAL REPORT.

Patients admitted:

Scarlet fever	2
Diphtheria	14
Measles	1
Rubella	1
Total	18
Hospital days	426

One case admitted to the Isolation Hospital died, the cause of death being diphtheria.

FINANCIAL STATEMENT

Debit:		
Salaries of staff		$3,516 00
Maintenance account		2,035 66
Total		$5,551 66
Credit:		
Accounts collected	$1,388 50	
Garden produce	150 00	
		1,538 50
Net cost of operation		$4,013 16

VISITING HEALTH NURSE'S REPORT.

Miss Gerry made 2,276 calls during the year and attended a three weeks' Public Health Extension Course at Toronto University in June.

Month	New-born Babies	Breast Fed	Cows' Milk	Miscellaneous	Special Calls	Revisits
1922						
November	25	21	1	3	11	187
December	21	13	4	4	7	138
1923						
January	50	45	3	2	6	148
February	47	42	4	1	5	114
March	43	38	5	0	4	155
April	48	42	5	1	6	153
May	32	27	4	1	10	108
June	..	..	..	..	..	...
July	55	45	5	5	8	107
August	62	46	7	9	18	132
September	38	37	1	..	14	141
October	45	37	6	2	6	141
Totals	466	393	45	28	94	1,524

Other calls not classified were:

Prenatal calls	180
Taking swabs	12

SANITARY INSPECTOR'S REPORT, 1922-1923.

Dr. R. M. Boyd,
Medical Officer of Health,
Fort William, Ont.

Alfred J. Bolus, M.R.S.I.,
Sanitary Inspector,
Fort William, Ont.

DEAR SIR:

I have the honour to submit herewith my Annual Report for the year ending 31st October, 1923.

MILK SUPPLY

A considerable amount of time has been expended on work in connection with our dairies. Public opinion is steadily but surely moving in the direction of a purer milk supply, and it is some satisfaction to be able to record the fact that our supply has been remarkably free from sediment, and, without exception, each dairyman is retailing milk richer in butter fat than last year when 115 samples tested showed an average of 3.22 per cent. butter fat as against 144 samples this year with an average of 3.56 per cent.

One hundred and eighty-six visits were made to dairy farms, city dairies and pasteurizing plants. Two hundred and forty-three samples of milk were collected for test in the Provincial laboratory, in addition to which I tested 149 samples myself at the dairies.

Notices to dairymen in respect to their milk, and bulletins *re* the methods necessary for production of clean milk numbered 150.

One hundred and forty-three letters and circulars together with 100 copies of the bulletins issued by the Health of Animals Branch were sent to Milk Producers interested in the Tuberculin Test of Cattle.

During the past year two of our pasteurizing plants have installed recording thermometers, and have also effected some improvement in other directions. The demand for pasteurized milk has shown its influence in the greater care as to cleanliness exercised in our other dairies.

One dairyman who failed to come up to standard required was closed out of business and two others were taken before the magistrate and fined for selling dirty milk. Two other persons were likewise fined for selling milk without a license.

ABATTOIR.

Business at the abattoir continues to increase, the figures given below show that the citizens are assured of an ample supply of fresh killed meat. The grade of animals slaughtered is also better than in former years and the condemnations less.

Many minor improvements tending to better sanitary conditions have been effected, and in addition, a refrigerator plant has been installed; this together with the storage capacity will need to be enlarged in the near future.

ANIMALS SLAUGHTERED

Cattle	1,453
Calves	1,602
Hogs	345
Sheep	303
Total	3,703

During the past year 1,806 pounds of meat was condemned as unfit for food, of this amount 1,100 pounds was tubercular.

Two hundred and thirty-eight visits was made at the abattoir during the year.

Bakeshops

One hundred and sixty-eight visits were made to bakeries, conditions in which were much improved. One bakeshop which became closed was ordered to remain unused until renovated.

Communicable Diseases.

Eighty-seven vists were made to homes in connection with communicable diseases.

Arrangements were again made whereby it was possible to have printed on some 60,000 electric light account forms, information to the public in regard to fly control and other preventive measures.

Nuisances.

All nuisances found received the attention necessary to abate same, 181 notices were served.

In the east end coal dock particularly, an effort was made to lessen the danger from flies, and in this connection 556 notices were served *re* manure, 518 notices to repair dilapidated privies and in addition, warnings were printed in five different languages and posted, these together with your article in the Finnish newspaper have shown good results. Many of the repairs done to privies were of a flimsy character, but I am satisfied that more interest will be shown in future by the people living in this section of the city, some work along the same lines was also done in the west end of the city and has shown results to a smaller extent.

One hundred and forty-five complaints by the public were investigated and dealt with as found necessary.

Police court proceedings *re* the above are given in summary under that heading.

One complaint in regard to living conditions on a boat was investigated.

Installation of Plumbing.

During the year fifty-five old premises were connected to sewer and plumbing installed in accordance with the city by-law governing same, of this number twenty were done by the city at the request of the owners and charged on taxes of the owner, the remainder were done at the direct expense of the owner.

Licenses.

During the year two new licenses were granted to retail milk and three applications for restaurant licenses were refused, premises found unsuitable. Three transfers were made in bakehouse licenses. One temporary permit was given for the storage of hides.

Business Premises.

Business premises and apartment blocks have been inspected during the past year, and with very few exceptions have been found in good order. A close watch has been kept on all places where food is sold or stored for sale. One so-called lung-testing machine was ordered out of use as insanitary.

Market.

The City Market opened on Friday 18th May, and was open each Tuesday and Friday until Friday, 2nd November. A supply of good foodstuffs always found plenty of buyers and no condemnations were necessary.

General.

Several visits were made to the C.P.R. boarding-houses and dining-rooms.

I accompanied Dr. Sparks and yourself on inspection of the Police Court cells, Children's Shelter, St. Joseph's Orphanage, Isolation Hospital and Annex, McKellar Hospital and all the dairies.

Visits were also made to the east and west end-sections of the city at the time of Mr. Dallyn's visit subsequent to the survey made by the Provincial department men.

POLICE COURT CASES

Selling milk without license	Fined	$10	and costs
" " " "	"	5	" "
Selling dirty milk	"	15	" "
" " "	"	10	" "
Throwing manure on lane	"	10	" "
Depositing garbage on street	"	5	" "
Transporting meat exposed to dust	"	5	" "
Keeping pigs after notice re same	"	10	" "
Depositing garbage on lane	"	10	" "
Failing to repair dilapidated privy	"	5	" "
" " " " "	"	5	" "
" " " " "	"	5	" "
Total fines		$95	

Convention.

With the sanction of the Board, I attended the Annual Convention of the Sanitary Inspectors' Association of Canada, held at Calgary early in September, a report of the proceedings being handed to the Board. The convention in 1924 is to be held in Fort William.

Recommendations

I would respectfully urge upon the Board for their careful consideration the necessity of securing a sufficient appropriation next year for use in the installation of plumbing in old premises where the owners cannot themselves find the money; also the formation of a definite programme in respect to the enforcement of this section of the Public Health Act on streets already provided with sewers.

The elimination of the privy closet and provision of proper sanitary arrangements tends greatly to reduce our infant mortality.

In conclusion, Sir, I beg to acknowledge with thanks the valuable co-operation and assistance you have given me during the past year.

All of which is respectfully submitted,

Alfred J. Bolus, M.R.S.I.,
Sanitary Inspector.

DIVISION OF LABORATORIES
THE PROVINCIAL BOARD OF HEALTH OF ONTARIO.

Yearly Report.

Branch Laboratory
at Fort William, November 1st, 1923.

SPECIMENS EXAMINED FOR THE MUNICIPALITY OF FORT WILLIAM.

Type of Specimen.			
Diphtheria (Swabs)—			
Diagnosis	Positive	46	
	Negative	87	
Release from quarantine	Positive	375	
	Negative	1,139	
	Total		1,647
Tuberculosis	Positive	23	
	Negative	140	
	Total		163
Typhoid	Positive	30	
	Negative	51	
	Total	81	
Syphilis—			
Colloidal gold test			53
Wassermann test	Very strongly positive	114	
	Strongly positive	29	
	Positive	50	
	Negative	604	
	Total		797
Dark field test for Treponema pallidum	Positive	5	
	Negative	5	
	Total		10
Gonorrhoea	Positive	91	
	Negative	123	
	Total		214
Milk Analyses	Chemical	385	
	Bacteriological	6	
	Total		391
Water Analyses	Chemical	0	
	Bacteriological	24	
	Total		24
Miscellaneous specimens			318
Total for the year ending 31st October, 1923			3,698

(Sgd.) N. O. Thomas.

BIRTHS REGISTERED IN THE CITY OF FORT WILLIAM
For year ending October 31s, 1923

Month	Total	Males	Females	Twins
1922				
November	59	29	30	..
December	59	33	26	1
1923				
January	66	31	35	..
February	61	31	30	1
March	80	45	35	..
April	61	34	27	..
May	64	29	35	..
June	67	35	32	..
July	74	37	37	2
August	65	33	32	1
September	51	29	22	..
October	70	41	29	2
Totals	777	407	370	7

STILLBIRTHS

1922	Total	Males	Females
November	3	1	2
December	1	1	..
1923			
January	..	..	..
February	7	4	3
March	4	3	1
April	2	1	1
May	3	1	2
June	1	1	..
July	5	4	1
August	4	1	3
September	1	..	1
October	1	1	..
	32	18	14

DEATHS

No. on International List:		
151	Congenital debility, etc.	25
79	Organic diseases of the heart	5
28	Tuberculosis of the lungs	7
92	Lobar pneumonia	13
104	Diarrhoea and enteritis (under two years)	4
81	Diseases of the arteries, etc.	8
150	Congenital malformations	4
175	Traumatism by other crushing	7
120	Bright's disease	8
185	Fractures	8
10	Influenza	3
91	Broncho-pneumonia	10
169	Accidental drowning	1
40	Cancer of the stomach, liver	3
45	Cancer of other or unspecified organs	4
61	Meningitis	3
109	Hernia, intestinal obstruction	3
42	Cancer of the female genital organs	1
50	Diabetes	1
64	Cerebral hemorrhage	6
71	Convulsions of infants	3
152	Other diseases peculiar to early infancy	5
154	Senility	2
24	Tetanus	2
43	Cancer of breast	2
60	Encephalitis	3
78	Acute endocarditis, myocarditis	2
105	Diarrhoea and enteritis (over two years)	1
108	Appendicitis	1
113	Cirrhosis of the liver	1
115	Other diseases of the liver	1
167	Burns	2
189	Ill-defined	1
1	Typhoid fever	1
9	Diphtheria	2
48	Chronic rheumatism	2
53	Leukemia	2
54	Anemia, chlorosis	1
80	Angina pectoris	1
82	Embolism and thrombosis	1
89	Acute bronchitis	1
117	Simple peritonitis	1
137	Puerperal septicaemia	1
146	Diseases of the bones	2
174	Traumatism by machines	1
110	Paresis of bowels, etc.	3
56	Over-indulgence of alcohol	1
156	Suicide by drowning	1
160	Suicide by stab wounds	1
63	Insular sclerosis	1
138	Puerperal albuminuria and convulsions	2

DEATHS

No. on International List:		
30	Tubercular meningitis	1
166	Crushed by falling wall	1
84	Acute lymphatitis in thymic gland	1
134	Attempted criminal abortion	1
102	Gastric ulcer	1
37	Syphilis	1
46	Tumour of the brain	1
	Total	182

There were fifteen deaths of non-residents in this municipality. The causes of death were as follows:

No. on International List:		
92	Lobar pneumonia	2
109	Intestinal obstruction	2
10	Influenza	1
151	Premature birth	2
151	Inanition	1
37	Syphilis	1
168	Asphyxiation in bed	1
9	Diphtheria	1
91	Broncho-pneumonia	1
185	Fractured skull	2
81	Arterio-sclerosis	1
	Total	15

There were four deaths which occurred in other municipalities but were registered here. The causes of death were:

No. on International List:		
56	Over-indulgence in alcohol	1
185	Fractured cervical vertebrae	1
156	Suicide by drowning	1
81	Arterio-sclerosis	1
	Total	4

FINANCIAL STATEMENT FOR YEAR ENDING OCTOBER 31ST, 1923

Salaries of City Hall staff		$6,874 77
Special clinic nurse		350 04
Carfare		90 00
Printing and stationery		88 58
Antitoxin syringes		11 92
Conventions		375 00
Phone and ice		111 50
Office equipment		42 72
Automobile		300 00
Incidentals		107 10
Salaries of Isolation Hospital staff		3,516 00
Maintenance of Isolation Hospital		2,035 66
		$13,903 29
Credits:		
Isolation Hospital accounts	$1,387 50	
Garden produce	150 00	
Police Court fines	95 00	
Antitoxin syringes	17 15	
Abattoir	43 76	
		1,693 41
Net cost of Department		$12,209 88
Per capita cost—Department		31.697 cents
Per capita cost—Isolation Hospital		26.436 "
Total per capita cost operation of Board		58.133 "

Respectfully submitted,

R. M. BOYD,
Medical Officer of Health.

HAMILTON

To His Worship the Mayor, the Chairman and Members of the Board of Health for the City of Hamilton.

Gentlemen:

For the nineteenth year in succession it is my privilege to submit for your consideration my annual report on the health of the City of Hamilton.

Through this report I wish to direct your attention to the many activities of the Department of Health as evidenced by the reports from the Public Health Laboratory; from the Division of Dental Hygiene; from the Division of Food Inspection, including Dairy Inspection; from the Division of Public Health Nursing, including the report of the visiting nurse dealing with Tuberculosis, and the report of the nurse dealing with Social Service and the control of venereal diseases; from the Division of Sanitary Inspection, including the report of the Chief Sanitary Inspector on smoke nuisances and their prevention; from the inspectors dealing with isolation and quarantine; from the health centre clinics detailing the activities of these in anti-tuberculosis work, child welfare work, particularly the immunization of children of school and pre-school age against diphtheria, and in addition a special reference to our work in this direction in connection with the city schools.

The findings of our Chief Sanitary Inspector in connection with the sanitary survey of schools, public, separate and private, is made the subject also of a separate report.

The concluding pages of the report will comprise a detailed analysis of vital statistics for the year beginning November 1st, 1922, and ending October 31st, 1923, showing births and deaths for the year by months; the deaths from individual diseases for the year, grouped under appropriate headings, with a special table relating to the causes of death in infancy. Communicable diseases reported and deaths from these latter are indicated fully in a table showing the monthly record for each disease. Comparative statistics of former years are given in some instances to enable the interested public to see in a general way only the results achieved in the saving of the lives of our citizens.

Population.—The estimated population for the year was 120,945, showing an increase of 690 over the previous year, when the population was estimated at 120,235.

Births.—The registration of living births during the year, or excluding still births and premature (used synonymously with still births by many physicians), totalled 3,117; this number is equivalent to an annual birth rate of 25.5 per thousand, as compared with 25.8 in 1922.

A table recording the births for each month in the year will be found at the end of this report.

Deaths.—The actual number of all deaths registered in the city reached a total of 1,424; this total, however, includes 186 premature and still births; by properly excluding these, the total is reduced to 1,238, and is equal to a rate of 10.2 per thousand, as compared with 9.8 for the previous year. This is a fraction higher than the rate for 1922.

Influenza was responsible for 42 deaths in 1923. During the month of February we had a serious epidemic of this disease. A large number of cases were designated simply as grippe, but in too many instances the disease assumed a pneumonic type. The question once more arises, of course, whether in some of these outbreaks we are dealing with pneumonia in epidemic form or not. How-

ever, deducting the influenzal deaths, of which there was only one in 1922, the total deaths for 1923 would make the death rates of 1922 and 1923 practically identical.

Infant Mortality Rate.—In my report for 1922, I remarked on the very low infantile mortality rate for that year, it having reached the lowest point on record for Hamilton, of 58 per thousand.

It is with much gratification that we are able to report the rate for the year under consideration as being 53.6.

The significance of this remarkably low rate will be better appreciated when compared with former years, as shown in the table of infantile mortalities at the end of this report. It will there be noted that for 1906, the second year of my incumbency as health officer, the rate was 128.9 per thousand, or nearly two and a half times greater than in 1923.

If this same number per thousand of living births had died in 1923, the number of infant deaths would have been 401 instead of 167. Or if the average mortality for the eighteen previous years, including the low rate of 1923, had been maintained, at least 307 infants, instead of 167, would have died.

A study of the before-mentioned table will show that except in one year, 1910-11, the infantile mortality rate was always well over one hundred per thousand births registered, in the first decade of the table.

One's curiosity is naturally aroused to inquire as to the factors which have been instrumental in bringing about this very desirable improvement in the preservation and care of our infant population.

The cause of this decrease in infant mortality is to be explained, no doubt, in part by the growing movement for the protection of child life and the movement for the furtherance of public health measures generally, as well as by the desire on the part of the people individually and by the community at large for a more sanitary and hygienic environment than was demanded by our forefathers.

A remarkable stimulus has been given in recent years to the work of educating mothers in the duties and responsibilities of maternity.

The distribution of popular newspaper and magazine literature on the subject of caring for expectant mothers and babies, particularly during the first year of life, has been very general. Health bulletins nowadays abound with information on child hygiene, and there has been a wide circulation of baby books, pamphlets, and leaflets by federal, state, and municipal health authorities, calculated to enlighten the general public on this very important branch of public health work.

In all populous centres and some of the smaller ones of Canada and the United States, child hygiene divisions are a part of the health departments with well baby clinics and prenatal clinics in connection therewith for the proper instruction of mothers in the care of their off-spring. In many cities (including Hamilton), voluntary organizations have taken an enthusiastic interest in the promotion of this excellent work. Among these the work of the Babies' Dispensary Guild and the Victorian Order of Nurses deserves special mention.

Our medical schools are devoting more and more attention to the training of physicians in the diagnosis of the diseases of infancy and childhood, so that pediatrics is becoming a popular field on the part of students of medicine for special attention, and for exclusive practice by many doctors. In Hamilton the improvement in methods of production, handling, and distribution of our milk has been very great within recent years. Almost the entire supply is scientifically pasteurized and this, together with the general enlightenment of the people as to the necessity of cold and cleanliness in the preservation of milk in good con-

dition, has been a big factor in lessening the gastro-intestinal diseases of babyhood during the trying seasons of summer and early fall.

Improved sanitary conditions in homes; better ventilation; access to parks and open spaces and healthy surroundings generally, are items of importance in the saving of infant life.

While the infantile mortality rate of 53.6 may be regarded by less favoured municipalities as an enviable one, yet when we consider that 28 deaths of infants are referred to malnutrition, and 24 to gastro-intestinal diseases, it becomes at once apparent that our figures might have been even lower if infant care had been better understood by some of the mothers of these 52 children.

Even the low rate of 1923 cannot be accepted as a final and unbeatable minimum. By comparing our infant mortality rate for 1923 with that which has obtained in New Zealand and Scandinavian countries for some years past, an idea can be formed of the possible further reduction in the loss to this young country, physically and economically, by the conservation of the infant lives needlessly wasted through ignorance and carelessness.

The value of child welfare work has been amply demonstrated, but in many centres it is still in the incipient stage. The growth and expansion of the work along practical and properly established lines should result in a further considerable decrease in our infant mortality.

General Death Rate.—The general death rate of 10.2, only .4 above the record death rate for the previous year, may be regarded with satisfaction, although some of the causes of death are worthy of special consideration.

In the groups of diseases, 252 deaths were referred to diseases of the circulatory system, in which are included diseases of the heart; this number represents 20.4 per cent. of the deaths from all causes which occurred during the year, as compared with a total of 197, or 16.6 per cent. of deaths from all causes for 1922.

To the respiratory system 141, or 11.4 per cent. of deaths from all causes, were referred, as against a total of 159, or 13.4 per cent. of all deaths in 1922.

Tuberculosis was responsible for the death of 48 persons, or 3.9 per cent. of deaths from all causes; in the previous year the number of deaths from this disease totalled 53, or 4.5 per cent. of deaths from all causes.

Cancer.—Cancer caused the death of 118 persons during the year, or 9.5 per cent. of deaths from all causes. This disease in Hamilton has been making steady progress for at least two decades. This condition, however, is in common with the rest of the civilized world. In a recent bulletin to the local press on this disease, I mentioned the fact that its cause and the reasons for its increasing prevalence have not been determined; various theories have been advanced, but our knowledge, even in the light shed upon the subject by modern laboratory investigations, of the true character and cause of cancer is so slender, that it would be unwise to advocate any of the theories advanced with any degree of dogmatism. The steady advance of the disease in Hamilton will be visualized by the following record:

In 1914 cancer caused the death of 72 persons, or 6.5 per cent. of the deaths from all causes; in 1919 exactly 100 deaths were referred to this disease, or 6.8 per cent. of all causes of death; in 1920 cancer was responsible for the death of 107 persons, representing 7.0 per cent. of all deaths registered; in 1921 the number of deaths was 87, or 6.9 per cent. of the deaths from all causes—a slight reduction as compared with the previous year; in 1922 cancer caused the death of 111 persons, or 9.3 of the total number of deaths from every cause; and, as already shown, in 1923 no less than 119 persons died from this disease, representing a percentage of 9.5 of all deaths.

It will thus be noted that cancer as a single cause of death was more fatal than any other during the year 1923.

The attention of the public has already been directed to the ravages of cancer in a series of articles in the *Health Officer's Corner* of the local press. The special points brought out in the articles were that cancer was showing signs of increasing, that it was a curable disease if treated in its early stages, that knowledge of the disease was not the thing to be feared the most, but ignorance, for a knowledge of the disease would mean early treatment while, if ignorant of its presence, the cancer may run its course over a period in which an incurable condition may develop. Some of the causes, signs, and symptoms of cancer anp other points were dealt with in the *Health Officer's Corner*.

Certain parts of the body are more prone to develop cancer than others; the disease may result, however, on any part of the body which is subjected to frequent irritation. Moles and warts are often the site of cancer, on account of the irritation occasioned by clothing.

Cancer of the lip is often caused by holding an irritating pipe stem in one place between the teeth; in fact, cancer in any part of the body is perhaps more frequently caused by irritation than by any other known cause.

Cancer of the tongue is of simple origin, generally resulting from broken or decayed teeth, but is a type most difficult to be dealt with.

It has been stated that some person on the North American continent dies of cancer every five minutes throughout the year.

In many cities of the United States, one week in the year is set apart for the special study and treatment of cancer. Public attention is directed to the subject by preachers from the pulpit, by lecturers from the platform, through the press, by the medical profession and public health authorities, by special activities at the clinics, and by any means possible to attract the attention of the public to this important subject.

This practice has been productive of many beneficial results; many of the cases dealt with at the clinics were on the average seen earlier than the usual run of such cases are seen in routine practice; this, of course, is one of the objects of the annual drive. Many of the cases rendered considerable study necessary to make accurate diagnosis; these were content to suffer mildly and were not concerned about themselves until aroused by the publicity of the campaign, but the fact is emphasized that the cases were seen earlier, and the diagnosis was correspondingly more difficult, but the cures effected were more frequent and more lasting.

Much publicity has very properly been given in our own city to the causes and cure for tuberculosis, and to the danger resulting from the neglect in the proper treatment and care of tuberculous persons. Similar publicity is advocated for cancer. I am confident that if an organized campaign of education were directed against cancer as has been carried on against tuberculosis during the last three decades, a remarkable reduction in the incidence of this fatal malady would result. The laity should know some of the signs and symptoms of the disease, e.g., that the appearance of moles and warts should be regarded with suspicion, as skin cancer may develop therefrom. Attention should be paid to bleeding from any orifice of the body, broken or decayed teeth, ulcerations, lumps, thickening or any other signs or symptoms of cancer, and the family physician or specialist should be consulted without any delay.

Cancer is even more fatal than vital statistics show. Competent surgeons have informed us that patients suffering from cancer, on account of leaving a locality or from some other cause, are frequently passed on from one physician

to another, and are tempted to try all sorts of advertised remedies, and when the end comes death is attributed to an intercurrent disease which should properly have been referred to as cancer.

A cure for cancer depends on early treatment; delay may cause the spread of the growth beyond possibility of cure.

Communicable Diseases.

Diphtheria.

It has been the custom of the department to designate as "*positive Klebs Loeffler*" those cases in which typical diphtheria bacilli have been found with no accompanying history of illness or actual evidence of diphtheria. The term diphtheria "*carriers*" has been restricted to cases in which, with the persistence of diphtheria bacilli in the nose or throat, there is a previous history of quarantine or a previous history of illness of which the department has had no notice.

There were reported to the department during the year 381 cases of diphtheria, as compared with 747 cases for 1922 and 608 for 1921. Of the cases reported 26 died, making a case fatality of 6.8 per cent., which was a much higher percentage mortality than in 1922, and approximately the same as occurred in 1921.

The seriousness of diphtheria as a cause of morbidity and mortality in Hamilton may be realized from the records of this disease for the past sixteen years, according to a table showing the cases and deaths occurring during this period. For the years 1908 to 1923, inclusive, 4,298 notifications as a result of clinical or laboratory findings, or both, have been received.

In 1908 there were 92 cases with 8 deaths; in 1909, 182 cases, 18 deaths; 1910, 152 cases, 23 deaths; 1911, 89 cases, 9 deaths; 1912, 130 cases, 10 deaths; 1913, 126 cases, 12 deaths; 1914, 194 cases, 16 deaths; 1915, 210 cases, 20 deaths; 1916, 223 cases, 35 deaths; 1917, 255 cases, 27 deaths; 1918, 128 cases, 20 deaths; 1919, 185 cases, 14 deaths; 1920, 596 cases, 44 deaths; 1921, 608 cases, 41 deaths; 1922, 747 cases, 32 deaths; 1923, 381 cases, 26 deaths.

The tremendous and rather sudden increase in the case incidence, together with the lower percentage of case fatalities, beginning with 1920, is doubtless to be explained by a very frequent use of the laboratory (practically in all cases) as an aid to correct diagnosis where the type of the disease is less virulent, and the symptoms are mild in character, resulting, of course, in a much more complete record.

In the past sixteen years there have been 355 deaths distributed with reference to age and sex as shown below:

	Total	Female	Male
Under 1 year	23	9	14
1 year to 2 years	26	13	13
2 years to 3 years	46	23	23
3 years to 4 years	32	12	20
4 years to 5 years	45	24	21
5 years to 6 years	34	16	18
6 years to 7 years	26	13	13
7 years to 8 years	35	18	17
8 years to 9 years	14	10	4
9 years to 10 years	16	10	6
10 years to 11 years	14	5	9
11 years to 12 years	12	6	6
12 years to 13 years	5	1	4
13 years to 14 years	3	1	2
14 years to 15 years	3	2	1
15 years to 16 years	1	1	..
16 years	1	..	1

	Total	Female	Male
18 years	1	..	1
19 years	1	1	..
22 years	2	1	1
25 years	1	1	..
27 years	2	2	..
30 years	1	1	..
31 years	1	..	1
34 years	1	1	..
35 years	1	1	..
38 years	2	1	1
39 years	1	..	1
40 years	1	..	1
43 years	1	1	..
54 years	1	..	1
Age not given	2	1	1
Total	355	175	180

From these figures it will be seen that diphtheria is essentially a disease of childhood, over 90 per cent. of deaths occurring in Hamilton being under the age of twelve years, and more than 75 per cent. of the children who succumb being under eight. The proportion of males to females dying appears to be approximately equal.

Diphtheria is relatively infrequent under one year. Although most of the deaths occur between the ages of two and seven years, in persons of older years a good deal of illness occurs, which incapacitates the patients for longer or shorter periods and results often in serious complications, with accompanying loss of valuable time. The Health Department has been able to accomplish a great work in preventing the spread of diphtheria in families, institutions and, to some extent, in schools, but the frequency of the carrier condition after mild attacks, and the reappearance of positive cultures in those temporarily free and released from isolation, render the control of epidemics exceedingly difficult. Treatment early and efficiently in all cases, it cannot be too often repeated, reduces the death rate to an insignificant minimum.

Because parents do not call in a doctor during the early days of illness, and less often because doctors lose valuable time by not giving antitoxin at once, the mortality from diphtheria remains high beyond any possibility of excuse.

With the object of educating the general public to the value of immunization by toxin-antitoxin against this dangerous enemy of our child population, we have undertaken an active compaign in school and home in favour of this procedure.

The Schick test consists in the injection of a small quantity of diphtheria toxin between the layers of the skin, and the result is tabulated in three or four days. The injection produces no constitutional effect. The resistance to diphtheria is obtained by injecting on three occasions one week apart a 1 c.c. dose of the toxin-antitoxin mixture. In from three to six months—a small percentage of individuals require longer—a resistance to diphtheria is got, which, in more than 90 per cent. of those injected, so far as is known, lasts for life.

Since January, 1922, a clinic for carrying out immunization of school and pre-school children has been carried on at the health centre under the direction of Dr. Deadman, assisted by Drs. Eaton, Farmer, and MacGregor, and has been well attended in consequence of the active interest of the public health nurses who are constantly, in their routine visits to the homes, calling the attention of parents to the advisability of having all children protected. Through the co-operation of the Board of Education and the School Medical Officer, Dr. J. E. Davey, the work has been started in the public schools and a comprehensive programme will be undertaken during 1924. The report of Dr. Deadman, in

part, with a table of results appended on the work already accomplished in the schools and at our clinic, is here given.

"The initial step taken was a general talk to the teachers of the school on the principles and value of diphtheria immunization. This was followed by the distribution to the children of a descriptive pamphlet and a permission slip. These the children were asked to take home for the information and consent of the parents or guardians. When signed, these permission slips were brought back to school, collected by the teachers, and passed on to the Health Department nurse. From these, triplicate rolls were made, the children being grouped according to classes. One roll was kept at the department, one was sent to the principal of the school, and one was used for checking at the time of the performance of the test. These rolls were found to be of great value in handling the children, as by this means confusion and delay were reduced to a minimum. I cannot speak too highly of the co-operation and assistance afforded us by the principals.

"On the day decided on for the Schick test, a room previously chosen was prepared with due reference to the principles of asepsis. The doctors worked in pairs, one applying the actual test, and the other applying the control test. The arms were in the meantime being prepared with ether by the nurse. In this way, with the services of four doctors and five or six nurses, it was possible to apply the Schick test to as many as 400 children in a little over an hour. Five days after the application of the Schick test all the arms were inspected, and all those showing positive reactions were given their first dose of toxin-antitoxin. For this injection the arms were prepared with iodine. The remaining two doses were administered at intervals of one week.

"It is interesting to note that the children from the poorer districts gave a lower percentage of positive reactions and especially those from the districts where diphtheria is most prevalent. In one school, out of 203 children, only 36 gave a positive reaction. This is no doubt due to the widespread immunity acquired by frequent contact with the disease."

TABLE OF RESULTS.

Place	Schick Reading	Positive Schick	Completed Treatments
Murray School	99	26	26
Fairfield	203	36	31
Memorial	465	233	201
Queen Mary	363	157	153
Lloyd George	Schick not done	...	222
Gibson	Schick not done	...	372
Health Centre	650	236	486
		Total treatments	1,491

At the time of going to press the number of immunizations done at the Health Centre and in the public schools has reached a combined total of nearly 5,000. The great majority have been children between the ages of three and nine years; a few babies have been brought to the clinic.

Among the total number receiving the protective injections there were five positive cultures in children receiving the treatment less than one month previous to the culture. There was a diagnosis of diphtheria in two cases receiving treatment less than one month previous, but with negative cultures. Four were diagnosed as being mild diphtheria in less than two months after treatment, although the cultures in these cases were negative; and in three similar cases three months after injections, the cultures were also negative. One girl contracted mild diphtheria six months after having received three injections, and a positive culture was obtained.

These figures require no comment and, in my opinion, no further elaboration is necessary to emphasize the value of toxin-antitoxin in the treatment of diphtheria. They are more significant when the incidence of diphtheria among the children of school and pre-school age in a city of 120,000 persons for the past year is considered.

Scarlet Fever.

Scarlet fever was more or less prevalent in each month during the year, the least number of cases notified in any month being ten in July, and the greatest number being fifty cases notified in October. The total for the year was 305 cases, with six deaths attributed to this disease.

The number of cases notified would not represent the number actually occurring throughout the year, for we are convinced a number of mild cases of scarlet fever escape detection, and it is from these undetected cases that danger from the spread of infection from this disease is the most difficult to control.

The undetected cases are usually of a mild type. No serious illness is noted by the parents, and the children mingle with others in the home, the street, and at school, exposing large numbers of children to infection.

Many of these cases have been discovered by our nursing staff in their visits to homes and schools. In some instances the nurses have noted the hands of the children, when sitting in the class rooms, actually peeling, and very little, if any, history of illness has been forthcoming, except that in a few cases the parents have admitted a slight indisposition without suspecting scarlet fever or other communicable diseases and, as no physician was called in to see the patients, and the parents had no suspicion of scarlet fever, the children were permitted to mix with others before recovery and so spread infection, with the possibility of more serious cases resulting.

In 1922, two hundred and forty-five cases of scarlet fever were notified, with three deaths.

Typhoid Fever.

Twelve cases of typhoid fever were notified during the year; infection in nine of these cases was traced to sources outside the city, while in the other three cases the infection was of doubtful origin. Two deaths were caused by typhoid.

Bacteriological examinations made by the city bacteriologist show that in 1921 b. coli was present in the city drinking water on nine occasions; in 1922, eighteen times, and in 1923 the figures jumped to seventy-two times present, viz.: three times in January, one in February, six times in March, once in April, eleven times in May, ten in June, ten in July, eleven in August, ten in September, eight in October, and once in the last two months of 1922.

The chlorine content ranges from two parts to four or five parts per 100,000, but at times is greatly in excess of this amount.

In addition to these conditions, the bacterial count has within recent years increased enormously over that prevailing ten years ago, and counts of 400, 500 and over 1,000 per c.c. were frequently recorded during the year. For instance, in 1912, when b. coli was not found throughout the year, the chlorine was steady at 1.1 part per 100,000, and the bacterial count at 37°C. never reached 100.

Results, as shown by our laboratory tests, indicate a marked increase in the pollution of the drinking water of the citizens of Hamilton, and measures are necessary on the part of the city council, without delay, for rendering it absolutely safe throughout the year. Steps should be taken forthwith for the installation

of the necessary equipment to accomplish this. In the previous year 21 cases of typhoid fever were notified, nine of which were traced to infection outside the city; three deaths were referred to this disease.

The small number of cases of typhoid fever reported during the year is a tribute to the almost general pasteurization of our milk supply, as the typhoid bacillus is one of the pathogenic organisms in milk which is destroyed in the process of efficient pasteurization, when present.

Influenza.

During the months of January and February a slight outbreak in influenza occurred, eleven cases being notified in January, and 103 cases in February; no cases were notified in the subsequent months of the year. A total of 115 cases were reported, with 42 deaths.

Chicken-pox.

Five hundred and twenty cases of chicken-pox were notified during the year, but no deaths were referred to this disease; in the previous year 530 cases of chicken-pox were notified.

Smallpox.

Ten cases of smallpox were notified during the year, as against fourteen cases in 1922. No deaths resulted from this disease.

Measles.

In the prevention and control of measles, sanitary science has so far been unable to record more than limited success.

This disease was prevalent in the city during the summer time; only one case was notified in February; the numbers in each month increased as the summer advanced, there being 42 cases in April, 140 cases in May, 228 cases in June, and a maximum number was reached in July, with 278 cases; then a considerable drop to 58 cases occurred in August, and only two cases in September. The total number of cases of measles notified throughout the year was 783, as compared with 669 cases in 1922. Three deaths were referred to measles in 1923.

During the spring months, as the annual school closing approaches, we are confronted with the possibility of considerable disruption of school classes and consequent loss of examinations from the appearance of measles in epidemic form.

The children attending kindergarten being practically all susceptible to this disease constitute the chief source of danger in this regard. An effort was made by the department to minimize this danger by closing the kindergarten classes for sixteen days when cases occurred among this group of children.

This action was taken at several schools during the year, with good results, as the dismissal of these little tots appeared to prevent the spread of the infection among the advanced classes. This procedure was further justified by the appearance, during the incubation period of those exposed and kept under daily observation in the home, of a considerable number of subsequent cases which would, had prompt measures not been taken, served as foci for rapid distribution of the disease.

Tuberculosis.

The duties in connection with the treatment of tuberculosis in the city have been ably carried out by the nurse in charge of this particular work. Details of the work so performed will be found in the report of the nurse.

The problem of the prevention of tuberculosis still remains one of the most difficult to solve, but as housing conditions continue to improve, and the cause and treatment of the disease by parents is better understood, particularly as to the danger of the disease being contracted in early child life,—in these, coupled with a ban placed on promiscuous spitting on the streets and in public places, lie our greatest hope of its solution.

I desire at this point to express my appreciation of the excellent work already accomplished, and still in progress, by the Hamilton Health Association. The untiring efforts of the association have undoubtedly been responsible to a very great extent for the manifest reduction of tuberculosis in the city during the past few years. I also greatly appreciate the hearty co-operation of the association with the Department of Health, which has at all times been in evidence.

Whooping Cough.

Whooping cough was prevalent throughout the year; the least number of cases notified in any month was ten in September, and the greatest number 179 in the month of March. The total number of cases for the year was 828, with eleven deaths, as against 758 cases and seven deaths in the previous year.

Other Diseases.

Of other diseases, only one case of anterior poliomyelitis was reported; this case terminated fatally. Particulars relating to mumps, erysipelas and other diseases will be found in a table at the end of this report.

The nurses and inspectors dealing with communicable diseases have been diligent in their work, and no instance of neglect in dealing promptly with cases has occurred during the year.

Sanitary Inspection of Schools.

On the re-opening of the schools after the summer vacation, a sanitary inspection was made of every school in the city; these include twenty-eight public, eighteen separate, six private and one normal, making a total of fifty-three schools.

The schools generally throughout the city may be regarded with satisfaction in respect of health conditions obtaining therein. Exception, however, to some details may be made in regard to at least five public and six separate schools, where conditions exist demanding further attention of the respective boards. These details have been duly noted on forms provided by the Provincial Board of Health, and the attention of the boards directed to the requirements.

Reports on each school were made in triplicate, one copy of each being sent to the Provincial Board of Health, one to the respective school authorities, and a copy of each report retained at the office.

The unsanitary conditions of two of the public schools in the city have been engaging the attention of the Department of Health for some time. One of these, Cannon Street School, has been remodelled on up to date lines and is now quite satisfactory as viewed from a health standpoint; the other, Murray Street School, is being entirely rebuilt, and on completion will rank with the most healthy school buildings in our city.

A few extracts from the reports on the different schools inspected will illustrate the necessity for a thorough sanitary inspection of the premises.

SCHOOL A:

1. Thoroughly overhaul the ventilating system in the old part of the premises (preferably to replace existing defective methods, with a plenum

system), so that the two systems be evenly balanced, and fresh air distributed in the class rooms of the new and old parts of the premises.

2. Provide means in the four class rooms referred to in the report for a correct view of the blackboards.

3. It is desirable that the bubble fountains be so formed as to preclude the possibility of the mouths of pupils being in direct contact with the orifice of the fountain.

SCHOOL B:

All conditions are satisfactory; the interior of the school building has been entirely renovated during the past year (as recommended).

SCHOOL C:

(1) Remove the foul glass urinals, provide separate stall stoneware fittings. (2) Remove the iron sinks and replace same with glazed stoneware fittings.

SCHOOL D:

On inspecting the school this day, it was noted that five of the W. C.'s were out of repair (early attention requested). (1) Increase number of electric light bulbs in darkened rooms. (2) Remove glass urinals. (3) Replace with separate stall glazed stoneware fittings. (4) All walls and ceilings throughout the premises should be painted or kalsomined.

SCHOOL E:

It is very desirable that the foul slate urinals be removed without further delay and that separate stall glazed stoneware fittings be provided.

While many of the public and separate schools as well as the Normal School are very satisfactory as viewed from a sanitary standpoint, and in some instances almost ideal conditions in respect of school hygiene have been attained, in others conditions still exist which demand the careful consideration of the respective boards, who have already been advised by me. I would particularly mention some of the types of bubble fountains in use at many of the schools. Some of the most expensive fittings are amongst the most unsatisfactory, inasmuch as the mouth of the pupil is in contact with the orifice of the fountain at each time of drinking; in others, a cup is formed around the bubble, and little tots have been seen drinking from this cup, being unable to reach the bubble. An ideal fountain head is found in the following conditions: (a) a uniform flow of water made possible by a controlling valve, irrespective of the pressure of water in the mains; (b) the fountain head so formed as to render it an impossibility for the mouth of the person drinking the water being in direct contact with the orifice; (c) the water not falling back on the orifice.

The respective school boards have been advised along these lines, and it is hoped improved conditions will be possible in the near future.

The Health Officer's Corner.

Through the courtesy of the management of our local daily papers, the *Spectator* and the *Herald*, the attention of the public is directed to the number of cases of communicable diseases notified each week, in each Saturday's publication. The part allotted for the purpose is known as the *Health Officer's Corner*. Weekly articles on live health subjects are written for the *Corner*.

I desire to thank the management of each of the papers for this courtesy so afforded, and for the many privileges extended to the Department at all times in being able to utilize the columns of the Press in bringing matters of health before the attention of the public.

Housing and Social Welfare.

An authority of repute has stated that "infantile mortality is twice as great in homes without bathtubs, although the infants do not use them. Housing is also not to be separated from typhoid and respiratory disease. Health, education, standards, inspection, control of rent, profiteering and a living wage are health factors related to housing."

The relation of housing to health and social welfare comprises various factors influencing the physical, mental and moral development of the family and the family life. Whatever benefits each unit of family life must of necessity be beneficial to the general community. Housing conditions are largely determined by the family income; some of these conditions are unsatisfactory as viewed from a public health standpoint.

The necessity for adequate air space, ventilation and the window area in relation to floor space, are matters well understood by the average citizen, That dirt, overcrowding and the lack of clean and well-fitted sanitary appliances, are factors in the spread of respiratory and other forms of diseases, may be well known to the majority of persons. Still the fact remains that housing conditions in many parts of our city leave much to be desired. The above quotation would indicate that bath tubs in homes exert an influence on the infantile mortality rate. There are other features in some of our city homes which militate against the comfort and possibly the health of the people in an even greater degree than the absence of a bathtub, such as a lack of a proper foundation; in some instances the floors of the rooms being actually laid on the ground, precluding any possibility for air to pass under the floor.

It is true that several houses in the city where this, among other unsanitary conditions, existed, have been closed by order of the Board of Health. In other houses general dilapidation and original poor construction mark these shelters as being poor specimens of what homes should be. It is also true that houses which at one period might have been regarded as comfortable homes, with all modern conveniences, have deteriorated to such an extent as to render them eligible for admission to the lowest category of sanitary dwellings.

In this latter classification might be included many large ten and twelve-room houses of three stories in height, and built on twenty-five foot lots, with very narrow passages between them, in some instances the eavetroughs being only a few inches apart. Very little natural light filters through the windows at the sides of the houses, while some of the rooms are in a darkened condition, and the occupants forbidden to use them for day or night occupation.

Our sanitary inspectors and nurses are frequent visitors to such homes, and, although overcrowding is seldom in evidence, other conditions which militate against the health and comfort of the occupants are frequently met with. This latter class of residence is situated in a section of the city which might have at an earlier period been fittingly described as residential, and in view of green pastures and pleasant scenery; as the years went by, the character of the district underwent a slow process of change. Factories and business premises were erected on the green pastures, and the pleasant scenery became outlined with tall chimneys, railway trackage and other utilities. The residential district had evolved into a factory and industrial locality, and the former residents removed to suburbia or to parts of the city where restriction against the erection of factories had been placed.

An outstanding feature in the type of house above outlined is the number and large size of rooms it contains; it is frequently the home of two families with boarders for each family. These houses are let at a comparatively low rental;

very little money is spent upon them for repairs; except when improvements are demanded by the Department of Health, the painter and decorator is practically unknown at these dwellings. The neglect of the owner is reflected in neglect by the tenant, very few of which make any attempt to keep their yards or fronts tidy or bright with flowers.

The process of house degeneration goes on apace until what were at one time bright, well-built villa residences, have degenerated into undignified-looking, untidy places where people just live in. While there is no specific or general overcrowding in this class of residence, mental health is undoubtedly threatened, through lack of privacy, impaired opportunity for home study, and that ever present irritation due to imperfect physical surroundings.

The mental, moral, and physical health of the people must be closely linked up with home surroundings, and the general unattractiveness evident in homes such as here outlined, together with the attendant poverty frequently met with therein, undermine the possibility of children brought up under these conditions becoming possessed of the higher standards of living, and moral qualities essential for effective citizenship.

It is therefore the duty of the Department of Health to, as far as practicable, correct conditions in homes which militate against the mental as well as the physical health of the community.

There has been marked improvement in housing conditions since the publication of my report for 1922. Many houses have been improved in their sanitary conditions, while others have ceased to be occupied as dwellings. New homes have been erected in every quarter of the city during the year, but the necessity for the provision of better housing for the artisan population in parts of our city is still very real.

Good housing conditions may be regarded as essential to successful health administration, and while Hamilton compares very favourably with any of the large cities of Canada, it is hoped that a large number of ideal artisan dwellings, which may be obtained at a reasonable rental, will be erected in Hamilton during the coming year.

General Remarks.

I would direct attention to the general activities of the Department of Health, as evidenced by the reports from the various divisions; these are self-evident, but I would briefly refer to some of the work which could only have been possible by the establishment of the Health Centre.

The success of the dental clinic at the Health Centre has been almost phenomenal, and it will be my privilege through the Board of Health to make application for dental equipment for the second room, which has already been partly prepared for dental service. An epitome of the work actually accomplished at the clinic will be found in the dentists' report.

The expectation of success for the Division of Child Hygiene has been more than realized. The nurses in charge of this work have in their report thereon shown most conclusively that a very great need has been met by the establishment of the various clinics and activities consistent with the prosecution of this important branch of preventive medicine.

Health Centre.

In my report for 1922 reference was made to the routine work being accomplished at that time, at the Health Centre, and as the operations of the clinics

established at that time were mentioned in detail, brief reference only will be necessary in this report.

The Tuberculosis Clinic.—The work of this clinic continued with unabated energy under the capable administration of Drs. Holbrook, Wilson, Morgan, Bray, and Johnson. Clinics are held on Mondays, Wednesdays, and Fridays for adults, and on Saturday mornings for school children, the latter being attended to by Dr. C. R. L. Morgan; Miss Mason, a graduate nurse, is in constant attendance.

Tuberculosis in all stages is dealt with at the clinics, and the attendance throughout the year has been well sustained.

The Dental Clinic.—The dental clinic under the direction of Dr. J. L. Stewart and Dr. J. E. Dores, two qualified dentists, together with Miss E. M. Breay, a trained and qualified nurse, has had a very successful year.

The number of treatments and details of the work accomplished are recorded in the dentists' report.

Division of Child Hygiene.—Clinics for Child Hygiene are held every Tuesday and Thursday under the care of Drs. Cannon, Cooke, and Kenny. The clinics which have been described in my report for 1922, have continued to meet with great success, the work of this department has been further extended during the year by the opening of clinics in other parts of the city, in order that mothers may be relieved of the necessity of carrying their children over long distances to the clinics. The report of the nurse in charge of this particular branch of child hygiene will show the attendance at the clinic has been well sustained throughout the year.

Toxin-Antitoxin Clinic.—Drs. J. MacGregor and A. Eaton have charge of the toxin-antitoxin clinic. This clinic is held every Wednesday, and large numbers of persons attend to avail themselves of the protection against diphtheria, possible by treatment at the clinic. This subject is more fully dealt with in this report under the heading of diphtheria.

These represent some of the activities in constant operation at the Health Centre. These activities will be increased in the near future, by the addition of a mental clinic and other channels of preventive medicine as time and opportunity afford

On behalf of the Board of Health as well as for myself personally, I desire to express our very great appreciation for the courtesy and kind consideration which His Worship the Mayor has manifested at all times, and for the great interest he has always taken in public health work. We also wish to thank the Board of Control and the City Council individually and collectively for their assistance so generously afforded in the accomplishment of our work.

I would embrace this opportunity on behalf of the Board of Health as well as myself to thank the medical practitioners of this city who have so nobly and generously given their time, help, and skill to the work of this department, and contributed so markedly to the success of the work at our various clinics; without this gracious aid our success would have been impossible. In this respect I would particularly mention: Drs. J. H. Holbrook, G. W. Wilson, C. R. L. Morgan, M. E. Johnston, M. C. Bray, J. C. MacGregor, A. T. Eaton, G. R. D. Farmer, O. A. Cannon, K. E. Cooke, W. G. Kenny, D. A. McLeod, P. T. H. Wythe.

In conclusion, I desire to place on record my heartfelt thanks to Alderman R. B. Spera, chairman, also to Controller Calvin Davis and Dr. Wythe, members of the Board of Health, for the kind and able manner in which they have conducted the business of the board during the year. I also thank these gentlemen

for the consideration and appreciation always manifested towards me, and to every member of my staff.

I have the honour to be, gentlemen,

Your obedient servant,

JAMES ROBERTS,
Medical Officer of Health.

REPORT ON LABORATORIES.

To James Roberts, Medical Officer of Health.

Dear Sir:

I am presenting herewith the report of the work done in the city laboratories for the year ending October 31st, 1923, and I must again extend my thanks to yourself and to the chairman and members of the Board of Health for your assistance and co-operation during the year. This year as usual has shown a considerable increase in the amount of work performed and with the increasing skill of the staff of technicians, it is hoped to constantly improved the efficiency of the laboratory.

The work in connection with venereal disease has shown an increase, and we are now doing very nearly 4,000 Wassermann reactions per annum. The work in connection with typhoid diagnosis remains about the same, the city being remarkably free of this disease. The examination of sputa for bacillus tuberculosis shows a slight decrease. The bacteriological examinations of samples of milk and water continues to increase, and we are now doing examinations for the organism of ringworm as a routine. The number of cultures examined for bacillus diphtheriæ shows a slight decrease and this, in my opinion, is at least partially due to the good effects of diphtheria immunization work carried out in the public schools. This year there are 227 less positive diphtheria cultures taken for diagnosis than last year. A very much enlarged programme of work in the public schools is under way this year.

There has been a very marked increase this year in the number of chemical examinations of urine and blood due to the introduction of the insulin treatment of diabetes. The urine examinations were increased from about 12,000 to about 21,000, and the chemical examinations of the blood were increased from 400 to over 1,400. This entails not only a great deal of time, but also requires a high degree of skill in order to have them carried out properly. There is every indication of this work continuing to increase. The distribution of insulin and the performance of the necessary laboratory work has now been undertaken by the Provincial Board of Health, so that this part of the work in so far as it relates to diabetes is to all intents and purposes public health work.

The present alterations and additions now being made to the General Hospital have made it necessary for the laboratory to vacate its present quarters which have become hopelessly inadequate, and new quarters specially planned for laboratory work have been allotted in the new outdoor wing on Victoria Avenue. Separate rooms are provided for the various departments of the work and the efficiency of the laboratory will be much improved. These quarters should be ready for occupation about midsummer and will necessitate a certain amount of new equipment, while the increasing demands on the laboratory may necessitate further technical assistance.

Sincerly yours,

WM. DEADMAN, B.A., M.B.,
Director.

CITY LABORATORIES REPORT FOR YEAR ENDING OCTOBER 31ST, 1923.

	Wassermann Reactions				Spirochaete Examinations			Gonococcus Films			Widals			Stools for Typhoid			Urine for Typhoid		
	Strong +++	Weak +	Neg.	Total	+	—	Total	+	—	Total	+	—	Total	+	—	Total	+	—	Total
November, 1922	45	21	254	320	0	1	1	18	95	113	0	12	12	0	7	7	0	6	6
December, 1922	37	8	200	245	0	0	0	16	63	79	3	8	11	0	4	4	0	1	1
January, 1923	57	18	343	418	0	0	0	20	91	111	3	5	8	0	9	9	0	8	8
February, 1923	34	15	260	309	0	1	1	7	91	98	1	1	2	0	0	0	0	1	1
March, 1923	56	10	262	328	0	0	0	9	82	91	1	13	14	0	1	1	0	1	1
April, 1923	43	6	296	345	0	0	0	9	70	79	1	5	6	0	0	0	0	0	0
May, 1923	44	4	304	352	0	0	0	11	91	102	2	7	9	0	1	1	0	0	0
June, 1923	70	7	299	376	0	0	0	17	90	107	1	13	14	0	2	2	0	1	1
July, 1923	40	10	227	277	0	0	0	11	71	82	2	8	10	0	1	1	0	1	1
August, 1923	48	14	254	316	0	0	0	16	90	106	10	6	16	0	2	2	0	0	0
September, 1923	32	9	246	287	0	0	0	15	91	106	2	13	15	0	11	11	0	4	4
October, 1923	31	9	247	287	0	0	0	17	113	130	2	6	8	0	1	1	0	1	1
Totals	537	131	3,192	3,860	0	2	2	166	1,038	1,204	28	97	125	0	39	39	0	24	24

CITY LABORATORIES REPORT FOR YEAR ENDING OCTOBER 31ST, 1923.

	Sputum for T. B.			Diphtheria Cultures				Waters	Milks	Urines	Chemistry of Blood
	+	—	Total	D+	R+	Neg.	Total				
November, 1922	7	63	70	180	251	1,614	2,045	24	28	1,835	53
December, 1922	7	71	78	91	314	1,302	1,707	26	15	1,764	57
January, 1923	6	69	75	132	178	1,165	1,475	21	29	1,937	66
February, 1923	1	54	55	41	31	1,000	1,072	24	17	1,673	46
March, 1923	4	64	68	33	48	1,038	1,119	30	28	1,693	101
April, 1923	9	126	135	5	9	586	600	27	27	1,664	89
May, 1923	7	95	102	37	13	646	696	55	31	1,660	119
June, 1923	2	62	64	52	16	761	829	40	34	1,586	118
July, 1923	8	72	80	63	23	638	724	49	45	1,605	95
August, 1923	1	43	44	9	12	526	547	47	40	1,895	228
September, 1923	3	35	38	38	7	645	690	39	23	1,814	237
October, 1923	1	43	44	36	15	1,426	1,477	39	27	2,072	198
Totals	56	797	853	717	917	11,347	12,981	421	344	21,198	1,407

CITY LABORATORIES REPORT.

Board of Health Work for the Year Ending October 31st, 1923.

Wassermann Reactions	3,860
Spirochaete Examinations	2
Gonococcus Films	1,204
Widal Reactions	125
Stools for Typhoid	39
Urine for Typhoid	24
Sputum for T. B	853
Diphtheria Cultures	12,981
Water Examinations	421
Milk Examinations	344
Ringworm	11
	19,864
Urine Examinations (chemical)	21,198
Blood Examinations (chemical)	1,407
	22,605

DIPHTHERIA IMMUNIZATION WORK.

Schools	Schick Reading	Positive Schick	Completed Treatments
Murray	99	26	26
Fairfield	203	36	31
Memorial	465	233	201
Queen Mary	363	157	153
Lloyd George	Schick not done	...	222
Gibson	Schick not done	...	372
Health Centre	650	236	486
	Total Treatments		1,491

Total Examinations for the Year 1922-23 (Including Hospital and Board of Health Work.)	46,781
Total Examinations, 1921-22	40,499
Increase	6,282
	or 15 p.c.

Food Inspection—Report of Chief Inspector.

To James Roberts, Esq., M.D., Medical Officer of Health, Hamilton, Ont.

Sir:

I submit for your consideration the report on food and dairy inspection, for the year ending October, 31st 1923, as follows:

Much of the work of the food and dairy division has to do with sanitary conditions under which every variety of food is produced, prepared, handled, distributed, cooked, and served. The personal hygiene of the individuals coming in contact with foods is a factor in food inspection, and the capacity of such individuals to appreciate the importance of bacteriological cleanliness and the consequence of carelessness, are points which have to be taken into account in the course of efficient food inspection. There has been a very marked improvement in the business of storing and handling foods, as well as in the preparation of the same for human consumption in recent years.

With the object of giving the Board some idea of the system followed by the division of food inspection in the daily routine, we may roughly divide the work under several appropriate headings, viz.:

General Food Inspection.

This includes such establishments as: Central market, retail markets, fish stores, groceries, milk depots, delicatessen stores, restaurants, bakeries, fruit stores, confectioners, ice cream factories, candy factories and other manufacturing, producing or distributing establishments. The following are points of importance in the inspection:

(a) Structural condition of the building, all rooms used for sale, manufacture of products or storage, or rooms used by the employees for dressing or toilet purposes.

(b) Light and ventilation.

(c) Cleanliness of floors, walls, ceilings, shelves, cases, counters, refrigerators, and utensils.

(d) Conditions of cellars, yard, water closets, and general surroundings.

(e) Cleanliness of employees.

(f) General condition and cleanliness of food stock or materials used in the manufacture of foods.

The Protection of Foodstuffs.

In the protection of foodstuffs due regard is paid to certain considerations. Foodstuffs which are not washed, peeled or cooked, before being eaten must be protected from street dust, dirt, flies, promiscuous handling by public, and other contaminating influences. Old newspapers recovered by junk dealers and old dirty baskets or other containers must not be used for wrapping or carrying foods. Milk must be kept in separate refrigerators or in compartments separate from other foodstuffs. No person is allowed to sleep in rooms where foodstuffs are manufactured, stored or handled, and in no such rooms is a toilet permitted to be installed. No room in which articles of food are kept stored, sold, or offered for sale can be used for domestic purposes.

All shops and stores used for the sale of foods must be supplied with proper lavatory accommodation.

Restaurants.

The inspection of restaurants includes all rooms and appurtenances used for storing, preparing, cooking or serving foods; the condition and cleanliness of employees, of all utensils, and of all adjoining rooms directly connected with the establishment. All rooms must be light and well ventilated; walls, ceilings and floors in good repair and clean; tables, counters and shelves must have clean surfaces; all utensils including containers for milk, cream, and water must be of material easily cleaned and if necessary sterilized. Ranges, steam tables, shelves, racks, blocks and machinery or tools used for cutting, grinding, and cooking or preparing the foods must be kept scrupulously clean at all times. There must be a sufficient supply of water for all washing purposes, and all sinks, wash sinks, etc., must be adequately trapped and covered with or constructed of impervious non-absorbent material. Examination is made of all meats, canned goods and other foods to determine their purity and wholesomeness.

Bakeries.

The rooms where baking is done should be kept clean and sanitary. The floors, walls and ceilings should be in good repair and have smooth surfaces, so as to be easily cleaned. The tools, utensils and machinery should be clean and kept free from accumulations of old material. No new bakery should be established without the inspector having approved the structural conditions and location. All bakeries must be light and well ventilated. Every bakery is required to have sufficient wire screening over all windows and doors and must be kept free as possible from flies and other vermin.

All bakeries since the revision of the Provincial Factories Act in 1913 are required to be built above the street level, thus doing away with the close and unsanitary habitations formerly occupied for the business of baking, and what is of much greater importance to employees in this industry, and to the general public as well, eliminating a fruitful source of tuberculosis and other respiratory diseases in an otherwise not unhealthy occupation.

Milk.

Measures to ensure a good milk supply for the city start with the farmer. The city by-law requires that he shall obtain a license from the Health Department before he can sell his milk to the distributor. Before he can obtain this license his cattle, stables, utensils and method must meet the requirements of the Health Department. The department inspector visits the dairy farm at intervals without warning, to see that proper methods are followed at all times. He constantly moves about among the farmers, assisting them with suggestions and advice to become better dairy farmers, and checking carelessness and wrong methods.

Dairy farms are scored for cleanliness and sanitary methods. On the score card a certain number of points are allotted for location and surroundings of the stable, the milk house utensils, water supply, cattle and methods of handling milk.

Clean surroundings, the use of clean utensils in milking and the previous cleaning of the flank and udder with a damp cloth are the precautions necessary on the part of the farmer to ensure a clean milk supply; as are also the cooling, covering and removing of the freshly drawn milk to the milk house ready for

shipment to the city by carrier or train. The responsibility of the farmer does not end until the milk is taken into the city plants, and he must see that the milk arrives in the city at a temperature required by the milk by-law.

At the city dairies the milk is measured or emptied into weighing pans; the cans are washed and returned to the farmer or carrier for the next day's shipment. Samples of this milk as received in the city dairies from the producer, are taken by the Health Department Inspectors and are tested for adulteration, skimming, butter-fat content, solids not fat; total solids, preservatives, sediment, acidity, bacterial content and methylene blue reduction. During hot weather temperatures of milk are taken, warm milk being condemned.

Milk showing less than 3.25% butter-fat is below standard (government and municipal standard is 3.25% butter-fat,) and the producer is notified to reach the standard; if below this figure his supply is excluded from the municipality. Samples of milk are at times taken at the dairy farm, when a test in the city has shown a low result, to assist the dairy farmer in locating the cause, and enabling him to remove low testing cows from his herd.

The sediment test is made by forcing one pint of milk through a cotton disc under pressure, whereby the dirt which is not visible in milk ordinarily is left on the disc; this test detects any carelessness on the part of the milker or dairy farmer and he is at once notified to remedy this condition. The farm is visited and should local conditions be bad the Health Department excludes the supply from the city.

Thus far the problem of serving a satisfactory milk has related almost entirely to the production. The handling and distribution in the city involves a much more complicated system. In the pasteurizing plants the milk is inspected, tested, weighed, clarified, pasteurized, cooled and bottled, placed in cooling rooms and kept cold until delivered to the consumer. In the plant care must be taken to ensure its cleanliness and purity, machinery must be kept clean and in perfect condition, employees must make sure that their hands do not come in contact with the milk; pipes, pasteurizer, bottling machines, and bottles must be thoroughly cleansed and sterilized, nothing can be left to chance for the reason that every precaution must be taken to keep the milk clean and wholesome.

Pasteurization of milk means heating it to a temperature of from 142 to 145 degrees Fahrenheit and holding for thirty minutes. Heating milk this way kills the germs of tuberculosis, typhoid fever, scarlet fever, diphtheria, dysentry, septic sore throat and others that are dangerous to health.

The status of any milk supply is judged by the samples taken. It is, therefore, imperative to procure proper and representative samples; nearly all of the city's supply is delivered in bottles to the consumer. In this case the collection of samples is comparatively simple. The samples, consisting of two one pint bottles, are selected at random from a delivery wagon of each dealer, or from several wagons in the case of the larger dealers. This method procures a fair representation of the dealer's whole supply. If the tests made of these samples do not show a fairly uniform result the dealer is instructed as to the findings. Samples are taken frequently from the delivery wagons. In addition samples are taken from stores and restaurants, a check being made upon the character of the milk, and the care given it at such stores and restaurants. Methods used for keeping it cold, and the protection against contamination, time of delivery and sale are matters of importance to the inspector.

At a meeting of the Board of Health held on January 15th, 1923, a communication was received from the Board of Control enclosing copies of recommendation

from the Hamilton Health Association. Recommendation "A" of the communication was as follows:

"Whereas a certain amount of meat is dangerous for food on account of tuberculous infection, and whereas under present regulations the supervision of slaughtered animals applies only to export meat, we would recommend that such supervision of abattoirs and slaughter houses be extended to all meat used for food for Hamilton citizens."

Recommendation "B" was as follows:

"Also in the matter of milk, whereas we believe that one of the causes of the spread of tuberculosis in children comes from milk from tuberculous cows, and whereas tuberculosis is very general, we would suggest that the Board of Health be requested to prevent the sale of milk unless it is from tuberculosis free herds or has been properly pasteurized."

The Board resolved that in the matter of recommendation "B," consideration should be given to the advisability of introducing a by-law compelling pasteurization of all milk. It might here be mentioned that the question of the compulsory pasteurization of milk had engaged the serious attention of the Board of Health long before the above communications were received. On two former occasions, at least, by-laws authorizing the pasteurization of all milk sold in Hamilton have been submitted by the Board of Health to the city council. After preliminary discussions between representatives of the Board of Health and the Board of Control, all parties interested both for and against pasteurization were invited to attend a meeting on November 23rd, 1923. The arguments against the scientific pasteurization of the civic milk supply dwindled down to the ordinary street vernacular against this and other progressive measures, with no semblance even of plausible evidence in support of the everyday contentions in opposition to this great safeguard against the transmission of infectious diseases by milk.

Dr. John W. S. McCullough, Chief Officer of Health for the Province of Ontario, Dr. D. A. McClenahan, and other authorities on pasteurization were present at the meeting, and much expert evidence was submitted. The occurrence of several recent outbreaks of typhoid as a result of the consumption of milk were recited, and other convincing data submitted in favour of the process. No decision was reached at the meeting, and the question is being held in abeyance in the meantime. The following is a summary of inspections made and notices served by my department:

Total Number of Inspections	6,209
Total Number of Milk Examinations	5,233
Inspections of Central Market	293
" " butcher shops	410
" " abattoirs	14
" " fruit and vegetable stores	210
" " butter and egg stores	22
" " grocery stores	545
" " ice cream and confectionery stores	585
" " ice cream factories	14
" " ice cream cone factories	2
" " candy factories	28
" " bottling works	17
" " restaurants and lunch rooms	1,170
" " bake shops	281
" " fish stores	84
" " dairy farms	4
" " city milk dairies	597
" " milk depots	416
" " milk wagons	215
" for licenses, milk, butcher, restaurants, etc.	594

Number of milk licenses refused	54
" " milk samples tested (chemical)	2,769
" " milk samples tested (bacterial)	311
" " cream samples tested	42
" " milk temperatures taken	717
" " sediment tests made of milk	1,193
" " M. B. reductase tests made	201
" " water samples collected	17
" " times weighing market products	29
" " complaints regarding food investigated	25
" " times attending at police court	12
" " miscellaneous inspections	661

NOTICES WERE SERVED AS FOLLOWS:

Notices to clean butcher shops	64
" " " fruit and vegetable stores	43
" " " grocery stores	78
" " " ice cream and confectionery stores	43
" " " ice cream cone factories	2
" " " candy factories	13
" " " restaurants and lunch rooms	409
" " " fish stores	18
" " " milk dairies	52
" " " bake shops	88
" " cover and protect food stuffs	46
" " screen doors and windows, food premises	18
" regarding premises unfit for handling food	19
" to discontinue sale of milk	9
" " take milk license	211
" regarding low chemical test of milk	101
" " high temperature of milk	207
" " sediment in milk	575

SEIZURES.

Number pounds beef	1,952
" " veal	150
" " pork	50
" " fish	705
" dozen ice cream wafers	3
" dozen straws	5
" dozen ice cream cones	7
" paper bags	100
" gallons of milk	94

Respectfully submitted,

C. SHAIN,
Chief Food and Dairy Inspector.

REPORT OF DAIRY FARM INSPECTOR.

To James Roberts, Esq., M.D., Medical Officer of Health, City of Hamilton.

Sir:

I have the honour to submit the following report on my work as Dairy Farm Inspector from November 1st, 1922, to October 31st, 1923.

During the above-mentioned period the number of producers who shipped milk to Hamilton varied from 430 to 450, the milk being shipped in from within a radius of twenty-nine miles.

The number of visits to dairy farms during the year was 2,434, some of the farms being visited more frequently on account of existing conditions which required improvements.

Three producers were excluded from shipping milk to the city for not complying with the city regulations.

One producer was refused a license to ship milk on account of unsanitary conditions.

Improvements on dairy farms within the past year were made as follows:

Number of milk houses built	29
" " milk houses repaired	16
" " barns built	5
" " stables repaired	5
" " stables whitewashed	390
" " inspections for dairy farm licenses	37
" " milk licenses refused	1
" " milk licenses cancelled	3
" " milk licenses suspended	3
" " stable tests taken	21

Notices were served as follows:

To build milk houses	37
To repair milk houses	30
To repair stables	9
To whitewash stables	210
To remove hogs	9
To remove accumulations of manure	32
To clean cattle	76
To discontinue use of milk:	
On account of disease in cows	3
On account of sediment in milk	98
On account of high temperature in milk	323
On account of low test of milk	32

I have the honour to be, sir,

Your obedient servant,

J. T. ARRELL,
Dairy Farm Inspector.

REPORT OF THE DENTAL CLINICS.

Dr. James Roberts, Medical Officer of Health, City of Hamilton.

Sir:

The annual report herewith submitted shows a considerable increase in the number of children cared for in the two dental clinics located in the public schools. The requests for treatment are continually increasing, keeping the clinics running to capacity every day.

The annual dental inspection of children in the public schools entrusted to our supervision during the past year showed a remarkable improvement in the dental condition of the children as compared with conditions noted in our initial survey three years ago. At that time ninety per cent. of the children examined required treatment, whereas in our last survey less than sixty per cent. were found to be dentally defective.

It is hoped that means may be provided for increasing the number of dental clinics in the schools to care for this work, so essential to the health and comfort of the children.

(Signed) H. A. THOMPSON, D.D.S.
W. G. MANNING, D.D.S.

Below is submitted a detailed report of the year's work at King George and Cannon Street Schools.

Total treatments	7,655
Total extractions	5,396
FILLINGS:	
Amalgam (silver)	3,349
Petroid cement	1,817
Copper cement	1,701
Gutta percha	3,213
Synthetic (enamel)	399
Temporary	320
Silver nitrate	4,905
Miscellaneous operations	420
New cases	3,232
Completed cases	2,458
Pupils inspected	18,500

HEALTH CENTRE DENTAL CLINIC.

To James Roberts, Esq., M.D., Medical Officer of Health, City of Hamilton.

Sir:

The annual dental inspection of the separate schools and the following public schools: Stinson, Queen Victoria, Victoria Avenue and West Avenue, shows a great improvement in the condition of the children's teeth. This is indeed very gratifying to those in charge of the work, the Board of Health and the school nurses; also the interest that the parents of these children are taking in the care of the teeth is appreciated.

The public is realizing the great part a clean mouth plays in the general health of the child. It is very necessary that children of pre-school age should be taught the regular use of the tooth-brush and when a cavity develops to have it attended to immediately. Many of the parents have the impression that the temporary teeth should not be treated. The Board of Health nurses and the school nurses have taken a great interest during the past year in popularizing preventive dentistry.

During the past year approximately 2,500 children have been treated at the Health Centre Dental Clinic. The 1923 inspection shows 70 per cent. of the children needing dental attention; the previous year showed 82 per cent. Included in this 70 per cent. many are completed cases returning to have additional work done, showing the vast improvement over the preceding year.

Below is submitted a detailed report of the year's work:

Total treatments	7,575
Total extractions	3,254
FILLINGS:	
Amalgam (Silver)	4,216
Synthetic (enamel)	254
Copper cement	2,973
Petroid cement	55
Gutta percha	831
Root fillings	231
Silver nitrate	222
Pulp removed	62
New cases	2,125
Completed cases	1,648
Gas cases	52

Individual statement of each school surveyed in 1923:

School:	No Inspected	No. requiring Treatment	Percentage in Good Condition
St. Ann's	338	226	33
St. Stanislaus	270	222	17
Holy Family	216	174	19
St. Thomas	195	126	35
St. Lawrence	318	231	27
Holy Rosary	296	192	35
Sacred Heart	348	233	33
St. Mary's	324	197	39
Holy Angels	151	114	24
St. Thomas Aquinas	185	123	33
St. Joseph's	187	118	36
St. Patrick's	297	205	31
Mount Carmel	32	26	18
Queen Victoria	526	380	27
Victoria Avenue	614	365	40
West Avenue	396	280	29
Stinson	785	623	20
	5,478	3,835	30%

Respectfully submitted,
J. L. STEWART, D.D.S., and J. E. DORES, D.D.S.

REPORT OF THE PUBLIC HEALTH NURSES.

(For the Year Ending October 31st, 1923.)

Dr. James Roberts, Medical Officer of Health, Hamilton.

Sir:

It is my privilege to report on the work accomplished by the nursing staff of your department during the year ending as above.

As in former years changes have occurred in the personnel of the staff, but, as will be observed by the tabulation of work submitted, the work of the nursing staff is marked by progressive improvement over former years.

Reports are furnished separately by the nurses in charge of tuberculosis and social service, the other divisions, such as child hygiene, communicable diseases, mental hygiene and general public health work, being shared by all other nurses of the department.

Nurses are in attendance at each of the department of health dental clinics; their work, however, being exclusively dental, service is not recorded in the report of the general nursing staff.

In relation to communicable diseases, scarlet fever, measles and whooping cough were endemic, becoming epidemic at various times throughout the year, diphtheria remaining generally insistent.

Scarlet Fever.

Although 305 cases of scarlet fever were notified, the number would not represent the actual number of cases occurring during the year, because of the mildness of the disease. Many instances have come to the knowledge of the nurses whereby the children were actually attending school while suffering from the disease. A case of scarlet fever is reported to the department, the nurse visits the home, inquires the source of infection. Frequently the mother is unable to tell except that the child contracted the disease at school. On examination of the children in the class, a child is found to be desquamating,

the child is excluded from school and the home visited. The mother will give a history of the child having a slight sore throat and of being unaware that her child had any serious illness.

To further illustrate the mildness of the disease occurring this year, a young lady contracted the disease and on questioning her we were able to ascertain that the source of infection must have been her place of business. Examination of the clerks revealed one young man with desquamating hands, giving a history of having had a slight sore throat a few weeks previously.

This work of visiting the cases, finding the source of infection, examining school children, visiting contacts and having them observe quarantine, entailed 1,526 visits to homes.

Measles.

The nurses try to impress upon the mothers the great necessity of endeavouring to prevent the spread of the disease among children. The school children are examined and absentees visited. The visiting of absentees is a very important part of the work because many a child kept home with a cold can be kept under observation, and if measles develop, the other children are not unnecessarily exposed to the disease. Total number of visits to cases and contacts was 1,226.

Whooping Cough.

This disease was epidemic during the months of March and April, many visits and revisits being made by the nurses, teaching the mothers the danger of the disease among little children and how best to prevent the spread of the disease. A total number of 1,181 visits were made.

Influenza.

I am very glad to be able to state that we had only a slight epidemic of this disease. A total number of 149 visits were made, including quite a few cases at which bedside care was given.

Diphtheria.

When a case of diphtheria occurs considerable work is involved. All contacts are cultured, to try and ascertain the source of infection. The children in the classroom exposed to the disease are cultured. Occasionally a child gives a positive culture. He may be well, or he may have had diphtheria, but he is quarantined until two negative cultures are obtained. Old cases of diphtheria are cultured at intervals to see whether the child is harbouring the K. L. bacilli or not. To illustrate how the nurses undertake to ascertain the source of infection three cases of diphtheria were reported in children under five years and in the same neighbourhood. All the children in the neighbourhood were cultured and one boy among 73 cultures obtained, who had diphtheria three months previously, showed a positive culture and was the probable origin of the three cases. In all, 3,041 visits were made for diphtheria and symptoms suspicious of the disease with a total of 6,789 cultures being obtained and 520 visits to the laboratory.

Other diseases such as typhoid fever, smallpox, mumps, chicken-pox and minor communicable diseases, including scabies, pediculosis, etc., necessitated 1,298 visits.

The nurse, when visiting a home, not only looks for a communicable disease, but teaches to prevent the spread of disease; teaches personal hygiene, such as the

care of the teeth and, if the service of a dentist is required, a dental card is filled out and given to the mother with instructions for the child to attend one of our dental clinics. Dental investigations and absentees totalled 586 visits.

The nurse looks around the home to see if the place is sufficiently ventilated, clean, sanitary in every detail and warm in the winter. Any unfavourable conditions discovered are reported to the sanitary department. The Red Cross Society advises us of all the new arrivals in our community. These are attended by the nurses; all the clinics are explained. One immigrant was in tears when the nurse arrived. She could not get the fire to burn; the nurse promptly showed her how and she is now a welcome visitor. Visits of this nature and visits to the relief department connecting up families for hospital treatment totalled 884.

Health Survey.

During the early part of the year, a house-to-house survey was made to ascertain the necessity of having another chest clinic opened in the north-east section of the city. Owing to pressure of work, only 350 families were visited, but the information obtained was nevertheless accurate and formed a fairly reliable foundation on which an estimate of health conditions along certain lines could be based. The information sought was as follows:

Rental value of premises (classified); living conditions; education of parents; monthly incomes; particulars of communicable diseases; morbidity and mortality information relating to children in the homes visited. Particulars of British and non-British nationality were obtained. Information of results have been duly tabulated, of which the following constitutes a summary:

Families owning their own homes—British, 83; non-British, 73. Total	156
Families renting homes—British, 94; non-British, 100. Total	194
Total	350
Living conditions.—Good—British, 96; non-British, 96. Total	192
Fair—British, 48; non-British, 79. Total	126
Bad—British, 6; non-British, 26. Total	32
Total	350

Of the homes visited no family received over $100 per month; some of them as low as $50. Particulars relating to communicable disease are recorded. One of the most important features recorded in the table of mortality among children of the non-British population under two years of age, is the number of deaths of which the cause is unknown.

In the course of the health survey, family histories were obtained of an interesting and instructive character. Instances may be given here which in some respects might be regarded as extreme, but are an evidence of some of the conditions confronting a public health nurse.

(1) Child in hospital, ready for sanatorium. Child, age fifteen years, three times in sanatorium; is now home. Child, age twelve years, in sanatorium two years; is now home (has nasal condition). Another is sick. Mother in sanatorium two years ago. Husband in Brant House—chest condition. Another girl—positive T. B. (this family want to keep a grocery store).

(2) Father has been an inmate of Hospital for Insane. One girl died of scarlet fever and diphtheria, and one boy of erysipelas and pneumonia. Physician was called to this home by public health nurse.

(3) Father healthy. Mother gives a T. B. history, negative sputum. Baby delicate. All under care of physician.

(4) Father has been in sanatorium three years. Now at home. Is visited by D. S. C. R. nurse. Others in family have no apparent illness.

(5) Father a mental case returned from insane asylum in July—incurable; moulder; condition harmless. Mother has a leg infection of fifteen years' standing. Five children had tonsillectomy.

(6) Mother has a hernia since birth of child, two years ago. Boy aged fifteen has been in hospital with strangulated hernia. One child has poliomyelitis; attends the hospital clinic for treatment. Girl has enlarged tonsils.

(7) Father had an accident ten years ago, and since that time complains frequently of headache. One child has a chest condition; will be taken to the clinic. The baby has a hernia (strapped).

(8) One child had pneumonia—resection of rib (age two years). Last year had diphtheria; is now in the sanatorium. All attend the chest clinic. Family give a T. B. history.

(9) One brother-in-law died at home, of T. B. Wife examined, and found to be in normal health. Others in family look anaemic. Under observation.

(10) Father has been a patient at the sanatorium; children are apparently well. Under observation.

(11) Mother died of T. B.; children delicate; chest clinic advised.

(12) Mother died of influenza four years ago. A child of ten years is the housekeeper, attending school in the morning only. Has an ear condition. Nurse visits every day to irrigate the ear.

As to establishing a chest clinic in this section, we were unable to complete sufficient data at the time and a more complete survey will be undertaken. Many of the above families were visited and revisited from time to time and corrections made which undoubtedly resulted in improved living conditions.

Immunization.

Our immunization clinics continue to be well attended. The nurses distribute literature explaining immunization, also slips whereby the parents give their consent for this treatment to be carried out; in all 445 visits have been made during the year. This work has been referred to in another report.

Examination of School Children.

In relation to communicable diseases, several thousand children were examined for the presence of infection, and absentees visited in their homes. Many of these latter were found suffering from a communicable disease, and in all probability if these children had not been visited by the nurses, the cases would never have been brought to the attention of the department.

Child Hygiene.

One of the main activities of the public health nurse is the care of the child and its conservation throughout every stage of life,—pre-natal, infancy, pre-school age, school age and adolescence.

The year opened with the child welfare clinic at the Health Centre fully maintaining the success of the previous year, and early in the year it was felt that in order to meet the increasing needs of this service, the establishment of other clinics became a necessity. As a consequence, four additional clinics were established, three being near the confines of the city, and the other at the Health Centre.

The attendance at the clinics continues to increase. The majority of the mothers bring their babies to be weighed, charted and instructed along the lines of preventive medicine, such as the proper feeding of the infant, the advantages of vaccination and immunization. Medical treatment is not administered at the clinics, but where nutritional service is needed such help is rendered as circumstances permit.

The nurses of the department visit the homes of babies born in the city as soon as practicable after registration. This is an important duty of the child hygiene bureau in all up to date health departments. A baby book is left and an invitation extended to attend one of our well-baby clinics.

This work entailed a total of 4,094 home visits throughout the year.

The infant and maternity boarding homes were frequently visited during the course of the year and all returns found to be correct and in accordance with statutory obligations.

Fresh Air Camp.

In all 355 children were examined as to their fitness to attend the summer camp at Burlington. Thirty visits were made to the camp and playgrounds by the nurses.

Bedside Nursing.

During the visits to the homes, the services of the nurses are frequently required for bedside nursing. For this work 315 visits were made. Throughout the year 15,970 visits were made to the homes of the people, to the schools and other places in the daily routine of the nurses' work.

We are greatly indebted to the City Relief Department and the Central Bureau of Social Agencies for their kind and prompt attention to many cases referred to them.

Respectfully submitted,
ANNIE B. BOYD.

TUBERCULOSIS—REPORT OF VISITING NURSE.

To James Roberts, Esq., M.D., Medical Officer of Health.

Sir:

I beg to submit the following report in connection with the chest clinic for the year ending October 31st, 1923.

During the past year no changes have been made in the routine work of the dispensary. Three clinics have been held each week throughout the year, Monday, Wednesday and Friday afternoons, on which days any person suffering from a chest disability may attend, be examined, and receive advice free of charge. A clinic is also conducted on Saturday mornings for children, which enables school children to be examined without losing time from school; eight to ten attend each morning. As a rule, children who are infected do not have extensive trouble, but by giving them special care while young, serious trouble which might develop in adult life is averted.

During the routine examination of the children, many cases of adenoids, diseased tonsils, and defective eyes and teeth are found; where there is no attending physician these cases are referred to the City Hospital and the dental clinic for treatment, and in almost every case where the parents carried out the advice improvement in the child's condition was marked.

The following statistics are submitted relating to our work throughout the year:

Total number of cases receiving attention	2,298
New patients under supervision	565
Old cases under supervision	1,375
Re-examinations	754
Total number of examinations	1,319
Suspected cases under observation	181
Cases of active tuberculosis found	123

The new patients discovered with active trouble may be classified as follows:

	Men	Women	Children	Total
Incipient	17	24	43	84
Moderately advanced	16	9	0	25
Far advanced	8	5	1	14
Total				123

Children with bronchial gland infection	30
Recommended for Sanatorium treatment:	
Men	25
Boys	42
Women	21
Girls	20
Children examined—school age and under	762
Patients were referred to the clinic by:	
Physicians	269
School nurses	80
Public health nurses	79
By friend, or without reference	116
Other sources	21
Positive cases of sputum from City Laboratory	56

The following particulars relating to the nationality of patients attending during the year may be of interest:

Canadians	394
English	82
Scotch	13
Irish	6
Americans	15
Others, including Russian, Italian and Chinese	55

During the year 1,757 visits were made to the homes of patients, 329 of these being new calls; there were also 133 miscellaneous calls. These include occasional visits made to patients after discharge from the sanatorium, visits to those who are under regular supervision, and visits to doubtful cases who are being kept under observation. Those cases that have been diagnosed as active tuberculosis are recommended for treatment in the sanatorium, and are as a rule admitted in a comparatively short time, thus lessening the danger to other members of the family and of the community.

At each visit advice is given the patient as to the conditions under which he should live, and he is given assistance in carrying out the instructions received at the clinic. Advice is also given as to the disposal of sputum, the proper method of disinfecting dishes, linen and anything that is used for the patient, and he is also told about the danger of infection to children, and how to avoid this.

Besides supervising the treatment advised by the doctor, it is the privilege and duty of the nurse to do what she can to make her patient more comfortable, and to relieve any hardships which she may come in contact with. In this work we have been greatly aided by the Miss Doolittle Trust Fund, J unior Health League, and by donations received from other sources. Both of these organizations have responded nobly during the past year to the many calls that have been made upon them. The Miss Doolittle Fund has supplied 200 quarts

of milk, 140 dozen eggs, quantities of fruit and groceries; two families have been supplied with extra coal and clothing; $95 has been drawn from this fund during the year.

The Junior Health League has supplied 10,621 quarts of milk; one quart daily has been supplied to twenty-five families; other families were also given extra milk. The members of the Junior Health League also visited a number of families during the year, taking them a few extras and in a number of ways doing a great deal to relieve suffering.

EXPENDITURES

By balance from 1922	$ 1 70
Cash for sale of thermometers	33 25
	$34 95
Expenditures	27 95
Cash on hand	$7 00

Respectfully submitted,

G. A. MASON,
Tuberculosis Nurse.

REPORT ON SOCIAL SERVICE

(And Other Work in Connection with the Control of Venereal Diseases).

To James Roberts, Esq., M.D., Medical Officer of Health.

Sir:

In submitting my report on Social Service, particularly in relation to the work entailed in connection with the control of venereal diseases in the city of Hamilton, I would deal more explicitly with the cases passing through the clinic at the General Hospital during the year ending October 31st, 1923.

The treatments at the clinic may be summarized as follows:

CARRIED OVER FROM 1922:	
Syphilis	216
Gonorrhoea	96
Total	312
NEW CASES REPORTING FOR TREATMENT FOR 1923:	
Syphilis	180
Gonorrhoea	112
Non-V. D	87
Total	379
TOTAL CASES REPORTED AT THE CLINIC:	
Syphilis 216 + 180	396
Gonorrhoea 96 + 112	208
Non-V. D	87
Grand Total	691
DISCHARGED—SYPHILIS:	
Apparently cured	2
Without permission	125
Transferred for treatment elsewhere	48
Total	175

DISCHARGED—GONORRHOEA:	
Apparently cured	46
Without permission	70
Transferred for treatment elsewhere	26
Total	142
Total discharged 175 + 142 = 317	
REMAINING UNDER TREATMENT:	
Syphilis	221
Gonorrhoea	66
Total	287

Number of cases pregnant, 6.

Four of these have been confined, the babies are doing well, and are apparently healthy.

Temporary reactions following phenarsenamine treatment have been noted in some instances. Jaundice resulted also in several cases; three of these were admitted to the hospital for treatment.

Forty-one patients had negative Wassermanns periodically during the year.

It will be noted that the number of patients under treatment was less than in 1922, in which year the number was lower than in 1921.

The totals being, for 1921	474
1922	399
1923	287

I would again urge the necessity of parents to warn their children, when approaching on or entering the adolescent period of their lives, against the danger of youthful indiscretions which may lead to disease and even death.

Much of the misery and shame resulting from venereal diseases might have been avoided if parents had been more faithful in the discharge of their responsibilities, and had given warning word, or administered the judicious advice which might have prevented the step being taken on the downward path by their offspring.

A social service nurse frequently meets with instances which serve as illustrations of these conditions, and when opportunity affords she renders help and advice that is invariably accepted with gratitude.

I have the honour to be, sir,

Your obedient servant,

C. E. FLOCK,
Social Service Nurse.

REPORT OF THE DIVISION OF SANITARY INSPECTION FOR THE YEAR ENDING OCTOBER 31ST, 1923.

To James Roberts, Esq., M.D., Medical Officer of Health.

Sir:

I have the honour of reporting on the work accomplished by the division of sanitary inspection for the year ending October 31st, 1923.

The following represents a summary of the work attended to by the sanitary inspectors throughout the year:

Complaints received and attended to	2,057
Statutory Notices	2,091
Verbal or Informal Notices	7,116
Total of notices	9,207

PREMISES INSPECTED.

Dwelling houses	9,615
Tenements and apartment houses	652
Hotels, lodging, boarding and rooming houses	445
Workshops, factories and offices	563
Restaurants and stores	329
Stables	554
Laundries	288
Second hand stores and junk yards	41
Yards, sheds, areas, outbuildings and alleyways	9,196
Vacant lots	157
Schools and public buildings	229
Other premises	2,946
Inspections for communicable diseases	1,106
Number of inspections	26,121
Number of re-inspections	6,872
Total of inspections and re-inspections	32,993

DEFECTS AND NUISANCES DISCOVERED AND REMOVED OR ABATED.—PLUMBING.

Defective or choked drains	360
Defective or choked sinks, urinals or washbasins	384
Defective soil pipes and other sanitary fittings	308
Defective ventilation of plumbing	124
Frozen plumbing or water pipes	87
Defective eavetroughs and leaders	997
Insufficient or improper plumbing	276
New plumbing or water services installed	469
Total of plumbing defects	3,005

PARTICULARS RELATING TO SMOKE NUISANCES.

Observations of chimneys and smoke stacks	306
Inspections of boiler rooms, power houses and equipment	327
Total of observations and inspections	633
Statutory or informal notices	163

OTHER NUISANCES OR DEFECTS DISCOVERED AND REMEDIED.

Dirty yards, courts, sheds, areas and alleyways	3,252
Dirty walls, ceilings and floors of dwellings and other premises	2,980
Inadequate natural light	77
Insufficient ventilation of premises	157
Keeping animals in or near dwellings	516
Lack of proper receptacles for manure, garbage and other waste	987
Accumulations of manure and other refuse	1,541
Defective and insanitary cellars or basements	670
Dilapidated and generally insanitary dwellings or other premises	93
Insanitary conditions in factories, offices or stores	25
Insanitary conditions in halls and theatres	11
Insanitary conditions in schools or public buildings	8
Overcrowding	182
Defective chimneys	97
Defective roofs	785
Defective gas stoves and fittings	119
Defective furnaces or stoves	107
Earth closets or privies	5,046
Miscellaneous	773
Total	17,426
Plumbing defects brought forward	3,005
Total of all defects remedied	20,431

I have the honour to be, sir,
Your obedient servant,

W. F. THORNLEY,
Chief Sanitary Inspector

Report on Smoke Nuisances: Their Abatement and Prevention for the Year Ending October 31st, 1923.

To James Roberts, Esq., M.D., Medical Officer of Health.

Sir:

I have the honour of submitting my report on smoke nuisances, their abatement and prevention, together with information respecting observations of chimneys and smoke stacks, with records of visits paid to boiler rooms, and other details incidental to the general question of smoke prevention, as affecting the city of Hamilton for the year ending October 31st, 1923.

The following details represent a summary of results actually accomplished:

Observations taken of chimneys and smoke stacks totalled	306
Inspections of power plants, boiler rooms, fuel supplies, boiler equipment, the testing of smoke-preventing apparatus, and visits for instruction as to firing boilers, reached a total of	327
Observations and inspections taken together totalled	633
Notices, either statutory or informal, were served in respect of premises	163

While it is claimed that improvement in the smoke situation of the city has been affected as compared with previous years, it is to be regretted that conditions in this respect may not be regarded as ideal at the present time.

The improvements recorded in previous reports, and the various installations of smoke-preventing equipment referred to in past years, have been well sustained, but in many apartment blocks, store premises, office blocks, church buildings, school premises, as well as at several of the factories, conditions exist which still demand the attention of your officials.

In many instances the owners of the premises have evinced a disposition to meet the demands of the Department of Health to effect an improvement in their methods of controlling the fuel situation for their plants, but have claimed that suitable fuel has not been obtainable.

It is a most regrettable fact that the worst possible coal for evolving smoke was brought into Hamilton from the United States, presumably by the coal dealers of the city, and that the atmosphere was being fouled by the smoke evolved from this objectionable fuel, because the owners of the premises at which these nuisances existed appeared to be in the humiliating position of being compelled to accept it, as no other more suitable fuel was available at the time.

It is a further regrettable fact that the article responsible for at least 95 per cent. of the smoke discharged into the atmosphere above our city is the bituminous coal imported from the United States, and for which many millions of dollars are poured into the coffers of United States mine owners, which could be diverted into the channels of Canadian products if a little more enterprise were manifested by responsible parties. In former reports Canadian coal has been advocated for Hamilton use.

Most commendable attempts have been made by the city fuel controller and W. O. Sealey, Esq., amongst others, to procure a supply of Alberta coal for this city. Success in a measurable degree has attended their efforts, but palpable obstructions have been placed in their way; it is not difficult to trace the cause for this obstruction. Coal has been moving from the States to Canada for many years past, and no determined effort, until recently, has been made to supply Ontario in general and Hamilton in particular with the splendid fuel available at the wealthy mines of Alberta.

Those who have been able to procure some of this Western product speak in glowing terms as to its quality and heat-producing properties. It is gratifying

to note that the users of this first supply of the Western article are well satisfied. It might here be stated, however, for the benefit of those who might think the Alberta coal has not reached the standard expected, if there be such, that the highest grades of Western coal have not as yet arrived in Hamilton. This applies to the enormous available quantities of anthracite from the Banff, Bankhead and other districts of Alberta. This bountiful anthracite coal supply for Hamilton, and Ontario in general, is only limited by the facilities for its transportation to these eastern parts.

The same observations are relatively applicable to the vast semi-anthracite and semi-bituminous fields awaiting development in those rich mineral regions of Western Canada; the territories from which they are available have been mentioned in the local press and in open correspondence. While many thousands of tons of coal have during the summer months been brought from Alberta into Ontario, with a limited amount actually arriving at Hamilton, the coal for the most part has been of the lignite order; this coal is not of uniform grade. It is not intended in this report to mention the various fields from which the different grades of lignite are procured, but coal importers are reminded that some of this order is of very poor grade, and care should be exercised to bring into the province high-grade fuels only.

All lignite coals disintegrate when exposed for any length of time to the elements. The higher grades will hold together for a greater length of time than will those of a lower order. Lignite coal, if stored, should be kept under cover, properly protected from the influence of sunlight and rain. If exposed in the open, a load of poor grade will, in a few weeks or months, instead of appearing as a heap of bright, shining lumps of coal, be reduced to a pile of dirty-looking slack, by a certain process of deterioration. This heap of slack, although shorn of its bright appearance, still retains many, if not all, of its thermal units, and is still available for fuel. The higher grades of lignite are also affected by the elements, but to a less serious degree.

The object, however, of importers should be to obtain anthracite, semi-anthracite and semi-bituminous coal for this province, and only bring in the lignites for special use, or in the event of any difficulty occurring in the shipment of the higher orders of Alberta coal.

It might be here noted that immense and unlimited supplies of lignite coals are available in the nearer western provinces of Saskatchewan and Manitoba; but the use of lignite in Ontario is not being advocated either from these or the further west provinces, as it is believed the other orders of coal, although a few cents higher per ton, are more suitable for local requirements.

In the report of the Department of Mines for Canada, it is stated that for the ten months ending October 24th, 1923, 19,450,000 tons of coal were imported into Canada, including 4,315,800 tons of anthracite. This quantity, based on the low average cost of $7.50 per ton, f.o.b. in Ontario, means that during the first ten months in 1923 no less a sum was sent into the United States for coal than 145,875,000 dollars.

The significance of this lies in the fact that our own rich coal fields were capable of supplying every ton of coal required in Canada, and further they were and still are able, if required, to supply the needs of the whole world for the present and future generations. This output of the mines of Western Canada is only limited by the facilities available for transportation.

This is a question that demands the intelligent consideration of our federal, provincial and civic governments, as well as all bodies corporate and incorporate

who claim to possess any interest in the growth and development of our own resources.

While Western coal is receiving consideration at the present time, it is well to remember that vast coal fields exist in Nova Scotia; this coal, however, is of the bituminous order, and is an excellent coking coal; large quantities produced are converted into coke, and during the process many by-products, such as gas, tar and ammonia, are recovered.

Many of these products and by-products are actually shipped to Hamilton in this form rather than the actual coal. There is, however, no reason why coal from Nova Scotia should not be delivered in this city and used here in competition with other imported bituminous coal, or coked in by-product ovens.

It will be seen that Ontario is, above all other provinces in the Dominion, the most heavily handicapped in respect to coal deposits, but it is urged that her importations should as far as practicable include coal produced from the mines of Canada.

The reduction of smoke emissions has been secured, as in former years, by the substitution of a non-objectionable smoke-evolving coal for the more offensive bituminous order, or by the equipment of boilers with smoke-preventing apparatus.

Attention has been directed in previous reports to smoke emissions from locomotives. During the year under review, such emissions have been of frequent occurrence, particularly in the neighbourhood of Stuart Street Station and yard. Many of the locomotive engines operating in various parts of the city are equipped with devices which, if properly attended to, should produce better results than have been obtained throughout the year. High volatile coal is invariably used in the locomotive engines entering and passing through the city, and is responsible for the objectionable smoke emissions referred to.

The most satisfactory solution for locomotive engines in the city of Hamilton is that coal firing be dispensed with entirely, and that electrification be adopted. There is no engineering difficulty existing which could prevent this very desirable change being effected in the near future.

I have the honour to be, sir,

Your obedient servant,

W. F. THORNLEY,
Chief Sanitary Inspector.

REPORT OF THE INSPECTOR IN CHARGE OF QUARANTINE AND ISOLATION, FOR THE YEAR ENDING OCTOBER 31ST, 1923.

To James Roberts, Esq., M.D., Medical Officer of Health.

Sir:

In submitting this report on quarantine and isolation for the year ending as above, I would direct attention to the large number of visits paid to homes in connection with the work of quarantine and isolation, apart from other details, as compared with previous years; the number of visits recorded total 3,233, against 1,182 for the previous year.

The considerable increase in the number of premises placarded is also worthy of note.

The work in general has been most strenuous throughout the year, and its accomplishment has only been possible by the assistance and co-operation rendered by all other divisions of the Department of Health.

Considerable additional work, as compared with former years, has been entailed by the inclusion of mumps, chicken-pox, and whooping cough, in the list of diseases for which placarding of premises is necessary.

Amendments to the regulations for the control of communicable diseases, particularly in relation to measles, have added to the duties and responsibilities of your staff, not only in regard to visits to the homes, affixing placards and other duties outside the office by inspectors and nurses, but also have necessitated the keeping of very accurate records, the checking and counter-checking of reports and entries, the granting and recording of exemption certificates for persons who possess reliable evidence of having had certain of the communicable diseases, either in this city or at some other place of residence, the granting of "return to school" permits and other matters dealt with by the office staff.

During the various epidemics, the office is frequently inundated with complaints; phone calls besiege the home of the Medical Officer of Health and other officials of the department that persons are breaking quarantine at placarded premises. It is to be regretted that not infrequently these complaints are well-founded, and defaulters dealt with as circumstances demand; in others, although the fact may be established that persons are seen entering and leaving placarded houses, no offense has been committed, for these persons may be breadwinners, who under the regulations for years past have been privileged, with certain reservations, to leave and enter the home when all other members of the household are under quarantine; or the person may be a privileged individual from the fact that he or she may have been able to produce such evidence to the Medical Officer of Health that he or she is immune by reason of having had the disease for which the home is placarded, and under the amended regulations is armed with a certificate which exempts such a one from the regular observation of quarantine rules.

The inspector, on visiting the premises, gives detailed information to the parents and others as to what is required of them, according to the nature of the disease; literature is also left for the further guidance of those responsible for the care of the patient, and all possible precaution taken to prevent the spread of infection, whether the patient is removed to the hospital or treated at home. The Health Department nurse follows up the visit of the inspector. The work accomplished by the nursing staff is dealt with in the report by the supervisor of nurses.

The following is a record of the work accomplished in connection with quarantine and isolation, for the year ending October 31st, 1923:

Houses placarded owing to presence of poliomyelitis	1
" " " " scarlet fever	158
" " " " diphtheria	129
" " " " measles	621
" " " " smallpox	4
" " " " chicken-pox	151
" " " " whooping cough	93
" " " " mumps	7
" " " " anthrax	1
Houses renovated after diphtheria, patient sent to City Hospital	190
" " " scarlet fever, patient sent to City Hospital	104
" " " smallpox, patient sent to Isolation	6
" " " typhoid fever, patient sent to City Hospital	3
" " " cerebro-spinal meningitis, patient sent to City Hospital	2
" " " tuberculosis, patient sent to Sanatorium	44
" " " erysipelas, patient sent to City Hospital	2

Miscellaneous renovations	427
Measles cards removed	512
Chicken-pox cards removed	110
Whooping cough cards removed	83
Mumps cards removed	7
Houses renovated after diphtheria cards removed	145
" " " scarlet fever cards removed	132
" " " poliomyelitis cards removed	5
" " " smallpox cards removed	2
Number of visits in connection with smallpox contacts	500
" " " " diphtheria contacts	11
" " " " scarlet fever contacts	33
" " " " measles contacts	151
" " " " quarantine and isolation	3,233
" " " " erysipelas	2
" " " " meningitis	1
" " " " tuberculosis	17
" " " " typhoid fever	1
Number of investigations of cases where persons were bitten by dogs	74

I have the honour to be, sir,

Your obedient servant,

C. J. ROBERTSON,
Quarantine Enforcement Officer.

VITAL STATISTICS.

	1922		1923	
	Births	Deaths	Births	Deaths
November	277	123	246	109
December	305	127	261	110
January	310	140	283	147
February	297	110	254	189
March	292	126	294	127
April	272	128	286	136
May	288	107	312	125
June	249	100	293	93
July	287	99	287	86
August	255	96	296	93
September	233	117	287	113
October	230	111	204	96
	3,295	1,384	3,303	1,424

COMPARATIVE TABLE.

SHOWING NUMBER OF DEATHS WITHIN THE FOLLOWING AGE PERIODS.

	1922	1923
Under 1 year	376	353
From 1 to 5 years	72	69
From 5 to 10 years	27	29
From 10 to 20 years	34	51
From 20 to 30 years	62	65
From 30 to 40 years	94	90
From 40 to 50 years	99	79
From 50 to 60 years	142	147
From 60 to 70 years	215	217
From 70 to 80 years	179	201
From 80 to 90 years	72	110
From 90 to 100 years	12	11
From 100 to 110 years	..	1
Age not given	..	1
	1,384	1,424

TABLE

Showing causes of death in children under 1 year, exclusive of premature and stillbirths:

Malnutrition	28
Gastro-Intestinal Diseases	24
Asphyxia Neonatorum	5
Toxæmia	2
Injury at birth	5
Meningitis	5
Atelectasis	2
Hæmophilia	1
Malformations	1
Cerebral Hæmorrhage	4
Imperforate Anus	2
Congenital Syphilis	4
Tetany	1
Patent Foramen Ovale	6
Asthenia	4
Cretinism	1
Convulsions	2
Septicæmia	2
Erysipelas	5
Whooping Cough	3
Diphtheria	2
Lobar Pneumonia	7
Bronchitis	2
Broncho Pneumonia	23
Leukæmia	1
Pyrexia	1
Spinal Bifida	5
Hydrocephalus	3
Epilepsy	1
Influenza	2
Cerebral Tumor	1
Appendicitis	1
Congenital Heart	3
Hæmorrhage Neonatorum	7
Drowning	1
	167

DEATHS.

I.—General Diseases.

Influenza	42
Measles	3
Typhoid Fever	2
Erysipelas	9
Whooping Cough	11
Scarlet Fever	6
Diphtheria	26
Sleeping Sickness	1
Epidemic Anterior Poliomyelitis	1
	101

Tuberculosis—

Lungs	37
Meninges	6
Intestines	1
Spine	3
Bones	1
	48

Carcinoma—

Stomach and Liver	26
Abdominal	1
Intestines	17
Breast	11
Uterus	13
Neck	9
Jaw	3
Kidney	1

CARCINOMA—*continued.*	
Bladder	5
Tongue	1
Rectum	7
Throat	4
Lip	1
Ovary	4
Pancreas	1
Not specified	5
	109
SARCOMA—	
Thoracic Cavity	1
Abdominal	1
Bladder	1
Brain	2
Hip	1
Jaw	2
Not specified	1
	9
Rheumatism (Inflammatory)	1
Septicæmia	7
Exophthalmic Goitre	5
Anæmia, Pernicious	18
Anæmia	1
Leukæmia	1
Diabetes Mellitus	17
Addison's Disease	2
Syphilis	2
Thyroidism	1
Hodgkin's Disease	1
Anthritis Deformans	1
Septic Sore Throat	3
Pyæmia	1
Potts' Disease	1
	62
II.—DISEASES OF THE NERVOUS SYSTEM.	
Meningitis	2
Cerebro Spinal Meningitis	2
Cerebral Hæmorrhage	33
Cerebral Tumor	1
Paralysis (General)	4
Paralysis (Agitans)	4
Disseminated Sclerosis	1
Epilepsy	1
Cerebral Abscess	2
Apoplexy	33
Hemiplegia	7
Paraplegia	1
Otitis Media	3
	94
III.—DISEASES OF THE CIRCULATORY SYSTEM.	
Aneurism	4
Endocarditis	21
Chronic Valvular Disease	8
Angina Pectoris	10
Arterio Sclerosis	70
Myocarditis	79
Heart Failure	17
Fatty Degeneration	4
Acute Dilatation	17
Mitral Insufficiency	4
Embolism	5
Cardiac Insufficiency	5
Thrombosis	2
Heart Disease	2
Cellulitis	3
Pericarditis	1
	252

IV.—Diseases of the Respiratory System.

Bronchitis	14
Broncho Pneumonia	53
Lobar Pneumonia	30
Hypostatic Pneumonia	3
Pleuro Pneumonia	3
Pneumonia	24
Oedema of Lungs	3
Pulmonary Abscess	3
Asthma	3
Pulmonary Embolism	4
Hæmatemesis	1
	141

V.—Diseases of the Digestive System.

Abscess of Liver	1
Duodenal Ulcer	5
Appendicitis	12
Peritonitis	4
Strangulated Hernia	3
Cirrhosis of Liver	4
Jaundice	1
Intestinal Obstruction	9
Gastro Enteritis	2
Gastritis	1
Gastric Ulcer	3
Convulsions (Gastritis)	2
Cholecystitis	4
Starvation	2
Colitis	1
Cholelithiasis	2
Intestinal Hæmorrhage	1
Volvulus	1
Acute Indigestion	3
Pancreatitis	5
Status Lymphaticus	1
Dilatation of Stomach	1
Gall Bladder	1
Convulsions not specified	1
	70

VI.—Diseases of the Genito-Urinary System.

Hysterectomy	2
Nephritis	43
Bright's Disease	9
Uræmia	4
Uterine Fibroid	3
Prostatic Hypertrophy	7
Ovarian Tumor	1
Prostatism	1
Albuminuria	1
Hæmorrhage of Kidney	1
Abscess of Kidney	1
Cystitis	1
	74

VII.—Diseases of the Puerperal State.

Eclampsia	1
Abortion	1
Septicæmia (Childbirth)	2
Childbirth	2
	6

VIII.—Diseases of the Skin.

Gangrene Leg	1
Gangrene Foot	1
	2

IX.—Diseases of the Bones.

Osteomyelitis	2
Mastoiditis	1
	3

X.—Malformations.

Spina Bifida	5
Hydrocephalus	3
Congenital Heart	3
Malformations	1
	12

XI.—Diseases of Early Infancy.

Malnutrition	28
Gastro Intestinal Diseases	24
Stillbirths	119
Premature	67
Asphyxia Neonatorum	5
Injury at Birth	5
Toxæmia	2
Meningitis	5
Atelectasis	2
Hæmophilia	1
Cerebral Hæmorrhage	4
Imperforate Anus	2
Tetany	1
Patent Foramen Ovale	6
Asthenia	4
Hæmorrhage Neonatorum	7
Syphilis	4
Cretinism	1
Convulsions	2
Septicæmia	2
Leukæmia	1
Pyrexia	1
Epilepsy	1
Cerebral Tumor	1
Appendicitis	1
	296

XII.—Diseases of Old Age.

Old Age	29
Debility (General)	1
Senile Decay	29
	59

XIII.—External Injuries.

Accidental Injuries—Falls, Burns, Poisonings	30
Drowning	3
Suicide	10
Fracture Skull	6
Fracture Femur	2
Fracture Hip	2
Killed—Train, Auto, Street Car, etc	17
Accidentally shot	3
Alcohol poisoning	2
Sunstroke	1
Murder	2
Suffocation	2
	80

XIV.—Ill-Defined Causes.

Found dead	1
Cause not given	4
Cause not known	1
	6

GENERAL DEATH RATE FOR NINETEEN YEARS

Deaths per thousand of population, based on assessment population for the current year:

1904-1905	14.1
1905-1906	13.4
1906-1907	13.4
1907-1908	13.4
1908-1909	13.1
1909-1910	13.8
1910-1911	12.2
1911-1912	12.8
1912-1913	11.5
1913-1914	11.9
1914-1915	11.6
1915-1916	11.7
1916-1917	10.9
1917-1918	12.8
1918-1919	13.6
1919-1920	13.2
1920-1921	10.6
1921-1922	9.8
1922-1923	10.2

INFANTILE DEATH RATE FOR CORRESPONDING PERIOD.

Deaths in children under one year per thousand of living birrhs:

1904-1905	144.7
1905-1906	128.9
1906-1907	117.2
1907-1908	133.7
1908-1909	115.6
1909-1910	128.3
1910-1911	97.8
1911-1912	119.1
1912-1913	109.1
1913-1914	103.4
1914-1915	97.6
1915-1916	98.3
1916-1917	86.2
1917-1918	81.8
1918-1919	81.6
1919-1920	86.3
1920-1921	77.6
1921-1922	58.0
1922-1923	53.6

SUMMARY OF COMMUNICABLE DISEASES

REPORTED FROM NOVEMBER 1ST, 1921, TO OCTOBER 31ST, 1922.

Diseases	Nov	Dec.	Jan.	Feb.	Mar	Apr.	May	June	July	Aug.	Sep.	Oct.	Total
Diphtheria	130	117	104	67	76	34	58	34	18	19	21	69	747
Measles	6	10	7	3	33	5	171	251	138	38	2	5	669
Chicken-pox	44	59	64	78	61	58	41	50	19	6	10	40	530
Whooping Cough	3	2	..	9	9	6	5	22	48	46	69	49	268
Scarlet Fever	44	24	36	16	15	6	7	5	8	8	9	32	210
Tuberculosis	10	14	12	11	20	14	11	13	18	9	13	17	162
Epidemic Anterior Poliomyelitis	..	..	..	..	..	..	..	2	30	27	11	4	74
Mumps	..	2	6	6	3	9	8	2	..	3	1	..	40
Erysipelas	..	5	8	..	2	..	..	..	..	..	2	..	17
Typhoid Fever	1	1	..	1	..	..	2	..	1	3	4	2	*15
Influenza	..	..	..	1	2	1	..	..	..	..	..	2	6
Smallpox	..	..	1	..	1	..	1	7	2	2	..	..	14
Meningitis	..	..	1	..	..	..	..	..	..	..	..	..	1
	238	234	239	192	222	133	304	386	282	161	142	220	2,753

*Includes 7 Typhoid Fever cases infected outside of the city.

POSITIVE KLEBS LOEFFLER.

	Nov	Dec.	Jan.	Feb.	Mar	Apr.	May	June	July	Aug.	Sep.	Oct.	Total
	7	9	18	7	14	3	10	10	8	..	15	22	123

SHOWING DEATHS FROM COMMUNICABLE DISEASES

REPORTED FROM NOVEMBER 1ST, 1921, TO OCTOBER 31ST, 1922.

Diseases	Nov	Dec.	Jan.	Feb.	Mar	Apr.	May	June	July	Aug.	Sep.	Oct.	Total
Diphtheria	7	1	6	2	4	1	3	1	1	..	3	3	32
Whooping Cough	..	..	2	2	..	..	..	..	1	..	1	1	7
Measles	1	..	..	..	..	..	..	1	..	..	..	..	2
Scarlet Fever	..	..	1	1	..	..	1	1	..	..	..	..	4
Typhoid Fever	..	..	..	..	..	..	..	..	..	..	..	1	1
Erysipelas	..	..	2	1	1	2	..	..	1	1	1	..	9
Influenza	..	..	..	..	..	1	..	..	..	..	..	..	1
Epidemic Anterior Poliomyelitis	..	..	..	..	..	..	..	..	3	2	2	..	7
Consumption	4	9	6	1	1	5	..	4	2	2	4	4	42
Tuberculosis (other forms)	..	1	1	3	2	1	..	1	2	..	..	..	11
Total	12	11	18	10	8	10	4	8	10	5	11	9	116

SUMMARY OF COMMUNICABLE DISEASES

REPORTED FROM NOVEMBER 1ST, 1922, TO OCTOBER 31ST, 1923

Diseases	Nov	Dec.	Jan.	Feb.	Mar	Apr.	May	June	July	Aug.	Sep.	Oct.	Total
Diphtheria	64	40	44	28	21	15	29	23	31	12	31	43	381
Measles	4	9	2	1	8	42	140	228	278	58	2	11	783
Chicken-pox	55	95	84	19	22	47	42	59	35	27	4	31	520
Whooping Cough	98	71	131	164	179	50	36	32	24	13	10	20	828
Scarlet Fever	34	20	32	28	11	21	31	16	10	17	35	50	305
Tuberculosis	7	9	11	4	13	15	20	5	15	13	10	4	126
Cerebro-Spinal Meningitis	..	..	..	..	1	1	..	..	..	..	..	..	2
Epidemic Anterior Poliomyelitis	..	..	..	1	..	..	..	..	..	..	..	..	1
Mumps	..	2	1	..	..	1	..	1	..	1	2	5	13
Erysipelas	..	1	1	2	3	3	2	..	..	..	..	1	13
Typhoid Fever	1	..	1	..	2	..	2	1	..	3	1	1	*12
Influenza	1	..	11	103	..	..	..	..	..	..	..	..	115
Smallpox	3	1	2	4	..	..	..	..	..	..	..	..	10
Anthrax	..	..	..	..	..	..	1	..	..	..	..	..	1
Total	267	248	320	354	260	195	303	365	393	144	95	166	3,110

*Includes 9 Typhoid Fever cases infected outside of the city.

POSITIVE KLEBS LOEFFLER.

	Nov	Dec.	Jan.	Feb.	Mar	Apr.	May	June	July	Aug.	Sep.	Oct.	Total
	78	39	41	6	18	1	2	12	1	..	2	6	206

SHOWING DEATHS FROM COMMUNICABLE DISEASES

REPORTED FROM NOVEMBER 1ST, 1922, TO OCTOBER 31ST, 1923.

Diseases	Nov	Dec.	Jan.	Feb.	Mar	Apr.	May	June	July	Aug.	Sep.	Oct.	Total
Measles	..	..	..	..	..	..	..	1	1	1	..	..	3
Scarlet Fever	1	..	..	1	1	2	..	1	..	..	..	..	6
Diphtheria	2	1	..	4	2	1	3	1	7	1	..	4	26
Typhoid Fever	..	1	..	..	..	..	1	..	..	..	..	..	2
Influenza	..	..	6	26	7	1	1	..	..	..	..	1	42
Whooping Cough	..	1	3	4	..	2	1	..	..	..	..	..	11
Consumption	2	3	2	4	4	1	4	2	5	3	4	3	37
Tuberculosis (other forms)	..	3	2	4	..	..	1	..	..	..	1	..	11
Cerebro-Spinal Meningitis	..	..	..	..	1	..	..	..	1	..	..	..	2
Epidemic Anterior Poliomyelitis	..	..	..	1	..	..	..	..	..	..	..	..	1
Erysipelas	..	..	1	..	2	4	1	..	..	..	1	..	9
Total	5	9	14	44	17	11	12	5	14	5	6	8	150

HANOVER

Annual Report of Medical Officer of Health, 1923

To be presented to Local Board of Health before 15th November, annually.
(Schedule B, Clause 1, Public Health Act)

Municipality, Hanover. County, Grey.
Name and address of M.O.H., Dr. G. B. Stalker, Hanover, Ont.
Date, November 13th, 1923.
Estimated population, 2,800.
Number of births per annum (exclude "stillbirths"), 70.
Number of stillbirths, 4.
Number of infant deaths under one year, 11.
Infant mortality rate per 1,000 living births, 157.
Number of deaths from all causes, 45.
Death rate per 1,000 of the population, 16.

COMMUNICABLE DISEASES

Disease	No of cases	No. of deaths
Typhoid fever	48	3
Diphtheria	8	1
Measles	4	0
Scarlet fever	3	0
Tuberculosis	1	1

Any special outbreak of communicable disease during the year?
Typhoid fever.
Methods adopted to combat the outbreaks?

MILK SUPPLY

(a) Source, farmers' herds.
(b) Character, good.
(c) Is supply pasteurized? About half supply pasteurized.

WATER SUPPLY

(a) Source, wells.
(b) Character, a lot of the wells are known to be highly polluted.
(c) How purified? Not purified.

Any special Public Health work carried on, such as child welfare, ante-natal clinics, tuberculosis clinics, venereal disease clinics, etc.?
None.
Any Public Health education by M.O.H.
None.
Did M.O.H. carry out sanitary inspection of schools during the year and make report?
Schools inspected, no report.

EXPENDITURE FOR PUBLIC HEALTH PURPOSES

(a) Salary or other remuneration of M.O.H.	$125 00
(b) Expenditure for other Public Health work	903 41
Total expenditure for Public Health	$1,028 41

GENERAL REMARKS

Brief outline of activities of M.O.H. and local Board of Health. (Additional sheets or printed report may be attached.)

The Sanitary Inspector, after his survey of the town, reported the sanitary condition to be good, with a few exceptions, which were later remedied. Slaughter houses, dairies, stables, etc., were inspected and kept in a sanitary condition. A few complaints came before the Board, which were dealt with.

November 13th, 1923.

Re Typhoid Fever.

We have had during the past year a serious outbreak of typhoid fever, forty-eight cases having been reported, with three deaths, and probably several other doubtful cases which were really typhoid, but not reported as such.

Mr. Berry of the Provincial Board of Health made an investigation into the cause of the epidemic and came to the conclusion that it was due to contamination of the milk supply by our municipal water. I think this conclusion is open to criticism.

The most of the cases occurred in families supplied by either the Rense or Gateman dairies. In the forty cases investigated by Mr. Berry, thirty-one were supplied by the Rense dairy and eight by the Gateman dairy, one was not supplied by either. The Rense dairy supplies nearly twice as many families as the Gateman dairy. Both dairies have the town water on their premises. The Rense dairy used this water for washing purposes (bottles, etc.) the water is first heated. All their milk is pasteurized. The Gateman dairy do not use the municipal water at all, but use either well or cistern water for washing bottles, utensils, etc.

Mr. Berry considered that the technique at the Rense dairy in handling and pasteurizing the milk was very good, but that raw water was used for washing up floors, etc., so that pails or utensils standing on the floor and then used in handling the milk might be the means of infecting the milk by drops of water dropping off the bottom of these containers into the milk.

In the case of the Gateman dairy it was presumed that both the well and cistern both went dry in the spring or early summer, and that town water was then used. Mr. Gateman denies that this was the case.

From the above it will be seen that the conclusion arrived at presumes and takes a good deal for granted.

At the time of Mr. Berry's investigation a new chlorinator was installed at the pump house, and since that time the water supply has been kept continuously over-chlorinated and yet we have had fresh cases of typhoid. (Not contacts).

This, in my opinion, suggests that we look elsewhere for the cause of the outbreak. It will be remembered that from one factory we had seven cases (adult males) develop within a short time. This pointed very strongly to infected drinking water. The factory obtained its water from wells (usually one, sometimes two) one of these wells which was under suspicion was closed, no more cases developed from that factory. Now if one well may become infected why not two or many.

On the other hand shortly after the epidemic broke out, people were warned to boil or treat their drinking water with chlorine, where this was done, no case of typhoid developed. It may seem strange that so many wells should become polluted, but still I think it is a possibility when you consider that this town has been having more or less typhoid every year for many years back. No doubt there are many typhoid carriers scattered about the town.

I understand that for the most part the subsoil of the town is a dense clay. Now as the town is filled with cesspools, septic tanks, closets, etc., it is not unreasonable to suppose that the soil in many places is highly charged with sewage and that during a wet season this pollution must find its way into many wells. This past spring was an exceptionally wet season. In the second week in May we had heavy snowfall, and later heavy rains so that the rivers overflowed their banks and many wells which ordinarily held only a small quantity of water were filled to the top.

It would therefore favour as the cause of the epidemic an infected condition of many of our wells, and in some instances (more especially children) the municipal water supply (but not through the milk).

Our new water system which is now nearing completion will, I trust, have a very beneficial effect on the incidence of typhoid fever here.

Respectfully submitted.

G. B. STALKER,
Medical Health Officer, Hanover.

KINGSTON

Annual Report of Medical Officer of Health, 1923

To be presented to Local Board of Health before 15th November, annually.
(Schedule B, Clause 1, Public Health Act)

Municipality, Kingston. County, Frontenac.
Name and address of M.O.H., A. R. B. Williamson, Kingston, Ont.
Date, November 14th, 1923.
Estimated population, 21,659.
Number of births per annum (exclude "stillbirths"), 577.
Number of stillbirths, 34.
Number of infant deaths under one year, 48.
Infant mortality rate per 1,000 living births, 83.
Number of deaths from all causes, 427.
Death rate per 1,000 of the population, 19.71.

COMMUNICABLE DISEASES

Disease	No. of cases		No. of deaths
Scarlet fever	143		3
Diphtheria	10		2
Typhoid fever	2	(Outside)	2
Chicken-pox	5		..
Measles	62		..
Sleeping sickness	3		..
Tuberculosis	30		16
Whooping cough	25		2

Any special outbreak of communicable disease during the year?
Measles in May and June.
Scarlet fever throughout the whole year.
Methods adopted to combat the outbreaks?
Isolation of patients in home or hospital. Exclusion of contact from schools and public assemblies generally during the stated incubation period. Repeated school inspection in classes where cases have appeared. Exclusion from school of cases of sore throat and coryza until diagnosis was made.

MILK SUPPLY

(a) Source, dairy farmers near the City.
(b) Character, good.
(c) Is supply pasteurized? Part is pasteurized.

WATER SUPPLY

(a) Source, Lake Ontario.
(b) Character, good.
(c) How purified? Chlorine.
Any special Public Health work carried on, such as child welfare, ante-natal clinics, tuberculosis clinics, venereal disease clinics, etc.?
A child welfare station is conducted by the Victorian Order of Nurses.
A venereal disease clinic is conducted at the General Hospital.
Any Public Health education by M.O.H.?
Did M.O.H. carry out sanitary inspection of schools during the year and make report?
Yes.

EXPENDITURE FOR PUBLIC HEALTH PURPOSES

(a) Salary or other remuneration of M.O.H.	$1,200 00
(b) Expenditure for other Public Health work	2,400 00
Total expenditure for Public Health	$3,600 00

GENERAL REMARKS

Brief outline of activities of M.O.H. and local Board of Health. (Additional sheets or printed report may be attached.)

LONDON

London, Ontario,
November 27th, 1923.

The Chairman and Members of the Board of Health,
London, Ontario.

SIRS:

I beg to submit the Secretary's report for the year, ending November 30th, 1923.

The attendance of the members of the Board at the Board's meetings was as follows:

Mayor Wenige	5
Ald. Douglas, (Chairman)	12
E. R. Seabrook	11
C. H. Mitchell	14
Dr. W. S. Downham	14

The city water supply was tested by the Hygienic Institute 168 times, and with a small number of exceptions found of "excellent sanitary quality."

The Plumbing Inspector reported 1,360 permits granted, 2,034 inspections required, 1,785 total inspections, 131 defects discovered and 117 defects made good, and greater co-operation between the Plumbing Inspector, the Building Inspector and the Engineer is sought respecting sewer connections. The plumbing by-law is being revised.

The sanitary inspections are exceptionally well looked after.

Mr. Sanders reports the following inspections: Restaurants and cafes 429, butcher shops 448, Chinese merchants 34, dairies and milk wagons 564, toilets 529, stables, yards, cellars and lanes 535, bake shops 185, hotels 81, fish shops and wagons 41, billiard rooms 67, barber shops 275, laundries 200, grocery shops, fruit and candy 531, theatres 5, insanitary houses 107, dye houses 5, chicken complaints 5, dumps 10, miscellaneous 420, police court 5.

Mr. Boss, Assistant Sanitary Inspector, reports the following inspections: quarantined 453, yards, lanes and cellars inspected 1,273, and toilets 1,063.

London's milk supply is well looked after. Dr. Tamlin inspected and reported on 532 dairies (including re-inspections) and 708 samples of milk were examined and reported upon by Dr. Slack. Wherever inspections showed unsatisfactory milk, the dealers were prohibited from selling in London.

Dr. Downham reported the following communicable diseases: Diphtheria 49, scarlet fever 231, chicken-pox 278, whooping cough 121, tuberculosis 61, gonorrhoea 87, syphilis 50, typhoid fever 11, infantile paralysis 2, mumps 17, measles 125, German measles 11, influenzal pneumonia 1, pellagra 2, encephalitis lethargica 4, lobar pneumonia 1, smallpox 1, goitre 1.

Dr. Downham reported with respect to indigent sick as follows: Admitted to Victoria Hospital, 118; admitted to St. Joseph's Hospital, 15; admitted to Sanatorium, 8; admitted to Preventorium, 10; not admitted to any institution, 89; total cases referred to medical officer of health, 245.

Dr. Gunn reported respecting the venereal disease clinic as follows: Number of patients admitted, 105; number of patients under treatment, 257 and number of nurses' visits, 787.

Miss Raymond reported as to tuberculosis, namely: Number of patients at dispensary, 919; number of new cases, 89; number of old cases, 826; number of deaths, 13 and number of nurses' visits, 4,411.

Mrs. Patterson reported attendance on the following: Ringworm 58 calls, impetigo 527, scabies 289, whooping cough 254, mumps 26, infective conjunctivitis 46, chicken-pox 19, measles 15, scarlet fever 9, miscellaneous 182, calls not home, 47.

Dr. Hill of the Hygienic Institute was appointed consultant.

The Milk By-law was amended so as to authorize and direct the Veterinary Inspector for the City of London to enforce the provisions of the Tuberculosis Order, providing assistance to dairies under municipal control by order-in-council, dated April 16th, 1917, and to seek the assistance of the Veterinary Director-General, as provided in that order, and to classify all dairies supplying this municipality into two classes, viz.: (*a*) Raw milk dairies; (*b*) Pasteurized milk dairies, and the by-law, as amended, was approved by the Hon. Manning Doherty and the Federal authorities.

The following sanitary sewers were recommended: Waverley Place, Cheapside Street, King Street, Vauxhall Street, Holman Street, Teresa Street, York Street, Florence Street, Ashland Avenue and Cheapside Street.

The fruit by-law was amended to provide:

"1. No person shall expose for sale upon any highway in the city of London or upon the Market Square, in the said city, any meat, poultry, game, flesh, fish or fruit, unless the same be covered by gauze or other covering to protect the same from flies and dust.

2. No person shall expose for sale upon the Market Square in the said city any meat, poultry, game, flesh, fish, fruit or vegetables and all foods used for human consumption unless the same be kept at least twenty-four inches above the level of the ground."

The Board dealt with the following complaints: (*a*) Sanitary conveniences during building construction; (*b*) Mr. Boyd *re* manure pile; (*c*) London and Port Stanley Railway Station sanitary conveniences; (*d*) Public Comfort Station; (*e*) drinking fountain condition; (*f*) Peterman plumbing by-law enforcement; (*g*) Adelaide St. dump; (*h*) river bank pollutions; (*i*) Sunshine Park conveniences; (*j*) Carefree Crescent dump; (*k*) Campbell dump; (*l*) Front St. dump; (*m*) the fertilizer plant.

The question of grading eggs was considered.

The Board has been aggressive in its work of the care of the public health.

All of which is respectfully submitted.

Your obedient servant,

S. BAKER,

Secretary Board of Health.

Annual Report of Medical Officer of Health, 1923

To be presented to Local Board of Health before 15th November, annually.
(Schedule B, Clause 1, Public Health Act)

Municipality, London. County, Middlesex.
Name and address of M.O.H., W. S. Downham, City Hall.
Date, December 5th, 1923.
Estimated population, 65,000.
Number of births per annum (exclude "stillbirths"), 1,474.
Number of stillbirths, 82.
Number of infant deaths under one year, 98.
Infant mortality rate per 1,000 living births, 66.4.
Number of deaths from all causes, 1,089.
Death rate per 1,000 of the population, 16.7.

COMMUNICABLE DISEASES

Disease	No. of cases	No. of deaths
Diphtheria	54	4
Scarlet fever	280	2
Whooping cough	124	1
Tuberculosis	63	31
Gonorrhoea	92	0
Syphilis	51	2
Typhoid fever	11	1
Infantile paralysis	3	0
Measles	186	0
Influenza pneumonia	1	0
Encephalitis Lethargica	5	1
Smallpox	1	0
Chicken-pox	345	0
Pellagra	2	0
Mumps	26	0

Any special outbreak of communicable disease during the year?
We have had a moderately large number of cases of scarlet fever all year.
Measles cases were present in epidemic form in November and December of 1923.
Methods adopted to combat the outbreaks?
Quarantine and isolation. Items of warning in daily paper.

WE ARE AGAINST DISEASE AND DEATH!

We assist you to keep your health

LONDON BOARD OF HEALTH

BUSINESS—Your Health.
ORGANIZATION—Mayor, Medical Officer of Health, Three Ratepayers.
EXECUTIVE—One M.O.H., One Contagious Nurse, Two Tuberculosis Nurses, One Venereal Disease Nurse, One Dairy Inspector, Two Sanitary Inspectors, One Plumbing Inspector, One Clerical Assistant.
SERVICES—Contagious Hospital Service, Smallpox Hospital Service, Tuberculosis Service, Venereal Diseases Service, Vital Statistics Service, School Epidemic Inspection, Water Inspection—City Water Tested Every Week.
INSPECTIONS—Dairy, Milk, Plumbing, Restaurants, Hotels, Boarding Houses, Grocery, Butcher and Fruit Shops, Bakeries, Laundries, Lavatories, Stables, Junk Shops, Dumps, Sewers and Miscellaneous Nuisances.
ENFORCING—Meat By-law, insuring clean and disease-free meat; Milk By-law, insuring clean milk pasteurized or milk from tuberculosis-free cows; Plumbing By-law, insuring sanitary and efficient plumbing.

DISEASES REPORTED AND ATTENTION GIVEN LAST YEAR

Diphtheria.....126	Measles..... 17	Scabies.....228
Scarlet Fever.....155	Whooping Cough.....541	Ringworm..... 85
Smallpox..... 1	Mumps..... 12	Conjunctivitis..... 76
Tuberculosis.....187	Meningitis..... 1	
Venereal Diseases.....124	Typhoid Fever..... 5	Total.....2,442
Chickenpox.....202	Impetigo.....686	
Sanitary Inspections..7,000	Dairy Inspections.....700	Milk Samples Tested..900

REPORT ALL COMMUNICABLE DISEASES PROMPTLY

New regulations for each province in Canada concerning communicable diseases are now in operation. The following diseases are now reportable to M.O.H. by attending physician and parents or guardian:

1—Anthrax
2—Actinomycosis
3—Botulism
4—Cerebro-Spinal Meningitis Epidemic
5—Chancroid
6—Chicken-pox
7—Cholera
8—Conjunctivitis, Acute Infections
9—Diphtheria
10—Dysentery
11—Encephalitis Lethargica
12—Gonorrhoea
13—Influenza Epidemic
14—German Measles
15—Glanders
16—Leprosy
17—Malaria
18—Malignant Oedema
19—Malaria Fever
20—Measles
21—Mumps
22—Paratyphoid Fever
23—Plague
24—Pneumonia, Acute Lobar, Bronchial or Lobular
25—Poliomyelitis, Acute Anterior
26—Puerperal Septicaemia
27—Rabies
28—Rocky Mountain Spotted Fever
29—Scarlet Fever
30—Septic Sore Throat
31—Smallpox
32—Syphilis
33—Tetanus
34—Trachoma
35—Trichinosis
36—Tuberculosis
37—Typhoid Fever
38—Typhus Fever
39—Whooping Cough
40—Yellow Fever
41—Goitre
42—Pellagra

CO-OPERATE—Report to the Department any condition you think insanitary or unhealthy. Your report will be absolutely confidential.

Members Board of Health:

L. H. Douglass, M.D., chairman. G. A. Wenige, mayor.
C. H. Mitchell. E. R. Seabrook. W. S. Downham, M.O.H.

Staff:

W. S. Downham, M.D., D.P.H., Medical Officer of Health. J. C. Young, Plumbing Inspector.
C. S. Tamlin, V.S., dairy Inspector. R. H. Sanders, Sanitary Inspector.

W. S. Downham, M.D., D.P.H., Medical Officer of Health.

Ald. L. H. Douglass, M.D., Chairman.

MILK SUPPLY

(a) Source, surrounding country.
(b) Character, mostly of good quality.
(c) Is supply pasteurized? About four-fifths pasteurized and one-fifth from cows tested and found to be free of tuberculosis.

WATER SUPPLY

(a) Source, springs and wells.
(b) Character, generally good.
(c) How purified? Light chlorination. Two or more samples tested weekly.

Any special Public Health work carried on, such as child welfare, ante-natal clinics, tuberculosis clinics, venereal disease clinics, etc.?

Tuberculosis clinic jointly with Byron Sanatorium. Twice weekly at Victoria Hospital with three nurses. Child Welfare Association conducts baby clinics at several schools in city and have four nurses. Ante-natal clinic at Victoria Hospital. Venereal disease clinic at Victoria Hospital. There is a branch of the Victorian Order of Nurses here. School nurses work in close co-operation with M.O.H. and communicable disease nurse.

Any Public Health education by M.O.H.?
Attached advertisement appeared four times during past year.
M.O.H. lectures to medical students and nurses.
Several items in local papers at various times.

Did M.O.H. carry out sanitary inspection of schools during the year and make report?
Yes.

EXPENDITURE FOR PUBLIC HEALTH PURPOSES

(a) Salary or other remuneration of M.O.H.	$5,000 00
(b) Expenditure for other Public Health work	12,100 00
Total expenditure for Public Health	$17,100 00

Scarlet fever and diphtheria wards are maintained by Victoria General Hospital and cost does not appear in Board of Health estimates.

GENERAL REMARKS

Brief outline of activities of M.O.H. and local Board of Health. (Additional sheets or printed report may be attached.)

Members of Board of Health for year 1923—Alderman L. H. Douglass, Chairman; Mayor Geo. A. Wenige, C. H. Mitchell, E. R. Seabrook, and Medical Officer of Health. The Board of Health met sixteen times during the year. There was a full board at practically every meeting.

The activities, other than general business, were briefly as follows:

The final arrangements for the passing and getting into operation of the milk by-law whereby the milk must be pasteurized or be from cows tested and found to be free of tuberculosis. About four-fifths of the milk used in the City is pasteurized. There are sixty tuberculosis-free herds sending milk into the City.

The passing of the fruit by-law regulating exposure and sale on the city market and public highways of fruit, meat, poultry, game, vegetables, etc.

A number of insufficiently signed petitions for sewers were brought before the Board of Health. In most cases construction was recommended on sanitary grounds.

The Board of Health recommended to the City Council that all sewage now entering the river be collected and properly treated, also that a new sewage purification system be constructed at the present sewage filter beds where the larger portion of the city sewage is now conveyed.

The plumbing by-law was amended in order to make it more efficient.

Miss M. Hanson reports that the following work has been done at the Tuberculosis Clinic at Victoria Hospital for year ending November 30th, 1923:

Number of patients at Dispensary		1,018
Number of new cases—Incipient	31	
Moderately advanced	15	
Far advanced	3	
Infected (not active)	14	
Non-T.B.	18	
Under observation	25	
		106
Number of old cases		912
Number of nurses' visits		5,095
Number of deaths		15
Number of individuals on visiting list during year (this includes observation and contact cases)		694
Number of patients leaving city during year		36
Number of patients admitted to Sanatorium		18
Number of patients admitted to Preventorium		18

Clinics are held on Tuesday and Thursday afternoons each week, and histories are taken of each patient and examinations made by doctors. Patients are visited in homes by nurses and instructed regarding precautions, etc. Sanitary sputum cups, flasks, paper handkerchiefs and literature regarding precautions are supplied to patients. Relief is sent to many houses, milk being sent to fifty families and groceries weekly to a large number. Clothing, etc., also being supplied to many families and rent and fuel paid for in some cases. This is made possible through the Sanatorium Aid Society. Homes, where an open case has been, have been fumigated by the Board of Health and contact cases are advised to come to Clinic for examination and visited in homes by the nurses.

London, Ontario, December 6th, 1923.

Dr. W. S. Downham,
Medical Officer of Health,
London, Ontario.

Dear Doctor:

Following is a brief report of the Venereal Disease Clinic:

Number of patients admitted	111
Number of treatments given to out-patients	2,340
Number of days for in-patients	2,351
Blood tests taken	254
Smears taken	54
Prescriptions	47
Number of visits made by Social Service nurse, nine of which were to jail	952

A large number of notices were given out by M.O.H. for patients to be examined or to continue treatment. It was necessary to bring fifteen of these before the Police Magistrate for not complying with the notices. Two people disobeyed summons to appear and were arrested. The Clinic is growing steadily.

Yours truly,

(Sgd.) J. G. Gunn, V.D.

DR. W. S. DOWNHAM,
Medical Officer of Health,
London, Ontario.

Dear Doctor:

I hereby submit report of work done as public health nurse during the year 1923.

Total number of calls during year being one thousand six hundred and eighty-two (1,682). This includes calls made by public health nursing students doing field work.

Total number of cases for year being five hundred and forty-nine (549). The larger number of calls being made on impetigo cases.

Only a small number of these cases go to the family physician, making it necessary for nurse to make frequent calls.

Nine cases sent home from school during the year, reported as skin disease, were found to be chicken-pox.

Total number of miscellaneous calls were two hundred and three (203), which were mainly undiagnosed cases.

Yours truly,

(Sgd.) (Mrs.) M. PATTERSON,
Public Health Nurse.

London, Ontario, December 10, 1923.

DR. W. S. DOWNHAM,
Medical Officer of Health,
London, Ontario.

Dear Doctor:

MILK INSPECTION

I have visited and inspected 532 herds and dairies on farms with approximately 6,000 head of cattle. Sixty herds have been tested by Dr. Bovaird, Federal Inspector.

Over 700 samples of milk have been taken to the Institute of Public Health for analysis. Over 500 samples have been taken at the dairies and from the wagons and examined by Mr. Sanders and myself and that found unfit was sent home or destroyed. The eleven pasteurizing plants in the city take care of about four-fifths of the total supply.

MEATS

About 450 shops and wagons containing meats were examined during the year. That which was found unfit for any reason was destroyed and in some cases the owners were prosecuted.

Total number of visits, 1,649.

Respectfully submitted,

(Sgd.) C. S. TAMLIN, V.S.

London, Ontario, December 6, 1923.

DR. W. S. DOWNHAM,
Medical Officer of Health,
London, Ontario.

Dear Doctor:

The following is a brief report of the inspections done by me as sanitary inspector, and also by Mr. H. Boss, assistant sanitary inspector.

Restaurants and cafes	500
Butcher shops	448
Chinese merchants' stores	34
Dairies and milk wagons	564
Toilets	529
Stables, yards, lanes, cellars	535
Bakeshops	185
Hotels	81
Fish shop and wagons	41
Billiard halls	67
Barber shops	275
Laundries	200
Grocery, fruit and candy stores	531
Theatres	35
Insanitary houses	107
Dye houses	5
Chicken complaints	5
Dumps	10
Miscellaneous	429
Attended police court	40
Total	4,621

About 1,000 outside toilets have been done away with and new toilets connected with the city sewer. A number of people have been to police court for refusing to connect with the sewer.

A large quantity of putrid meat has been destroyed and a number of butchers fined during the year.

H. Boss reports the following:

Quarantines	453
Releases	450
Inspections—	
Yards, lanes and cellars	1,273
Toilets	1,063
Total inspections	3,239

Respectfully submitted,

(Sgd.) R. H. SANDERS,
Sanitary Inspector.

London, Ontario, December 3rd, 1923.

DR. W. S. DOWNHAM, M.O.H.
London, Ontario.

Dear Sir:

In reviewing the work of the plumbing department for the past year, I am pleased to report that a great deal has been accomplished in ridding the city of insanitary conditions by the installation of sanitary plumbing conveniences.

While a great deal of modern plumbing has been installed in old buildings, a large number of new buildings have been erected this year into which plumbing has been installed.

During the year about 1,500 permits have been issued, 2,000 inspections made and 135 defects discovered and rectified.

Your obedient servant,
(Sgd.) JAS. C. YOUNG, S.E.

Your obedient servant

W. S. DOWANHAM, M.D., D.P.H.,
Medical Officer of Health.

MINDEN

Annual Report of Medical Officer of Health, 1923

To be presented to Local Board of Health before 15th November, annually
(Schedule B, Clause 1, Public Health Act)

Municipality, Minden. County, Haliburton.
Name and address of M.O.H., Dr. W. S. Patrick, Minden, Ont.
Date, November 16th, 1923.
Estimated population, 839.
Number of births per annum (exclude "stillbirths"), 17.
Number of stillbirths, none.
Number of infant deaths under one year, 2.
Infant mortality rate per 1,000 living births, 117.6.
Number of deaths from all causes, 9.
Death rate per 1,000 of the population, 10.7.

COMMUNICABLE DISEASES

Disease	No. of cases	No. of deaths
Chicken-pox	2	None
Gonorrhoea	3	None
Erysipelas	1	None
Measles	2	None
Impetigo	5—plus	None
Mumps	1	None
Scarlet fever (mild type)	11	None
Goitre (rough estimate)	over 100	None

Any special outbreak of communicable disease during the yea

Methods adopted to combat the outbreaks?

Several cases of children with impetigo attending school investigated, treatment given and ordered away from school until cured.

See note re goitre.

MILK SUPPLY

(a) Source, all direct from farm.
(b) Character—.
(c) Is supply pasteurized? No.

WATER SUPPLY

(a) Source, Minden village supply from Gull River, farm supply wells.
(b) Character, Gull River—good. Wells.
(c) How purified? Some wells chlorinated. Several wells and river supply tested. One well condemned.

Any special Public Health work carried on, such as Child Welfare, ante-natal clinics, tuberculosis clinics, venereal disease clinics, etc.?

Goitre prophylaxis demonstration under direction of Dr. Phair of the Department of Education, taking in all schools in Haliburton county.

Any Public Health education by M.O.H.?

Talks to school teachers in connection with inspection of schools, and special attention given to individual cases where required.

Did M.O.H. carry out sanitary inspection of schools during the year and make report?

Yes.

EXPENDITURE FOR PUBLIC HEALTH PURPOSES

(a) Salary or other remuneration of M.O.H.: Retaining fee	$25 00
(b) Expenditure for other Public Health work	48 00
Total expenditure for Public Health	$73 00

GENERAL REMARKS

Brief outline of activities of M.O.H. and local Board of Health. (Additional sheets or printed report may be attached.)

Owing to small amount allowed for retaining fee and expenses, very little can be done in the way of Public Health work. We are going ahead with the goitre prophylaxis work and a grant has been allowed for this purpose.

In this connection I would like to call your attention to the number of mental defectives in this county that have casually come to my attention. There are a great number. Possibly close intermarriage and illegitimacy is a cause (or a result). This is a very serious problem, and if you wish I shall be pleased to take the matter up further with you. Next year I intend to collect some reliable statistics in this connection, picking out certain families. This will include a determination of mental age, physical examination and other tests. This work I am doing at my own expense.

In connection with my remarks *re* mental defectives in Haliburton County, I would like to point out that this is a very serious problem, which has a direct bearing on other problems here. I have for a long time been deeply interested in psychological medicine, and on coming here two years ago was at once struck by the mental condition of a number of the people—especially of the younger generation.

The original settlers were apparently of good stock, but they have remained here more or less isolated from the rest of the world, and have intermarried to a considerable extent. So far I have nothing beyond a few cases of actual insanity that have come directly to my notice. But from casual observation I am led to believe that there are a great number of mentally defective children.

With your sanction I shall be pleased to investigate this matter more thoroughly and give you a reliable report. As a preliminary, I suggest that I make a report on a few families, examination including psychological tests to determine mental age, physical examination noting particularly stigmata of degeneration, and history. This work I shall be pleased to make a start on at my own expense—as a demonstration. Should you think a more extensive survey advisable, I shall be pleased to offer my services.

The state of affairs may be alarming, but I am asked as to a remedy. Possibly the only feasible plan would be in connection with some scheme of reforestation (another serious problem) and buying up of farms and scattering the people. Sterilization of the mentally unfit would be an ideal method—but we are hardly advanced enough for that. At any rate I would like to collect for you some actual statistics, to show that I am not in the least exaggerating conditions.

The tragedy of it all is, that children are being born with inherent mental weakness, and these grow up and again produce their kind. This, of course, is a world problem, but I really believe that in this county conditions are particularly bad in this respect. I have already taken this matter up with Dr. Phair and others.

You will be interested to know that I am purchasing a Jones metabolimeter, this will be very useful for determining basal metabolism ratio in connection with our goitre work.

In the matter of goitre—another condition that is very frequent here—we are already taking active measures as far as the school children are concerned. But to my mind, the matter of mental defectives is a far more serious problem.

Yours sincerely,

W. S. PATRICK,
Medical Health Officer.
Minden Township.

OAKVILLE

Annual Report of Medical Officer of Health, 1923

To be presented to Local Board of Health before 15th November, annually.
(Schedule B, Clause 1, Public Health Act)

Municipality, Oakville. County, Halton.
Name and address of M.O.H., Dr. J. H. Stead, Oakville, Ont.
Date, November 15th, 1923.
Estimated population, 3,566.
Number of births per annum (exclude "stillbirths"), 84.
Number of stillbirths, 1.
Number of infant deaths under one year, 1.
Infant mortality rate per 1,000 living births, .28.
Number of deaths from all causes, 33.
Death rate per 1,000 of the population, 9.25.

COMMUNICABLE DISEASE

Disease	No. of cases	No. of deaths
Scarlet fever	17	2
Diphtheria	7	0
Chicken-pox	3	0
Scarlatina	2	0
Spinal meningitis	2	2
Smallpox	1	0
Measles	17	0

Any special outbreak of communicable disease during the year?

There was no special outbreak of communicable disease during the year. In fact, Oakville was conspicuously free of infectious disease, especially when one considers how intimately the social and business life of its citizens is related to the larger communities of Toronto and Hamilton.

Methods adopted to combat the outbreaks?

In all cases isolation of the patient was insisted on. In the case of smallpox, the patient was isolated and the unvaccinated inmates of the household were vaccinated and quarantined for fourteen days.

MILK SUPPLY

(a) Source, from neighbouring farmers.
(b) Character, fair to good.
(c) Is supply pasteurized? Two of the three milk vendors sell pasteurized milk.

WATER SUPPLY

(a) Source, Lake Ontario.
(b) Character, fair.
(c) How purified? Sedimentation and chlorination.

Any special Public Health work carried on, such as Child Welfare, ante-natal clinics, tuberculosis clinics, venereal disease clinics, etc.?

No.

Any Public Health education by M.O.H.?

No.

Did M.O.H. carry out sanitary inspection of schools during the year and make report?

Yes.

EXPENDITURE FOR PUBLIC HEALTH PURPOSES

(a) Salary or other remuneration of M.O.H.	$100 00
(b) Expenditure for other Public Health work	683 97
Total expenditure for Public Health	$783 97

GENERAL REMARKS

Brief outline of activities of M.O.H. and local Board of Health. (Additional sheets or printed report may be attached.)

Four regular meetings of Local Board of Health are held each year, at which general problems affecting the health of the town are discussed. Special meetings are also called from time to time to consider any emergency that may arise. A close supervision is kept on the drinking water, and the milk supply is regularly inspected with a view to maintaining cleanliness and ascertaining if the requirements of the by-law respecting the amount of total solids and the percentage of butter fat are carried out.

This year an unfortunate circumstance occurred, when a young man, who was a driver for one of the milk dairies, in a fit of commercial jealousy introduced dirt and filth into the milk bottles of an opposition dealer. This young man admitted his guilt, and was dealt with by the local magistrate.

Quite recently the water supply became polluted with colon bacilli to a degree dangerous to health. An order to boil all drinking water was issued by your Board, and remained in force for several weeks. It is thought that the pollution was due to the fact that the drinking supply was pumped directly from the lake during the time that the cleaning operations were being carried out on the sedimentation basin. The development of one case of typhoid fever at this time occasioned some alarm, but the fact that no other case developed would lead to the assumption that the infection in this case was not water-borne, and probably arose from individual causes.

It is a matter of regret that up to the present time, the by-law respecting water closets recently drawn up has been found to be of no effect. Four property owners have applied for redress under the by-law, and after estimates have been made by several plumbing firms, the work still remains undone. It is to be hoped that whoever is responsible for the delay in bringing this matter to a point, where it is workable will be seized with the importance of this question, and do what is necessary to overcome the difficulty which at the most appears to be a very trifling one.

I would like to make, in closing, some suggestions relative to the collection of garbage. It would be a matter of great convenience to householders, if garbage, rubbish and ashes were collected from the rear of the house, instead of from the street line. It would also do away with the unsightly garbage receptcles which appear on the street on the days of collection. A more suitable wagon should be provided for refuse collection. There is one obtainable for $390.00, which holds six cubic yards, and is so designed that one horse can operate it. This vehicle has a good appearance, and is provided with a water-proof cover, which unrolls from the driver's seat, and prevents to a large extent the escape of disagreeable odours, and the scattering about the roadway of refuse and waste papers. This wagon is also provided with a rear dumping device. Finally, a new method should be found of disposing of refuse, other than the present one of dumping it in the marsh. This method of garbage disposal, apart altogether from rendering a very conspicuous part of the town very unsightly, is, in addition, contrary to the provisions of the Public Health Act, which forbids the dumping of garbage on the banks of a running stream.

JOHN H. STEAD,
Medical Health Officer.

OSHAWA

Annual Report of Medical Officer of Health, 1913

To be presented to Local Board of Health before 15th November, annually.
(Schedule B, Clause 1, Public Health Act)

Municipality, Oshawa. County, Ontario.
Name and address of M.O.H., T. W. G. McKay, M.D., 58 King Street East, Oshawa, Ont.
Date, November 15th, 1923.
Estimated population, 15,565 (from assessor's roll).
Number of births per annum (exclude "stillbirths), 488.
Number of stillbirths, 24.
Number of infant deaths under one year, 55.
Infant mortality rate per 1,000 living births, 112.7. A decrease of 25 per cent. since Public Health nursing service has become well established.
Number of deaths from all causes, 177.
Death rate per 1,000 of the population, 11.22.

COMMUNICABLE DISEASES

Disease	No. of cases	No. of deaths
Measles	468	4 (pneumonia)
Diphtheria (active)	46	3
Diphtheria (inactive)	59	0
Scarlet fever	48	2
Whooping cough	31	3 (pneumonia)
Chicken-pox	30	0
Mumps	14	0
Erysipelas	8	1
Typhoid fever	8*	0
Tuberculosis	69†	10‡

Any special outbreak of communicable disease during the year?

Outbreak of measles commencing about April 1st, 1923, and lasting until the first week in June. All other contagion, less than the average appearance for the last three years, but more cases have been reported proportionately, this being due to a better understanding of Public Health work, and an appreciation of departmental service. Frequent reporting of contagion by householders, without doctor in attendance, is to be favourably commented on.

Methods adopted to combat the outbreaks?

We have no isolation hospital at present. We give an intensive watchfulness to each case and contact reported. An investigation is given every case. Educative work of all kinds is persistently carried out and is our main endeavour. The whole municipality is treated as if it were a scattered isolation hospital, and we consider each room in which a patient is isolated as a ward in such a hospital. Efficient supervision is the watchword, as well as insistence on absolute conformity with the requirements of provincial regulations.

MILK SUPPLY

(a) Source, Three local dairies, all selling bottled milk; (two pasteurized as well). A few small supplies are allowed, but under control.
(b) Character, consistently up to standard.
(c) Is supply pasteurized? Ninety per cent. of all milk sold is pasteurized.

WATER SUPPLY

(a) Source, Lake Ontario.
(b) Character, unexceptionable. Repeated collection and examination is made.
(c) How purified? Drifting sand filters, with chlorination (3 lbs. per million gallons), exceptionally in rough water alum has to be added as a coagulant, usually in the spring only.

Any special Public Health work carried on, such as Child Welfare, ante-natal clinics, tuberculosis clinics, venereal disease clinics, etc.?

Two Public Health nurses doing ante-natal visiting work, maternal and infant and Child Welfare, tuberculosis visiting, and control of contagious disease, nursing, isolation and quarantine. Surveillance of female V.D. cases under the attending doctor's advice, Social Welfare work and educative work. Male V.D. work under surveillance of M.O.H., all cases being kept track of

*Seven in Oshawa hospital, 1 at home. Case incidents: None from Oshawa; 4 in Whitby; 1 in Cochrane; 1 on island in Lake Simcoe; 2 in country district.
†Twenty-seven new cases; 42 cases carried.
‡Six at home; 4 in sanatorium or hospital.

and treatment provided, if unable to pay for same. Public Health laboratory, under competent doctor as director, doing work on a similar plan to the Provincial Laboratories in Toronto, and providing laboratory facility for study and report of pathological specimens, urine, blood, stomach contents, etc., on a pay basis, as indicated by schedule enclosed. In every case where people are unable to pay, or are indigents, the work is carried out at the expense of the local Board. The Board of Education provides two Public School nurses, not under our control, but working in correlation.

Any Public Health education by M.O.H.?

Talks on Public Health matter at home and school clubs, club meetings, social meetings of different kinds, and extensive use of the public press for propaganda work, publishing of reports, etc.

Did M.O.H. carry out sanitary inspection of schools during the year and make report?

Yes. Report in preparation.

EXPENDITURE FOR PUBLIC HEALTH PURPOSES

Budget, $8,000; expenditure, $8,200; salaries, $6,500; expenditure, $1,700. Laboratory carries its own expense.

(a) Salary or other remuneration of M.O.H., salary per annum	$500 00
Is also indigent medical officer, but apportions all cases to other doctors.	
(b) Expenditure for other Public Health work, doctors, Board of Education, Public School nurses and dentists	4,972 54
Total expenditure for Public Health (as above)	$13,172 54
Expenditure of Relief Department of the town of Oshawa	$2,813 79
Community Welfare Association relief work	487 80
Lake Shore Convalescent Home	210 00

GENERAL REMARKS

Brief outline of activities of M.O.H. and local Board of Health. (Additional sheets or printed report may be attached.)

1923.

Population—Total, 15,565. Foreign speaking, 4,000 (approximately).

BOARD OF HEALTH

Salaries:			
M.O.H.	$500 00		
Director of laboratory	500 00		
Sanitary inspector	1,800 00		
Senior Public Health nurse	1,600 00		
Junior Public Health nurse	1,400 00		
Office clerk and stenographer	700 00		
Total of salaries		$6,500 00	
Office expenditures:			
Doctor's attendances—Intra-natal	$2 00		
Emergency	4 00		
Diphtheria	32 00		
Whooping cough	2 00		
Venereal disease	238 00		
		$278 00	
The Public Health laboratory has carried its own expenses and is no charge.			
Office supplies and printing		$1,422 00	
Total expenses of Board of Health		$8,200 00	
			cts.
Annual per capita cost of Board of Health			55.19

BOARD OF EDUCATION

(Medical and Nursing Inspection)

Salaries:			
Senior Public School nurse	$1,400 00		
Junior Public School nurse	1,300 00		
Senior dentist	800 00		
Second dentist	800 00		
Third dentist	400 00		
Office expenditures and supplies	272 54		
		4,972 54	
Annual per capita cost of the Board of Education Health programme			31.95

MUNICIPAL RELIEF

Grant to Relief Officer		$500 00	
Grant to Oshawa Hospital	$800 00		
Cases at Oshawa Hospital	261 00		
Cases at Home for Incurables	132 00		
Cases at Sanatoria—Muskoka	22 65		
King Edward	891 64		
Cases at Hospital for Sick Children	700 50		
Ambulance service	6 00		
Total expenses for hospital service		2,813 79	
Total cost of above services		$16,486 33	
Annual per capita cost of hospitalization			cts. 18.07
Per capita cost of Relief Officer grant			3.21
Relief orders for illness—Material Relief. Municipal orders were not issued, except through Community Welfare Association.			
Total expenditures for municipal relief by Council		.....	
The annual per capita cost for relief, less hospitalization			
The annual per capita cost for total municipal relief			21.28

COMMUNITY WELFARE ASSOCIATION

Total expenditures	$487 80	
If paid for by the town the per capita cost would be		3.13

RED CROSS ACTIVITIES

Appropriations for Public Health Department	$115 00
Fresh-air cottage at the lake	210 00
Milk for school children (one year)	900 00

MUNICIPAL RELIEF WORK

No municipal relief work required this year.

PUBLIC HEALTH AND RED CROSS TENTS AT OSHAWA FAIR

Paid for by Mrs. Fred Cowan	$30 00

JUNIOR RED CROSS ACTIVITIES

Supplies, glasses, etc.	$25 00
Sum total of Red Cross activities	$1,280 00
Per capita cost if paid by the town would have been	8.23

SUMMARY OF TOTALS

Board of Health	$8,200 00
Board of Education	4,972 54
Municipal Relief	3,313 79
Community Welfare Association Relief	487 80
Red Cross Activities	1,280 00
Grand total	$18,254 13
Total of per capita costs if all were paid by the Municipality	119.78
Total of per capita costs paid by the Municipality	108.42

LABORATORY ACTIVITIES

Laboratory operating expenses for the year	$114 84	
Receipts from pay work done		$205 00
Credit balance for the year	90 16	
No. of specimens examined through the laboratory		1,564
Examined free	1,445	
Specimens charged for	119	
Schick tests made	12	
Toxin antitoxins given	2	

SANITARY INSPECTOR'S ACTIVITIES—1923

First five months of the year (Mr. F. C. Palmer):

Water samples for analysis	8
Milk samples for analysis	9
Plumbing inspections, fixtures and installations (also included in Mr. Hubbell's report)	126
Communicable diseases visited	185
Placarded	72
Indigent calls	10
Fumigations	49
Houses inspected	56
Dairy inspections	17
Bakery inspections	15
Butcher shops	8
Cafes	8
Town dump	16
Septic tank	11
Inspections re nuisances, etc., including junk yards and poolrooms, etc	107

Next two months of the year—Inspection for these two months were done by the kindness of the Town's Engineer's foreman and the Relief Officer.

Last five months of the year:

Water samples taken	30
Milk samples taken	15
Plumbing installations, including inspection of 337 stacks and 1,307 fixtures	333
Plumbing inspections	530
Communicable diseases placarded	387
Fumigations—House	48
Rooms	51
Inspection re nuisances, etc., for the last five months of the year from June 15th to November 15th	695

According to Mr. Hubbell's records over 2,000 inspections were made.

VACCINATIONS DONE

Fifty-six at foreign clinic.

As a little indication of the value of Public Health control of contagious diseases it is found:

Scarlet fever in 1923	Scarlet fever reported was 48 cases—2 deaths.
Diphtheria in 1923	Diphtheria reported was 46 active, 59 inactive—3 deaths
Tuberculosis in 1923	63 active cases—10 of these being indigents. 6 suspect cases—10 deaths. 14 cases received sanatorium care. 7 cases received hospital care.
Typhoid fever	8 cases—no deaths. 7 cases in Oshawa Hospital—1 at home. 4 Whitby. 1 Cochrane (place of origin). 2 country district. 1 on island in Lake Simcoe.
Measles	468—4 deaths (pneumonia).
Whooping cough	31—3 deaths (pneumonia).
Chicken-pox	30.
Mumps	14.
Erysipelas	8—1 death.

1923—PUBLIC HEALTH NURSES' ACTIVITIES—TOTAL CALLS MADE

Contagious diseases	1,966
Child Welfare	1,152
Bedside care and treatment	453
Social Service and Welfare	208
Birth registration	366
Prenatal welfare	313
Tuberculosis	244
Total number of calls	4,702

Total number of separate individual patients directly under observation in one year, —— , not including any contacts observed in home or abroad.

WELFARE CLINICS

Total attendance:

(1) English-speaking..... 1,356 babies
(2) Foreign-speaking..... 722 babies and pre-school age children

Average weekly attendance, English-speaking..... 50
Average weekly attendance, foreign-speaking..... 14

Total number of separate individual children under observation in the English-speaking clinic during the year, 284; foreign, 192.

Total number of separate individual children under observation and not at clinics, 960.

Year	1920		1921		1922		1923	
Population	12,246		11,582		12,780		15,565	
Disease	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths
Diphtheria—Active	77	6	70	6	53	2	46	3
Inactive	2	..	64	..	23	..	59	..
Scarlet fever	82	1	22	1	80	2	48	2
Measles	151	2	3	0	84	0	468	4
Typhoid fever	6	0	6	3	1	0	8	0
Mumps	3	0	64	0	2	0	14	0
Whooping cough	..	..	51	0	73	0	31	3
Chicken-pox	11	0	110	0	131	0	30	0
Smallpox	69	0	7	0	0	0	0	0
Encephalitis lethargica	0	0	2	2	0	0	0	0
Meningitis	0	0	3	1	2	1	0	0
Anterior poliomyelitis	0	0	0	0	1	1	0	0
Tuberculosis—Active	0	0	23	5	36	6	63	10
Erysipelas	0	0	7	1	8	1	8	1
Venereal disease—								
Chancroid	0	0	0	0	1	0	1	0
Gonorrhoea	0	0	29	0	57	0	60	0
Syphilis	0	0	13	0	12	0	24	1

STATEMENT OF REVENUE 1921-22-23, DERIVED FROM PLUMBING PERMITS AND RELATIVE MONTHLY STANDINGS

Month	1921	1922	1923	Increase Over 1922	Decrease Under	Over all
Jnauary	$16 00	$11 25	$8 50	.....	$2 75	.....
February	6 50	9 75	6 25	.....	3 50	.....
March	2 25	12 75	29 50	$16 75	.....	$10 50
April	34 75	26 75	48 00	21 25	.....	31 75
May	10 50	48 50	75 00	26 50	.....	58 25
June	19 75	87 50	124 00	36 50	.....	94 75
July	72 50	52 00	128 00	76 00	.....	170 75
August	15 25	40 50	108 75	68 25	.....	239 00
September	21 50	43 50	105 25	61 75	.....	300 75
October	11 25	60 75	69 50	8 75	.....	309 50
November	10 00	33 75	65 00	31 25	.....	340 75
December	6 25	36 50	76 00	39 50	.....	380 25
Total	$226 50	$463 50	$843 75	.....	.....	.....

1923—Increase in revenue over 1922..... $380 25
1923—Increase in revenue over 1921..... 617 25

The present revenue for the first 14 days of 1924 give an increase of $39 more than was received from the total of the same period for the three years, 1921, 1922, 1923.

STREET MAINTENANCE FROM PUBLIC HEALTH SERVICE ASPECT

Flushing of streets	$2,800 00	
Cleaning and pick-up on paved streets	3,600 00	
Snow removal	1,030 00	
Cleaning catch-basins on paved streets	683 00	
Cleaning sanitary sewers	477 00	
Cleaning storm sewers	203 00	
Cleaning out-fall	90 00	
Cutting weeds	525 00	
Oiling dirt roads	1,625 00	
Total		$11,033 00

SCAVENGING

Scavenging, removal of garbage and waste material.....	$6,700 00

WATERWORKS DEPARTMENT

New mains installed, 16,000 feet.
Total of mains in town, 192,000 feet, valued at $530,000.00.

WATER PUMPAGE

Water pumped, 1922	289,500,000 gallons		
Water pumped, 1923	368,400,000 gallons		
Average, 1923, per diem	1,000,900 gallons		
Minimum pumpage any day	786,600 gallons		
Treatment of water and allowing cost for capital investment	$17.70 per million gallons		
Total cost of treatment of water per annum			$6,262 80
Cost of treatment per 1,000 gallons			1 77
Capital up-keep		$1 20	
Wash water		02	
Filter repair and renewal		20	
Alum		12	
Chlorine		02	
Filter power		21	
		$1 77	
Total cost of operating, including engineer, wages, coal power, pumps, teaming, etc., per 1,000 gallons			$5 20
Treatment of water		1 77	
Pumphouse engineer		1 02	
Power		2 19	
Sundries		04	
		$5 20	

Water pumpage per capita:

62.9 gallons per diem per capita
- 48.79 for public usage (revenue producing)
  - 29.4 domestic consumption
  - 17.4 industrial usage
  - 1.99 public services, street washing, fountain, etc.

Total.....48.79

14.11 water used for operating purposes, losses, etc. (non-revenue producing).
- 4.65 operating water
- 9.46 loss, overflow at tank, leaky main, etc.

Total.....14.11

Revenue producing water	77.5% of total pumped
Non-revenue producing water	22.5% of total pumped
	100%

Total cost street maintenance, sanitary service, scavenging, and waterworks department		$23,995 80
Average per capita charge would be	cts. $1.54.16	

SEWERS

Approximately 5 miles of new sewers laid this year. Cost of same, $42,000–43,000.

Oshawa, Ont., November 15th, 1923.

Dr. T. W. G. McKay, Medical Officer of Health,
Oshawa, Ont.

DEAR SIR:

Permit me the honour of submitting a report of the work done by your Sanitary and Plumbing Inspector for the year 1923.

The duties of this office having been delegated to three different inspectors during the past year, it has been more difficult to arrange a suitable report of work done than it would have been under one inspectorate. Regarding the work done during the four and one-half months of my appointment, I have endeavoured to comply with the by-laws of the town, as well as the Public Health Act of Ontario, by enforcing as much as possible, with consistency, its laws and edicts pertaining to the health of the general public, by visitations, inspections, etc., of back yards, public places, and in many cases private homes, where with some attention much benefit would be derived; also restaurants, butcher shops, bakeries, laundrys, pool rooms, schools, etc., where the public are frequenters, and to prevent as far as possible any danger of contamination, by urging the necessity of cleanliness and sanitation.

During the period of my appointment, I have been fortunate indeed to acquire the co-operation of the various officials of the town, not forgetting your untiring efforts and assistance, which have been so willingly and ably administered. In fact, the citizens of the town generally have assisted very materially by their endeavours to comply with our regulations, and in many cases where notices have been served the request has been speedily agreed to and remedied.

From records in my possession, over two thousand inspections have taken place during 1923, and the general conditions of the town are as follows:

STREETS

The town's history of street cleanliness is greatly in advance of former years. Different reasons for this condition exist. *Namely*, a better and more durable street surface, and the system of flushing instead of sprinkling, and on the dirt streets oil has been used quite freely to prevent dust from entering the homes through the screen windows, which are the chief means of ventilation in the homes during the summer months. No complaint of this nature has been presented to me.

SIDEWALKS

As concrete sidewalks are considered the most sanitary, we are pleased to inform you of the extensions of sidewalks during the year. Some three miles have been added this year, making a total of 54½ miles.

SEWERS

It is a great pleasure to inform you of the wonderful advancement in laying sanitary and storm sewers. We still have with us the trouble of tree roots clogging the sewer connections.

Eighteen inspections of chocked or defective sewer connections and drains were made, which were attended to at the earliest possible time.

Forty-nine inspections were made of general conditions of sewers during the year. In some cases privies were placed at man holes on streets where there was not sufficient fall for the effluent to be taken away. In cases of this type the companies concerned were notified to remove the nuisance, and this was complied with immediately. Such cases occur usually when streets are being resurfaced, and then only for a short time.

Two inspections where the main sewer had backed up were made, and the cause has been remedied.

Some 16,028 feet of sanitary sewer have been added this year, making a total of 21¼ miles.

Some 10,908 feet of storm sewer have been added this year, making a total of miles.

Water Supply

In all districts where water mains are being installed, the use of well water is being abolished and the wells filled in.

Four wells were found, through laboratory analysis, to be supplying water unfit for human consumption, and were ordered to be filled in.

Thirty samples were sent to the Provincial Laboratories for analysis, and I am pleased to state in every case samples of our town supply show consistently free from contamination.

Nuisances

One hundred and fifty-eight inspections of back yards and lanes were made investigating conditions, and a stated time given for the abatement of nuisance. Some two or three were summoned to court through their neglect in complying with the necessary request.

Forty houses have been inspected by request, and occupants notified of the necessity of cleaning up, and such repairs made as should be in order to comply with Public Health laws.

Seven inspections of junk yards were made and proper instructions given as to what would be expected done.

Sixteen horse stables were inspected, with the result that in every visit the party owning same was handed a copy of the Provincial Act regarding the same.

Dumps

Twenty-six inspections of town dumps were made.

Pool Rooms

All pool rooms have been regularly inspected, sixty-one visits being made during the year. The one on the base line is not up to standard as yet, but the proprietor assures us of a speedy transformation, and also his intention of keeping strictly to our By-laws governing the same.

Communicable Diseases

Three hundred and eighty-seven inspections and investigations were made, including placarding and quarantine.

Forty-eight fumigations owing to communicable disease.

Plumbing

Five hundred and thirty plumbing inspections have been carried out.

Three hundred and nine permits have been issued representing 337 stacks and 1,307 fixtures.

Revenue turned over to Town Treasurer, $773.25.

	Stacks	Fixtures	Revenue
November, 1922.....	14	61	$33 75
December, 1922.....	16	63	36 50
January, 1923.....	4	12	8 50
February, "	3	9	6 25
March, "	11	65	29 50
April, "	16	56	48 00
May, "	34	121	75 00
June, "	56	208	124 00
July, "	58	216	128 25
August, "	49	182	108 75
September, "	46	189	105 25
October, "	30	125	69 50
Representing for 12 months.....	337	1,307	$773 25

Twelve septic tanks have been installed and inspected.

One hundred and eighteen plumbing installations were in old houses where old earth closets had been in use.

Food

Seventeen inspections of dairies were made.

Fifteen samples of milk were sent to Toronto laboratories for analysis.

Sixty-two inspections of restaurants and cafes were made, and where neglect of duties regarding the keeping of same was practised, they were notified to immediately comply with our by-law.

Fifteen inspections of bake shops were made.

Fifty-seven inspections of butcher shops were made.

Schools

Twenty inspections of Public and High schools were made, and defective conditions reported to the Board of Education which were duly rectified.

Notices

One hundred and thirty-two official notices have been served.

Summonses

Three summonses were issued to delinquents and three convictions recorded for non-compliance in the time given.

The aforementioned report indicates the various branches of the Public Health work, which come under the supervision of your Sanitary and Plumbing

inspector, but does not include the many minor interviews and requests for advice and the many telephonic communications which are not recorded, but which take a certain amount of valuable time.

The relief and indigent interests have been most creditably handled by Councillor Brown as Chairman of the Relief Committee. Much credit is due Mr. Brown for his untiring efforts, not only in securing relief, but in determining who should bear the expense. By his energetic detective ability he has saved the Town of Oshawa several hundred dollars, besides rendering necessary relief to parties in distress.

Respectfully submitted,

D. A. HUBBELL,
Sanitary Inspector.

Oshawa, Ont., November 29th, 1923.

DR. T. W. G. MCKAY,
Medical Officer of Health, Oshawa, Ont.

Dear Sir:—

Herewith is presented the most outstanding activities of the Nursing Service of the Department of Public Health from November 1st, 1922 to October 31st, 1923.

COMMUNICABLE DISEASES

Almost every type of contagious disease common to our climate and section of the province has been present, with the exception of smallpox, and at certain seasons of the year the entire time of one nurse is employed combating these diseases. Each case is visited in the home, isolation made as complete as possible, and members of the family are instructed in the care of the patient and quarantine measures. Many cases of the more serious types, such as diphtheria and scarlet fever, are given bedside care through the illness, and especially so where it is impossible for the mother to give the care so essential. The much vexed question of an isolation hospital has not yet been answered by our municipal authorities, nor has any solution been proffered for any of our difficult problems this past year; nor yet has the housing problem made isolation measures less difficult. The over-crowded two and three room apartments, sublet, in houses already overcrowded make one think at times that any effort directed toward isolation might be followed by a question mark, for with the care of the sick must go a preventive healthy programme for each member of the family.

Infectious diseases reported for the year are as follows:—

Measles	468	....	4 deaths.
Diphtheria (active)	46	....	3 deaths.
Diphtheria (inactive)	59	....	
Scarlet fever	48	....	2 deaths.
Whooping cough	31	....	3 deaths.
Chicken-pox	30	....	
Mumps	14	....	
Erysipelas	8	....	1 death.
Typhoid fever	7	....	5 of these from outside municipalities in Oshawa Hospital.
	711		
Tuberculosis (active)	63	....	10 deaths.
Tuberculosis suspect cases	6		

With the exception of measles, all types of contagion have been lighter the past year. Immunization of all diphtheria contacts has done much to lessen

the spread of this disease. The laboratory we have in connection with the Department of Public Health has hastened the diagnosis of suspect cases, and no case has been released without two successive negative swabs.

Three cases have refused to respond to antitoxin and treatment alone, necessitating then the removal of the tonsils and adenoids. This operation was carried out in the patient's home by the doctor, with the assistance of the Public Health Nurses before the isolation could be removed. An attitude of intelligent responsibility is being shown by all toward measures adopted by the Department of Health, and an understanding co-operation in measures which four years ago seemed but imperfectly understood.

Tuberculosis

The tuberculosis work has branched out considerably since the previous report. Concentrated attention has been given sixty-nine cases, and these have been treated in the same way as our other communicable cases in the above list. The education and examination of contacts is our chief point of interest, and with all we have managed to get done, it must be admitted the Public Health workers have never felt satisfied with the results of this work, and how inefficient is the control over the spread of this disease. The insidious onset of tuberculosis, the often great delay in the appearance of marked symptoms even after the infective organism has well established itself, is one of the great causes of our difficulty in handling this disease. Through the year, fourteen cases have received sanitorium care, and seven hospital care, ten of whom were indigent cases.

Child Welfare

Realizing the vast importance of Child Welfare work in all its branches, Pre-natal, Maternity, Infant and Pre-school, each nurse has missed no opportunity to make this work tell its story in the history of infant mortality and its prevention.

Pre-Natal

More concentrated work has been given to this branch, and approximately 150 mothers were safe-guarded. Admitting that the mothers are the most vital factors in the community—its very growth and development depending on them—the community should offer them the best that our knowledge of the importance of pre-natal care can give. Good pre-natal care should be made as popular a custom as infant welfare work is at present.

Infant Mortality

Infant mortality is given in the following:

Intestinal	6	.... 4 of which occurred in the foreign population.
Premature	19	
Stillborn	24	
Other causes	30	

79 deaths registered.
512 births registered.
173 of the above were born in the Oshawa Hospital.

The decrease in the intestinal infection of infants is further marked this year. A reduction to six infants under one year, four of the six being among the non-English speaking population, which indicates there is still much to do along preventive lines among these people. The co-operation of others in reporting

sick babies to us has been splendid, and if the lay public would only realize the importance of getting medical assistance early, no doubt all of these babies could have been saved. The number of premature births and stillbirths is still appallingly large. We cannot hope for better results until we have been placed in touch with the majority of the pre-natal cases of the municipality. Not only is the pre-natal care instrumental in reducing the infant mortality, but the care given during the period of maternity adds much to this. As yet we have not the trained maternity worker with us, and when we consider that 350 births out of 512, occurred in the homes, such a worker is the natural professional link between our pre-natal and infant welfare work.

Infant Welfare Clinics

The greatest attraction and interest in the field of Public Health relates to the fate and welfare of the babies. No greater guarantee of health can be suggested than the baby clinics, where in one session we come in contact with a large number of mothers and infants. Here the mothers come for advice regarding infant feedings and physical defects. If a baby is found to be ill, the mother is immediately referred to her physician. The clinics are for prevention only, not for treatment of disease. One of the most satisfactory activities in our programme is the Well Baby Clinic for English-speaking mothers, established three and one-half years ago. It has gradually but surely grown in numbers and interest until now our weekly attendance hovers around fifty.

Total attendance for the year (English) 1,356 babies.

Total attendance for the year (Foreign) 722 babies and pre-school age children.

The clinic for babies of foreign-speaking mothers remains a problem. Whether it is difficult for them to understand our methods in this country, or whether they are influenced constantly by racial trends and customs which they cannot easily throw aside, or whether our methods are at fault, is a question. Much appreciation and excellent results are being obtained among a few families, but, nevertheless, it continues a discouraging proposition to cope with. The attendance is good during the summer months, but very slack during the colder seasons.

Pre-School Age

In each clinic considerable attention is being directed to the pre-school age. The two to six period of child life. Before now, the pre-school age child has been almost neglected in the concentration on school health and infant welfare, but at last he is given a place. Talks on cleanliness, nutrition, and teeth are given special attention, and many corrections of physical defects have been made by the family physician.

Crippled Children

During the year a survey of crippled children of Oshawa was made by the nurses upon the request of the local Rotary Club. Several names and histories were handed to the Rotary committee, with the result that two cases have already received expert attention available, and perfect results. The Rotary Club are continuing their philanthropic work the value of which can never be estimated in monetary return, but can be estimated in value of citizenship.

Red Cross Co-operation

An ever busy organization, the Red Cross increased its active interest in Child Welfare by establishing a Fresh Air Cottage at Lake Ontario for six weeks during the summer vacation. By courtesy of the Oshawa Paris Commission, the use of this cottage was given to the Red Cross Society, and the continuance of this general attitude in the cause of humanity may grow into establishing a permanent Fresh Air Home during the summer months. This rounded out our programme of Public Health work, in as much that we were able to select twenty-four children who were much underweight and in need of a change of air, following serious illnesses. Without any exception, each child made a creditable gain. Next year it is the purpose of the Red Cross to increase the time allotment and to give accommodation to more of the little ones in need.

Educational Methods Advertising of Public Health Work

To further health work in its educational and advertising purpose, we erected a Public Health tent at the local Fair Grounds. Here hundreds of babies and pre-school age children were weighed, and the mothers advised upon care and feedings. The instructive panels "Silent Salesmen of Health" were given due attention by the visitors at the tent. Five hundred glasses of milk were given to children, who thereby learned and appreciated the value of this beverage as a food.

Every opportunity of carrying the Public Health message to the people of the town, and outside has been seized. Talks have been given to groups, schools, home and school clubs, private and religious organizations.

Newspaper publicity means much, and it has constituted an important medium of reaching the larger public. Through notices, news items, reports of monthly meetings, the public is kept in frequent touch with activities of the nursing services, and no doubt many new conceptions of health work have come thereby.

Relief Work

As in previous years the Red Cross has contributed to the welfare of many families and children in the relief work. Not least among this is their contributions to the up-keep of a loan cupboard in which pneumonia jackets, layettes, linen and bedding are kept for emergency needs.

For cases of contagion, in a community where there is no isolation hospital, this exchange of bedding fills a great and dire need.

A total of 4,702 calls has been made by two Public Health nurses; below are the details of visits.

Contagious diseases	1,966 calls.
Child welfare	1,152 "
Bedside care	453 "
Birth registration	366 "
Pre-natal	313 "
Tuberculosis	244 "
Social welfare	208 "

Social Welfare

Just here is an opportune place for a few remarks on the social problems which are thrust upon the members of public organizations such as ours in an industrial town. The certain unfolding of much social misery indicates the

necessity of developing the strongest liason with social relief agencies. Such will in time, no doubt, make its most effective expression in the appointing of a social case worker, working hand in hand with the Department of Health, and charity organizations of every type.

Respectfully submitted,

B. E. HARRIS, R.N.
Public Health Nurse.

Oshawa, Ont., December 3rd, 1923.

Mayor and Council, Oshawa, Ont.

Gentlemen:

I hereby submit to your honourable body, my report for the second year in which I have been acting as Relief Officer for the Town of Oshawa.

Although the position is without honorarium, no less attention has been given, on that account, to any case reported as requiring assistance.

The work for the year ending November 30th, 1923, has been of a very strenuous character and has taken so much of my time as to make it impossible for me to give much attention to my own affairs, and as a result I have been put to a considerable loss. The work has involved three visits to Toronto, six visits to Whitby, and one to Campbellford. In the months of March and April much of my time was taken up with work in the Police Court, watching the Town's interest in affiliation cases and also cases of non-support.

Eighty-nine cases of indigency have been reported, necessitating over 300 visits before these were ultimately disposed of. Owing to several of these cases coming before the local magistrate, they have meant ten to twelve visits and many hours in the police court.

The applications for relief have been definitely found to vary greatly in their character and the justification entitling them to benefit. There have been citizens who have fought nobly against sickness and adversity, and in some cases have refused even to ask for relief, until my attention has been called to their case by other citizens who knew the circumstances. While I have been proud of these people as citizens for their reticence and personal pride, still I have been glad to render all the assistance possible.

I may say that I have had quite a large number of cases where it has been necessary to take strong measures in dealing with their applications, and have had to give evidence in police court against many for their apparent wilful neglect in providing the necessities of life for their families. This has meant taking up the cases with the Children's Aid Society, and even necessitated the taking away of their children from them in order to protect these young lives. The fathers and mothers in these cases have been of a low type, needing constant watching to keep them at work and making provision for their families.

We have still with us those people, who, while they work, apparently live much beyond their income. One week out of work, or a little sickness, finds these people applying to the town for assistance. Such people must expect to be met with pertinent questions from the relief officer before being assisted.

Forty cases have been investigated, granted relief, hospital care, or medical attendance, amounting to $1,763.15.

Forty-three other cases have been investigated in which it was found that the town had no legal responsibility. These investigations alone have

saved the town a considerable sum of money. The actual amount cannot be arrived at as some are hospital, some are sanatorium, and some are asylum cases, varying in length of time from a few weeks to months, and in some cases, years.

The average cost in the hospital for an indigent case for one year is approximately $560.00. The same is true of a sanatorium case. In asylum cases the average cost is $260.00 per annum. The cost to the municipality for cases sent to institutions, as well as the amount saved to the municipality in the case of cases not sent to institutions, may be readily computed from such figures. All that is required is the number of individuals and the time of stay in the different institutions. This information is on record in the Treasurer's office.

In six cases asking for relief I gave a point blank refusal, as I considered that they were cases of real imposition.

Parents Not Wanted

I am sorry to say that I have had five cases coming under this heading; that is children who have sought to get rid of their aged parents, and have applied to the town to do something for them on purpose to be relieved of any responsibility connected with the same. Happily, I am well versed in the law covering such cases, and am able to get the parties concerned together and put the matter squarely before them with the result that I have only had to take one to the House of Refuge who is being paid for by children who are out of town. This, as you are aware, gives me much work in getting relatives together. I will not guarantee secrecy in these cases, as I feel that the painfulness of some demands made publicly will only serve to shame the parties concerned. "He that wasteth his Father and chaseth away his Mother is a Son that causeth Shame and bringeth Reproach."

One interesting case has been overlooked in this summary. With reference to the estate of Mrs. Fisher, deceased, I have succeeded in getting the Town Treasurer in touch with the solicitors for the estate. And as a result the town will be reimbursed to the amount of $1,391.00 with interest, as per an agreement arranged.

I would like to draw your attention to the fact that there are some very peculiar cases to be dealt with. One instance:—a man, an American citizen, seventeen years in Canada, but not having taken out papers to become a Canadian citizen, comes to Oshawa two years ago, works steadily, falls sick, becomes a serious case after a long time in the local hospital. It is ultimately decided that his case is one for the House of Refuge. The question in my mind was "Is this man chargeable to Oshawa?" I worked on the case and found that he had a sister in Buffalo. I got in touch with her and put the case before her. Finding also that he had a nephew I got him interested in the case. The question arose, "Would they receive him over the border as the man had to be taken over in an ambulance?" After much exchange of correspondence, I finally got Mr. Disney to take him over on chance. Happily they received him in Buffalo, and the nephew became responsible for the bill which was a considerable one. This would altogether likely have been lost money but for my relationships to the case.

Owing to the resignation of the sanitary inspector, I acted in that capacity for two months, thus saving the town an interim expenditure of $300.00 the salary which would have been paid for that time.

During the two months fifty-four notices were served and two cases taken to court and convictions obtained.

Before closing, I would like to place on record my appreciation of the splendid assistance rendered to me by Dr. McKay, Nurse Harris, and of also the Police Department and the heads of the various firms who continue to give me every assistance in my investigations.

In conclusion, permit me to say that no effort has been made to shirk responsibility, either my own or the town's. Applications for relief have been always treated with all the courtesy necessarily due them.

Respectfully submitted,

A. W. Brown,
Relief Officer.

PRESENT STATE OF THE McLAUGHLIN BEQUEST TRUST FUND

Dr.

Total expenditures to date	$1,492 31
Balance on hand in bank	268 59
	$1,760 90

Cr.

Dec. 29, 1921—By Bequest	$1,200 00
June 30, 1922—Interest	18 00
Dec. 31, 1922—Interest	8 50
June 30, 1923—Interest	3 05
Nov. 24, 1922—Credit by refund on McAinsh account, books for Department	18 50
Mar. 21, 1923—Refund from Municipality on Marlowe account for re-decorating Board of Health rooms	121 85
Feb. 7, 1923—Refund on loan	100 00
Dec. 31, 1922—Cash from Municipality of East Whitby. Re-imbursement for work done by the Department; collecting water and milk samples and laboratory work	35 00
Cash receipts for laboratory work done, deposited in the Dominion Bank	256 00
	$1,760 90

Bills outstanding for laboratory work done	$63 00
Accounts collectable	53 00
Indigent	10 00

Oshawa, Ont., November 29th, 1923.

Dr. T. W. G. McKay,
Medical Officer of Health, Oshawa, Ont.

Dear Sir:—

The following work was done at the laboratory of the Department of Public Health, during the twelve months ending November 15th, 1923.

Material	No. of examinations	
Sputum—for the diagnosis of tuberculosis, etc.	98	Free.
Throat swabs—for the diagnosis of diphtheria, etc.	930	Free.
Sent to Provincial Laboratory	290	Free, except postage.
Urine—for the diagnosis of diabetes, Bright's disease, pyelitis, etc.	85	
Blood—for the diagnosis of anaemia, etc.	14	
Blood—for the diagnosis of typhoid fever	14	Free.
Exudate—for the diagnosis of venereal disease, gonorrhoea	113	Free, except postage.
Miscellaneous—pleural fluid, spinal fluid, etc.	10	

There were ten Schick Tests done and Toxin-Antitoxin administered in two cases.

Respectfully submitted,

Grant L. Bird, M.B.
Director of Laboratory.

Oshawa, Ont., January 26th, 1924.

DR. JOHN W. S. MCCULLOUGH,
Chief Health Officer of Ontario,
Spadina House, Spadina Crescent, Toronto, Ont.

Dear Sir:—

The enclosed four papers are properly 1922 report, but their presence, accompanying this report, is of value in giving a rapid historical review of the work done by the Department of Public Health in Oshawa in the past four years, therefore, I have felt it wise to send them along with this report, feeling that it was the wiser place for them to turn up.

Yours truly,

T. W. G. MCKAY, M.D.
Medical Officer of Health.

Oshawa, Ont., November 30th, 1922.

The following work has been done at the laboratory of the Department of Public Health, Oshawa:

Examination	No. of cases
Sputum—for the presence or absence of bacillus of tuberculosis	12
Throat cultures—to detect the presence or absence of diphtheria	220
Urine—the diagnosis of diabetes, Bright's disease, pyelitis, cystitis, etc.	15
Blood—for the diagnosis of anaemia	2
Blood—for the diagnosis of typhoid fever	4
Exudate—venereal disease, gonorrhoea	35
Spinal fluid, including lumbar punctures—for the diagnosis of infantile paralysis, cerebral spinal meningitis, tubercular meningitis, etc.	6

The above work was done for diagnostic purposes at the request of eighteen medical doctors of the municipality and surrounding district.

G. L. BIRD, M.B.

As a little indication of the value of Public Health control of Contagious Diseases it is found:

Scarlet fever in 1921—Scarlet fever reported was	22 cases		1 death.
" " 1922 " " "	80 "		2 deaths.
Diphtheria in 1921—Diphtheria reported was	70 "	(clinical or active)	6 deaths.
" " " " "	64 "	(carriers or inactive)	
" 1922 " " "	53 "	(clinical or active)	2 deaths.
" " " " "	23 "	(carriers or inactive)	

All these were under continued supervision of Public Health nurses.

Tuberculosis in 1921—Tuberculosis reported was	23 cases	5 deaths.
" " " " "	36 "	6 deaths.

While through Public Health Nursing Service and a more humane understanding of the proper care of such cases, twenty-four of these cases were admitted to Sanatoria for treatment.

Typhoid Fever. Thanks to our water supply from Lake Ontario and an efficient filtration plant and chlorinating system

In 1921	In 1922
6 cases reported.	1 case only was reported.
4 imported from outside Municipality to hospital.	
3 of these died.	

Besides these diseases, measles, chicken-pox, whooping cough, and other contagious diseases were also being looked after in the same intensive way.

Bedside nursing care in many of these cases, as well as in ordinary illness cases, was freely given.

TOWN OF OSHAWA POPULATION

	1920	1921	1922
Population	10,146	12,248	12,780
(Approximately 2,500 to 3,000 non-English speaking population.)			
Average per capital cost of Board of Health	58.68 cents	56.88 cents	60.89 cents

LOCAL BOARD OF HEALTH SUMMARIES

Salaries:	1920	1921	1922
Medical Officer of Health	$100 00	$100 00	$500 00
Sanitary Inspector (6 months at $1,350.00, 6 months at $1,800.00)	1,575 00	1,800 00	1,800 00
Office Clerk and Stenographer	*450 00	500 00	500 00
First Public Health Nurse	1,200 00	1,500 00	1,500 00
Second Public Health Nurse	.....	*1,500 00	†1,500 00
Board of Health office expenses	2,628 82	1,567 68	2,106 97
" " total expense	5,503 82	5,467 68	7,781 97
Grand total	5,953 82	6,967 68	7,781 97

*Paid by Red Cross.
†Less $125.

BOARD OF EDUCATION HEALTH EXPENDITURES

	1920	1921	1922
Public School Nurse	$1,100 00	$1,300 00	$1,350 00
First School Dentist	.....	960 00	960 00
Second School Dentist	.....	.....	720 00
Nurse's supplies	.....	.....	.....
Dental supplies	.....	.....	.....
Total	.....	$2,260 00	$3,030 00
Average per capita cost of Board of Education health expenses	10.841	18.453	23.78
Grand total of Board of Health and Board of Education health expenses	69.5 per cap.	75.3 per cap.	84.6 per cap

PUBLIC HEALTH NURSES' ACTIVITIES

	1920 10 months	1921 12 months	1922 12 months
Total calls made	1,362 (1 nurse)	3,293 (2 nurses)	4,617 (2 nurses)
Contagious diseases	900	500	1,471
Child welfare	212	1,200	1,252
Bedside care and treatments	250	754	639
Social Service	....	450	429
Calls re birth registration	....	....	250
Pre-natal welfare of mother	....	100	217
Tuberculosis	....	288	165

Total number of separate individual patients directly under observation in one year, 1,883, not including any contacts observed in home or abroad.

WELFARE CLINICS, TOTAL ATTENDANCE

	Last six months		
(1) English speaking	427	966	1,184
(2) Foreign speaking	No clinic this year	920	824
Average weekly attendance, English speaking		26	
" " " Foreign speaking		16	

Total number of separate individual children under observation during the year 1922: English, 155; Foreign, 131.

Total number of separate individual children under observation in the English-speaking clinic during two years, over 250.

Total number of separate individual children under observation and not at clinics, fully as many more as at both clinics.

N.B.—Annual calls considered a good average for a Public Health nurse in Public Health Welfare Work in other municipalities, 1,500 to 2,200.

SANITARY INSPECTOR'S ACTIVITIES

	1920	1921	1922
Water samples taken	55	106	63
Milk samples taken	18	43	51
Cream samples taken	...	...	10
Plumbing installations	201	90	174
Plumbing inspections	610	303	304
Communicable diseases placarded	323	166	209
Rooms fumigated	478	396	76
Inspection re nuisances, etc.	1,800	1,493	1,670
Total	3,485	2,597	2,557

During part of the year 1920 Mr. Philip Chaney placarded cases of contagion, released and fumigated.

OTTAWA

Annual Report of Medical Officer of Health, 1923

To be presented to Local Board of Health before 15th November, annually.
(Schedule B, Clause 1, Public Health Act)

Municipality, Ottawa. County, Carleton.
Name and address of M.O.H., T. A. Lomer, City Hall, Ottawa.
Date, November 15th, 1923.
Estimated population, 117,239 (Assessor's census).
Number of births per annum (exclude "stillbirths"), 3,081.
Number of stillbirths, 127.
Number of infant deaths under one year, 436.
Infant mortality rate per 1,000 living births, 141.51.
Number of deaths from all causes, 1,748.
Death rate per 1,000 of the population, 14.909.

COMMUNICABLE DISEASES

Disease	No. of cases reported	No. of deaths
Tuberculosis (pulmonary)	152	91
Typhoid	32	6
Scarlet fever	300	15
Diphtheria	320	33
Smallpox	24	0
Measles	763	8
German measles	361	0
Chicken-pox	187	2
Mumps	44	0
Whooping cough	637	56
Erysipelas	17	4
Poliomyelitis	1	0
Cerebro-spinal meningitis	4	0
Influenza	1	64
Lethargic Encephalitis	1	3

Any special outbreak of communicable disease during the year?
Whooping cough especially during January, February, March, April, and May.

Methods adopted to combat the outbreaks?
Following up school absentees by Public Health nurses.
Quarantining cases and keeping contacts under observation.
Encouraging use of Pertussis vaccine for contacts.

MILK SUPPLY

(a) Source, dairy farms in 25-mile radius.
(b) Character, very good.
(c) Is supply pasteurized? Over 90 per cent.; remainder from tuberculin-tested herds.

WATER SUPPLY

(a) Source, Ottawa River at Lemieux Island.
(b) Character, varies; turbid and very polluted in spring.
(c) How purified? Chloramine, with liquid chlorine in reserve.

Any special Public Health work carried on, such as child welfare, ante-natal clinics, tuberculosis clinics, venereal disease clinics, etc.?
Three child welfare stations, where infant feeding and pre-natal clinics are carried on.
Venereal disease clinic.
Tuberculosis clinic, operated by private charity and assisted by Health Department.

Any Public Health education by M.O.H.?
Occasional lectures to mixed audiences in schools.
Infant welfare educational publicity in connection with Central Canada Exhibition, when annual baby show conducted by M.O.H.

Did M.O.H. carry out sanitary inspection of schools during the year and make report?
Not yet completed.

EXPENDITURE FOR PUBLIC HEALTH PURPOSES

(a) Salary or other remuneration of M.O.H.	$5,300 00
(b) Expenditure for other Public Health work	50,081 52
Total expenditure for Public Health	$55,381 52

(This does not include expenditure for Isolation and Smallpox Hospitals, both of which are under Health Department.)

GENERAL REMARKS

Brief outline of activities of M.O.H. and local Board of Health. (Additional sheets or printed report may be attached.)
Printed report will be forwarded.

Chairman and Members, Board of Health, Ottawa.

Gentlemen:

This year has shown a slightly higher general death rate and infant death rate than the preceding year and also a considerable decrease in the birth rate.

The outstanding feature in regard to the increased death rate is the severe outbreak of whooping cough during the winter and spring which caused fifty-six deaths directly due to this disease and a considerable number in addition where the cause of death was given as respiratory disease but where whooping cough was the primary factor.

Tuberculosis, 1923

A noticeable increase in deaths due to pulmonary tuberculosis, as well as in the number of cases reported, was recorded during the year.

Month	Cases reported	Deaths from pulmonary tuberculosis	Deaths from other forms of tuberculosis
November	7	5	2
December	6	9	1
January	13	11	2
February	13	5	2
March	12	9	0
April	6	14	2
May	11	4	2
June	10	6	2
July	10	9	1
August	13	7	0
September	22	5	4
October	29	7	1
Totals	152	91	19

Scarlet fever showed fewer cases but about the same number of deaths.

Diphtheria showed a very gratifying decrease amounting to about 25 per cent. both in the number of cases reported and in the mortality.

Influenza was unusually prevalent during the late winter and early spring and, though never reaching epidemic proportions, it caused sixty-four deaths, almost all occurring during the months of February and March. This, together with the increased number of deaths from pulmonary tuberculosis and whooping cough, accounts for the slightly higher general death rate.

Small-pox occurred only in scattered cases during the first six months of the year, twenty-four in number of which twelve were reported in January. All cases were treated in the Hopewell Hospital. Since the month of April no cases have appeared and the hospital has been closed.

Typhoid fever has been almost entirely absent, only six cases having developed in the city during the year, none being fatal.

Twenty-six cases from outside points were treated in the local hospitals, six being fatal.

TYPHOID FEVER, 1923

Origin	Cases reported	Deaths
Ottawa	6	0
Other points in Ontario	17	3
Province of Quebec	9	3
Totals	32	6

Venereal Disease

The Venereal Disease Clinic has been in operation throughout the year at the Water Street Hospital for free treatment of these diseases. The amount of work done at this clinic is shown in attached table.

VENEREAL DISEASE CLINIC

Cases admitted to Out-patient Department—								
Male	Syphilis,	54,	Gonorrhea	31,	Double infection	18		
Female	"	46	"	5	"	"	5	
Total		100		36			23	Grand total 159
Patients admitted in Hospital wards—								
Male	Syphilis	19,	Gonorrhea	41,	Double infection	10		70
Female	"	15	"	30	"	"	5	50
Total		34		71			15	Grand total 120

In-patients	120
Out-patients	159
Total	279
Treatments given to out-patients	3,115
Syphilis, 2,125, gonorrhoea 990.	
Treatments given to in-patients	1,541
Total treatments	4,656

Infant Mortality

This year has shown an increase in the Infant death rate which is attributable to two factors: the diminished birth rate and the outbreak of whooping-cough.

The infant deaths for the year totalled 436 as compared with 417 last year, an increase of nineteen or 4.5 per cent.

Deaths from diarrhoeal diseases showed a new low mark being only 13.5 per cent. of the infant deaths as compared with 14 per cent. in 1922 and 25 per cent. in 1921.

Deaths from contagious disease and respiratory disease shows a large increase due, as previously pointed out, to whooping cough.

The proportion of infant deaths to total deaths was 24.9 per cent., the same figure as in 1922.

The principal causes of infant mortality are shown in the subjoined table:—

Deaths	Under Six months	Six months to One year	Total
Convulsions of infants	5	5	10
Diarrhoea and enteritis	34	25	59
Respiratory diseases	37	42	79
Contagious diseases	24	32	56
Prematurity	67	5	72
Congenital malformation	7	5	12
Congenital debility	20	3	23
Marasmus, etc	12	3	15
Other diseases	77	33	110
Total	283	153	436

At the beginning of the year the city laboratory was turned over to the Provincial Board of Health to operate as a Branch Provincial Laboratory under an agreement whereby the city was to provide quarters, light and heat and one-fifth of the salary of the staff. The city also undertook to erect certain additional accommodation necessary for carrying out Wassermann tests.

SPECIMENS EXAMINED AT PROVINCIAL BRANCH LABORATORY OCTOBER 31, 1922, TO NOVEMBER 1, 1923

Type of Specimen		Number of Positive Negative		Total Specimens
Diphtheria (swabs)				5,087
Diagnosis			3,798	
	Positive	439		
	Negative	3,359		
Release from quarantine			1,289	
	Positive	134		
	Negative	1,155		
Tuberculosis				397
	Positive	69		
	Negative	328		
Typhoid				74
	Positive	16		
	Negative	58		
Gonorrhoea				545
	Positive	231		
	Negative	314		
Milk Analyses				
	Chemical and Bacteriological			1,180
Water Analyses				2,491
	Chemical	45		
	Bacteriological	2,446		
Miscellaneous Specimens				
	Chiefly Chlor. Lime for Cl. and Ammonia Sol. for NH_3			1,202
				10,976

The laboratory work of the city has been very efficiently carried out by the Provincial Branch Laboratory under this arrangement at a considerable financial saving to the city, but it is a matter for regret that the promised

addition to the building has not yet been started. As a result Wassermann tests cannot yet be undertaken by the laboratory and blood specimens still have to be sent to Toronto for examination with the inevitable delay, loss and damage to specimens due to transit. It is to be hoped that the city will carry out its agreement in regard to this building in the near future so that this necessary work can be done here.

It is with deep regret that I have to record the death of Mr. J. A. Seguin, for two years a most valued member of the Board of Health.

In conclusion I wish to thank the members of the Board of Health, the staff of the Health Department, and the physicians in charge of the Child Welfare stations for their assistance and co-operation throughout the year.

Tables of vital statistics and the reports of the various sub-departments are appended.

All of which is respectfully submitted.

T. A. LOMER,
Medical Officer of Health.

OWEN SOUND

Report of Medical Officer of Health

Owen Sound, November 1st, 1923.

To the Members of the Local Board of Health,
Township of Derby:

Gentlemen: In accordance with the Public Health Act, I herewith present to you my annual report of matters pertaining to the health of this township.

The population of the township is 1,530. Births 31; deaths 18. Death under 1 year 4. Death rate per thousand of population was 12.

There were thirteen cases of measles reported during this year and one case of scarlet fever. However, there is a mild epidemic of scarlet fever at present in the adjoining City of Owen Sound, and doubtless it will spread to this municipality. I would urge the greatest vigilance in checking the spread of this disease.

During the month of May, I inspected all the school premises in company with the Sanitary Inspector. During this inspection, I gave health talks in some of the schools. A copy of this report was sent to each School Board. These reports for the most part were well received and acted upon; but some of the School Boards still pay no attention to our requests. It is about two years since the Trustees of U. S. S. No. 2, Derby and Sydenham promised to put in a proper urinal, but up to the latest reports nothing has been done. The school grant should be withheld till this matter is attended to.

Kilsyth School Board have not put new roof on closets, but have made repairs to roof. The next six months will show whether these repairs are sufficient or not.

The Board of S. S. No. 4 have not placed a new urinal as requested. Complaints are made that this school is very cold in winter—too cold, some days, for teaching. Surely the School Board will attend to these matters.

I am glad to say that all of this report is not in the fault-finding tone.

Kilsyth School Board have put a new metal ceiling and walls in the school at a considerable expense, thus settling once for all the falling of plaster and adding very materially to the appearance to the school room.

The Trustees of S. S. No. 2 (Dunn's School) deserve great credit for alterations made this year. The school floor was raised and a basement excavated under the whole school, with plenty of windows installed. A new furnace was put in, and tables and benches provided for the pupils to use at noon. During the winter months hot meals are served in the basement. This school in every respect is a fine model for the other schools to copy.

We want the trustees of the various Boards to believe that the efforts of the Board of Health are in the interests of the health of the children; and we would ask their best co-operation to this end.

All of which is respectfully submitted.

A. B. Rutherford, M.O.H.

FURTHER REPORT OF M.O.H.

Since my regular Annual Report of November 1st, there have been a number of cases of scarlet fever reported in the township, nearly all being from Kilsyth School. I am convinced that these cases all arose from an unreported case, perhaps unreported because not recognized. Fortunately the cases have mostly been mild; but there is no guarantee how long the epidemic will remain so.

The law is strict and the penalties severe for not reporting contagious disease. The first symptoms of scarlet fever are headache, vomiting, sore throat, fever, with a fine red rash appearing inside of one or two days. The tongue is usually badly coated. No one can help suspecting a patient with this group of symptoms. Be fair and report the case to your doctor or to the M.O.H. and steps will be taken to protect other members of your family and the general public.

I trust the people of this township will be good citizens and help in stopping the spread of this disease.

A. B. RUTHERFORD, M.O.H.

PORT HOPE

Annual Report of Medical Officer of Health, 1923

To be presented to Local Board of Health before 15th November, annually.
(Schedule B, Clause 1, Public Health Act)

Municipality, Port Hope. County, Durham.
Name and address of M.O.H., Geo. A. Dickinson, Port Hope, Ont.
Date, November 8th, 1923.
Estimated population, 4,575.
Number of births per annum (exclude "stillbirths"), 110.
Number of stillbirths, 1.
Number of infant deaths under one year, 2.
Infant mortality rate per 1,000 living births, 18.
Number of deaths from all causes, 71.
Death rate per 1,000 of the population, 15.

COMMUNICABLE DISEASES

Disease	No. of cases	No. of deaths
Scarlet fever	1	0
Chicken-pox	1	0
Typhoid fever	1	0
Tuberculosis	1	0
Measles	249	0
Pertussis	14	0
Venereal diseases	16	0

Any special outbreak of communicable disease during the year?
There was an epidemic of measles. In the month of February 26 cases were reported, in March 156, in April 65, and in the month of May 2 cases.

Methods adopted to combat the outbreaks?
Notification, placarding and isolation of cases.

MILK SUPPLY

(a) Source, dairy farms.
(b) Character, good.
(c) Is supply pasteurized? About one-third of the supply.

WATER SUPPLY

(a) Source, Lake Ontario.
(b) Character, fairly good.
(c) How purified? Filter basins.

Any special Public Health work carried on, such as Child Welfare, ante-natal clinics, tuberculosis clinics, venereal disease clinics, etc.?
No.

Any Public Health education by M.O.H.?
Reports on milk supply, inspection of milk reports, condition of water supplies, distribution of pamphlets and publications of the Provincial Board of Health.

Did M.O.H. carry out sanitary inspection of schools during the year and make report?
Yes.

EXPENDITURE FOR PUBLIC HEALTH PURPOSES

(a) Salary or other remuneration of M.O.H.	$600 00
(b) Expenditure for other Public Health work	167 20
Total expenditure for Public Health	$767 20

GENERAL REMARKS

Brief outline of activities of M.O.H. and local Board of Health. (Additional sheets or printed report may be attached.)

Inspection of dairy farms, dairies, analysis of milk, supervision of water supplies and analysis of water as per reports attached hereto.

Report of Analysis of Water for Year 1923

J. W. S. McCullough, Esq., M.D.,
Toronto, Ont.

During the year eighty-one samples of water from the town supply were taken for analysis and of these there were forty-six samples absolutely pure. Thirty-five samples showed pollution while ten of these thirty-five samples showed an amount of pollution that is usually considered dangerous. Although on the whole the condition of the town water seems fairly satisfactory.

The following table shows the number of samples taken each month and the results of analysis, viz:—

	Number of Samples	Colon bacilli in						Samples pure	Totals
		0.03 cc.	0.1 cc.	1 cc.	10 cc.	20 cc.	30 cc.		
1922									
December	6	0	0	0	0	3	3	0	6
November	6	0	0	0	0	0	0	6	6
1923									
January	6	0	1	2	2	0	0	1	6
February	6	0	0	0	0	0	3	3	6
March	4	0	0	0	0	0	3	1	4
April	8	0	2	1	2	1	2	0	8
May	8	0	0	0	0	0	1	7	8
June	6	0	0	0	0	0	3	2	6
July	9	0	0	0	0	1	4	4	9
August	8	0	0	0	0	0	0	8	8
September	8	0	0	0	0	0	0	8	8
October	6	0	0	0	0	0	0	6	6
Total	83	0	3	3	4	6	19	46	81

Milk Inspection

During the year the premises of the licensed vendors have been inspected several times, and the dairies supplying these vendors have also been inspected.

Cleanliness. In making the inspection one of the chief points insisted upon was cleanliness. Of the twenty-one premises visited the conditions were excellent in fifteen, fairly good in five and not good in one case. The milk from this dairy is no longer being sent to town and unless the improvements considered necessary are made we will try and prevent the product of this dairy being consumed in Port Hope.

Stables. Eighteen of the stables visited were in good shape; they were clean, well lighted, well ventilated and well constructed.

Ice. In order to keep milk in satisfactory condition it should be cooled soon after being milked. For this purpose sixteen producers use ice. One dairyman has an excellent spring while two use cold water from good wells.

Milk-houses. Quite a number of the best producers use a separate building for storing, cooling and preparing the milk for the vendors. These milk-houses are very satisfactory and we urge upon the producers the desirability of providing good milk-houses.

Cows. The dairy herds from which Port Hope receives its milk supply are among the best in this district. And I think in every case the cows were

in good condition, they were clean and seemed to be in the best of health. The best dairymen keep the cows clean by clipping the hair from the udders flanks and the tail, and many of them regularly use a curry comb to clean the cows.

One or two dairies use a milking machine and they seem to be very satisfactory. They are clean and labour saving and it would seem to be very beneficial if they were used to a much greater extent than they are.

From year to year there is a steady improvement in the condition of our milk supply. Where we find a producer who is not inclined to make very necessary improvements we usually succeed in inducing the vendors to discontinue buying milk from him. We do everything to encourage the progressive dairyman while the man who is not inclined to make improvements soon finds he cannot get sale for his product.

All the samples of milk examined for dirt sediment were found to be very clean.

The average per cent. of butter fat for each month of the year was, viz:—

November,	1922.....	3.18	May,	1923.....	3.12
December,	"	3.10	June,	"	3.16
January,	1923.....	3.22	July,	"	3.15
February,	"	3.20	August,	"	3.23
March,	"	3.11	September,	"	3.22
April,	"	3.17	October	"	3.15

The average per cent. of butter fat for the year was 3.17 per cent.

School Inspection

The report of the sanitary inspection of the public schools in this municipality have been sent to the secretary of the boards interested for their perusal.

Extensive improvements are being made to the West Primary School. These improvements seem most complete and satisfactory and make this school quite up-to-date.

It would be very desirable if improvements along the same lines could be made to the East Primary School.

Supplies

During the year the usual supplies of diphtheria antitoxin, vaccine points, notification cards, Widal slides, pertussis vaccine, nitrate of silver ampoules, etc. have been obtained from the Provincial Board of Health and distributed among the physicians in the municipality.

Geo. A. Dickinson,
Medical Officer of Health.

Port Hope, November 10th, 1923.

SAULT STE. MARIE

Annual Report of Medical Officer of Health, 1923

January 1st—October 31st

To be presented to Local Board of Health before 15th November, annually.
(Schedule B, Clause 1, Public Health Act)
Municipality, Sault Ste. Marie. County, Algoma.
Name and address of M.O.H., A. S. McCaig, Sault Ste. Marie, Ont.
Date, November 15th, 1923.
Estimated population, 22,000.
Number of births per annum (exclude "stillbirths"), 638.
Number of stillbirths, 25.
Number of infants under one year, 44.
Infant mortality rate per 1,000 living births, 69.9.
Number of deaths from all causes, 220.
Death rate per 1,000 of the population, 10.

COMMUNICABLE DISEASES

Disease	No. of cases	No. of deaths
Cerebro-spinal meningitis	2	2
Chicken-pox	34	0
Diphtheria	35	3
Gonorrhoea	5	0
Measles	10	0
Mumps	2	0
Septicaemia	1	1
Scarlet fever	19	1
Smallpox	2	0
Syphilis	11	0
Tuberculosis	18	13
Whooping cough	3	0
Typhoid fever	5	0

Any special outbreak of communicable disease during the year?
No.
Methods adopted to combat the outbreaks?

MILK SUPPLY

(a) Source, local dairies.
(b) Character, generally good.
(c) Is supply pasteurized? Sixty per cent. or more.

WATER SUPPLY

(a) Source, St. Mary's river and wells.
(b) Character, good except for boat contamination.
(c) How purified? Chlorination.
Any special Public Health work carried on, such as Child Welfare, ante-natal clinics, tuberculosis clinics, venereal disease clinics, etc.?
Well-baby clinic, ante-natal clinic, venereal disease clinic, little mother classes.
Any Public Health education by M.O.H.?
Well-baby and ante-natal clinics. Addresses to Farmer clubs and other organizations on Public Health matters, particularly tuberculosis, milk supplies, water supplies, venereal diseases, etc.
Did M.O.H. carry out sanitary inspection of schools during the year and make report?
As required for investigation of complaints.

EXPENDITURE FOR PUBLIC HEALTH PURPOSES

(a) Salary or other remuneration of M.O.H.	$1,200 00
(b) Expenditure for other Public Health work	3,127 61
Total expenditure for Public Health	$4,327 61

GENERAL REMARKS

Brief outline of activities of M.O.H. and local Board of Health. (Additional sheets or printed report may be attached.)

The local Board of Health was active during the year. It carried out a complete inspection of all dairies during the year, supervised the work of the sanitary inspector, assisted the public health nurse and was instrumental in having the clinic for the treatment of venereal disease established here. The members of the Board were: Mr. G. J. Saunders (chairman), Miss G. B. Way, Mr. J. J. O'Connor, Mr. James Dawson, Mayor, and the Medical Officer of Health.

A. S. McCaig,
Medical Officer of Health.

Sault Ste. Marie, Nov. 15th, 1923.

To the Mayor and Aldermen of the City of Sault Ste. Marie.

Gentlemen:

As required by Schedule "B" of the Public Health Act, I beg to submit for your consideration a statement of the sanitary condition of the city for the year 1923, including the annual report of the Medical Officer of Health.

The members of the Board of Health were: Mr. G. J. Saunders, Chairman; Miss G. B. Way, Mr. J. J. O'Connor, The Mayor, Mr. James Dawson and the Medical Officer of Health, Dr. A. S. McCaig.

There has been no serious epidemic of disease during the year though the communicable diseases have been more or less prevalent, diphtheria causing three deaths, scarlet fever one, cerebro-spinal meningitis two and tuberculosis thirteen. The mortality from tuberculosis is alarming and discouraging and gives the health authorities a great deal of anxiety. As a means of preventing the disease the Board of Health early in the year placed before your honourable body the necessity of taking all possible means to cut off every avenue of infection, and asked your council to pass a by-law, as provided by the Animal Contagious Diseases Act, providing for the free testing for tuberculosis of all dairy herds supplying milk to the city, and this having been done that all milk thereafter sold in the city must either be pasteurized or come from herds certified as being free from tuberculosis. The need for such a measure is apparent when statistics shows that seven per cent. of all forms of tuberculosis is of bovine origin, and that from 25 to 33 per cent. of tuberculosis in children under five years of age is due to infection with the bovine type of tubercle bacillus. We hope that the by-law will be pushed along as rapidly as possible and that a safer milk supply for the city will soon be assured.

At the beginning of the year all dairies supplying milk to the city were inspected by members of the Board of Health. The majority was found in a satisfactory condition but in some cases changes in the manner of handling the milk and in the stables were required before a license to sell milk was granted. The frequent examination of milk samples at the laboratory is a good check upon the quality of the milk being sold in the city. Examination often shows gross contamination and the vendor is warned or his license cancelled as circumstances warrant.

The sanitary condition of the city was well looked after by the sanitary inspector and all complaints of nuisances or insanitary conditions were promptly investigated by the sanitary inspector, Medical Officer of Health or other members of the Board of Health.

Hotels, restaurants, boarding-houses, butcher shops, grocery stores, bakeries, ice cream parlors and laundries were all kept under close supervision during the year.

The work of the public health nurse is meeting with much favour. Under the supervision and with the assistance of the Medical Officer of Health, Well Baby clinics were conducted once a week and Ante-natal clinics once a month. This branch of the public health work is beginning to show excellent results. Our infant mortality rate has been reduced to 69.9 per thousand living births. This is an excellent record. We will soon need another nurse. We are receiving a great deal of voluntary assistance in our child welfare work, otherwise we would be greatly handicapped in carrying on. The most generous gift to the Board of Health was a Ford coupe from the Rotary Club of the city, for the use of Miss Miller, the public health nurse.

During the year a clinic for the treatment of venereal diseases was established at the laboratory of the Provincial Board of Health and the number of cases now receiving treatment there shows that the establishing of the clinic in the city has been in the interests of the public health.

All of which is respectfully submitted.

G. J. SAUNDERS,
Chairman of the Board of Health.

SIOUX LOOKOUT

Sioux Lookout, Ont., 1924.

Annual Report of Medical Officer of Health, 1923

Chairman and Members of Local Board of Health.

I hereby present to you my Annual Report for the year 1923.

Municipality, Sioux Lookout. County, Kenora.
Name and address of M.O.H., Gordon L. Bell, Sioux Lookout, Ont.
Estimated population, 1,353.
Number of births per annum (exclude "stillbirths"), 41.
Number of stillbirths, 3.
Number of infant deaths under one year, 5.
Infant mortality rate per 1,000 living births, 120.
Number of deaths from all causes, 16.
Death rate per 1,000 of the population, 12.

COMMUNICABLE DISEASES

Disease	No. of cases	No. of deaths
Scarlet fever	2	0
Typhoid	2	0

Whooping cough was quite prevalent during October, November and December. School cases of same were sent home and kept there until recovered. Also children with whooping cough were kept away from the local theatre.

MILK SUPPLY

(a) Source, numerous dairies.
(b) Character, mostly good; some need improving.
(c) Is supply pasteurized? No.

WATER SUPPLY

(a) Source, well, Pelican lake and town spring.
(b) Character, good.
(c) ———.

In conjunction with the Provincial Health Nurse, Miss Corbman, all school children were examined and advised as to any deficiencies. A large number of goitre cases were found and these have been advised for special treatment. An oculist on invitation tested any eye cases suspected of being below normal. We hope to continue this work yearly.

A Child Welfare Clinic was conducted by Dr. Bell of Toronto in December and should prove a great benefit to the community An endeavour was made to have as many sources of drinking water as possible tested. Notices were posted to this effect, which had good response, about thirty sources in all being tested.

The public school was inspected both in spring and fall.

Expenditure Public Health Purposes

(*a*) Salary or other remuneration of Medical Officer of Health, $75.00 per year.

(b) Expenditure for other Public Health Work, (nil).

Total expenditure for public health, $75.00.

An endeavour has been made to improve the standard of milk supplied in this town. The result of a series of milk tests were published in the local press and had, I feel sure, good results as the latter tests showed a marked

improvement over those shown first. There is still much to be desired in this line however and a milk by-law, now being drafted, will be submitted for your consideration at your next regular meeting.

A general health inspection of the town was made twice in 1923 by Dr. Sparks and myself. I may say that Dr. Sparks gave much useful advice towards bettering the sanitary conditions, especially our water supply. I would like to suggest that some improvements be made to the spring in the East and in view of the fact that so many people are supplied from it. The top is practically useless and there is seepage from the road around it.

Numerous samples of lake water from the railroad supply were examined and these showed contamination. The intake should be extended further out into the lake where tests have proved that the water is pure. This matter has been put before the railroad officials.

Once again the question of sewage disposal from the railroad buildings comes up. The present state of affairs is a disgrace but it seems impossible to compel the companies to deal with this matter in a satisfactory manner. The condition of the creek leading from the roundhouse is a menace to the health of the community. I would suggest that you take some action to compel, if possible, a proper disposal of this eyesore.

I would like to bring before you for discussion the question of garbage disposal. At present there is neither regular collection of garbage nor any supervision of the "Nuisance Ground". If it were possible for the town to have the garbage collected and disposed of by a town employee, it would, I think, be an improvement.

I would like to say in conclusion that great assistance has been given by Mr. T. Cunningham. He has collected through the year many water and milk samples and has accompanied me on inspection rounds.

Yours very respectfully,

G. L. Bell,
Medical Officer of Health.

ST. CATHARINES

Annual Report of Medical Officer of Health, 1923

To be presented to Local Board of Health before 15th November, annually.
(Schedule B. Clause 1, Public Health Act)

Municipality, St. Catharines. County, Lincoln.
Name and address of M.O.H., D. V. Currey, St. Catharines, Ont.
Date, November 21st, 1923.
Estimated population, 21,141.
Number of births per annum (exclude "stillbirths"), 621.
Number of stillbirths, 41.
Number of infant deaths under one year, 46.
Infant mortality rate per 1,000 living births, 74.1.
Number of deaths from all causes, 282.
Death rate per 1,000 of the population, 13.4.

COMMUNICABLE DISEASES

Disease	No. of cases	No. of deaths
Chicken-pox	39	0
Diphtheria	8	1
Measles	688	3
Mumps	3	0
Scarlet fever	27	0
Small-pox	3	0
Tuberculosis	18	13
Typhoid fever	13	2
Whooping cough	42	3
Venereal	116	3

Any special outbreak of communicable disease during the year?

Measles—Six hundred and eighty-eight cases of this disease were reported, with three deaths.

Typhoid fever—Thirteen cases of this disease were reported, with two deaths. Most of these cases were admitted from outside city and placed in hospital for treatment.

Methods adopted to combat the outbreaks?

MILK SUPPLY

(a) Source, 28 vendors.
(b) Character, regulations well observed.
(c) Is supply pasteurized? About 50 per cent.

WATER SUPPLY

(a) Source, by feeder from Lake Erie.
(b) Character, good.
(c) How purified? Chlorinated.

Any special Public Health work carried on, such as Child Welfare, ante-natal clinics, tuberculosis clinics, venereal disease clinics, etc.?

Child hygiene clinic held each week; average attendance—20.
Tuberculosis clinic held twice monthly; average attendance—7.
Venereal disease clinic held four days per week.

Any Public Health Education by M.O.H.?

Health films brought from Provincial Board shown to six audiences; M.O.H. spoke at each showing. Literature from Provincial Board of Health distributed to physicians and others.

Articles on Public Health have been written by the M.O.H. for the local newspapers.

Did M.O.H. carry out sanitary inspection of schools during the year and make report?

Yes, reports are attached.

EXPENDITURE FOR PUBLIC HEALTH PURPOSES

(a) Salary or other remuneration of M.O.H.	$ 1,200 00
(b) Expenditure for other Public Health work	10,240 17
Total expenditure for Public Health	$11,440 17

GENERAL REMARKS

Brief outline of activities of M.O.H. and local Board of Health. (Additional sheets or printed report may be attached.)

See attached report.

Milk

During the past summer, besides the usual monthly test for butter fat, temperature and sediment by the Sanitary Inspector, samples of milk from all vendors have been sent to the Provincial Board of Health Laboratories for bacterial count. The results of this were very far from encouraging and show that much of the milk in this city has too many bacteria per cubic centimetre; an effort will be made to materially lower this count during another year. We never will have safe milk until we insist on all milk either being pasteurized or come at least from tuberculin-free cattle.

The Lions Club of this city has been supplying milk for infants and expectant mothers unable to otherwise buy it, and the milk tickets have been distributed by the Health Nurse.

Child Welfare

A change has been made in checking up stillborn and premature births this year. Although in many instances, the physicians signified the death as premature, it has been entered in the list of stillbirths unless the child lived; and if a card showed that the child only lived for a few minutes, it has now been entered in the list of deaths.

Our infant mortality rate is 74.1, an increase of 14.8 over last year. However, it is gratifying to note that there were only two cases of deaths from diarrhoea and enteritis reported.

More intensive work in Child Welfare Work is being done here than was ever done before, and much credit must be given to the Victorian Order of Nurses and the different women's organizations for their splendid co-operation with Miss Read, the Health Nurse, without which it would be impossible to carry on effectively. The Child Welfare Centre had an average weekly attendance of twenty. To Dr. Lindsay and his assistants, we owe a debt of gratitude, and we are very grateful to the Board of Directors of Alexandra Hall for the use of their rooms. The Centre has, however, outgrown its quarters and some other provision should be made for it.

The work of the Rotary Club among crippled children is a wonderful work and should show good returns.

Tuberculosis

A splendid step was taken this year by the Sanatorium Board when a free diagnostic clinic for chest cases was opened last June. The clinic rooms at the General and Marine Hospital are used the first and third Friday afternoons of each month and Dr. Holbrook, the Superintendent of the Mountain Sanatorium, Hamilton, is in attendance. All cases must be referred from the family physicians or some health agency, and a report on each case is sent to the physician interested in the case.

It would appear that this work should be carried on by the Board of Health, and I would ask you to consider this matter when making up your estimates.

It is unfortunate, as far as our statistics are concerned, that not all cases of this disease are reported to your Board. You will notice in our statistics, that there were eighteen cases with thirteen deaths; this rate, of course, is far too high, and I am sure that many cases were not reported by the physicians.

Special Clinic

There has been considerably more work done at the Clinic this year. In fact, the work is increasing all the time. Dr. Zumstein the physician in charge, has been very regular and conscientious; and Miss Wilson, the Clinic Nurse, has given excellent satisfaction.

Victorian Order of Nurses

The Victorian Order of Nurses continues to do excellent work by home visits, and at the present time, they are doing practically all the prenatal work.

Sewers

During the year, 201 houses were connected up and Westchester Avenue sewer laid. I am pleased to state that the whole city is now sewered, and there is no excuse at all for outside toilets, these will be done away with as speedily as possible.

Garbage Disposal

Each summer, there are numerous complaints about flies, odor and smoke, from people living near the dump; and the only solution appears to be the building of an incinerator.

Salaries

During the year, the salaries paid Health Nurses in other places have been investigated, and it seems that this city is paying the smallest salaries of any place in the Niagara district.

The work of the Nurses has been entirely satisfactory in every way, and I would recommend that a substantial increase be given each of them.

Social Hygiene

The Lincoln County Social Hygiene Council was formed last spring, and under its auspices, several health films have been shown to large audiences in St. Catharines. This very important prevention work should receive the co-operation of all citizens, especially those having growing-up families. The proper place, of course, to teach anything about sex matters to the children is the home.

Cancer

The number of deaths from cancer recorded this year is very high, and it seems that the only way to cut down this rate is by annual examination by the family physician. Early cancer might easily be removed, but unfortunately, most cases are only seen by the physician in the very latest stage.

Prenatal Work

Owing to the number of still and premature births, it would be an excellent thing if some arrangement were made for a prenatal clinic in this city. Many of these lives might be saved if the expectant mother had proper prenatal advice.

Food Inspection

This city has now reached the state where it is essential to have a milk and food inspector who can devote all his time to this work, not only in the

city but in the dairies and abattoirs in the surrounding country. There is no doubt that much of the meat and food sold here is not fit for use, and some of it may be very dangerous. An energetic and well-trained inspector would eliminate to a very great extent, this condition. It seems a peculiar condition of affairs when meat which is to be exported must be inspected but meat which is to be used locally is not inspected at the present time.

SUPPLIES FROM PROVINCIAL BOARD OF HEALTH DISTRIBUTED

Anti-meningitis serum	140	c.c.
Anti-typhoid vaccine	80	c.c.
Diphtheria antitoxin	23,000	units
Tetanus antitoxin	90,000	units
Pertussis vaccine	550	c.c.
Small-pox vaccine	370	capillary tubes
Silver nitrate	410	ampoules
Diphtheria diagnostic tubes	50	"
Wassermann diagnostic tubes	265	"
Tuberculosis sputum bottles	68	"
Widal slides	4	"

CONSUMPTIVE SANATORIUM

Admissions	31
Discharged	19
Deaths	9

ISOLATION HOSPITAL

Admissions	28
Scarlet fever	4
Diphtheria	6
Measles	15
Small-pox	1
Whooping cough	1
Septic sore throat	1
Deaths	None

DEATHS—INTERNATIONAL CLASSIFICATION

No.		Cases
1	Typhoid	2
6	Measles	3
8	Whooping cough	3
9	Diphtheria	1
10	Influenza	14
18	Erysipelas	1
20	Septicaemia	1
	Infected glands (neck)	1
	Carbuncle	1
28	Tuberculosis, lungs	13
30	Tubercular meningitis	3
37	Syphilis	3
39	Cancer of tongue	1
	" jaw	1
	" oesophagus	1
	" larynx	1
40	Cancer rectum	1
	" of stomach	4
	" intestines	2
	" liver	3
42	" uterus	1
43	" breast	1
44	" face	1
45	" prostate	3
	" lungs	1
	" mediastinum	1
50	Diabetes	2
54	Pernicious anaemia	3

60	Encephalitis	2
61	Meningitis	4
63	Bulbar paralysis	1
	Amiotrophic sclerosis	1
64	Cerebral hæmorrhage	20
65	Softening of brain	1
66	Paralysis agitans	1
67	General paralysis, insane	2
71	Convulsions, infants	1
77	Pericarditis	1
78	Otitis media	1
79	Chronic valvular heart disease	13
	Endocarditis	8
	Myocarditis	17
80	Angina pectoris	1
81	Atheroma	1
	Arterio sclerosis	5
	Aneurysm	2
84	Lymph adenoma	1
	Hodgkinson's disease	1
89	Bronchitis—acute	7
90	Bronchitis—chronic	1
91	Broncho-pneumonia	13
92	Lobar pneumonia	14
93	Pleurisy	1
94	Pulmonary embolism	1
96	Asthma	2
101	Stricture oesophagus (lye)	1
102	Ulcer, stomach	1
104	Diarrhoea and enteritis	2
108	Appendicitis	4
110	Intussusception	1
	Multiple polyposis of sigmoid	1
	Strangulation bowels	1
115	Cholycystitis	2
117	Peritonitis	1
118	Indigestion	1
	Malnutrition	1
119	Acute nephritis	2
120	Chronic nephritis	5
124	Cystitis	1
126	Prostatitis	1
128	Uterine haemorrhage (non-puerp.)	1
129	Fibroid uterus	1
132	Salpingitis	2
138	Puerperal albuminuria	3
	Puerperal toxaemia	1
144	Abscess, jaw	1
145	Eczema	1
	Fungoid granuloma	1
150	Congenital malformation	
	Mouth	1
	Heart	2
	Incomplete development	1
151	Prolapse umbilical cord	1
	Cervical adentitis	1
	Icterus neonatorum	1
	Marasmus	1
	Premature birth	4
152	Atelectasis	2
	Haemorrhage of newborn	3
153	Injury at birth	2
154	Senility	11
158	Drowning, suicidal	1
165	Accidental poisoning	1
167	Accidental burns	2
169	Accidental drowning	2
174	Traumatism by machine	3
175	" electric railway	1
	" automobile	4
170	" firearms	1

176	Injuries by animals	1
185	Fracture, femur	3
	Not known	1
	Total	282

No.

D. V. CURREY,
Medical Officer of Health.

SIMCOE

Annual Report of Medical Officer of Healeh, 1923

To be presented to Local Board of Health before 15th November, annually.
(Schedule B, Clause 1, Public Health Act)

Municipality, Town of Simcoe. County, Norfolk.
Name and address of M.O.H., Dr. J. C. C. Grasett, Simcoe, Ont.
Date, November 15th, 1923.
Estimated population, 4,041.
Number of births per annum (exclude "stillbirths), 80.
Number of stillbirths, 1.
Number of infant deaths under one year, 6.
Infant mortality rate per 1,000 living births, 77.5.
Number of deaths from all causes, 59.
Death rate per 1,000 of the population, 14.6.

COMMUNICABLE DISEASES

Disease	No. of cases	No. of deaths
Scarlet fever	16	0*
Typhoid fever	2	0
Dyphtheria	2	0
Measles	1	0
Encephalitis lethargica	1	1
Tuberculosis	0	0
Whooping cough	3	0
Chicken-pox	4	0

*Up to November 15th, which is end of Public Health year.

Any special outbreak of communicable disease during the year?

Yes. Scarlet fever raged in a more or less epidemic form during the last three months of the Public Health year. It appears to be of a mild type, as no deaths have occurred up to this date, November 15th, 1923, and no complications have been reported.

Methods adopted to combat the outbreaks?

The public schools, Sunday schools and Saturday afternoon children's entertainment at the Lyric Theatre were closed for a period of nearly two weeks. Quarantine regulations were made more strict, one measure being to include the bread winners and the friends visiting the homes as subject to quarantine for one week, which covers the incubation period.

MILK SUPPLY

(a) Source, derived from 13 dairy farms.
(b) Character, certified, pasteurized, and raw.
(c) Is supply pasteurized? Yes, all milk is pasteurized except the certified milk and a small quantity of raw milk to meet the requirements of some patrons.

WATER SUPPLY

(a) Source, Simcoe Waterworks.
(b) Character, analysis of this water has always shown a perfectly pure and healthy water.
(c) How purified? It has not been found necessary up to the present to use any such measure.

Any special Public Health work carried on, such as Child Welfare, ante-natal clinics, tuberculosis clinics, venereal disease clinics, etc.?

A Public Health nurse has been engaged to give a two months' demonstration on Public Health work, after which it is hoped the town officials, school trustees and public generally will have an opportunity of witnessing the many benefits to be derived from such an official. This question has been before the local Board for some time back and the only obstacle in the way of having such an appointment made has been the one of expense and, as the present Council were pledged to economy and retrenchment, this question was one that had to suffer up to the present time in abeyance to such policy.

Any Public Health education by M.O.H.?

No definite educating measures beyond sending out a pamphlet each year of advice and instruction for a better sanitary condition of the town. Improving the sanitary situation by doing away with the outside closets. This year all that part of the town known as the "fire-limits," which includes all of the business and more thickly populated section of the town, has to be cleared of all outside closets. The property owners being obliged to connect up with the water and sewer system. It is hoped to extend this area until all outside privies are eliminated so far as possible.

Did M.O.H. carry out sanitary inspection of schools during the year and make report?

Yes; the report of each school is a part of this report.

EXPENDITURE FOR PUBLIC HEALTH PURPOSES

(a) Salary or other remuneration of M.O.H.	$150 00
(b) Expenditure for other Public Health work	419 70
Total expenditure for Public Health	$569 70

GENERAL REMARKS

Brief outline of activities of M.O.H. and local Board of Health. (Additional sheets or printed report may be attached.)

General Remarks

The water and milk system are two of the most important items that should receive the attention of health officials. Simcoe is fortunate in having a service in both of these supplies that is not generally the case in towns of a similar population. The water that is derived from our waterworks system is and always has been of a pure and healthy character. Derived as it is from a soil that is most favourable for a good filtration and secured from an area that is devoid of most of the usual sources of pollution such as populative towns, factory sites, etc., accounts principally for the fact that the frequent analyses made have on no occasion failed to show a perfectly pure drinking water.

Our milk supply is obtained from the one single depot. The character of the milk may be obtained by those who may have a preference for it. The supply is secured from fifteen dairy farms, which are subject to inspection from time to time. The milk of each dairy farm is tested monthly. When found deficient in butter-fat and dirt test the supply from this farm is cut off or perhaps advised to improve the quality of his herd. Most stables are kept in good condition with walls whitewashed and kept clean, manure removed to a proper distance from the stables, etc. The certified milk is obtained from Jersey herds, which are subjected to the tuberculosis test every six months, the defectives when found are, of course, removed. The milk is tested about once a month, the last test being made on October 9th, in which the highest in butter-fat reached 4.6 and the lowest 3.8. The batch test reached 3.8 at this particular analysis, four dairies were found excessive in the dirt test and each one notified. Persistence in this particular renders their supply being cut off.

Licenses to two "Maternity boarding-houses" were issued and both were kept under inspection, all regulations being lived up to properly.

An attempt was made this year to require each stable owner where a horse or cow was kept to secure the manure in properly constructed fly-proof bins and removed at frequent intervals during the warm season, especially. Owners of horses and cows were all advised of the necessity of living up to this regulation and a time limit placed for completion of the same. For obvious reasons the matter did not meet with the success that was expected and quite a number are still in the same condition as formerly.

Respectfully submitted,

J. C. C. Grasett, M.D., M.O.H.,
Municipality of the Town of Simcoe, County Norfolk.

WELLAND

Annual Report of Medical Officer of Health, 1923

To be presented to Local Board of Health before 15th November, annually.
(Schedule B, Clause 1, Public Health Act)

Municipality, Welland. County, Welland.
Name and address of M.O.H., J. H. Howell, Welland.
Date, November 15th, 1923.
Estimated population, 8,705.
Number of births per annum (exclude "stillbirths"), 212.
Number of stillbirths, 21.
Number of infant deaths under one year, 19.
Infant mortality rate per 1,000 living births, 89.6.
Number of deaths from all causes, 105.
Death rate per 1,000 of the population, 12.06.

COMMUNICABLE DISEASES

Disease	No. of cases	No. of deaths
Measles	25	0
Scarlet fever	16	0
Diphtheria	15	4
Small-pox	7	0
Whooping cough	6	1
Typhoid fever	10	1

Any special outbreak of communicable disease during the year?
No. Cases scattered throughout the year.

Methods adopted to combat the outbreaks?
Isolation, quarantine, and disinfection.

MILK SUPPLY

(a) Source, two dairies.
(b) Character, good.
(c) Is supply pasteurized? Yes; all from both dairies.

WATER SUPPLY

(a) Source, Welland Canal.
(b) Character, turbid and contains colon bacilli.
(c) How purified? Chlorination.

Any special Public Health work carried on, such as Child Welfare, ante-natal clinics, tuberculosis clinics, venereal disease clinics, etc.?
Weekly Child Welfare clinic, well attended; active Public Health nurse who makes a large number of visits to children of pre-school age, and ante-natal cases.

Any Public Health education by M.O.H.?
No special.

Did M.O.H. carry out sanitary inspection of schools during the year and make report?
Schools inspected, and all in first-class condition.

EXPENDITURE FOR PUBLIC HEALTH PURPOSES

(a) Salary or other remuneration of M.O.H.	$1,000 00
(b) Expenditure for other Public Health work	2,781 69
Total expenditure for Public Health	$3,781 69

GENERAL REMARKS

Brief outline of activities of M.O.H. and local Board of Health. (Additional sheets or printed report may be attached.)

WELLAND

Report of Public Health Nurse for the Year November 1st, 1922, to October 31st, 1923

Number of visits made during the year, 2,575. Of these, 1,276 were child welfare visits (babies under one year); 2,445 were pre-school age visits and 198 prenatal visits. 375 different homes were visited during the year.

We had a total clinic attendance of 2,048, a weekly average of forty. There are 215 mothers registered at the clinic with a total of 260 babies and pre-school children. Some of the mothers bring more than one child. We have reason to be proud of our clinic. A great deal of the success is due to the faithfulness in attendance of Dr. Reive and Dr. Boyd. We are indeed grateful to them for their help and advice. We are also grateful to Miss Webb, the school nurse, Miss Jones, the nurse at the Empire Cotton Mill, and to Mrs. A. Hanna for their help at the clinic each week.

We have had our clinic tea served each week by the ladies of Queen St. Home and School Association, Central Home and School Association and the Imperial Order the Daughters of the Empire, and the Crowland Women's Institute. This social cup of tea has been much appreciated by the mothers, and I believe has helped materially in the clinic work.

It has been said "Within natural limitations, any community can determine its own death rate." No one can estimate what it has meant to some homes in Welland that Welland decided to try to lower the death rate in babies. And too, no one can estimate in dollars and cents the value to some little ones of real good health, due to the campaign of "Better Babies for Welland." We are proud of our babies, and we have every reason to be.

(Sgd.) Anna M. Oram,
Public Health Nurse.

As the report to the Provincial Board of Health indicates, we have had no special outbreak of disease during the year. While there were ten cases of typhoid fever reported, practically all the cases on investigation show that the diseases were contracted outside of the city, and were brought to the hospital for treatment. Not one of them could fairly be attributed to our city water. The single death, was in a man who had been working in Port Colborne. While the canal water always shows colon bacilli, chlorination makes it safe, even if it is not so pleasant.

The seven cases of smallpox were very mild, with the exception of one. It was impossible to locate the source of the disease, but as there had been a few cases in the surrounding district, they probably arose from some mild case which had not been quarantined. However, our cases were isolated and quarantined and as a result we had no further spread.

As the report shows, our death rate was fairly low, being 12.04 per thousand as compared with 12.8 a year ago. Of the 105 deaths reported, forty-seven occurred at the hospital, a large number of whom were non-residents. The diseases causing the most deaths were: heart disease, 14; pneumonia, 13; apoplexy, 10. There were ten deaths as the result of accidents.

The death rate among children under one year of age was 89.6 per thousand births, slightly higher than a year ago, but only about half the rate before we began child welfare work. As the appended report of the Public Health Nurse, Miss Oram, will show, our baby clinics have been well attended and there is no doubt our low death rate among babies is largely due to the valuable work of the clinic, and the efficient oversight of the babies by Miss Oram.

Owing to some changes in the milk supply of the city, numerous examinations, both for the percentage of butter fat and total solids, have been made at intervals during the year, also the dirt test to ascertain the cleanliness of the milk supplied by the producers. All the milk supplied to the citizens is pasteurized, and in respect to quality and cleanliness is first-class.

The sanitary condition of the city is good, and where nuisances are reported they are promptly investigated and the Sanitary Inspector, Mr. Geo. Lee, endeavours to have them abated.

A year ago I referred to the fact that the Public Health Act provided that there shall be supervision of all plumbing, and advised the City Council to pass a Plumbing By-law and appoint a competent man to enforce it. This has not been done, and I would again urge that the matter receive the attention of the Council.

The Chairman and Members of the Board of Health have been ready and prompt in dealing with problems before the Board, and I wish to acknowledge their valuable assistance.

I have the honour to be,

Your obedient servant,

J. H. HOWELL,
Medical Officer of Health.

ISSUED BY
THE PROVINCIAL BOARD OF HEALTH,
ONTARIO.

THE EPIDEMIC OF VIRULENT SMALLPOX IN WINDSOR AND VICINITY

February, 1924
F. Adams, M.B., D.P.H.,M.O.H. for the
Essex Border Municipalities.

In the latter part of February Windsor and vicinity experienced an outbreak of smallpox unusual in origin, often unusual in transmission, irregular in type, and shockingly virulent, but yielding, as all smallpox yields, to vaccination. This paper is an attempt to set forth the main features of this epidemic.

Origin of the Epidemic.

The origin of the epidemic was unusual. On February 2nd G. D., a respected citizen of Windsor, came down with an extraordinary sickness from which he died on February 11th. He was seen during his illness by four physicians, including two experienced consultants. There is now no doubt that this man's illness was hemorrhagic smallpox but the disease was so irregular that it was not recognized. It was only when persons who had been in contact with G. D. began to come down ill with the symptoms of smallpox that there was any suspicion as to the true nature of his malady. Very soon it became plain that the disease was not confined to the Border Cities but had broken out in Amherstburg, Maidstone and Detroit, Michigan, U. S. A., all originating in the one missed case. The total number of cases of smallpox in all these places was 67 and the number of deaths was 32.

Difficulties in Diagnosis.

One of the outstanding features of this epidemic of smallpox was the irregular and unusual character of a large proportion of the cases and it may be useful briefly to present some of the unusual cases.

To consider first the original missed case.

Case 1. G. D. This man took sick on a Saturday night with a violent headache, vomiting, sore throat and some general pains

in the back and elsewhere. On Tuesday he broke out everywhere with a rash resembling urticaria such as often follows the administration of diphtheria antitoxin. His whole body was covered by raised irregular blotches of all shapes and from a bean to an egg in size. On Wednesday this rash was a light brown in color. His principal complaint was a persistent headache, sore throat, and sore mouth. He had been troubled with repeated attacks of sore throat and his teeth had bothered him a great deal and he had intended having them all out because of pyorrhea. His temperature was about 101, he was perfectly rational, answered questions readily, even rose to laughing at a joke. He readily sat up in bed, opened his mouth, put out his tongue and said "AH" to have a throat swab taken. He was unvaccinated but gave no history of exposure to smallpox. There was no particular change in the symptoms except that the rash became darker as the days went by and about two days before death occurred there was hemorrhage from the bowels. The diagnosis made by all physicians who saw this man was purpura hemorrhagica and it was believed that the root of the trouble lay in the sore throat or bad teeth of the patient. It is to be remembered that this case came out of a clear sky, that each of the physicians who saw the case was experienced in the diagnosis of smallpox and that in spite of this the diagnosis was completely missed. At no time during the epidemic which followed did a case occur that looked in the least like this first one - also that the source of infection of this initial case has not been discovered.

Case 2. J. I. On Wednesday, February 20th, this man took ill with severe headache and pain which the physician thought at first was in the patient's back, but on further examination seemed to be in the abdomen extending down into the groin. He was unvaccinated but gave no history of contact with smallpox and was sent into one of our general hospitals as a case of surgical kidney. That was late Wednesday night or early Thursday morning. On Friday morning he broke out in an intense red

rash which is so well described in the chapter of smallpox in Ker's Book of Infectious Diseases that the description is given verbatim.

"A very interesting and ill-omened form of erythema, which is sometimes classed as scarletini form, but which has distinct characters of its own, is the rash which is called by French authors "le rash astocoide" or the lobster rash. This is a very vivid and intense erythema, almost erysipelatous, of a most brilliant red colour, approaching more the tint of scarlet than anything ever seen in scarlet fever. It is general all over the body and involves also the face, which is usually congested and puffy. It only occurs in hemorrhagic cases, and is therefore of grave prognostic significance. It is early followed by hemorrhages into the conjunctive, and later over the surface of the skin".

This patient died twenty-four hours later with hemorrhages from the bowel and under the skin everywhere. His temperature never exceeded 101°. His total illness was under four days. He had never been vaccinated. He had been asked if he had been in contact with smallpox and said "No." As a matter of fact he had visited Case No. 1 but at the time he took sick he did not know that G. D.'s illness was really smallpox.

Case No. 3. On Sunday, February 24th, M. B., a trained nurse, age 34, was sent from/out of town into the other one of our general hospitals and had her appendix removed the same night. Hemorrhage had occurred in the distal end of the appendix. During Monday night she broke out with a mixed kind of rash. Her face was flushed as with Scarlet Fever but with inflamed eyes. There was a rash on the body which resembled measles. She had come off a Scarlet Fever case two weeks before but believed that she had had Scarlet Fever as a child. She had no sore throat and no strawberry tongue. The inflamed eyes with a rash on the body rather pointed to measles but there was no typical measles rash on the face, no spots in the mouth, no cold in the head nor bronchitis. She had never been successfully vaccinated but had not been exposed to smallpox as far as she knew. The case was not believed to be smallpox but in view of the uncertainty of the diagnosis the case was isolated and the nurse who was caring for her was vaccinated at once. Wednesday the patient continued much the same, Thursday it was learned that the patient's brother had smallpox and the home was in quarantine. Friday there was

blood in the urine and on that day we allowed the patient to go home, where she died a few days later. Exposure to smallpox was traced later.

Case 4. At about the same time a man was sent into one of our general hospitals vomiting blood and passing blood from the bowel. He had a fever of $1\frac{1}{2}^{o}$ and no history that would point to gastric ulcer or anything of that kind and no signs or symptoms that would point to typhoid. He had been vaccinated successfully in childhood a nd again about ten years ago and still again since the beginning of the epidemic, the last vaccination not having taken. The patient was thirsty and had the typical appearance of a straight hemorrhage case but not knowing precisely what was wrong with him we had him strictly isolated. Later on we concluded that his hemorrhage was due to taking 105 grains of aspirin in 15 hours. He recovered.

These cases will, I think, serve to illustrate some of the difficulties we had in the way of diagnosis in the presence of an epidemic of irregular smallpox. Ordinarily the differential diagnosis of smallpox is from influenza, chickenpox, drug rashes, and perhaps syphilis and impetigo. These were not the diseases we had to consider, but scarlet fever, measles, erysipelas, surgical conditions of the abdomen, aspirin poisoning, peliosis rheumatica and exfoliative dermatitis.

We have made an attempt roughly to classify the types of cases seen in the Border Cities. All told we had in the Border Cities 34 cases of smallpox. 8 of these were in persons who had been vaccinated years before and all of these cases were perfectly clear cases of smallpox. Six cases were vaccinated during their incubation period and came down with smallpox and a taking vaccination. All of these were also perfectly plain cases of smallpox, offering no difficulties in diagnosis. Twenty-one cases had never been successfully vaccinated at any time in their lives and of these no less than 11 were irregular in type. Of the 11 distinctly irregular cases, one had a rash which might be described as hemorrhagic urticaria, six had lobster rashes more or less complete, one had lobster rash or

the face and a measles-like rash on the body, three had a flushed face and a smallpox rash which came out late and badly. It is to be noted that not one case presenting the features of irregularity that have been described recovered from the disease.

Cases of Smallpox without a rash.

Not included in any of our figures as actual smallpox were 8 cases in the Border Cities and 3 at Amherstburg presenting the following features. They were all persons vaccinated before and having good scars, 10 years or more old. They came down ill with the usual symptoms of smallpox - fever, headache, backache, prostration, and so on. After an illness of 3 or 4 days they recovered completely without developing a rash. We are inclined to the opinion that these cases were infectious on account of their illness but the evidence is not conclusive.

Methods of Transmission.

Smallpox is usually transmitted by at least a fairly intimate contact with a case and aerial infection, fomites, third person carriers and cases having symptoms but no rash play a relatively small part in transmission. In our epidemic these unusual methods of transmission played a very considerable part. Out of a total of 67 cases these unusual methods of transmission apparently operated in no less than 29.

Measures adopted to control the epidemic.

When the epidemic first broke out there was a period of two or three days in which we were not certain that we were really dealing with an outbreak of smallpox. The cases were irregular and it was only after we had seen two or three typical cases that we were sure what we were dealing with. While certain preliminary steps had been taken two or three days before it was on Saturday night, February 23, that the Board of Health met to determine what measures should be taken to check the epidemic. By that time we knew that the disease we were dealing with was smallpox, that the community was seeded with cases and that it was an exceedingly virulent and irregular form of the disease. The Local Board of Health for the Essex Border Municipalities has a distinctly unusual composition. The Board has jurisdic-

tion over six municipalities and every member of the Board is a doctor who has at some time been a Medical Officer of Health himself. The measures decided upon by the Board were as follows - Provision was made for the care of the sick and the maintenance and medical supervision of families in quarantine, but the most vital decision of the Board was in respect to vaccination. The Board was a unit in the opinion that the one thing that would stop the epidemic was vaccination of the whole population. Our population is about 70,000 persons and the problem before the Board was to get that population vaccinated in the shortest possible period of time. The Procedure decided on was as follows. Then and there three of our nurses using three phone lines called up every doctor in the Border Cities that could be reached and asked him if in the emergency he would consent to vaccinate any person who came to his office free of charge, it being understood that the Board of Health would supply vaccine and pay for vaccinations at the rate of 25¢ apiece. Within half an hour we had the consent of about $\frac{3}{4}$ of our doctors. The rest could not be reached but we assumed their consent and telephoned them Sunday morning. Before midnight a statement of the situation was prepared and sent out to every clergyman in the Border Cities, with a request that it be read from the pulpit at every service on Sunday. The gist of the announcement was that an epidemic of exceedingly severe smallpox was present in the Border Cities, that there had already been a number of deaths and that everyone was advised to be vaccinated at once and to have all the members of his household vaccinated, finally, that arrangements had been made with every doctor in the Border Cities under which he would vaccinate any one who came to his office free of charge. On Sunday at our request the secretary of the Chamber of Commerce called up every large employer of labour in the Border Cities, explained the situation to him and asked him to urge vaccination upon all his employees Monday morning. Monday afternoon a full page advertisement of the Board of Health setting forth the situation appeared in the local paper.

The effect of these measures was all that we could have asked for. There are some 70 doctors in the Border Cities and we

had simply created 70 free vaccination stations. The doctors offices began to be crowded with applicants for vaccination on Sunday morning and within the next six days we estimate that well over 95% of our population was vaccinated. There was nothing compulsory about any of our methods. We simply took the public into our confidence, told them the situation as it really was, advised general vaccination and made provision for it without charge. The anti-vaccinationist, usually so noisy and troublesome, gave us no trouble at all. As far as checking the epidemic was concerned the effect of these measures was 100% perfect. We had one big splash of cases and then silence and that silence has continued without interruption right up to the present moment - almost three months.

Vaccination.

The total figures for the whole epidemic covering the Border Cities, Amherstburg, Maidstone and Detroit are as follows:-

	Cases	Deaths	Mortality
Never successfully vaccinated	45	32	71%
Vaccinated successfully 12 to 65 years before	10	0	0
Vaccinated successfully in incubation period i.e. came down ill with smallpox and a taking vaccination	1?	0	0
Totals	67	32	48%

You will note that no person who had ever been vaccinated successfully at any time in his or her life, whether it was in the incubation period of smallpox or years and years before, died of smallpox. You will note also that of the persons who had never been successfully vaccinated and who developed smallpox 71% died of the disease. That is a wonderful story in regard to the efficacy of vaccination as mitigating the severity of the disease, but the figures by no means tell the whole story.

A few persons who had never been successfully vaccinated recovered but they all had severe attacks and had a terrible fight for their lives.

On the other hand persons who had been previously vaccinated successfully, no matter how long before, had mild attacks. Incidentally it should be mentioned that no one vaccinated successfully within 12 years took smallpox at all. But the real marvels of vaccination can, in my opinion, be appreciated only by personal experience in an epidemic such as we went through in the Border Cities. I feel that I might very well close this paper by telling you of some of our actual experiences.

In Windsor there is a family named M-, consisting of ten persons. All of them were exposed to smallpox and about equally. Nine of them had been vaccinated successfully in previous years and none of these contracted smallpox. The tenth person had never been vaccinated, contracted the disease and died inside of four days of the hemorrhagic lobster rash type of smallpox.

During the epidemic we had to employ a large number of nurses to look after the sick and we had also to expose to the disease orderlies, ambulance drivers, clergymen and others. We made it an absolute rule that no one should be exposed to smallpox through our action unless that person had a vaccination scar already and was also freshly vaccinated by us. The result of this precaution was that not a single person who was exposed to the disease through any action on our part came down with smallpox.

Of course when a case of smallpox developed in a household we vaccinated every other person in the house. Contacts of this kind which in Maidstone, Amherstburg and the Border Cities run into the hundreds, all, as far as I know, escaped smallpox as a consequence of timely vaccination.

In Windsor a certain Mrs. McL., 62 years of age, never vaccinated, developed smallpox and died of it. Her husband, 72 years of age, vaccinated successfully 62 years ago, had a trifling attack of the disease.

Mrs. J. D. of Walkerville, 52 years of age, never vaccinated, developed smallpox and died after an illness of eight days. Her husband with a history of exposure many times in excess of that of his wife, had a trifling attack of smallpox. He had been successfully vaccinated 12 years ago.

The proprietor of a laundry came down sick with smallpox and on investigation it was found that out of a total staff of 25 persons at the laundry he alone was unvaccinated and he was the only one who contracted the disease.

A. D., age 50, and his son R. D., age 25, neither having been successfully vaccinated, died of smallpox. Mrs. A. D., vaccinated successfully 32 years before, took smallpox also but it was a trifling illness.

Mrs. B. of Windsor came down with a mild attack of smallpox. She is 58 years old. When she was 8 years old she went into a convent for 3 years and in the first of those years she was vaccinated successfully. As a result of that vaccination 50 years ago her attack of smallpox was a negligible affair. The scar on her arm is so faint that it can be recognized only by careful search in a good light.

G. D., the man who had the original illness that was smallpox but was not diagnosed as such, had a daughter Josephine, 12 years old. She was exposed to her father through the whole course of sickness and later on to her mother and aunt who developed smallpox <u>but she has not had one single day's illness herself.</u> Six years ago she was vaccinated to go to school and she has on her left arm a scar about the size of an old fashioned Canadian five cent piece. Twenty-one close relatives of this little girl, all unvaccinated, are dead of smallpox.

It is when one has had close personal experience with incidents such as these, when one has had to send nurses by the dozen up against the most virulent smallpox with nothing to protect them except vaccination and they nurse the disease week in and week out without contracting it, when one has seen a community of thousands of persons threatened with decimation by smallpox and one has seen wholesale vaccination pull the disease up short and weeks and weeks go by without any fresh cases at all, then and then only does one fully appreciate the marvellous gift which Jenner made to science and to humanity.

Lessons to be learned from the Epidemic.

1. Exceedingly virulent smallpox is present in the province.
2. Irregular forms of the disease presenting great difficulties in diagnosis, are apt to occur.
3. The disease may be transmitted through unusual channels and quarantine of cases and all contacts should be very rigid.
4. Vaccination is the one sure weapon against the disease.

In this epidemic -

(a) No one vaccinated successfully within 12 years contracted smallpox.

(b) No one ever vaccinated successfully, no matter how long ago, died of smallpox.

(c) Of the smallpox cases in persons who had never been successfully vaccinated, 71% died.

(d) Vaccination of almost the whole population stopped the epidemic abruptly and completely.