SESSION II.
1906.
NEW ZEALAND.

DEPARTMENT OF PUBLIC HEALTH

(REPORT OF THE), BY THE CHIEF HEALTH OFFICER.

Presented to both Houses of the General Assembly by Command of His Excellency.

MY LORD,— Public Health Office, Wellington, 1st August, 1906.

I have the honour to submit to Your Excellency the sixth annual report of the Chief Health Officer of the colony, and as it is the last one I will have the pleasure of making, I desire to say that the creation of the Public Health Department by me has more than justified its existence, and under the able guidance of the Chief Health Officer and his assistants has completely changed for the better the public health conditions under which our colonists live.

I have the honour to be
Your Lordship's most obedient servant,
J. G. WARD,
Minister of Public Health.

His Excellency the Governor of New Zealand.

The CHIEF HEALTH OFFICER for the Colony to the HONOURABLE THE MINISTER OF PUBLIC HEALTH.

SIR,— Department of Public Health, Wellington, 1st August, 1906.

During the past year I am glad to say no serious epidemic of any kind has occurred in the colony. The general health, from a preventive-medicine point of view, has been good. An attack of diphtheria in July of last year, with subsequent sick-leave which you were good enough to grant me, cast the burden of managing the Department upon the shoulders of Dr. Valintine, Assistant Chief Health Officer. During my absence in Britain and the Continent you have had ample opportuinty of assessing the skill and zeal with which he conducted his work. Nothing I can say can increase the value of the impression which this close intercommunication made, but I wish to record my gratefulness to him for the way in which he performed his onerous duties.

The several officers in their varying capacities have done excellent work, and if I mention Dr. Makgill specially it can occasion no suggestion of invidious praise. Situated as he is at the Head Office he has been required to undertake in addition to his onerous duties as Bacteriologist to the Department and Vaccine Superintendent a large amount of administrative work, which does not fall to the lot of the District Health Officers in their several districts. I would draw your attention, however, to the value of the work he has done with respect to the bacteriological examination of water-supplies all over the colony, in addition to his work with respect to reporting on the many pathological specimens which are submitted to the Department.

The colony is fortunate in that it has as Analysts men of the highest scientific attainments, but I would like to draw your attention more particularly to Dr. Maclaurin, who, in addition to his work as Analyst for the Wellington District, has helped me greatly on other than local questions.

With respect to the clerical staff, I wish to record my entire satisfaction with the way in which the Chief Clerk, Mr. Grix, has done his work. His under-officers are happy and contented, and I am convinced that no Department offers less cause for complaint to the public as regards despatch, courtesy, or skill than does the Health Department. No better tribute as to Mr. Grix's control could be offered.

Dr. Valintine has gone on six months' leave, and I hope that in turn the other members of the scientific arm of the Department may be permitted to pool their leave, and so visit the schools and workshops of the older world.

Last year I drew your attention to the value which the Department would receive by allowing the District Health Officers to commute their yearly leave, so that they might be able to visit other parts of the world. My recent journey through Britain and the Continent has only more fully confirmed me in this view.

Milk-supply.

That there is urgent need for more stringent examination and efficient control of the various agents who handle this most important article of food is evidenced by the exhaustive report of Dr. Valintine and the various District Health Officers. In my statement to you for the year 1902, and subsequently, I drew attention to the unsatisfactory way in which dairies were governed and supervised. I am not now considering the milk which leaves the colony either as butter or cheese—the system of grading initiated by Mr. Kinsella, Chief Dairy Commissioner, assures in a very great measure the real goodness of that which goes to feed our customers oversea—I am looking rather at that which is consumed by our own people in the colony.

The unsavoury and insanitary state of many of the small byres, the ignorance or want of care of many of the milkers, combined with the occasional ill treatment of the milk by carrier or distributor, results not infrequently in transforming an ideal food for children into a veritable agent for ill health and death. The importance of conserving the purity and food-value of milk has been realised by sanitarians all the world over. Nothing has been the subject of more writing, criticism, and suggestion in public-health journals within recent years than the question of how best to hand to the consumer this important fluid in the same condition as it came from the cow. Above all articles of alimentation the most susceptible to adverse and insanitary surroundings its protection from these seems most difficult to obtain. The struggling, hardworking, if often hard-up, keeper of cows finds it difficult even when convinced of the necessity of erecting comfortable, sanitary, milking-places to do so. The early hour at which the work has often to be done in order to meet the urban market offers difficulties which only up-to-date byres, capital, and ideal honesty can solve. Mechanical milkers, hygienic milking-pails, are often, or are at any rate considered to be, outside the reach of the owners of small herds. Large measures of reform are undoubtedly required in these directions, but even when these have been assured, great deterioration can and does take place in consequence of the manner in which milk is treated during its transit from the dairyman to the retailer. It would seem at first sight an easy matter to take such measures as would prevent ill usage at this stage, and were there no undue dispersion of effort a great deal could be effected at this point. As it is, the dubiety as to responsibility which at present exists as between the Agricultural Department, the local authorities, and this Department, has prevented any sustained and effective control. The buyer, however, is far from free from blame. One has only to take his walks abroad before the shutters are down, so to speak, and see the heterogeneous kind of receptacle set outside the respectable ratepayers' doors, into which the milkman is required to dump the pint or quart, and it is easy to realise that even if the milk had escaped all the previous perils it has many more to meet. Wide-mouthed open jugs, tin billies, with here and there only a properly constructed vessel, adorn the doorsteps or window-sills. Grant that careful inspection has secured the cleanliness of the milk till the sleepy distributor has measured it out into the vessel, what dirt and dust may not be swept into it as it waits exposed to the wind-swept streets ?

The whole system wants rearranging. It must first be clearly laid down who is responsible for the sanitation of the cow, the byre, the carriers, and the distributors. The present uncertain responsibility as to the control must be settled. There should be no difficulty in deciding this. Short of requiring the Health Department to control the whole cycle from the cow to the consumer—that is, of milk consumed by our own people—the Agricultural Department might be made responsible for its purity until it is put upon the train, and this Department should have absolute control from that point.

I cannot help thinking that my previous suggestion, though possibly not the best, should at least be given a fair trial. Briefly, my proposal was that all milk entering any town of over 4,000 inhabitants should pass through a municipal conduit. It should be delivered at a municipal pasteurising-factory. There it should be carefully assayed, pasteurised, and delivered by officers of the borough. No hardship need be entailed on the supplier, large or small. Just as the farmer now has his interests safeguarded at the butter-factory, so could they be at the municipal depot. He could be, as now, credited with the butter-fat value of the milk he sends in, while the passing of it through a general pasteuriser would, in a measure, eliminate most of the noxious materials which it had acquired either at the time of milking or in transit. By reason of the bulk, the municipality could conduct the operation cheaper, and what is of more importance, with greater certainty. From the depot it could be sent out in pro-

perly constructed sealed bottles, which would insure cleanliness despite the distributor's carelessness and the buyer's apathy. The local authority, as has been done in many places in Britain and the Continent, could arrange for the preparation and sale of the so-called humanised milk, especially suitable for those children who are dependent upon cows' milk instead of that best of all food, the milk of their mother.

It is hopeless to leave this to private enterprise—at least, for the present. There are many reasons for this, not the least of them being the apathy of the parent. Poverty, or more often want of interest, prevents them from inquiring into the skill or care of the seller, and the result is that, even where private companies have put a good pasteurised milk on the market, consumers have declined either to pay the little extra cost or to take the trouble to discriminate between those who endeavour to supply a pure article and those who do not. Were a common channel provided, as would be the case if my scheme were adopted, milk could be retailed as cheaply as it is now, and every one could rest assured that it was of the best.

The value of a pure milk-supply cannot be overestimated in its influence upon infantile mortality. Milk forms, or ought to form, the staple article of diet until at least the age of five years has been reached. One city, I am pleased to say, is carefully considering a scheme of this nature, and it would well become Christchurch to lead in this as she has done in other matters which make for the better control of insanitary questions. Under the ægis of the Hon. Mr. Wigram, she grasped the greater-city question, and successfully. If she should be successful in her projected experiment she will have established greater claims to the gratitude of New Zealand generally than even her great exhibition can offer. The Council's scheme, as I understand it, goes further than the one suggested by me. It includes the collection of the milk from the cow-keeper. My only objection to this extension is the greater initial capital that would be necessary; but to this there can be no complaint from a sanitary point of view. Last year, infantile diarrhœa, enteritis, and marasmus carried off 538 of our children under one year. These ailments are, in many instances, only synonyms for impure milk and bad feeding.

There are those who argue—and, I admit, with much show of reason—that the pasteurisation of milk destroys some vital principle in the milk, that it diminishes its food-value, and its constant use by children may have deleterious results. I am convinced, however, that, until the growing of milk—if I may be permitted the use of the word—is made more profitable, some treatment of it must be made in order to checkmate the power of the organisms introduced through carelessness, apathy, and ignorance on the part of the milker, carrier, and buyer. If authorities need be cited I can call to my side one of the greatest of bacteriologists, Elie Metschnikoff, Director of the Pasteur Institute, who asserts that while proper pasteurisation of milk destroys or inhibits the growth of organisms its food-value is not in any way lessened.

It seems strange in these humanitarian times to suggest a monetary reward for the care of the young, but the experiment has been tried in Huddersfield and found to yield results which, while good as regards the children, suggest heartsearching on the part of parents. Mr. Broadbent made it known that he would present the mother of every child born during his term of office which was healthy on its first birthday with £1. The results have been excellent. To justify a following in Mr. Broadbent's footsteps it is not necessary to argue callousness or mercenary motives on the score of the mothers or fathers. Let us leave the analysis to whomsoever will, the result is what I am concerned with.

Doubtless—nay, I am certain—there will rise up many who will offer objection to this scheme of municipalisation. Some will say, "Where is this socialistic undertaking of work hitherto left in the hands of the individual to cease?" I am not concerned to argue out the general principle of what should and what should not be undertaken by the State in contradistinction to the people. A colony which owns railways, telephones, and coal-mines, which carries on successfully a far-reaching system of life and fire insurance, which has passed an old-age-pension scheme, the admiration of all who have taken the trouble to carefully consider it, needs no justification for extending the same care which it exercises over those who have borne the brunt and stress of life to those who are just beginning. We may or we may not be able to legislate so as to influence the birth-rate, but assuredly we can do much to lessen the yearly toll which impure milk and improper feeding exacts from those just entering upon their citizenship.

I am not optimistic enough to imagine that, even when all these precautions have been taken to secure that this most important article of diet has been handed to the parent or consumer, no contamination will take place. Effort will have to be made to educate the householder as to how and when it should be stored. The dirty bottle and unclean tube must be preached against, and the awful consequences which such maltreatment entails must be pointed out not once but many times ere their full value is realised; but something, and a very important something, will have been done when the reforms advocated have been brought about.

The experiment has been tried in several places of supplying milk properly adjusted as to purity and constitution for children of all ages. Bottles containing such milk are sent out of such size as to

contain " one meal " or more. In this way it was hoped that the carelessness or ignorance of the nurse might be eliminated. The stopper removed, a patent and easily applied teat is attached to the bottles, and in this way all possible danger of contamination is prevented. There are evidences, as I have said, of a desire on the part of some of the cities in New Zealand to look into and if possible undertake some such scheme. I suggest that the Government should do everything it can to help such efforts. Until, however, all uncertainty ceases as to responsibility for the sanitation of dairies in the widest sense of the word, pasteurisation and care in the distribution must savour somewhat of shutting the stable-door when the horse has escaped.

Medical Inspection of School-children.

As you are well aware, the matter has received considerable attention in most parts of the world. In Great Britain and on the Continent of Europe and America special officers are set apart for this very important work. Any scheme, to be practicable, must not cost too much; it may be therefore that the best cannot be obtained just at once. The fact that out of a total of 117,000 children attending Board schools throughout the colony only some 27,327 live in and about the Cities of Auckland, Wellington, Christchurch, and Dunedin, indicates quite clearly that, even if the children in the larger centres could be looked after, a very great number would still go uninspected.

The scheme which you approved is briefly as follows: The name of any child which the teacher considers in any way not up to the normal standard of health should be placed upon a list. A Medical Inspector should be appointed to examine these children. He should report to the parent. This scheme certainly casts a further responsibility upon a not overpaid and already hardworking individual; but I am certain from the expressions of opinion which have reached me from all parts of the colony that whatever may be their objections to the prescribed scheme of work, there will be few to refuse this voluntary task. As a matter of fact, a large number of teachers have for some time back practically carried out this system, reporting to the parent instead of to a medical inspector. That there is necessity for such inspection is evidenced by the fact that so many countries have instituted these examinations. In many places on the Continent whole-time inspectors are retained, who examine *all* children. I feel assured that with very little instruction the school-teachers in the colony would be able to " spot " any child suffering from, say, eye-strain, deafness, throat-troubles, obviously defective teeth, spinal troubles, or, in fact, any serious departure from the normal.

The object of enlisting the help of the teacher is to lessen the cost. Instead of the medical inspectors having to examine, say, 117,000 children they would only be required to deal with, say, 10 per cent. —roughly, 11,700. Doubtless were it possible to examine all, greater certainty might be assured, but I suggest that the lesser scheme be tried—at any rate at first.

Mr. W. H. Dawson, in a recent article, states that as far back as 1889 Germany instituted these examinations, and the results have been excellent. Speaking of the attitude taken by parents generally, " the vast majority of parents heartily welcome the school doctor's recommendations, and carry them out."

In Berlin in 1902 12·3 per cent. of the children notified for admission into primary schools were put back as unfitted for the time for school-work. Last year 34,562 newly registered children were examined, and nearly three thousand put back, over seven thousand having been placed under oversight.

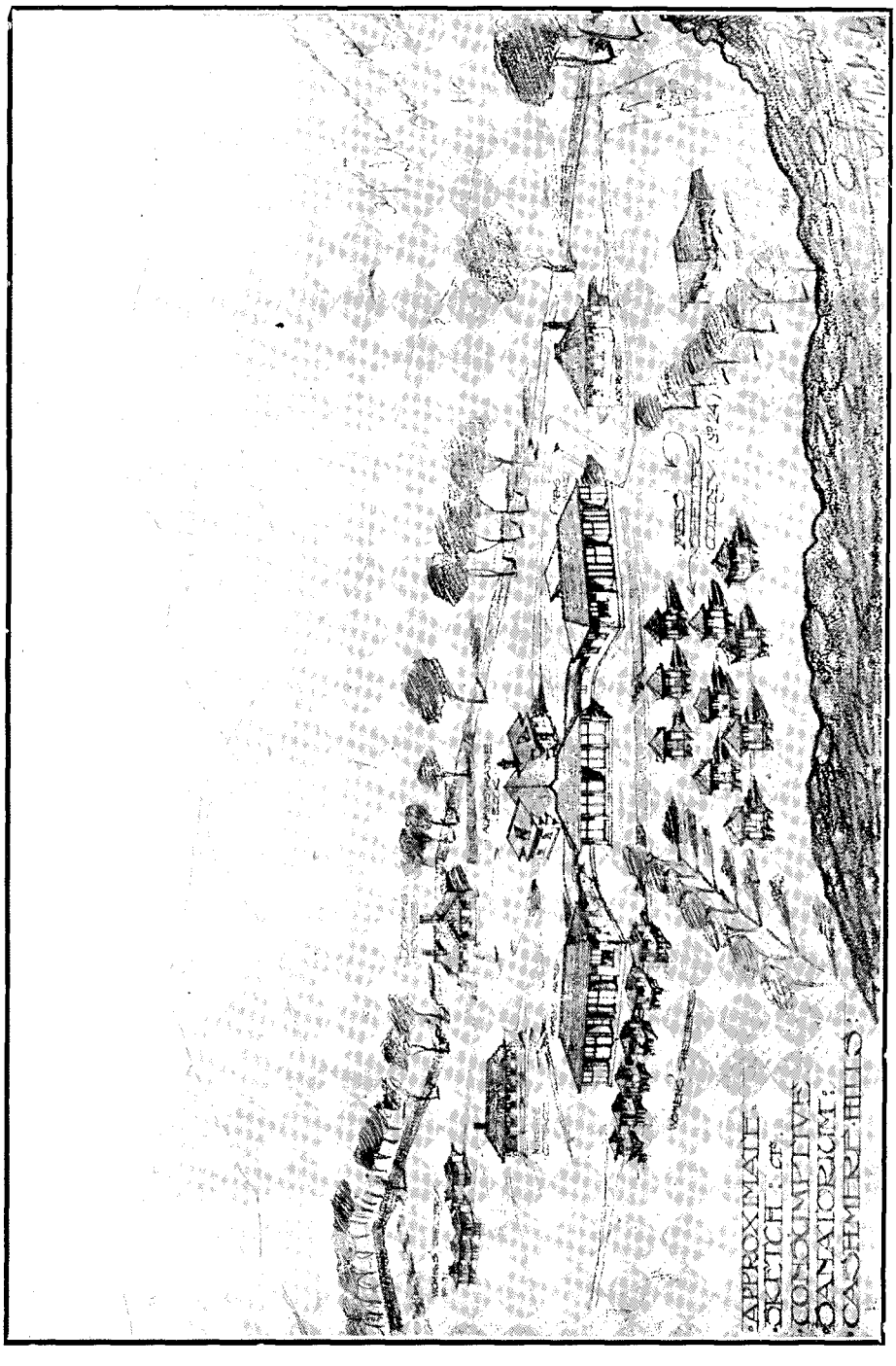
I placed the rough outline of the scheme before a conference of teachers in Dunedin lately, and it was received most enthusiastically. The Inspectors in Otago were good enough to assure me of their help. As a matter of fact they had *in transitu* from England a set of Snellen's types for use in the Otago schools. I have laid the matter before the Education Boards throughout the colony for their consideration and suggestions. I believe they will help in this important work of safeguarding the young. I suggest that any money spent by Education Boards should be subsidised by the central authorities.

I sincerely trust that by the time it is necessary to report to you again the scheme will have become *un fait accompli.*

The Campaign against Tuberculosis.

It gives me very great pleasure to record the steady progress of the movement. Gradually the various Hospital Boards are coming to see the wisdom of making provision for those unfortunate enough to suffer from this disease. By pen and speech the several officers of the Department have done much to awaken the public to a realisation of the magnitude and power of the enemy. Many in authority have actively taken up the burden, and gradually open-air shelters are being provided.

I drew attention last year to the good work done by Dr. Valintine, and I have pleasure in recording my appreciation of the help Dr. Makgill has rendered in his quiet unobtrusive way in the development of a suitable, cheap, and at the same time scientific, shelter for the housing of persons suffering from consumption. The result of Dr. Finch's efforts in Canterbury have been crowned with a most inspiriting success. The trustees of the Cashmere Estate have donated an excellent site on the Port Hills, near


APPROXIMATE
SKETCH OF
CONSUMPTIVE
SANATORIUM
CASHMERE HILLS

Christchurch, while the people, stimulated by Dr. Jennings, Mr. Beswick, and others, have contributed liberally. Mr. Hurst Seagar has exercised his acknowledged artistic and architectural skill in designing an excellent sanatorium capable of housing some sixty patients. Through his courtesy I have been able to give an interesting picture of the institution.

Wellington, Taranaki, Nelson, Invercargill, and Waimate have already made provision, and many other districts have passed the parting of the ways. Nurse Maude still continues her admirable work in Christchurch.

The great hopes foreshadowed in my previous reports are gradually being realised. The necessity of having only sympathy to offer to the poor homeless seeker after health is, I am truly thankful to say, getting less and less. No part of the Health Officer's duty is more painful than that of dealing with this class of patient, and the relief which the establishment of these open-air shelters brings is whole-heartedly appreciated. It is easy in the secluded privacy of one's study or office to talk of surrender to socialism, and to rate departure from strict economic principles, but face to face with the indigent consumptive it is difficult to assume this academic indifference. We have decided to help in every way science can suggest the continuance of the irrevocably insane, the incurable imbecile: surely some pity and help is justifiable with respect to the sufferer from consumption.

In a previous report I dwelt upon the necessity of providing light employment in the open air for those patients who had recovered sufficiently to re-enter the workaday world. As it is now, the man or woman who leaves a sanatorium, leaves comfort, liberal feeding, and all that makes for a healthful life to go back to a close, possibly overcrowded room, poor food, and work indoors. That the disease recurs, that the patient fails and finally dies, is unfortunately sometimes the after-history of a person who left the institution "improved." The wealthy sufferer can alter his whole mode of life—give up his work in the office for work on the farm. Something like this should be practicable for the poor man. I suggested that if private employers would not help, the Government might be able to give work on some of the State farms or forest nurseries. Many a poor soul would be glad to do what work he could for the sake of his food and room to pitch his shelter, if he could get the chance.

I sincerely trust that some arrangement may be effected, either with the Lands or Forestry Department.

Alleged Danger from the Presence of a Sanatorium.

Here and there are to be found critics of the purely destructive school. Their ingenuity in offering objections to any site which may have been selected is great. It is not to be suggested that these gentlemen are inspired by any but the best motives—I for one certainly think such inspiration improbable—but nevertheless it is to be regretted that they usually wait until the scheme has become an almost accomplished fact before they think fit to offer their advice. The splendid site offered by the trustees of the Cashmere Estate has been the subject of much comment in Christchurch. The objections offered are of two kinds:—

1. That the presence of the sanatorium will depreciate the value of the surrounding property.

The best answer to this is the fact that the donors own large areas of land behind, on either side, and in front of the selected site. Surely the fact that they have no objections should estop all others from raising this plea.

2. That the fact that patients and friends of patients may travel on the trams will necessarily be a source of danger to the citizens of Christchurch.

There might be something to answer in this if it were suggested that the people now suffering from consumption never travelled in trams. The great bulk of the patients will be drawn from Christchurch and the suburbs. At present they are spread all over the city, living under conditions which are unfavourable to themselves, and in many instances dangerous to others. Knowing as we do that the great source of infection lies in the sputum of the diseased person, that the first, middle, and last lesson they learn in a sanatorium is the value of this danger and the absolute necessity for destruction of the sputum, common-sense assures us that the dangers of infection must be lessened instead of increased.

The newspapers, whilst giving the very greatest facility for *audi alteram partem*, have, I am glad to say, wisely refrained from doing anything which would retard this necessary and beneficial work.

Cambridge Sanatorium.

Good work has again to be recorded for the past year. An event of great importance was the resignation of Miss A. S. Rochfort, the Matron. With the institution from its beginning, she, in conjunction with Dr. Makgill, then District Health Officer for the Auckland District, rendered services which cannot be too highly praised. Her kindness, tact, and personality endeared her, not only to patients, but to staff as well. The Department has lost a self-sacrificing and devoted servant. Miss Duffin, who for several years acted as senior Sister, was appointed Matron, and has given great satisfaction.

The resignation of Dr. Pentreath, the Medical Superintendent, opens up the question of general management. At present, Drs. Reid and Edmonds, of Cambridge, have been appointed Medical Visitors. This arrangement is working very well.

I visited many of the sanatoria in the Old World quite recently, and I have no hesitation in saying that "Te Waikato" need fear nothing by comparison. Its constructive cost per bed is less than that of many, and the methods of treatment are quite up to date.

Regulation of the Sale of "Patent Medicines."

There is, I am very pleased to say, evidence on the part of many of the leading newspapers in the colony of a desire to help in the war against the circulation of harmful so-called patent medicines. Canada has, I believe, brought into force a regulation on all-fours with the one introduced here last year, and several of the States of America have followed suit. I have suggested therefore that an amendment of our Public Health Act should be made, so that the term "patent medicine" shall include what undoubtedly the Legislature meant it to embrace—namely, all secret or proprietary medicines. In a strictly legal sense a patent medicine is one the formula of which has been deposited with the Registrar of Patents. As a matter of fact, patent medicines proper cover but an infinitesimal part of the nostrums now on the market. Many of the "cures" now being so lavishly advertised are in the very gravest sense injurious. A large number of the "invigorators" recommended with such profusion of adjective and literary skill are nothing more than mixtures of alcohol with colouring-matter, to which has been added a small quantity of some simple medicinal gum or vegetable. The exhaustive and scathing series of articles which appeared in *Collier's Weekly* from the pen of that master of clear and incisive English, Mr. Adams, are worthy of the most serious attention of all interested in the physical and moral welfare of our community.

The regular imbibation of such mixtures as Peruna, specially recommended as they are to combat the lassitude and loss of energy which sometimes follows parturition and suckling, containing as it does twice as much alcohol as champagne, can be attended by only evil results. Unknowingly, the users become more and more dependent upon the tipple, and in the end may become confirmed drinkers. Surely no consideration need be given to the vendors of such articles. Victoria has decided that such "medicines" containing more than 10 per cent. of alcohol must be so labelled and so sold. Such a regulation is of value, but there are many nostrums on the market which are even more dangerous than those which depend upon alcohol for producing the feeling of *bien etre*. Some merely serve as kites for blackmailers. I am convinced that a law having for its end the suppression of all such things would be good. A large number of the sellers of so-called electric belts are swindlers pure and simple. I have received many letters from men and youths who have sent ill-to-be-spared money to such people. As one correspondent puts it, "The man who has been had says nothing, because he does not care to show that he has been such an ass." These people are people the State should step in and guard. The monetary damage is often great, but not infrequently that is the least among many injuries done the poor dupe. In the case of such diseases as consumption and cancer, the wiley advertiser of a cure steals not only the sufferer's money but his only chance of recovery. At a time when removal of the tumour or a sojourn in a sanatorium might have effected a restoration to health the poor victim is wasting his money and "losing the tide."

Sanitation among the Maoris.

Dr. Pomare, in his report, again emphasizes the necessity which I have pointed out in several reports of instituting a system of birth and death registration for the Maoris. The greatest blow will have been struck at the mana of the tohunga when all deaths will require to be certified to and registered. May I again recommend this matter for your consideration.

I am not certain whether the remarks of Dr. Buck traverse paths which are forbidden, but I heartily concur in his description of the evils attendant upon the communal holding of land. Until every Maori realizes that a particular patch is his and his alone, steady and consistent cultivation will never take place.

Dr. Pomare's report on his recent trip amongst the islands of the Cook Group is interesting, and I cordially indorse his suggestion that all Natives returning from work outside should be examined for syphilis and other venereal diseases. The ravages of such diseases are undoubtedly great, and their results could be greatly controlled if such an examination were carried out.

Vital Statistics.

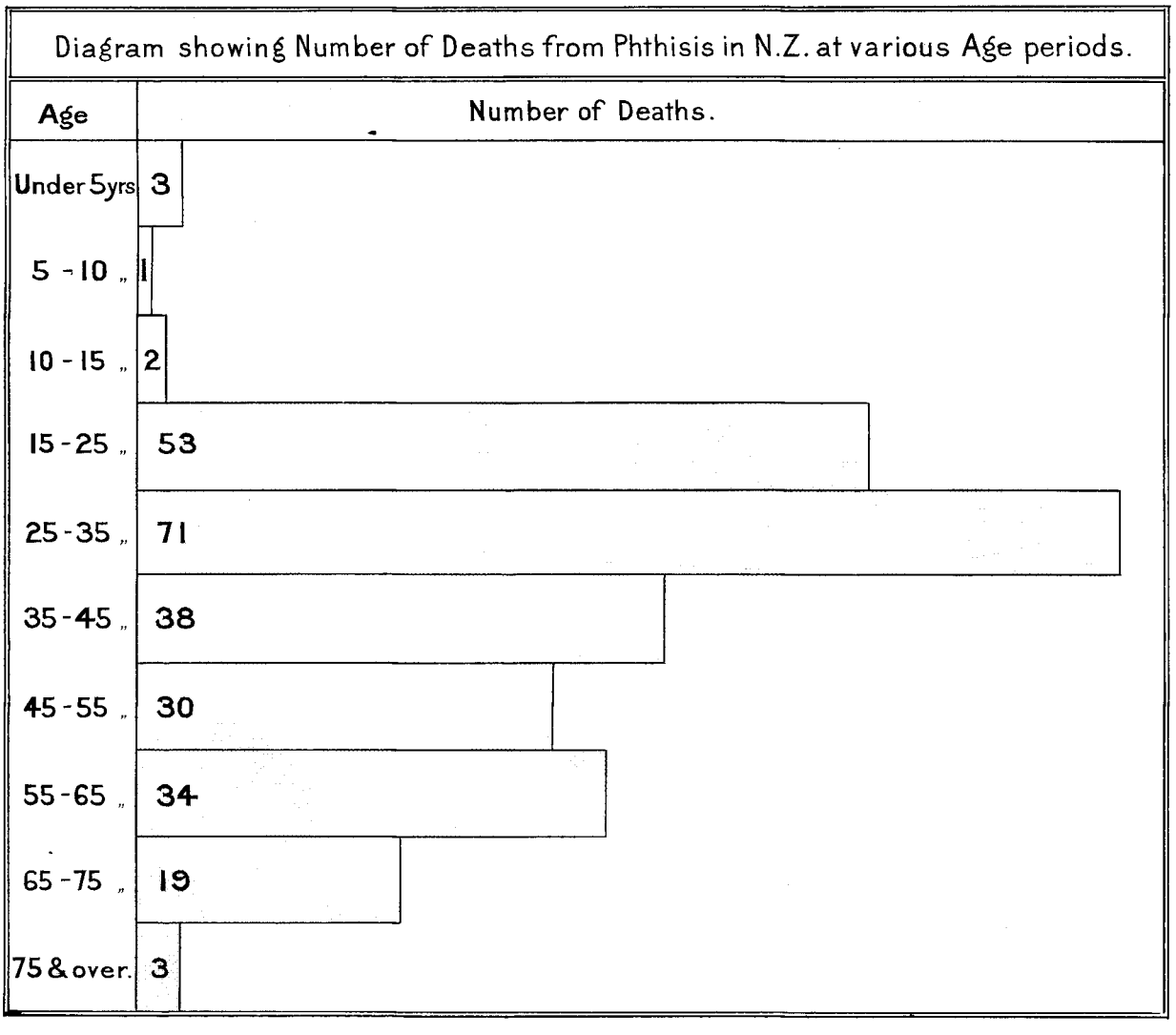
I am indebted to the Registrar-General, Mr. E. J. von Dadelszen, for these most valuable figures:—

Births.

The number of births registered in the colony during 1905 was 23,682, or 27·22 in every 1,000 persons living. The rate is the highest reached since the year 1894, the number of births being 916 in excess

Phthisis in 1905.

Diagram showing Number of Deaths from Phthisis in N.Z. at various Age periods.



of that for the year 1904, an increase of 4·02 per cent. From 1882 until the year 1899 there was a regular fall in the birth-rate. The number of births registered in a year reached 19,846 in 1884, and, after falling to 17,876 in 1892, has risen to 23,682 in 1905, as stated above.

The figures for each year from 1882 are worthy of notice, especially in connection with the subsequent particulars given as to marriages solemnised and the growth of population :—

Year.	Number of Births.	Rate per 1,000 of Population.	Year.	Number of Births.	Rate per 1,000 of Population.
1882	19,009	37·32	1894	18,528	27·28
1883	19,202	36·28	1895	18,546	26·78
1884	19,846	35·91	1896	18,612	26·33
1885	19,693	34·35	1897	18,737	25·96
1886	19,299	33·15	1898	18,955	25·74
1887	19,135	32·09	1899	18,835	25·12
1888	18,902	31·22	1900	19,546	25·60
1889	18,457	30·07	1901	20,491	26·34
1890	18,278	29·44	1902	20,655	25·89
1891	18,273	29·01	1903	21,829	26·61
1892	17,876	27·83	1904	22,766	26·94
1893	18,187	27·50	1905	23,682	27·22

The marriages have increased numerically, and the population of the colony also.

Year.	Number of Marriages.	Mean Population (excluding Maoris).	Year.	Number of Marriages.	Mean Population (excluding Maoris).
1882	3,600	509,309	1894	4,178	679,196
1883	3,612	529,292	1895	4,110	692,417
1884	3,800	552,590	1896	4,843	706,846
1885	3,813	573,362	1897	4,928	721,609
1886	3,488	582,117	1898	5,091	736,260
1887	3,563	596,374	1899	5,461	749,984
1888	3,617	605,371	1900	5,860	763,594
1889	3,632	612,716	1901	6,095	777,968
1890	3,797	620,780	1902	6,394	797,793
1891	3,805	629,783	1903	6,748	820,217
1892	4,002	642,245	1904	6,983	845,022
1893	4,115	661,349	1905	7,200	870,000

The average number of children to a marriage may be ascertained by comparing the number of legitimate births for a series of years with the marriages, but commencing with the marriages in the year preceding that for which the first number of births is taken.

The figures for the twenty-year period 1886–1905 show a decline in the proportion of births to every marriage in the preceding year from 4·90 to 3·24, as below :—

Year.	Marriages.	Legitimate Births.	Proportion of Births to every Marriage solemnised in the Preceding Year.
1885	3,815	...	...
1886	3,489	18,697	4 90
1887	3,565	18,518	5·31
1888	3,617	18,325	5·14
1889	3,632	17,845	4·93
1890	3,797	17,675	4·87
1891	3,805	17,635	4·64
1892	4,002	17,283	4·54
1893	4,115	17,514	4·37
1894	4,178	17,824	4·33
1895	...	17,711	4·24
1895	4,110	...	...
1896	4,843	17,778	4·32
1897	4,928	17,911	3·70
1898	5,091	18,154	3·68
1899	5,461	18,006	3·54
1900	5,860	18,640	3·41
1901	6,095	19,554	3·34
1902	6,394	19,734	3·23
1903	6,748	20,835	3·26
1904	6,983	21,737	3·22
1905	...	22,600	3·24

If the average result be taken out for the ten years 1886–95, it will be found to represent 4·73 births to a marriage. Dealing similarly with the figures for 1896–1905 the result is an average of 3·49, so that regarded annually or decennially there is a decided fall to be observed.

In the Australian States a similar decrease is noticeable.

New Zealand had in 1880 the highest birth-rate (40·78); in 1900 the case was reversed; but in 1905 the New Zealand rate was higher than that of Queensland (1904), New South Wales, Victoria, and South Australia.

The movement over ten years is calculated as under :—

Birth-rates per 1,000 of Population.

State or Colony.	1896.	1897.	1898.	1899.	1900.	1901.	1902.	1903.	1904.	1905.
Queensland	30·06	29·92	28·28	27·31	30·21	28·28	27·68	24·71	27·12	..
New South Wales ...	28·35	28·42	27·14	27·10	27·43	27·60	27·17	25·28	26·73	26·73
Victoria	27·33	26·59	25·72	26·71	25·82	25·77	25·23	24·46	24·65	24·83
South Australia ...	28·46	26·97	24·98	25·51	25·78	25·39	24·85	23·43	24·70	23·82
Western Australia ...	22·65	25·82	29·35	30·64	31·46	30·32	30·09	30·27	30·34	30·30
Tasmania	28·16	27·73	26·24	25·98	28·25	28·40	28·95	28·61	29·59	29·32
New Zealand	26·33	25·96	25·74	25·12	25·60	26·34	25·89	26·61	26·94	27·22

This table shows that although New Zealand had in 1900 the lowest birth-rate in Australasia, the rate in this colony for 1905 was higher than that of Victoria and some others.

A declining birth-rate is noticeable in many civilised countries, and attention has been drawn by statisticians and political economists to the serious consequences that may result. That fertility among women in New Zealand is decreasing, from whatever causes, further facts will tend to show.

Taking the number of married women in New Zealand at what may be considered the child-bearing ages (*i.e.*, from 15 to 45 years, inclusive) as shown by each census since 1878, and for the same years the number of legitimate births (excluding plural) registered, the birth-rate per 1,000 married women of the above-stated ages is easily found, and is shown to be steadily declining. In 1878 the rate was 337 per 1,000, in 1896 it had fallen to 252, and in 1901 to 244 ; or, in other words, in 1878 one married woman of the ages specified in every three gave birth to a child, while in 1901 the rate was one in four only. The figures for each census year are given below.

Birth-rates (Legitimate) per 1,000 Married Women at Child-bearing Ages for each Census Year, 1878 to 1901.

Year (Census).	Number of Married Women between 15 and 45 Years of Age.	Number of Legitimate Births (Confinements).	Birth-rate per 1,000 Married Women of from 15 to 45 Years of Age.
1878	50,995	17,196	337·2
1881	57,458	18,003	313·3
1886	62,704	18,532	295·5
1891	63,165	17,455	276·3
1896	69,807	17,596	252·1
1901	79,406	19,355	243·8

And another table is given, showing for a period of twenty years the numbers of married women at the quinquennial periods of age belonging to the full term 15 to 45 years, with the proportions that those numbers bear to every 100 married women living at 15–45.

These proportions are found to have diminished appreciably at the earlier ages, 15–20 and 20–25 ; but the numbers of the living are much smaller at those ages than at the higher ones, 25–30 and onwards to 40–45, and the effect of this lesser number of wives at the lower ages in reducing the birth-rate would not be so much as might at first be thought probable.

It is, however, undoubtedly a fact that to have a growing proportion of wives at the earlier productive ages is the best position, but it is not the one which obtains at present in New Zealand.

Married Women under 45 Years of Age, given according to Age-groups, as at the Censuses of 1881, 1891, and 1901 ; with the Proportion in each Group for every 100 of the Whole.

Age-groups.	Married Women under 45, excluding Chinese.					
	Numbers at Census.			Proportion per Cent.		
	1881.	1891.	1901.	1881.	1891.	1901.
15–20	1,233	750	777	2·14	1·19	0·98
20–25	8,996	8,862	10,053	15·66	14·03	12·66
25–30	13,133	14,540	17,923	22·86	23·02	22·57
30–35	12,656	14,576	19,617	22·03	23·08	24·70
35–40	11,811	12,959	16,854	20·55	20·51	21·23
40–45	9,629	11,478	14,182	16·76	18·17	17·86
Totals	57,458	63,165	79,406	100·00	100·00	100·00

A further table shows the declining birth-rate, and the increase in the marriage-rate, in the United Kingdom.

Birth and Marriage Rates in the United Kingdom, 1886, 1891, 1896, 1901, *and* 1903.

Year.	Mean Population.	Births. Number.	Births. Rate per 1,000 of Population.	Marriages. Number.	Marriages. Rate per 1,000 of Population.
1886 ...	36,313,582	1,145,577	31·5	241,180	6·6
1891 ...	37,802,440	1,148,259	30·4	275,970	7·3
1896 ...	39,599,072	1,152,144	29·0	296,089	7·5
1901 ...	41,550,773	1,162,975	28·0	313,351	7·5
1903 ...	42,371,219	1,183,601	27·9	316,415	7·5

The above figures are taken from the report of the Registrar-General of England (66th number), published in 1905.

The birth-rates for ten years in Great Britain and certain countries of the European Continent are also given from the same source. The rates in England and Wales, and in Scotland, are higher than those in New Zealand, but the rate for Ireland is lower. France has the lowest rate of all quoted.

Birth-rates in European Countries, 1894 to 1903.

Countries.	Number of Births per 1,000 of Mean Population.									
	1894.	1895.	1896.	1897.	1898.	1899.	1900.	1901.	1902.	1903.
Hungary	41·5	41·9	40·5	40·3	37·7	39·3	39·3	37·8	38·8	36·7
Austria	36·7	38·1	38·0	37·5	36·2	37·1	37·3	36·9	37·0	...
Italy	35·4	34·7	34·7	34·6	33·4	33·8	32·9	32·6	33·3	31·5
German Empire	35·9	36·1	36·3	36·0	36·1	35·8	35·6	35·7	35·1	...
Netherlands	32·7	32·8	32·7	32·5	31·9	32·0	31·5	32·3	31·8	31·6
Scotland	29·9	30·0	30·4	30·0	30·3	29·8	29·6	29·5	29·2	29·2
Norway	29·8	30·6	30·4	30·0	30·3	30·9	30·1	29·8	29·1	28·7
England and Wales ...	29·6	30·2	29·6	29·5	29·3	29·1	28·7	28·5	28·5	28·4
Belgium	29·0	28·5	29·0	29·0	28·6	28·8	28·9	29·4	28·4	27·5
Sweden	27·1	27·5	27·2	26·7	27·1	26·4	26·9	27·0	26·5	25·6
Switzerland	27·1	27·1	27·9	28·1	28·4	28·9	28·6	29·1	28·7	27·7
Ireland	22·9	23·2	23·6	23·5	23·2	22·9	22·7	22·7	23·0	28·1
France	22·3	21·7	22·5	22·3	21·8	21·9	21·4	22·0	21·7	21·1

From the year 1895 marriages have shown an increase, the rate being then 5·94 per 1,000 of population. In 1905 the rate rose to 8·28, the highest record since 1875, when it was 8·94 per 1,000 of mean population. The number of marriages solemnised in 1905 was 7,200, an increase of 217 on the number for 1904.

Marriage-rates in Australasia per 1,000 *of Population for Five Years.*

	1901.	1902.	1903.	1904.	1905.
Queensland	6·61	6·31	5·72	5·93	...
New South Wales	7·68	7·53	6·86	7·21	7·42
Victoria	6·99	7·02	6·29	6·80	7·24
South Australia	6·44	6·61	6·25	6·85	7·00
Western Australia	9·65	9·77	9·33	8·83	8·48
Tasmania...	7·68	7·47	7·57	7·55	7·61
New Zealand	7·83	8·01	8·23	8·26	8·28

In April, 1896, New Zealand had 83,659 children living under the age of five years, and in March, 1901, the number was 86,806, an increase of 3,147, although the population at all ages increased in the quinquennium by 9·86 per cent. Between 1886 and 1891 the children living under five years actually decreased in number by 3,624, the increase of population of all ages (8·33 per cent.) being less than between 1891 and 1896 (12·24 per cent.) or 1896 and 1901 (9·86 per cent.). The number of children under one year to the total population at all ages, according to the results of four censuses, was :—

	Children under One Year.	Total Population (all Ages).
Census 1886	18,355	578,482
" 1891	16,443	626,658
" 1896	17,070	703,360
" 1901	18,381	772,719

Thus, in 1886, with a population of 578,482 persons, there were 18,355 children under one year, against 18,381 children of that age in 1901, with a population of 772,719 persons.

The births registered in 1885 were 19,693, against 19,546 in 1900. The birth-rate fell from 34·35 per 1,000 of the population in 1885 to 25·60 in 1900.

Deducting 1,469, the number of deaths of children under one year registered in 1900, from 19,546, the number of births for that year, leaves 18,077, or within 304 of the living children under one year at the time of the last census.

Twin Births.

There were 242 cases of twin births (484 children), and triplets were registered in three instances, in 1905. The number of children born was 23,682; the number of mothers was 23,434: thus, on an average, one mother in every 97 gave birth to twins, against 93 in 1904, and 97 in 1903.

Illegitimacy

The births of 1,082 children were illegitimate: thus 46 in every 1,000 children born were born out of wedlock, against 45 in 1904.

The following table gives the rates of illegitimacy in Australasia. The rate in 1905 in New Zealand was less than in any of the Australian States except South Australia and Western Australia:—

Proportion of Illegitimate Births in every 100 *Births.*

Year.	Queensland.	New South Wales.	Victoria.	South Australia.	Western Australia.	Tasmania.	New Zealand.
1896	5·22	5·71	5·63	3·45	5·61	5·91	4·48
1897	6·02	6·58	5·42	3·53	5·27	5·74	4·41
1898	6·04	6·93	5·29	3·62	4·99	5·09	4·23
1899	5·97	7·15	5·49	3·95	4·91	6·08	4·40
1900	6·40	7·01	5·91	4·24	4·82	5·43	4·63
1901	5·93	7·16	5·58	3·98	3·88	5·94	4·57
1902	6·04	6·60	5·51	4·36	3·96	5·36	4·46
1903	6·76	6·71	5·73	4·18	4·69	5·61	4·55
1904	6·89	7·12	5·74	4·01	4·36	5·82	4·52
1905	...	7·37	5·61	4·37	4·19	5·52	4·57

These figures show the proportion of illegitimate births to every 100 births for this colony to be very steady for the period 1896–1905; the difference amounts only to 0·09 per cent. on a comparison of the first and last years.

The total number of births registered was 19,299 in 1886 and 23,682 in 1905, while the illegitimate births rose from 602 to 1,082. The causes that led to the fall in the birth-rate certainly did not greatly affect the number of illegitimate children.

The number of spinsters in the colony between 15 and 45 increased during the ten years from 65,035 (census 1891) to 100,310 (census 1901), or at the rate of 55·9 per cent., while the illegitimate births increased from 638 to 937, or at the rate of 46·9 per cent. only.

It would therefore appear that the larger proportion of illegitimate births now obtaining cannot with any certainty be taken as indicative of increased looseness of living on the part of the people.

The following figures, showing the rate of illegitimacy per 100 births in Australasia and in the United Kingdom, are based on statistics for a period of five years in the former and ten years in the latter:—

Country.	Illegitimate Births per Cent.	Country.	Illegitimate Births per Cent.
New South Wales	6·9	Tasmania	5·8
Victoria	5·7	New Zealand	4·5
Queensland	6·4	England and Wales ...	4·2
South Australia	4·2	Ireland	2·6
Western Australia... ...	4·3	Scotland	7·2

Of the total number of children born in Australasia during the five years ended 1900, 5·67 per cent. were illegitimate, as compared with 4·42 per cent. in the United Kingdom for the same period.

The figures in the next table, which give the percentages of illegitimate births in a number of foreign countries, cover in most cases a period of five years.

Country.	Illegitimate Births per Cent.	Country.	Illegitimate Births per Cent.
Germany	9·08	France	8·82
Prussia	7·68	Belgium	7·67
Bavaria	13·43	Netherlands	2·60
Saxony	12·89	Sweden	11·13
Austria	14·20	Norway	7·43
Hungary	9·13	Italy	6·45

For England and Wales the proportion of illegitimate births to the total births in 1903 was 3·9 per cent., having gradually diminished from 7 per cent. in 1845. The minimum rate was 2·4 per cent., in Monmouthshire, and the maximum 7·7 per cent., in Montgomeryshire. For London the percentage was 3·6.

The average proportion of illegitimate births in Scotland in five years was 6·3 per cent., but in Ireland the extremely low average of 2·6 per cent. obtained.

The Legitimation Act.

An important Act was passed in 1894, entitled the Legitimation Act, which makes provision for the legitimation of children born before marriage on the subsequent marriage of their parents. Under this Act any child born out of wedlock, whose parents afterwards marry, is deemed to be legitimised by such marriage on the birth being registered in the manner prescribed by the Act. For legitimation purposes Registrars must register a birth when called upon to do so by any person claiming to be the father of an illegitimate child; but such person is required to make a solemn declaration that he is the father, and that at the time of the birth there existed no legal impediment to his marriage with the mother of the child. He has also to produce the evidence of his marriage. It will thus be seen that in cases dealt with under the Act registration becomes the test of legitimacy. In the December quarter of 1894, 11 children were legitimised; in the year 1895 the number was 68; in 1896, 56; in 1897, 48; in 1898, 59; in 1899, 41; in 1900, 62; in 1901, 47; in 1902, 96; in 1903, 65; in 1904, 87; and in 1905, 84; making altogether 724 legitimations since the passing of the law.

"*The Infant Life Protection Act*, 1896."

By this statute it has been rendered unlawful for a person to take charge, for payment, of an infant to maintain or nurse for more than three days without holding a license as an infants' home keeper. The house of such a person must be registered as an infants' home.

The administration of this law is a matter entirely managed by the police. The licensed homes are periodically inspected, and the results have shown that licensees generally comply with the required conditions, the homes and infants being well looked after.

The Commissioner, in his report for the year ended 31st March, 1905, writes:—

"During the year there were 528 registered homes throughout the colony, representing 728 infants, against 544 homes and 854 infants in 1903.

"Twenty-one deaths occurred in the homes during the year, against twenty-eight in the preceding year. Five licensees were prosecuted for breaches of the Act, and convicted, against six prosecutions and four convictions in 1903. Three licenses were cancelled, and no neglect by licensees was disclosed at inquests."

Births and Birth-rates in the Four Chief Cities.

The total number of births registered as occurring in the four chief centres and suburbs in 1905 was 6,335, as against 5,970 for the previous year.

There is increase in the births for the four chief cities and suburban boroughs found on comparison with figures for 1904. The birth-rates for 1905 were:—

	Birth-rates per 1,000 of Mean Population.	
Auckland City	30·06	
" and five suburban boroughs	...	27·88
Wellington City	29·70	
" and two suburban boroughs	...	29·38
Christchurch City	29·70	
" and one suburban borough	...	29·63
Dunedin City	23·90	
" and six suburban boroughs	...	23·97

By the inclusion of the suburbs the rate is raised at Dunedin, but lowered at Auckland, Wellington, and Christchurch. It will be observed that Christchurch has the highest rate, Wellington next highest, Auckland and Dunedin following with intervals. The difference between the Christchurch rate (29·63) and the Dunedin rate (23·97) is considerable. The birth-rate for the whole colony last year was 27·22 per thousand. Auckland, Wellington, and Christchurch are thus over the average, and Dunedin below it.

The birth-rates for three of the central boroughs last year show a rise when compared with 1904. In Auckland the rate fell from 31·08 to 30·06; but it rose in Wellington from 26·77 to 29·72, in Christchurch from 27·53 to 29·70, and in Dunedin from 22·40 to 23·90. The rates for five years, 1901 to 1905, are:—

	Births per 1,000 of Population.				
	1901.	1902.	1903.	1904.	1905.
Auckland (without suburbs) ...	30·00	30·80	31·67	31·08	30·06
Wellington " ...	26·35	25·29	29·22	26·77	29·72
Christchurch " ...	24·12	25·84	26·59	27·53	29·70
Dunedin " ...	22·04	19·96	19·54	22·40	23·90

Deaths.

The deaths in 1905 numbered 8,061, being equivalent to a rate of 9·27 in every 1,000 persons living, as against 9·57 in 1904. The lowest rate experienced since the year 1887, when the deaths were 10·29 per 1,000 of the population, was that for 1896 (9·10).

Comparative Death-rate for the Period 1895 *to* 1905.

Country.	1895.	1896.	1897.	1898.	1899.	1900.	1901.	1902.	1903.	1904.	1905.
New Zealand ...	9·91	9·10	9·14	9·84	10·24	9·43	9·81	10·50	10·40	9·57	9·27
Queensland ...	11·38	12·10	11·33	12·66	12·07	11·73	11·88	12·08	12·38	10·11	...
New South Wales	11·79	12·30	10·88	12·48	11·82	11·16	11·68	11·95	11·59	10·62	10·13
Victoria ...	13·25	13·35	12·90	15·94	14·28	12·75	13·22	13·40	12·90	11·92	12·10
South Australia*	11·25	11·48	11·24	13·06	12·14	10·64	11·11	11·79	10·71	10·22	10·14
Western Australia	17·78	16·45	16·97	16.05	13·76	12·92	13·36	13·63	12·60	11·91	10·83
Tasmania ...	11·38	11·63	11·53	13·51	12·25	11·05	10·45	10·84	11·92	11·01	10·23
England and Wales	18·7	17·0	17·4	17·5	18·2	18.2	16·9	16·2	15·4	...	...
Scotland ...	19·4	16·6	18·4	18·0	18·1	18·5	18·0	17·2	16·6	...	...
Ireland ...	18·4	16·6	18·4	18·1	17·6	19·6	17·8	17·5	17·5	...	...
Denmark ...	16·8	15·6	16·5	15·5	17·3	16·9	15·8	14·6	14·6	...	...
Norway ...	15·7	15·2	15·3	15·3	16·9	15·9	14·9	13·9	14·8	...	...
Sweden ...	15·2	15·6	15·4	15·1	17·7	16·8	16·0	15·4	15·1	...	...
Austria ...	27·7	26·4	25·6	24·9	25·4	25·2	24·2	24·7	...	...	...
Hungary ...	29·7	28·9	28·5	28·0	27·2	26·9	25·4	27·0	26·1	...	...
Switzerland ...	19·1	17·7	17·6	18·2	17·6	19·3	18·0	17·2	17·6	...	...
German Empire ...	22·1	20·8	21·3	20·5	21·5	22·1	20·7	19·4	...	...	...
Netherlands ...	18·6	17·2	16·9	17·0	17·1	17·8	17·2	16·3	15·6	...	...
France ...	22·2	20·0	19·5	20·9	21·1	21·9	20·1	19·5	19·2	...	...
Italy	25·0	24·0	21·9	22·9	21·8	23·8	21·9	22·1	22·2	...	...

* Excluding the Northern Territory.

In this statement New Zealand is conspicuous as showing the lowest death-rate. The rates for the principal Australian States are a little higher, but, generally speaking, far below those for the United Kingdom, or the European Continental States mentioned in the table.

Pertect accuracy in comparing one country or colony with another can only be attained by the use of what is termed an "index of mortality." The proportions of the living vary in regard to the different age-groups, and the ordinary death-rate—which is calculated on the population as a whole—does not afford a true means of judging of the relative healthiness of the places compared. But by taking a population like that of Sweden, and applying the percentage at each age-group to the death-rates, a standard of health or index of mortality can be arrived at. This has been done for New Zealand, in accordance with a resolution of the Statistical Conference held at Hobart in 1902, and the result is expressed in tabular form.

Index of Mortality in New Zealand for 1905.

Ages.	Estimated Mean Population, 1905.	Number of Deaths, 1905.	Death-rate per 1,000, 1905.	Percentage of Population of Sweden, 1890 (Standard).	Index of Mortality in New Zealand per 1,000.
Under 1 year	20,706	1,599	77·22	2·55	1·97
1 and under 20 years	365,226	867	2·37	39·80	0·94
20 and under 40 years ...	286,491	1,242	4·34	26·96	1·17
40 and under 60 years ...	138,765	1,271	9·16	19·23	1·76
60 years and upwards	58,812	3,082	52·40	11·46	6·01
Totals	870,000	8,061	9·27	100·00	11·85

A similar calculation for the States of the Australian Commonwealth has been made for 1904. The results, when compared with the actual rates, exhibit to what degree the age-constitution of the population affects the death-rate. The figures for New Zealand are also given.

	Year 1904.	
	Index.	Actual.
Queensland	13·23	10·01
New South Wales	14·10	10·62
Victoria	14·29	11·92
South Australia	13·32	10·22
Western Australia	15·60	11·91
Tasmania	14·36	11·01
New Zealand	12·04	9·57
" (1905)	11·85	9·27

Deaths and Death-rates of the Four Principal Cities and their Suburbs.

In the earlier annual reports on the vital statistics of the four chief towns the central boroughs alone were dealt with, particulars respecting the suburbs not having been obtained. But this omission was held to be a grave defect, as the suburban death-rate may differ much from the death-rate at the

centre. Steps were therefore taken early in 1895 to collect statistics of the suburban boroughs as well as of the four chief cities. As regards Auckland and Christchurch, the whole of the area usually recognised as suburban has not yet been brought under municipal government, and the statistics given below do not deal with such portions as still remain in road districts. The omission, however, is not very important, for there are in either case quite enough suburbs included within borough boundaries to give a fair idea of the death-rate of Greater Auckland and Greater Christchurch. As further boroughs are formed the vital statistics will be made to include them.

The total number of deaths registered for the four centres in 1905 was 2,388—viz., 2,007 in the cities, and 381 in the suburbs.

By including the suburbs the death-rate for last year is lowered at three of the four centres. The rates for the year are :—

	Death-rates per 1,000 of Mean Population.
Auckland City	12·15
" and five suburban boroughs	10·52
Wellington City	10·55
" and two suburban boroughs	10·21
Christchurch City	10·76
" and one suburban borough	10·89
Dunedin City	11·13
" and six suburban boroughs	10·12

If the suburbs are included, the death-rate is found to be highest at Christchurch and lowest in Dunedin; Auckland and Wellington taking second and third places respectively. The death-rate for the colony was 9·27 per 1,000 of mean population. The four centres might be expected to show a higher average than this.

If the number of deaths of infants under one year be excluded, the mortality among the rest of the population is found to have been for 1904 and 1905 in the following ratio to the 1,000 living :—

	1904.	1905.
Auckland (including suburbs)	8·11	7·96
Wellington "	7·89	7·38
Christchurch "	7·62	8·25
Dunedin "	9·60	8.51

The degree of infantile mortality is perhaps best shown in the proportion of deaths of children under one year of age to every 100 births. For 1904 and 1905 the proportions at the chief centres were,—

	1904.	1905.
Auckland (including suburbs)	7·01	9·15
Wellington "	9·53	9·62
Christchurch "	10·30	8·90
Dunedin "	9·30	6·71

Thus in 1905 the proportions for Dunedin and Christchurch are less than those found at either of the other two chief cities.

Mortality at Four Centres, excluding Suburbs.

Excluding suburbs, and dealing with the deaths at all ages in the four cities or central boroughs only, the rates for 1905 are found to be lower than in the previous year at Wellington and Dunedin, but higher at Auckland and Christchurch. The figures for four years are given :—

	Deaths per 1,000 of Population.			
	1902.	1903.	1904.	1905.
Auckland (excluding suburbs)	17·21	12·97	11·11	12·15
Wellington "	12·58	11·30	10·75	10·55
Christchurch "	12·24	11·39	10·50	10·76
Dunedin "	11·86	14·77	13·59	11·13

Omitting the deaths of infants under one year, and calculating the rate on the population of one year of age and upwards, two of the boroughs show lower rates for 1905 than for the previous year.

	Deaths per 1,000 of Population, excluding Infants (under One Year of Age).				
	1901.	1902.	1903.	1904.	1905.
Auckland (excluding suburbs)	9·93	12·86	9·45	9·24	9·39
Wellington "	8·12	9·54	8·84	8·42	7·80
Christchurch "	10·69	9·03	8·83	7·87	8·46
Dunedin "	10·88	10·35	13·61	11·90	9·64

Subjoined is a table showing the rates of infant mortality in the four cities for each of the past five years, together with the mean rates for the period.

	Deaths of Children under One Year to every 100 Births.					
	1901.	1902.	1903.	1904.	1905.	Mean of Five Years.
Auckland (excluding suburbs)	11·57	15·41	12·08	6·93	10·13	11·22
Wellington "	10·43	12·97	9·28	9·55	10·02	10·45
Christchurch "	11·35	13·32	10·49	10·36	8·60	10·82
Dunedin "	9·07	8·60	7·27	8·74	7·21	8·18

Causes of Death at Four Centres, including Suburbs.

While treating of the death-rates at the chief cities and surroundings, it is desirable to refer to the causes of mortality, which is done in the remarks that follow. The deaths for the whole colony, classified according to their cause, are treated of at length a little further on.

Specific Febrile and Zymotic Diseases (at Four Chief Centres).

The mortality from these diseases was lower at each of the four centres in 1905 than in the previous year. The total deaths in this class were 115 for 1905 and 202 for 1904.

	Deaths from Febrile and Zymotic Diseases.	
	1904.	1905.
Auckland and suburbs	52	45
Wellington "	65	34
Christchurch "	36	27
Dunedin "	49	9
Totals	202	115

Of the above, diarrhœal diseases caused most deaths in 1905 at the four centres taken together, the total number being 44. Influenza came next, with 13 deaths, typhoid fever 10, whooping-cough 2, diphtheria 8, scarlet fever 5, and other zymotic complaints 33.

Comparison of the deaths for each city, including suburbs, shows,—

Zymotic, &c., Diseases.	Auckland.		Wellington.		Christchurch.		Dunedin.	
	1905.	1904.	1905.	1904.	1905.	1904.	1905.	1904.
Diarrhœal diseases ...	21	24	12	30	9	21	2	17
Influenza	3	4	3	5	4	3	3	14
Typhoid fever ...	7	9	2	4	1	2	...	4
Measels	...	...	...	4	...	..	...	...
Scarlet fever ...	2	1	3	3	...	...	...	...
Bubonic plague ...	...	1	...	...	...	...	...	...
Diphtheria	3	3	4	5	...	2	1	...
Whooping-cough ...	...	...	...	...	1	1	1	2
Other zymotic diseases	9	10	10	14	12	7	2	12

Parasitic Diseases (at Four Chief Centres).

Hydatids were fatal at Christchurch (1 death), and at Dunedin (1 death).

Dietetic Diseases (at Four Chief Centres).

These numbered 18, 8 being due to want of breast-milk, scurvy, or malnutrition, 6 to alcoholism, and 4 to delirium tremens.

Constitutional Diseases (at Four Chief Centres).

The deaths at the four cities numbered 646 in 1905. The first in importance of these diseases, and of all causes of death, is tubercle. The figures for 1904 and 1905 show 259 and 211 deaths for each year respectively.

	Phthisis and other Tubercular Diseases.			
	1905.		1904.	
	Phthisis.	Other Tubercular Diseases.	Phthisis.	Other Tubercular Diseases.
Auckland and suburbs	37	12	45	10
Wellington "	28	14	50	18
Christchurch "	44	10	42	16
Dunedin "	47	19	51	27
	156	55	188	71

The mortality from tubercular diseases for 1905 is 8·84 per cent. ot the total deaths at the four boroughs and their suburbs from all causes.

Deaths from cancer rose at the chief towns from 184 in 1904 to 191 in 1905. The latter number is 8 per cent. of deaths for the year from all causes.

The number of deaths from cancer at the four chief towns and their suburbs for each of the last five years was as under :—

	1901.	1902.	1903.	1904.	1905.
Auckland and suburbs... ...	32	44	37	45	35
Wellington "	38	37	47	44	47
Christchurch "	41	25	33	38	49
Dunedin "	43	59	62	57	60
Totals	154	165	179	184	191

Diabetes shows 32 deaths in 1905, against 24 in 1904.

Developmental Diseases (at Four Chief Centres).

There were 283 deaths in this class, of which 110 were from premature births, 157 from old age, and 16 from other causes.

Local Diseases (at Four Chief Centres).

Deaths in this class were 52 more than in 1904, the figures being 1,275, against 1,223. Diseases of the circulatory system were the most fatal of this class, amounting to 302. Diseases of the nervous system show 283 deaths—102 from apoplexy. Diseases of the respiratory system show 279 deaths for 1905, against 272 in the former year. Bronchitis, pneumonia, congestion of the lungs, pleurisy, and allied diseases form this group.

Under the head of "Diseases of the Digestive System" there were 251 deaths at the four centres, including 94 from enteritis; peritonitis, 14; gastritis, 19; cirrhosis of liver, 14; jaundice and liver-disease, 21; and dentition, 9. From appendicitis 15 deaths are particularly noted.

Diseases of the urinary system caused 109 deaths. The remaining deaths were: 4 disease of organs of special sense, 10 of the lymphatic, 31 of the reproductive systems, 2 of the organs of locomotion, and 4 of the integumentary system.

Violent Deaths (at Four Chief Centres).

There were 139 violent deaths, 109 of which were classed as accidental. Seven of these latter were caused by fractures, and 19 by falls. In 11 cases deaths resulted from the deceased being run over by a cart, tram, train, &c. Nine deaths were from burns or scalds, 16 by drowning, 6 by suffocation, 3 by poisoning, 9 by injuries to head, spine, hip, &c.; besides 9 from accident at birth, and 20 others.

One death was classified as homicide. Of 28 suicides, 7 were by shooting, 2 by cutting throat, 7 by poison, 7 by hanging, 3 by drowning, 1 by suffocation (gas), and 1 by jumping from a house.

Vital Statistics of Australasian Capitals, 1904.

The vital statistics of the chief cities, *with their suburbs*, of Australasia, show that the death-rate in Wellington (N.Z.) for 1904 was lower than that of any other of the principal towns for the same year.

Capital Cities (including Suburbs).	Estimated Mean Population.	Births.		Deaths.		Excess of Births over Deaths.
		Total Number.	Rate per 1,000 of Population.	Total Number.	Rate per 1,000 of Population.	
Melbourne ...	504,960	11,886	23·54	6,558	12·99	5,328
Sydney	514,800	13,215	25·67	5,675	11·02	7,540
Adelaide... ...	169,397	4,016	23·71	2,022	11·94	1,994
Brisbane* ...	125,068	3,301	26·40	1,433	11·46	1,868
Perth	48,400	1,780	36·78	823	17·00	957
Hobart	34,888	999	28·64	555	15·91	444
Wellington ...	55,618	1,479	26·59	580	10·43	899

* Ten mile radius.

AVERAGE AGE AT DEATH, AND EXPECTATION OF LIFE.

The average age at death of persons of either sex, in each of the ten years 1896–1905, was as follows:—

	Males.	Females.		Males.	Females.
1896	36·80 years	32·41 years.	1901	41·64 years	37·68 years.
1897	38·80 "	34·77 "	1902	41·07 "	34·88 "
1898	39·29 "	35·69 "	1903	39·56 "	35·43 "
1899	37·73 "	33·54 "	1904	41·47 "	38·44 "
1900	40·31 "	36·14 "	1905	43·03 "	39·13 "

The average expectation of life at each year of age has been compiled from a table given in a paper on the rates of mortality in New Zealand which was published by Mr. George Leslie. This is the best and most up-to-date information procurable, but it is not guaranteed by the authorities of the Government Life Insurance Department.

The table shows, on comparison with New South Wales figures (Coghlan's) that at birth the expectation of life to the male infant in New Zealand is considerably greater than in that State, the figures being 54·44 years (N.Z.), against 49·60 (N.S.W.), and for females 57·26 and 52·90.

At 21 years of age the expectation in New Zealand for males is 43·77 years, against 41·35 (N.S.W.), and for females 45·59, against 43·62.

At age 45 the comparison is, for males, 25·23 years (N.Z.), 23·27 (N.S.W.); females, 27·46 years (N.Z.), against 25·34 (N.S.W.).

At the age of 70, the limit of a normal life, the figures for New Zealand are—males 9·48 years, females 10·23, against 8·64 for both sexes in New South Wales.

Throughout the comparison is in favour of this country.

Expectation of Life in New Zealand.

Age.	Average Duration of Life: Years.		Age.	Average Duration of Life: Years.		Age.	Average Duration of Life: Years.	
	Male.	Female.		Male.	Female.		Male.	Female.
0	54·444	57·260	35	32·829	34·954	70	9·481	10·227
1	59·102	61·214	36	32·054	34·215	71	8·988	9·673
2	59·169	61·220	37	31·282	33·475	72	8·504	9·130
3	58·626	60·647	38	30·511	32·734	73	8·035	8·604
4	57·924	59·934	39	29·744	31·990	74	7·586	8·095
5	57·167	59·148	40	28·979	31·243	75	7·160	7·614
6	56·396	58·343	41	28·220	30·493	76	6·758	7·164
7	55·606	57·520	42	27·465	29·739	77	6·379	6·742
8	54·791	56·680	43	26·715	28·981	78	6·022	6·349
9	53·956	55·825	44	25·971	28·221	79	5·683	5·982
10	53·094	54·953	45	25·231	27·458	80	5·362	5·636
11	52·212	54·069	46	24·499	26·694	81	5·055	5·312
12	51·315	53·180	47	23·773	25·927	82	4·765	5·005
13	50·425	52·294	48	23·055	25·163	83	4·489	4·714
14	49·539	51·415	49	22·344	24·399	84	4·229	4·439
15	48·663	50·545	50	21·636	23·640	85	3·982	4·180
16	47·803	49·690	51	20·932	22·885	86	3·747	3·935
17	46·960	48·847	52	20·231	22·135	87	3·525	3·705
18	46·139	48·016	53	19·530	21·392	88	3·313	3·487
19	45·336	47·198	54	18·836	20·655	89	3·110	3·283
20	44·551	46·393	55	18·150	19·926	90	2·914	3·089
21	43·775	45·593	56	17·478	19·202	91	2·723	2·905
22	43·005	44·803	57	16·822	18·485	92	2·525	2·731
23	42·235	44·021	58	16·183	17·776	93	2·323	2·564
24	41·463	43·244	59	15·560	17·077	94	2·101	2·400
25	40·684	42·474	60	14·949	16·386	95	1·843	2·238
26	39·899	41·708	61	14·348	15·705	96	1·553	2·082
27	39·108	40·946	62	13·754	15·037	97	1·247	1·931
28	38·319	40·187	63	13·170	14·386	98	0·960	1·774
29	37·526	39·431	64	12·600	13·752	99	0·677	1·600
30	36·736	38·678	65	12·046	13·135	100	0·500	1·424
31	35·949	37·928	66	11·512	12·534	101	...	1·195
32	35·165	37·181	67	10·994	11·954	102	...	0·889
33	34·384	36·438	68	10·486	11·365	103	...	0·500
34	33·605	35·695	69	9·981	10·792			

ORPHANHOOD OF CHILDREN.

New Zealand statistics give detailed information on this subject, which appears to be unique. In a paper read by Mr. H. W. Manly, actuary of the Equitable Life Assurance Society, on the 27th April, 1903, before the Institute of Actuaries at London, under the heading "Children's Benefits," he stated that in order to ascertain the ages and the number of children left by a married man at his death he had to go to the same source as Mr. King did when he constructed his table of "Family Annuities"—viz., the "Statistics of the Colony of New Zealand." And, further, after announcing his intention of making very considerable use of the information, he gave the tables, grouping five ages together. ("Journal of the Institute of Actuaries," October, 1903.)

Although the subject is not one of general interest, it may be excusable to draw attention here to the tables published for the year 1905 and the experience of the quinquennial period, as shown in the "Statistics of New Zealand."

The first table shows, for the year 1905, the total number of men who died at each year of age from twenty upwards; the number of married men stated in the registers as having died (*a*) childless, (*b*) leaving children; and the number and ages of the children living at the time of the father's death. The next is a similar table, but giving five years' results for all ages of the fathers. A condensation of the table is shown.

New Zealand, 1901 *to* 1905.

Ages of Married Men at Death.	Number of Married Men who died		Number and Ages of Living Issue.					
	Childless.	Leaving Children.	Under 5.	5 to 10.	10 to 15.	15 to 21.	21 and over.	Not specified.
20 to 30 ...	73	158	234	35	1	...	...	13
30 „ 40 ...	130	639	717	674	303	48	...	83
40 „ 50 ...	150	946	600	958	1,074	978	330	151
50 „ 60 ...	190	1,403	260	626	1,075	1,925	3,174	417
60 „ 65 ...	132	1,050	55	175	397	999	4,131	251
65 and upwards ...	644	4,290	63	186	479	1,336	19,645	1,286

A table has also been prepared showing, for the year 1905, the number and ages of the youngest orphan children left.

INFANTILE MORTALITY.

Subjoined is a classified statement of the deaths of infants under one year during 1905, with the ratio of the deaths in each class to the 1,000 births during the year :—

Year.	Sex.	Under 1 Month.	1 and under 3 Months.	3 and under 6 Months.	6 and under 12 Months.	Total under 12 months.
	Number of Deaths.					
1905 ...	Male	406	159	165	171	901
	Female	308	126	125	139	698
	Deaths to the 1,000 Births.					
1905 ...	Male	33·53	13·13	13·63	14·12	74·41
	Female	26·61	10·89	10·80	12·01	60·31

Seventy-four out of every thousand of male children born, and sixty of every thousand females, are found to have died before attaining the age of one year. The mortality is thus one in thirteen of male children and one in seventeen of females, even in New Zealand, where conditions are far more favourable to infant-life than in Australia, at least as far as relates to the cities.

It will also be seen from the figures that the chances of living during the first year of age are far greater for female than for male infants. Thus, during the year 1905 there were—

100 deaths of males to 71 deaths of females under 1 month of age;
100 " 83 " from 1 to 3 months of age;
100 " 79 " from 3 to 6 months of age;
100 " 85 " from 6 to 12 months of age;
100 " 81 " under 12 months of age.

The rates of infantile mortality—that is, the proportion the deaths of children under one year of age bear to the births—are higher in the Australian States than in New Zealand.

Dealing with the results for ten years, the deaths of infants under one year are in the large proportion of three-fourths of the total deaths under five, as might be expected, the first year being the tenderest period. (See notes to tables.)

Deaths of Infants under One Year, and Proportion to Births.

Year.	Deaths of Infants under 1 Year of Age. (Totals for each Year, and Means of 10 Years.)					Total Births registered in each Year, and Mean of 10 Years.	Proportion of Deaths of Infants under 1 Year to every 1,000 Births.
	Under 1 Month.	1 Month and under 3 Months.	3 Months and under 6 Months.	6 Months and under 12 Months.	Total under 12 Months.		
1896	566	229	304	340	1,439	18,612	77·3
1897	512	240	269	333	1,354	18,737	72·3
1898	573	289	306	342	1,510	18,955	79·7
1899	619	389	378	420	1,806	18,835	95·9
1900	607	288	293	281	1,469	19,546	75·2
1901	610	272	392	289	1,563	20,491	76·3
1902	665	344	313	390	1,712	20,655	82·9
1903	692	346	367	365	1,770	21,829	81·1
1904	669	260	356	331	1,616	22,766	71·0
1905	714	285	290	310	1,599	23,682	67·5
Means of ten years ...	623	294	327	340	1,584	20,411	77·6

NOTE.—The total number of deaths of infants for the period included in the table is 15,838.

Deaths of Children under Five Years, and Proportion to Deaths at all Ages.

Year.	Deaths of Children under 1 to 5 Years of Age. (Totals for each Year, and Means of 10 Years.)						Total Deaths at all Ages for each Year, and Mean of 10 Years.	Deaths under 5 Years: Per Cent. of Mortality at all Ages.
	Under 1 Year.	1 Year and under 2 Years.	2 Years and under 3 Years.	3 Years and under 4 Years.	4 Years and under 5 Years.	Total Deaths under 5 Years.		
1896	1,439	215	59	76	64	1,853	6,432	28·81
1897	1,354	187	84	69	38	1,732	6,595	26·26
1898	1,510	200	91	72	47	1,920	7,244	26·50
1899	1,806	291	111	74	56	2,338	7,680	30·44
1900	1,469	205	93	64	58	1,889	7,200	26·24
1901	1,563	208	85	68	52	1,976	7,634	25·88
1902	1,712	307	118	92	61	2,290	8,375	27·34
1903	1,770	275	126	111	64	2,346	8,528	27·51
1904	1,616	169	83	63	43	1,974	8,087	24·41
1905	1,599	176	97	61	46	1,979	8,061	24·55
Means of ten years	1,584	223	95	75	53	2,030	7,584	26·76

NOTE.—The total number of deaths included in this table of children under 5 years is 20,297.

Although 15,838 infants (under one year) were lost to the colony by death during the decade, and 20,297 children under five, the third table shows much more satisfactory results for this colony than for New South Wales or Victoria in the matter of the preservation of infant life. Dealing with averages of five years, in New Zealand only 77 infants under one year are found to die out of every 1,000 born, against 102 in New South Wales and 98 in Victoria.

Year.	Proportion of Deaths of Infants under 1 Year of Age to every 1,000 Births.		
	New Zealand.	New South Wales.	Victoria.
1900	75·2	103·3	95·3
1901	76·3	103·7	102·9
1902	82·9	109·7	108·6
1903	81·1	110·4	106·4
1904	71·0	82·4	77·6
Means of five years	77·3	101·9	98·2

European countries show still higher mortality of infants than the principal Australian States: England and Wales, 152 (under one year) to every 1,000 births; France, 152; Italy, 167; Hungary, 214. Sweden (98) and Norway (91) are notable exceptions.

The principal causes of mortality in children under one year for New Zealand are given, with the numbers of deaths for five years from such causes. Premature birth stands first in order of importance, marasmus or debility coming next.

Deaths under One Year.—Principal Causes.

Principal Causes of Deaths of Infants.	1901.	1902.	1903.	1904.	1905.
Miasmatic diseases	41	92	191	36	20
Diarrhœal diseases	95	176	122	152	92
Premature birth	264	303	301	291	360
Convulsions	91	82	103	95	96
Bronchitis, pneumonia, pleurisy	207	235	241	149	208
Enteritis	116	154	167	231	193
Marasmus, &c.	260	294	270	273	258

A table is added to show that higher mortality obtains in the large towns than in New Zealand as a whole and two States of Australia.

Year.	Wellington and Suburbs.			Sydney and Suburbs.			Melbourne and Suburbs.		
	Total Births.	Deaths of Infants under 1 Year.	Proportion of Deaths of Infants under 1 Year to 1,000 Births.	Total Births.	Deaths of Infants under 1 Year.	Proportion of Deaths of Infants under 1 Year to 1,000 Births.	Total Births.	Deaths of Infants under 1 Year.	Proportion of Deaths of Infants under 1 Year to 1,000 Births.
1900	1,243	91	73·2	12,127	1,322	109·0	12,067	1,364	113·0
1901	1,326	133	100·3	12,601	1,517	120·4	12,375	1,536	124·1
1902	1,321	172	130·2	13,002	1,457	112·1	12,498	1,590	127·2
1903	1,520	141	92·8	12,749	1,483	116·3	12,012	1,493	124·3
1904	1,479	141	95·3	13,215	1,300	98.4	11,886	1,102	92·7
Means of five years	1,378	136	98·4	12,739	1,416	111·1	12,168	1,417	116·5

CAUSES OF DEATH (THE WOHLE COLONY).

The deaths registered in the colony during 1905, arranged in the several classes according to their assigned causes, give the rates as follows:—

Causes of Death.	Number of Deaths.			Proportion to Total Deaths.			Proportion per 10,000 living, 1905.	Porportion per 10,000 living, 1904.
	Males.	Females.	Total.	Males.	Females.	Total.		
				Per Cent.	Per Cent.	Per Cent.		
Class I.—Specific febrile or zymotic diseases,—								
Order 1. Miasmatic diseases ...	90	82	172	1·92	2·43	2·13	1·98	3·24
„ 2. Diarrhœal diseases ...	66	62	128	1·41	1·84	1·59	1·47	2·28
„ 3. Malarial diseases ...	...	...	...	...	...	...	...	...
„ 4. Zoogenous diseases ...	...	...	...	...	...	...	...	...
„ 5. Venereal diseases ...	21	7	28	0·45	0·21	0·35	0·32	0·26
„ 6. Septic diseases	30	33	63	0·64	0·98	0·78	0·72	0·94
Total Class I	207	184	391	4·42	5·46	4·85	4·49	6·72
Class II.—Parasitic diseases ...	12	4	16	0·26	0·12	0·20	0·18	0·27
Class III.—Dietetic diseases ...	42	10	52	0·90	0·30	0·64	0·60	0·62
Class IV.—Constitutional diseases ...	767	670	1,437	16·36	19·87	17·83	16·52	18·60
Class V.—Developmental diseases ...	539	440	979	11·47	13·05	12·14	11·25	9·69
Class VI.—Local diseases,—								
Order 1. Diseases of nervous system	521	392	913	11·11	11·62	11·33	10·49	10·22
„ 2. Diseases of organs of special sense	8	5	13	0·17	0·15	0·16	0·15	0·12
„ 3. Diseases of circulatory system	643	371	1,014	13·71	11·00	12·58	11·66	11·28
„ 4. Diseases of respiratory system	572	408	980	12·20	12·10	12·16	11·26	10·85
„ 5. Diseases of digestive system	410	371	781	8·75	11·00	9·69	8·98	9·54
„ 6. Diseases of lymphatic system	10	32	42	0·22	0·95	0·52	0·48	0·36
„ 7. Diseases of urinary system	265	110	375	5·65	3·26	4·65	4·31	3·59
„ 8. Diseases of reproductive system,—								
(*a.*) Of organs of generation	1	39	40	0·02	1·16	0·50	0·46	0·34
(*b.*) Of parturition ...	...	79	79	...	2·34	0·98	0·91	1·01
„ 9. Diseases of locomotive system	9	5	14	0·19	0·15	0·17	0·16	0·22
„ 10. Diseases of integumentary system	8	5	13	0·17	0·15	0·16	0·15	0·15
Total Class VI	2,447	1,817	4,264	52·19	53·88	52·90	49·01	47·68
Class VII.—Violence,—								
Order 1. Accident or negligence ...	425	95	520	9·06	2·82	6·45	5·98	7·02
„ 2. Homicide	3	2	5	0·07	0·06	0·06	0·06	0·06
„ 3. Suicide...	69	20	89	1·47	0·59	1·11	1·02	1·18
„ 4. Execution	1	....	1	0·02	...	0·01	0·01	...
Total Class VII.	498	117	615	10·62	3·47	7·63	7·07	8·26
Class VIII.—Ill-defined and not-specified causes	177	130	307	3·78	3·85	3·81	3·53	3·86
Grand totals	4,689	3,372	8,061	100·00	100·00	100·00	92·65	95·70

The next table shows, for either sex, the number of deaths from each cause registered during the year 1905 :—

Causes of Death.

Class.	Causes of Death. Order and Diseases.	Males.	Females.	Total.
I.—Specific Febrile or Zymotic Diseases.	Order 1.—*Miasmatic.*			
	Small-pox	...	...	...
	Chicken-pox ...	...	...	...
	Measles	4	4	8
	Epidemic rose-rash, rubeola	...	...	...
	Scarlet fever, scarlatina	4	6	10
	Typhus	...	...	...
	Bubonic plague ...	...	...	...
	Dengue	...	...	...
	Relapsing fever ...	...	...	...
	Influenza	40	30	70
	Whooping-cough ...	2	1	3
	Mumps	...	...	...
	Diphtheria	12	23	35
	Cerebro-spinal fever ...	1	...	1
	Simple and ill-defined fever	...	...	...
	Enteric fever, typhoid	27	18	45
	Other miasmatic diseases	...	...	...
	Total Order 1 ..	90	82	172
	Order 2.—*Diarrhœal.*			
	Simple cholera ...	8	5	13
	Diarrhœa	58	57	115
	Dysentery	...	...	...
	Total Order 2 ...	66	62	128
	Order 3.—*Malarial.*			
	Remittent fever ...	...		...
	Ague	...	...	...
	Beriberi	...	...	...
	Total Order 3 ...	...	...	...
	Order 4.—*Zoogenous.*			
	Hydrophobia ...	...	...	...
	Glanders	...	...	...
	Splenic fever ...	...	...	...
	Cow-pox and other effects of vaccination	...	...	...
	Total Order 4 ...	...	...	...
	Order 5.—*Venereal.*			
	Syphilis	19	7	26
	Gonorrhœa, stricture of urethra, ulcer of groin	2	...	2
	Total Order 5 ...	21	7	28
	Order 6.—*Septic.*			
	Phagedæna... ...	...	...	...
	Erysipelas	5	3	8
	Pyæmia, septicæmia...	25	9	34
	Puerperal fever, pyæmia, septicæmia	...	21	21
	Total Order 6 ...	30	33	63
	Total Class I ...	207	184	391

Class.	Causes of Death. Orders and Diseases.	Males.	Females.	Total.
II.—Parasitic Diseases.	Thrush	...	...	...
	Other diseases from vegetable parasites	...	...	...
	Hydatid disease ...	12	4	16
	Worms	...	...	...
	Other diseases from animal parasites	...	...	...
	Total Class II ...	12	4	16
III.—Dietetic Diseases.	Starvation, exposure...	1	1	2
	Want of breast-milk...	1	1	2
	Scurvy	5	1	6
	Intemperance—			
	Chronic alcoholism...	22	4	26
	Delirium tremens...	7	...	7
	Other dietetic diseases	6	3	9
	Total Class III	42	10	52
IV.—Constitutional Diseases.	Rheumatic fever ...	21	11	32
	Rheumatism ...	4	4	8
	Gout	1	...	1
	Rickets	1	3	4
	Cancer	313	253	566
	Tabes mesenterica, tubercular peritonitis	17	17	34
	Tubercular meningitis, acute hydrocephalus	39	36	75
	Phthisis	254	242	496
	Other forms of tuberculosis, scrofula	48	25	73
	Purpura, hæmorrhagic diathesis	8	3	11
	Anæmia, chlorosis, leucocythæmia	22	28	50
	Diabetes mellitus ...	35	44	79
	Other constitutional diseases	4	4	8
	Total Class IV	767	670	1,437
V.—Developmental Diseases.	Premature birth ...	196	164	360
	Atelectasis	8	4	12
	Cyanosis	3	5	8
	Spina bifida ...	1	6	7
	Imperforate anus ...	1	...	1
	Cleft palate, hare-lip...	1	1	2
	Other congenital defects	4	7	11
	Old age	325	253	578
	Total Class V ...	539	440	979
VI.—Local Diseases.	Order 1.—*Diseases of Nervous System.*			
	Inflammation of the brain or its membranes	67	52	119
	Cerebro-spinal meningitis	1	1	2
	Apoplexy	168	131	299
	Softening of brain ...	16	8	24
	Hemiplegia, brain paralysis	20	19	39

Causes of Death—continued.

Class.	Causes of Death. Orders and Diseases.	Males.	Females.	Total.
VI.—Local Diseases—*continued.*	ORDER 1.—*Diseases of Nervous System*—continued.			
	Paralysis (undescribed)	42	35	77
	Paralysis agitans ...	8	2	10
	Insanity, general paralysis of insane	33	13	46
	Chorea	...	...	...
	Epilepsy	23	21	44
	Convulsions ...	68	53	121
	Laryngismus stridulus	...	...	...
	Idiopathic tetanus ...	1	1	2
	Paraplegia, diseases of spinal cord	17	16	33
	Locomotor ataxia ...	8	2	10
	Other diseases of nervous system	49	38	87
	Total Order 1 ...	521	392	913
	ORDER 2.—*Diseases of Organs of Special Sense.*			
	Otitis, otorrhœa ...	8	5	13
	Epistaxis, and diseases of nose	...	...	...
	Ophthalmia, and diseases of eye	...	...	...
	Total Order 2 ...	8	5	13
	ORDER 3.—*Diseases of Circulatory System.*			
	Endocarditis, valvular diseases	407	242	649
	Pericarditis... ...	2	4	6
	Hypertrophy of heart	6	2	8
	Fatty degeneration of heart	53	29	82
	Angina pectoris ...	24	12	36
	Syncope	98	43	141
	Aneurism	13	4	17
	Senile gangrene ...	10	4	14
	Embolism, thrombosis	13	23	36
	Phlebitis	...	3	3
	Varicose veins, piles ...	....	...	...
	Other diseases of circulatory system	17	5	22
	Total Order 3 ...	643	371	1,014
	ORDER 4.—*Diseases of Respiratory System.*			
	Laryngitis	9	5	14
	Croup	7	8	15
	Other diseases of larynx and trachea	...	1	1
	Asthma, emphysema	15	7	22
	Bronchitis	198	159	357
	Pneumonia... ...	261	164	425
	Pleurisy	28	28	56
	Other diseases of respiratory system	54	36	90
	Total Order 4 ...	572	408	980

Class.	Causes of Death. Orders and Diseases.	Males.	Females.	Total.
VI.—Local Diseases—*continued.*	ORDER 5.—*Diseases of Digestive System.*			
	Stomatitis, cancrum oris	...	2	2
	Dentition	10	9	19
	Sore throat, quinsy ...	3	3	6
	Dyspepsia	4	1	5
	Hæmatemesis ...	4	3	7
	Melæna	2	6	8
	Diseases of stomach, gastritis	54	65	119
	Enteritis	135	125	260
	Ulceration, perforation of intestine	3	...	3
	Ileus, obstruction of intestine	35	20	55
	Stricture or strangulation of intestine	2	1	3
	Intussusception of intestines	4	6	10
	Hernia	20	12	32
	Fistula	1	1	2
	Peritonitis	31	33	64
	Ascites	...	3	3
	Gall-stones	5	6	11
	Cirrhosis of liver ...	24	16	40
	Other diseases of liver, hepatitis, jaundice	25	28	53
	Appendicitis ...	37	16	63
	Other diseases of digestive system	11	15	26
	Total Order 5 ...	410	371	781
	ORDER 6.—*Diseases of Lymphatic System and Ductless Glands.*			
	Diseases of lymphatic system	5	5	10
	Diseases of spleen ...	...	...	...
	Bronchocele ...	2	25	27
	Addison's disease ...	3	2	5
	Total Order 6 ...	10	32	42
	ORDER 7.—*Diseases of Urinary System.*			
	Acute nephritis ...	29	14	43
	Bright's disease ...	132	67	199
	Uræmia	18	13	31
	Suppression of urine ...	6	...	6
	Calculus	2	1	3
	Hæmaturia... ...	2	...	2
	Diseases of bladder and prostate	55	4	59
	Other diseases of urinary system (kidney-diseases undescribed)	21	11	32
	Total Order 7 ...	265	110	375
	ORDER 8.—*Diseases of Reproductive System.*			
	(*a.*) Diseases of organs of generation,—			
	Ovarian disease ..	...	8	8

Causes of Death—continued.

Class.	Causes of Death. Orders and Diseases.	Males.	Females.	Total.
VI.—Local Diseases—*continued.*	Order 8.—*Diseases of Reproductive System*—continued			
	(*a.*) Diseases of organs of generation—*ctd.*			
	Diseases of uterus and vagina	...	23	23
	Disorders of menstruation	...	1	1
	Pelvic abscess ...	...	7	7
	Perineal abscess ...	1	...	1
	Diseases of testes, penis, scrotum, &c. ...	...	...	...
	(*b.*) Diseases of parturition,—			
	Abortion, miscarriage	...	20	20
	Puerperal mania ...	...	1	1
	Puerperal metritis ...	...	...	...
	Puerperal convulsions	...	9	9
	Placenta prævia (flooding)	...	17	17
	Phlegmasia dolens ...	...	1	1
	Other accidents of child-birth	...	31	31
	Total Order 8 ...	1	118	119
	Order 9.—*Diseases of Organs of Locomotion.*			
	Caries, necrosis ...	3	1	4
	Arthritis, ostitis ...	3	1	4
	Other diseases of organs of locomotion	3	3	6
	Total Order 9 ...	9	5	14
	Order 10.—*Diseases of Integumentary System.*			
	Carbuncle	1	...	1
	Phlegmon, cellulitis ...	3	2	5
	Lupus	...	2	2
	Ulcer, bed-sore ...	...	...	...
	Eczema	2	1	3
	Pemphigus	2	...	2
	Other diseases of integumentary system	...	...	...
	Total Order 10 ...	8	5	13
	Total Class VI ...	2,447	1,817	4,264
VII.—Violence.	Order 1.—*Accident or Negligence.*			
	Fractures, contusions	210	29	239
	Gunshot wounds ...	21	1	22
	Cut, stab	12	4	16
	Burn, scald ...	20	19	39
	Sunstroke	...	...	...
	Poison	10	7	17
	Drowning	126	16	142
	Suffocation	17	10	27
	Otherwise	18	9	27
	Total Order 1 ...	425	95	520
	Order 2.—*Homicide.*			
	Murder, manslaughter	3	2	5
	Wounds in battle ...	...	...	...
	Total Order 2 ...	3	2	5
	Order 3.—*Suicide.*			
	Gunshot wounds ...	24	...	24
	Cut, stab	15	2	17
	Poison	5	8	13
	Drowning	7	7	14
	Hanging	13	2	15
	Otherwise	5	1	6
	Total Order 3 ...	69	20	89
	Order 4.—*Execution.*			
	Hanging	1	...	1
	Total Class VII ...	498	117	615
VIII.—Ill-defined and Not-specified Causes.	Dropsy	...	...	...
	Marasmus, &c. ...	162	126	288
	Mortification, gangrene	1	...	1
	Tumour	3	1	4
	Abscess	...	1	1
	Hæmorrhage ...	...	...	...
	Sudden (cause unascertained)	11	2	13
	Other ill-defined and not-specified causes	...	...	...
	Total Class VIII ...	177	130	307
	General totals ...	4,689	3,372	8,061

MORTALITY FROM FEBRILE AND ZYMOTIC DISEASES.

The deaths in 1905 from specific febrile or zymotic diseases amounted to 391, a propotion of 4·49 in every 10,000 persons living, and a decrease of 177 on the number of deaths in 1904, when the proportion was 6·72.

The feature of last year's mortality is the comparative freedom of the colony from some of the epidemic diseases most fatal to children—viz., measles, scarlet fever, scarlatina, and whooping-cough—the total deaths from these causes being only 21, against 58 in 1904 and 478 in 1903.

The diseases in this class that have caused the greatest mortality during the past ten years are stated in the table that follows. Of these, diarrhœal complaints were by far the most fatal, causing 2,282 deaths in the decennial period. Influenza comes next, with 1,319 deaths; typhoid fever third, with 838 deaths; whooping-cough fourth, with 579 deaths; measles fifth, with 505 deaths; diphtheria next, 472 deaths; scarlet fever, with 228 deaths; and puerperal fever, with 201 deaths:—

Diseases.	1896.	1897.	1898.	1899.	1900.	1901.	1902.	1903.	1904.	1905.
Measles	1	1	56	137	9	6	134	143	10	8
Scarlet fever and scarlatina	4	2	2	...	10	17	39	131	13	10
Diphtheria	74	49	45	58	63	44	54	23	27	35
Whooping-cough ...	24	2	6	123	90	9	83	204	35	3
Influenza	89	120	219	135	181	219	117	56	113	70
Diarrhœal diseases ...	334	257	275	298	199	139	275	184	193	128
Enteric or typhoid fever...	124	106	120	93	68	95	53	61	73	45
Puerperal fever ...	10	18	19	15	24	20	25	28	21	21

The mortality from measles from 1896 to 1898 was not great, but rose to 137 deaths in 1899, falling again to 9 deaths in 1900 and 6 deaths in 1901, again rising to 134 in 1902, and further to 143 deaths in 1903. During 1904 and 1905 this disease was not epidemic in the colony, and caused only ten and eight deaths respectively. From scarlet fever and scarlatina there were only 10 deaths last year, as compared with 131 in 1903, and 13 in 1904. The mortality from diphtheria, which was 74 deaths in 1896, fell to 35 deaths in 1905, the figures for the intervening years not presenting any striking features.

Whooping-cough in 1896, 1897, and 1898, caused 32 deaths. In 1899 the mortality sprang up again to a total of 123 deaths, against 90 in 1900, 9 in 1901, and 83 in 1902. In 1903 the mortality was heavy, the number of deaths being 204, but in 1904 only 35 deaths are recorded from this complaint, while last year the number was further reduced to 3 deaths.

The deaths from influenza numbered 7 in 1905, as against 113 in the previous year. The figures for the eight previous years ranged from 89 to 219, the last being for the years 1898 and 1901.

From diarrhœal complaints the deaths in 1905 were 128, against 193 in 1904; while in 1896 the mortality reached the height of 334 deaths, and in 1889 was even higher (355), with a much smaller population than in 1905.

Enteric or typhoid fever was less fatal in 1905 than in 1904, the figures being 45 deaths, against 73. The highest mortality during the decennium was in 1896, when the deaths numbered 124 for the colony.

BUBONIC PLAGUE.

The year 1900 saw the outbreak of the disease known as the bubonic plague in Sydney and other parts of Australia. In that year there was one death from plague in New Zealand, which occurred in Auckland. None happened in the year 1901, but three deaths from this cause, all males, were registered at Auckland during 1902. No deaths from plague were recorded in 1903, but one death occurred in 1904. Last year no deaths were ascribed to this cause. The Public Health Department is taking every possible precaution. [In no instance has the disease spread beyond the single case.]

VACCINATION.

The vaccinations registered for the last ten years are as under:—

Year.	Total Vaccinations registered of Children under 14 Years of Age.	Vaccinations of Children under 1 Year of Age.	Number of Births registered.	Proportion of Successful Vaccinations of	
				Children under 14 Years of Age to Total Births. Per Cent.	Children under 1 Year of Age to Total Births. Per Cent.
1905 ...	3,818	2,079	23,682	16·12	8·78
1904 ...	18,368	2,323	22,766	80·68	10·20
1903 ...	11,683	5,566	21,829	53·52	25·50
1902 ...	8,763	2,611	20,655	42·43	12·64
1901 ...	3,768	1,984	20,491	18·39	9·68
1900 ...	4,525	3,151	19,546	23·15	16·12
1899 ...	5,133	3,379	18,835	27·25	17·94
1898 ...	10,349	5,507	18,955	54·60	29·05
1897 ...	12,440	6,162	18,733	66·41	32·89
1896 ...	11,917	5,727	18,612	64·03	30·78

The number of successful vaccinations of children registered in 1905 was 3,818, against 18,368 in 1904. The fall prior to 1902 was consequent on the alteration of the law relative to vaccination in England, and subsequently in this colony, while the increase shown for the three years 1902–4 was no doubt due to a slight visitation of small-pox from abroad, which caused one death in 1903.

Nine children out of every hundred born in 1905 are shown to have been successfully vaccinated in that year. This is a falling-back to the position which obtained in 1901 as regards vaccination of infants. The exemptions taken out will also be found from the subsequent remarks to have fallen in number. The procedure under the new law as regards vaccination is similar to that previously in force. The Registrar issues a notice when a birth is registered, with forms for certificate as to the result of vaccination attached. Vaccination is still compulsory, if exemption is not secured in four months from date of birth. But everything is now subject to the provisions of the "exemption clause," which is the main feature, and governs the rest. Any parent or custodian who has conscientious objections—believing that vaccination would be injurious to the child's health—can apply for a certificate of exemption to a Magistrate or Registrar of Births; and, when the child's parent or guardian is resident outside of a borough, the application may be made to and certificate granted by a Justice of the Peace.

Thirteen thousand one hundred and seventy-nine exemption certificates were issued from the 13th October, 1900, when the Act came into force, to the end of the year 1905. Of these, 1,966 belong to the year 1905, when, as before stated, the successful vaccination of children under one year of age amounted to 2,079, or 9 per cent. of births.

[I have referred in this and my previous reports to the deplorable falling-off in vaccinations.]

When no exemption certificate is obtained, the law now allows to the parent *twelve months* instead of *six* from the date of birth in which to vaccinate, and a similar period from date of taking charge of child in case of a custodian. There are penalties for not vaccinating, as before. One conviction for neglecting to vaccinate a child removes liability until the child is four years of age.

The figures given above do not include Maoris vaccinated, nor vaccinations of adult persons other than Natives.

[A large number of Maoris have been vaccinated, I am glad to say, and the number of revaccinations has been considerable.]

PARASITIC DISEASES.

There were 16 deaths from parasitic diseases, the proportion per 10,000 living being 0·18. Deaths from hydatids numbered 16 in 1905.

DIETETIC DISEASES.

Under the class "Dietetic diseases" are included 33 deaths from intemperance. But these cannot be said to represent the full extent of the mortality really caused by the abuse of alcoholic liquors. Many deaths of intemperate persons are attributed to diseases of the liver, kidneys, &c., in the medical certificates.

CONSTITUTIONAL DISEASES: PHTHISIS, CANCER, ETC.

The deaths from constitutional diseases in 1905 numbered 1,437, or 16·52 per 10,000 of population, and 18 out of every 100 deaths from all causes. This class of disease is more fatal than any other except that defined as "Local diseases," on account of the great numbers of deaths from cancer and phthisis, with other tubercular complaints, which are classed as "Constitutional."

The number of deaths from phthisis was 496 in 1905. The deaths in 1905 were in the proportion of 5·70 in every 10,000 persons living, against 7·08 in the previous year.

Figures for ten years are quoted, showing that the total number of deaths from this disease in 1902 was the highest recorded during the decennium, though the rate has been higher in some of the previous years.

Year.	Deaths from Phthisis.	Rate per 10,000.
1896	523	7·40
1897	596	8·26
1898	597	8·11
1899	593	7·91
1900	577	7·56
1901	596	7·66
1902	617	7·73
1903	570	6·95
1904	598	7·08
1905	496	5·70

Of the persons dying from phthisis in New Zealand during 1905, more than one-half were born in the colony. The numbers are: Total of deaths from phthisis, 496; 275 of them having been New-Zealand-born. The proportion is 55 per cent.

At the census of 1901 the New-Zealand-born were shown to be 67 per cent. of the population, which would give the approximate number of the same in 1905 as 582,900. The death-rate from phthisis amongst these persons was, judging from the numbers in the table annexed, 4·72 per 10,000 living.

The death-rate from phthisis in the United Kingdom is stated by the Registrar-General to be at the rate of 12·03 per 10,000 living for the year.

Deaths from Phthisis, 1905.

TABLE showing the Number of Persons who died from Phthisis in the Colony during the Year 1905, classified according to Age, Sex, and Length of Residence in the Colony.

Length of Residence in the Colony.	Age at Death.										
	Under 5 Years.	5 to 10.	10 to 15.	15 to 25.	25 to 35.	35 to 45.	45 to 55.	55 to 65.	65 to 75.	75 and upwards.	Total.
Males.											
Under 1 month	...	...	...	1	...	2	...	...	...	...	3
1 to 6 months	1	...	...	...	1	1	1	...	...	...	4
6 to 12 months	...	...	...	3	...	...	...	...	...	...	3
1 to 2 years	...	...	...	1	2	...	...	...	..	...	3
2 to 3 years	...	...	...	...	3	1	...	...	...	...	4
3 to 4 years	...	..	...	...	4	...	1	...	...	...	5
4 to 5 years	...	...	...	...	2	...	...	...	...	...	2
5 to 10 years	...	...	...	...	...	5	1	...	...	...	6
10 to 15 years	...	...	...	...	4	3	...	1	1	...	9
15 to 20 years	...	...	...	...	1	3	...	1	...	...	5
20 to 25 years	...	...	...	...	2	...	3	2	...	...	7
25 years and upwards ...	...	...	...	...	6	3	14	25	13	2	63
Not known	...	...	...	2	5	7	7	4	4	1	30
Born in colony	2	1	2	46	41	13	3	1	1	...	110
Totals	3	1	2	53	71	38	30	34	19	3	254
Females.											
Under 1 month	...	...	...	...	...	...	...	...	...	...	...
1 to 6 months	...	...	...	...	1	...	...	...	..	...	1
6 to 12 months	...	...	...	...	...	...	...	...	...	...	...
1 to 2 years	...	...	...	1	1	...	...	...	...	...	2
2 to 3 years	...	...	...	...	1	...	...	...	...	...	1
3 to 4 years	...	...	...	...	...	1	...	1	...	...	2
4 to 5 years	...	...	...	...	...	...	...	...	...	...	...
5 to 10 years	...	...	...	...	1	...	...	...	...	...	1
10 to 15 years	...	...	...	...	...	...	...	...	...	...	...
15 to 20 years	...	...	...	1	...	...	...	...	...	...	1
20 to 25 years	...	...	...	1	6	4	...	1	...	...	12
25 years and upwards ...	...	...	...	...	6	8	11	14	10	3	52
Not known	...	...	...	2	...	1	1	...	...	1	5
Born in colony	1	...	5	66	69	20	4	...	...	...	165
Totals	1	...	5	71	85	34	16	16	10	4	242
Totals of both sexes ...	4	1	7	124	156	72	46	50	29	7	496

In Australasia the rate is materially increased by the deaths of persons who have come from other countries either already suffering from phthisis or predisposed thereto. There is no reason for believing that this circumstance has more effect on the death-rate in Australia than in New Zealand.

From other forms of tuberculosis the deaths in 1905 were 182, or 2·09 per 10,000 of population. Thus a large addition has to be made to the deaths from phthisis to appreciate the full mischief done by tubercular disease.

Deaths from all Tubercular Diseases.

The mortality from all forms of tubercular disease, taken together, has been at the average rate of about 10 persons per 10,000 living for the last ten years. This rate is far lower than that which obtained in England during the year 1903, when the proportion was 17·42 per 10,000 living.

A table is supplied showing the results for each of ten years in New Zealand. Besides the death-rate from tubercular disease, it also shows the percentage of deaths by tubercle to those from all causes, which was from 8·41 to 11·57 per cent. for the decennial period 1896–1905

DECENNIAL TABLE, 1896–1905, showing the Death-rate from Tubercle per 10,000 Living, and Percentage of Total Deaths.

Year.	Mean Population.	Number of Deaths from Tubercular Diseases.	Rate per 10,000.	Percentage of Total Deaths from all Causes.
1896	706,846	680	9·62	10·57
1897	721,609	763	10·57	11·57
1898	736,260	769	10·44	10·62
1899	749,984	795	10·60	10·35
1900	763,594	752	9·85	10·44
1901	777,968	775	9·96	10·15
1902	797,793	802	10·05	9·58
1903	820,217	769	9·38	9·02
1904	845,022	799	9·46	9·88
1905	870,000	678	7·79	8·41

DECENNIAL TABLE, 1896–1905.—Deaths (Persons) from various Tubercular Diseases registered in New Zealand, specifying the Number under and over Five Years of Age.

Year.	Tabes Mesenterica, Tubercular Peritonitis.		Tubercular Meningitis, Acute Hydrocephalus.		Phthisis.		Other Forms of Tuberculosis, Scrofula.		Total Deaths from Tuberculosis.		Total of all Ages.
	Under 5 Years.	Over 5 Years.	Under 5 Years.	Over 5 Years.	Under 5 Years.	Over 5 Years.	Under 5 Years.	Over 5 Years.	Under 5 Years.	Over 5 Years.	
1896	36	11	30	28	5	518	19	33	90	590	680
1897	35	9	33	32	7	589	13	45	88	675	763
1898	37	12	37	38	10	587	11	37	95	674	769
1899	43	19	32	40	10	583	12	56	97	698	795
1900	20	20	24	55	13	564	9	47	66	686	752
1901	30	22	30	31	10	586	14	52	84	691	775
1902	26	19	36	30	5	612	8	66	75	727	802
1903	22	28	39	35	9	561	11	64	81	688	769
1904	17	18	44	44	5	593	12	66	78	721	799
1905	15	19	37	38	4	492	8	65	64	614	678

Nine deaths from "lupus" recorded during the decennium have not been included in the above table. They were all deaths of adult persons (3 males and 6 females), excepting 1, aged 13 years. Two deaths of females, aged 13 and 69 respectively, were registered as from this disease in 1905.

It will be seen that the term "tubercular diseases" includes "phthisis," "tabes mesenterica," "tubercular peritonitis," "tubercular meningitis," "acute hydrocephalus," with other forms of tuberculosis (scrofula, &c.). Of these the mortality from phthisis forms by far the greatest part of the whole. Thus, in 1905 there were 496 deaths from phthisis out of a total of 678 deaths from all tubercular complaints. Of 496 deaths by phthisis, only 4 were of persons under 5 years of age.

Examination of the next table, giving the full series of ages of persons who died from tubercular disease during the year 1905, shows that of 34 deaths from tabes mesenterica, with tubercular peritonitis, 15 were of children under 5 years. Also that, of 75 deaths from tubercular meningitis, with acute hydrocephalus, 37 were of persons under 5 years, and 24 from 5 to 20 years. Under "other forms of tuberculosis" (excepting phthisis) the greater numbers of deaths are at ages under 30 years.

The mortality from phthisis is heaviest at 20–30 years, being 183 deaths out of 496 of all ages; but large numbers are found in the columns as far as that for the advanced term of 65 to 70 years, at which the deaths of 1905 were 20, and 16 deaths from this cause are of persons of 70 years and upwards.

TABLE showing the Number of Deaths (Persons) from Tubercular Diseases registered in New Zealand during the Year 1905, arranged in Groups of Ages.

—	Under 1 Year.	Under 5 Years.	5 to 10.	10 to 15.	15 to 20.	20 to 25.	25 to 30.	30 to 35.	35 to 40.	40 to 45.	45 to 50.	50 to 55.	55 to 60.	60 to 65.	65 to 70.	70 to 75.	75 to 80.	80 and upwards.	Total, 5 Years and over.	All Ages.
Tabes mesenterica, tubercular peritonitis	12	15	3	1	3	3	4	2	...	1	1	...	1	...	...	...	...	...	19	34
Tubercular meningitis, acute hydrocephalus	12	37	11	8	5	5	1	3	3	...	1	...	1	...	...	...	...	...	38	75
Phthisis	2	4	1	7	33	91	92	64	40	32	25	21	25	25	20	9	5	2	492	496
Other forms of tuberculosis, scrofula	3	8	6	4	6	9	3	9	7	5	4	3	5	1	3	...	...	...	65	73
Totals ...	29	64	21	20	47	108	100	78	50	38	31	24	32	26	23	9	5	2	614	678

To show the mortality from tuberculosis in various parts of the colony, a table giving the deaths in the various provincial districts is added, which, however, only shows that the mortality is distributed very much according to population. The deaths in the North Island, are however, found to be 48 fewer than those for the South Island, or 315 deaths and 363 deaths for those divisions respectively.

TABLE showing the Number of Deaths (Persons) from Tubercular Disease registered in each Provincial District of New Zealand during the Year 1905.

Provincial District.	Tabes Mesenterica, Tubercular Peritonitis.	Tubercular Meningitis, Acute Hydrocephalus.	Phthisis.	Other Forms of Tuberculosis, Scrofula.	Total Deaths from Tuberculosis.
Auckland ...	9	8	117	19	153
Taranaki ...	1	9	16	3	29
Hawke's Bay ...	1	4	27	2	34
Wellington ...	6	17	63	13	99
Marlborough ...	...	...	7	4	11
Nelson ...	3	1	29	4	37
Westland ...	...	2	5	2	9
Canterbury ...	4	13	101	6	124
Otago ...	10	21	131	20	182
Totals ...	34	75	496	73	678

Cancer.

The deaths from cancer during the year 1905 were 566. There were more deaths of males than of females, the numbers being—males 313, females 253. The rate of mortality per 10,000 living was 6·51. The apparent increase in deaths from this disease is shown further on, and compared with that of England.

It is certain, however, that out of a total of 8,061 deaths from all causes in New Zealand during 1905, 566, or 7·02 per cent., were caused by cancer.

The death-rate from cancer is not so great as that from tubercular diseases, but is nevertheless a most alarming matter, not only on account of the number of deaths, but because of its progressive increase.

A decennial table shows that the deaths from cancer per 10,000 persons living rose from 5·5 in 1896 to 7·1 in 1903, 6·76 in 1904, and 6·51 in 1905; and that whereas 6·05 out of every 100 deaths were attributable to cancer ten years ago, the proportion had grown to 7·02 last year.

TABLE showing for each of the Ten Years 1896 to 1905 the Number of Persons registered as having died from Cancer, the Proportion of Deaths from Cancer per 10,000 living, and the Percentage of all Deaths attributed to Cancer.

Year.	Estimated Mean Population.	Deaths from Cancer.	Total Deaths, all Causes.	Deaths from Cancer per 10,000 of Living Persons.	Percentage of Total Deaths due to Cancer.
1896	706,846	389	6,432	5·50	6·05
1897	721,609	395	6,595	5·47	5·99
1898	736,260	471	7,244	6·40	6·50
1899	749,984	468	7,680	6·24	6·09
1900	763,594	430	7,200	5·63	5·97
1901	777,968	515	7,634	6·62	6·75
1902	797,793	536	8,375	6·72	6·40
1903	820,217	582	8,528	7·10	6·82
1904	845,022	571	8,087	6·76	7·06
1905	870,000	566	8,061	6·51	7·02

To exhibit how cancer affects the different parts of the human body in respect of each sex, the experience of five years (1901 to 1905) is shown in a succeeding table. Of any single organ affected, the stomach is the one most liable to be the seat of cancer among males, while the mouth, lips, tongue, and throat, taking all these organs together, show a large number. Next to the stomach, the liver is with males the organ which is most often attacked, to judge by mortality records, and next in order come the intestines and rectum. Afterwards follow the kidneys, bladder, and urethra.

Amongst the females, the organs of generation—ovaries, uterus, and vagina—as a group, show most cases of mortality from cancer; but, as with the males, the stomach is, of any single organ, the one most affected, the breast, liver, intestines, and rectum following. Females do not contract cancer in the mouth (judging by the returns of deaths), tongue, lips, and throat to nearly the same extent as prevails among males. Whatever may be the cause, the figures are remarkable, being only 6·5 out of every 100 deaths from cancer among females, against 28·3 out of every 100 of males dying from the same cause, or, expressed in numbers, 74 deaths of females occurred against 400 of males from cancer in the mouth, &c., in a five years' experience of mortality.

DEATHS FROM CANCER, 1901, 1902, 1903, 1904, AND 1905.—TABLE showing the Number of Deaths of Males and Females from Cancer during the Years 1901 to 1905, classified according to the Part of the Body affected.

Part affected.	1901.		1902.		1903.		1904.		1905.	
	Number of Deaths.	Proportion of Specified.	Number of Deaths.	Proportion of Specified.	Number of Deaths.	Proportion of Specified.	Number of Deaths.	Proportion of Specified.	Number of Deaths.	Proportion of ecified.
Males.										
		Per Cent.		Per Cent.		Per Cent.		Per Cent.		Per Cent.
Mouth, lip, tongue, throat, neck, &c.	60	24·69	63	24·14	99	33·56	99	32·46	79	26·69
Stomach	97	39·92	112	42·91	96	32·54	107	35·08	107	36·15
Intestines, rectum	32	13·17	32	12·26	35	11·87	34	11·15	29	9·80
Liver	37	15·23	38	14·56	35	11·87	42	13·77	49	16·55
Kidneys, bladder, urethra, &c.	13	5·35	12	4·60	17	5·76	13	4·26	25	8·45
Leg, foot, &c.	...	...	...	...	4	1·35	7	2·30	4	1·35
Lung	4	1·64	4	1·53	9	3·05	3	0·98	3	1·01
	243	100·00	261	100·00	295	100·00	305	100·00	296	100·00
Not specified	22	...	35	...	30	...	18	...	17	...
Totals	265	...	296	...	325	...	323	...	313	...
Females.										
		Per Cent.		Per Cent.		Per Cent.		Per Cent.		Per Cent.
Mouth, tongue, throat, &c. ...	6	2·77	16	7·44	21	9·05	12	5·17	19	8·09
Breast	38	17·51	33	15·35	33	14·23	25	10·78	38	16·17
Stomach	61	28·11	43	20·00	51	21·98	55	23·71	51	21·70
Intestines, rectum	19	8·76	33	15·35	28	12·07	32	13·79	34	14·47
Kidneys, bladder	2	0·92	8	3·72	5	2·16	4	1·72	7	2·98
Ovary, uterus, vagina ...	55	25·35	44	20·46	48	20·69	58	25·00	49	20·85
Liver	29	13·36	33	15·35	38	16·38	35	15·09	27	11·49
Gall-bladder, spleen, pancreas...	2	0·92	3	1·40	4	1·72	1	0·43	4	1·70
Lung, spine, thigh, shoulder ...	5	2·30	2	0·93	4	1·72	10	4·31	6	2·55
	217	100·00	215	100·00	232	100·00	232	100·00	235	100·00
Not specified	33	...	25	...	25	...	16	...	18	...
Totals	250	...	240	...	257	...	248	...	253	...

Considering the numbers of persons dying at the different age-periods, the following table of ten years' results shows the age of 30 years to be the time of life at which deaths from cancer begin to be numerous (it is really 35 for males and 30 for females). The maximum of deaths is reached at the period 60 to 65 for males, and 55 to 60 for females. These remarks are given without reference to the numbers of persons living at the various ages.

Deaths from cancer, it will be observed, are very rare among children under 5 years, and not frequent in those above that age.

DEATHS FROM CANCER.—DECENNIAL RETURN.—TABLE showing the Number of Persons (Males and Females) at Different Ages registered as having died from Cancer in New Zealand during the Ten Years 1896 to 1905.

Year.	Under 1 Year.				Total under 1 Year.	1 to 2.	2 to 3.	3 to 4.	4 to 5.	Total under 5 Years.	5 to 10.	10 to 15.	15 to 20.	20 to 25.	25 to 30.	30 to 35.	35 to 40.	40 to 45.	45 to 50.	50 to 55.	55 to 60.	60 to 65.	65 to 70.	70 to 75.	75 to 80.	80 and upwards.	Total 5 Years and over.	All Ages.
	Under 1 Month.	1 to 3 Months.	3 to 6 Months.	6 to 12 Months.																								
1896	..	..	..	..	..	..	..	..	2	2	2	1	1	2	5	6	14	21	36	59	74	67	49	29	14	7	387	389
1897	..	1	..	..	1	..	1	..	1	3	..	2	1	1	..	7	10	22	41	42	71	74	49	35	29	8	392	395
1898	..	..	..	..	..	..	..	2	..	2	1	2	2	5	5	8	17	36	47	47	77	79	69	35	30	9	469	471
1899	..	..	..	..	..	..	..	1	..	1	3	3	..	1	4	6	15	21	42	48	82	64	87	45	27	19	467	468
1900	..	1	..	..	1	..	..	1	..	2	..	..	6	2	2	6	7	16	40	35	75	78	59	51	31	20	428	430
1901	..	..	1	..	1	..	..	..	..	1	2	..	4	5	5	8	20	31	53	60	65	80	74	63	33	11	514	515
1902	..	..	..	..	..	..	..	..	..	..	1	..	3	5	5	7	22	35	49	50	72	88	86	67	31	15	536	536
1903	1	..	..	..	1	..	..	..	..	1	4	1	2	6	10	9	20	37	47	68	69	87	96	72	38	15	581	582
1904	..	..	..	1	1	..	..	..	1	2	3	1	3	2	9	6	15	25	35	57	72	99	99	79	31	33	569	571
1905	..	..	..	..	..	..	..	..	1	1	..	1	3	1	9	10	15	26	39	58	67	84	96	99	38	19	565	566

The number of deaths of persons from cancer in each provincial district are given in another table, according to age-groups, but the result merely shows the disease to be one found everywhere throughout the colony—at least, there is no sufficient evidence of climatic conditions affecting the mortality to a great extent in any particular part of the country.

TABLE showing the Number of Deaths from Cancer registered in each Provincial District of the Colony of New Zealand during the Years 1902–5.

Provincial Districts.	1902.			1903.			1904.			1905.		
	Under 5 Years.	Over 5 Years.	Total.	Under 5 Years.	Over 5 Years.	Total.	Under 5 Years.	Over 5 Years.	Total.	Under 5 Years.	Over 5 Years.	Total.
Auckland ...	...	115	115	...	117	117	1	114	115	...	110	110
Taranaki ...	...	24	24	...	21	21	...	21	21	...	20	20
Hawke's Bay	...	15	15	...	26	26	...	25	25	...	16	16
Wellington ...	...	95	95	1	107	108	...	113	113	...	106	106
Marlborough	...	7	7	...	6	6	...	5	5	...	6	6
Nelson ...	...	33	33	...	28	28	...	32	32	...	25	25
Westland ...	...	19	19	...	35	35	...	16	16	...	10	10
Canterbury ...	...	98	98	...	105	105	...	109	109	...	112	112
Otago ...	...	130	130	...	136	136	1	134	135	1	160	161
Totals ...	...	536	536	1	581	582	2	569	571	1	565	566

The death-rates for cancer in respect of each sex are given for each of ten years, selected to show the position as from 1886 to 1905 :—

DEATHS from CANCER in every 10,000 Persons of each Sex living in New Zealand.

Year.	Males.	Females.	Year.	Males.	Females.
1886	3·69	3·67	1901	6·48	6·77
1890	4·72	4·79	1902	7·05	6·35
1894	6·65	5·27	1903	7·51	6·63
1898	6·77	5·98	1904	7·23	6·23
1899	6·85	5·56	1905	6·79	6·18
1900	6·12	5·09			

The mortality was higher among the males than among the females (with the exception of 1890 and 1901), which is the reverse of English experience, where the rate was 7·32 per 10,000 of males and 10·03 of females for the year 1903. In the United Kingdom, however, the rate of increase is so much higher among males than with females that the Registrar-General calculates equilibrium will be reached in about the year 1932, and thereafter the rate among males would exceed the rate among females.

The increase in the numbers for the sexes together for England and New Zealand is represented in the proportions below :—

DEATHS from CANCER in every 10,000 Persons living.

Year.	New Zealand.	England.	Year.	New Zealand.	England.
1881	2·69	5·20	1899	6·24	8·29
1886	3·68	5·90	1900	5·63	8·28
1891	4·68	6·92	1903	7·10	8·71
1896	5·50	7·64			

The actual number of deaths of persons of either sex and all ages registered in New Zealand during the last fifteen years was :—

	Males.	Females.	Totals.		Males.	Females.	Totals.
1891	154	141	295	1900	246	184	430
1892	173	134	307	1901	265	250	515
1893	188	144	332	1902	296	240	536
1894	240	168	408	1903	325	257	582
1895	208	175	383	1904	323	248	571
1896	205	184	389	1905	313	253	566
1897 ...	210	185	395				
1898	263	208	471	Totals ...	3,680	2,968	6,648
1899	271	197	468				

MORTALITY FROM DEVELOPMENTAL DISEASES.

The total of deaths from developmental diseases was 979, or 11·25 per 10,000 persons living. The mortality from premature birth comprised 360 deaths, and that from atelectasis, cyanosis, and other congenital defects 41 deaths. The proportion of deaths from premature birth varies from 11 to 15 out of every 1,000 births, and that from congenital defects from 2 to 4 per 1,000 births. Particulars for ten years exhibit the annual rates :—

Number and Proportions per 1,000 Births.

Year.	Deaths from Premature Birth.		Deaths from Congenital Defects.	
	Number.	Proportion per 1,000.	Number.	Proportion per 1,000.
1896	... 230	12·36	... 46	2·47
1897	... 211	11·26	... 52	2·78
1898	... 251	13·24	... 54	2·85
1899	... 261	13·86	... 47	2·50
1900	... 276	14·12	... 55	2·81
1901	... 264	12·88	... 63	3·07
1902	... 303	14·66	... 79	3·82
1903	... 301	13·79	... 67	3·07
1904	... 291	12·78	... 58	2·54
1905	... 360	15·20	... 41	1·73

Stating the result in another way, there was one death from premature birth to every 66 births in 1905, and one death from congenital defect to every 578 births. In England the proportion of deaths from premature birth to every 1,000 births was as high as 19·93 in the year 1900.

OLD AGE.

Deaths from old age in 1905 numbered 578, against 470 in 1904.

MORTALITY FROM LOCAL DISEASES.

Deaths by diseases of the nervous system were 913, or 11·33 out of every 100 deaths from all causes, and 10·49 out of every 10,000 persons living. Of the 913 deaths, 299 were due to apoplexy, 121 to convulsions, and 119 to inflammation of the brain and its membranes. Paralysis, including hemiplegia and paralysis of the insane, caused 172 deaths, and locomotor ataxia 10 deaths. Paraplegia, with diseases of the spinal cord, caused 33 deaths. Deaths from nervous diseases (excluding convulsions of children) numbered 792, or 9·10 per 10,000 persons living.

Diseases of the circulatory system resulted in 1,014 deaths, being 12·58 out of every 100 from all causes, and 11·66 per 10,000 persons living. Of the total number in this order, endocarditis and valvular disease of the heart contributed 649 deaths. From angina pectoris there were 36 deaths, from syncope 141, from aneurism 17, and from other forms of heart-disease (hypertrophy, fatty degeneration, and pericarditis) 96.

Diseases of the respiratory system show 980 deaths, of which 782 were attributable to bronchitis and pneumonia. Taken together, these two complaints were the cause of more deaths than was phthisis; and adding 56 from pleurisy, 15 from croup, 14 from laryngitis, and 113 from other respiratory diseases, the mortality in the order is found to be 12·16 per cent. of the total deaths, and 11·26 per 10,000 of the population.

Deaths from diseases of the digestive system also formed a large proportion of the whole (9·69 per cent.), the number being 781. Enteritis was most fatal, showing 260 deaths, liver-diseases (93), gastritis (119) coming next, while 53 deaths were due to appendicitis.

Of 375 deaths from diseases of the urinary system in 1905, the deaths from Bright's disease of the kidneys (albuminuria) numbered 199.

Of the groups (*a*) and (*b*), constituting the order styled "Diseases of the reproductive system," the greater mortality is found under (*b*), "Diseases of parturition." In considering the deaths of women in childbirth the number from Order 6, Class I, under the designation "Puerperal fever, pyæmia, septicæmia," have also to be dealt with.

As the figures are highly important, a special comparative statement has been made out, giving besides the number of deaths of mothers the proportions in every 10,000 children born. These proportions, taken over ten years' comparison, fluctuate irregularly, the extreme limits being 38·37 per 10,000 births in the year 1900, and 58·64 for the year 1903.

Women dying in Childbirth.

Year.	Deaths of Women in each Year.			Deaths of Mothers to every 10,000 Children Born.*
	In Childbirth.	From Puerperal Fever, &c.	Total.	
1896	77	10	87	46·74
1897	64	18	82	43·76
1898	72	19	91	48·01
1899	71	15	86	45·66
1900	51	24	75	38·37
1901	70	20	90	43·92
1902	85	25	110	53·26
1903	100	28	128	58·64
1904	85	21	106	46·56
1905	79	21	100	42·23

* Stillbirths are not registered.

But any conclusion drawn from the above figures must be held as qualified by the remarks touching the matter of diminished fertility of wives at the child-bearing ages.

VIOLENT DEATHS.

Deaths by violence form a large item in the total mortality. In 1905 the proportion per 10,000 of persons living was 7·07, the total number of deaths having been 615.

Of 498 males who died violent deaths, 69 were suicides. The deaths of females by violence were far fewer than those of males, amounting to 117, and out of these only 20 committed suicide. A table given previously states the full list of deaths from external or violent causes for the year 1905.

Accidental deaths numbered 520—males 425, and females 95. Of the total male deaths, 201 resulted from fractures or contusions, and 126 from drowning. Of the female deaths, 16 were due to drowning.

I have the honour to be
Sir,
your most obedient servant,
J. M. Mason, M.D., D.P.H., Camb.,
Chief Health Officer for the Colony.

The Honourable Sir J. G. Ward, K.C.M.G., Minister of Public Health, Wellington.

APPENDIX.

REPORTS OF DISTRICT HEALTH OFFICERS.

AUCKLAND DISTRICT.

Department of Public Health, Auckland, 1906.

J. Malcolm Mason, Esq., M.D., &c., Chief Health Officer, Wellington.

I HAVE the honour to submit to you the sixth annual report of the Auckland Health District, covering the period from the 1st April, 1905, to the 31st March, 1906.

The character of the work in the district this year might well be summarised in the words of the old adage, "In time of peace prepare for war." I feel satisfied the better public sentiment towards the improvement of health conditions is being well maintained. The self-evident humanitarian aspect of the prevention of disease is being more and more strengthened by a ready recognition on the part of local authorities and the community in general that the less convincing economic side of the problem warrants ample moral and financial support. To quote from a recent writer, Dr. Carter, Commissioner of Public Health, United States Army: "Modern sanitary requirements unquestionably cost money, but any expenditure that prevents disease and improves public welfare should be regarded as an investment yielding the largest returns not only in respect to improved wealth and happiness, but also as an insurance of industrial prosperity which is directly measurable by dollars and cents."

The statistics given below show that once again Auckland City amongst the four chief centres possesses the unenviable distinction of displaying the highest percentages in those two great factors which test the sanitary condition of a town—infantile mortality and enteric-fever rate. It would seem that in the succeeding year peace must give way to war.

VITAL STATISTICS.

In order to compare the vital statistics of Auckland and suburbs with those of the three other chief centres of the colony the period covered by the returns of the Registrar-General are taken, and these are for the period from the 1st January to the 31st December, 1905, whereas the data otherwise in this report are for the Department's year, 1st April, 1905, to 31st March, 1906.

In comparing the following figures it is to be borne in mind that Auckland and suburbs (suburban boroughs only) possess 25·5 per cent. of the mean population of the four chief cities with their suburban boroughs (only). The populations treated of are—

Auckland	58,384
Wellington	58,365
Christchurch	52,722
Dunedin	59,663

BIRTH-RATE.

The two previous year's records showed gratifying increase in the birth-rate in Auckland District. For a second year in succession Auckland City heads the column.

	Birth-rate per 1,000 of Mean Population.
Auckland City	30·06
Wellington	29·72
Christchurch	29·70
Dunedin	23·90
The mean for the whole colony was	27.65
The mean for Auckland and suburbs was	27·88
The mean for the four centres was	27·71

While the birth-rate for Auckland compares favourably with that of the rest of the colony, it is well to recognise that we are only "comparing ourselves with ourselves." England is lamenting that whereas the birth-rate per 1,000 in England and Wales, 1873–77, was 35·8, it had dropped in the period 1888–92 to 30·8, and by the period 1898–1902 to 28·8.

DEATH-RATE.

Comparing the death-rate per 1,000 of mean population in Auckland City and its suburbs with the average of the four centres of population during the past five years, we have the following:—

	Auckland City.	Auckland and Suburbs.	Average of Four Centres.
1901	13·10	11·80	11·50
1902	17·21	15·27	12·74
1903	12·97	12·23	11·73
1904	11·11	10·20	10·73
1905	12·15	10·52	10·43
Mean for five years	13·31	12·00	11·42

The death-rate for England and Wales in 1903 was 15·4.

The following are the death-rates after excluding the deaths of children under one year :—

	Auckland and Suburbs.	Average of Four Centres.
1901	8·65	8·96
1902	11·10	9·56
1903	8·57	9·14
1904	8·11	8·30
1905	7·96	8·02

Infant Mortality.

The extraordinarily low rate of infant mortality recorded for Auckland in 1904 gives place to something like a mean death-rate over the year 1905, and the following is the comparative table of deaths under one year to every 100 births :—

	Auckland City.	Auckland and Suburbs.	Average for Four Centres.
1901	11·57	9·88	9·70
1902	15·41	14·07	11·94
1903	12·08	12·15	9·42
1904	6·93	7·01	9·03
1905	10·13	9·15	8·59
	11·22	10·45	9·74

Auckland City's position in this respect with regard to the other three principal cities is as follows :

	1905.	Mean for Five Years.
Auckland	10·13	11·22
Wellington	10·02	10·45
Christchurch	8·60	10·82
Dunedin	7·21	8·18

N.B.—The mean rate for Auckland City for the three years prior to 1901 was 15·37.

The above figures show a very decided improvement, but, as compared with the other cities, still leave something to be done in Auckland for the protection of infant life.

This death-rate is better than that of England and Wales, where the falling birth-rate and excessive death-rate among infants are held to mark a period of national physical degeneracy. Improper feeding and insanitary surroundings are causes of the latter feature, and these are capable of control.

The percentage of deaths of infants under five years to the total deaths is :—

	Auckland and Suburbs.	Mean in the Four Centres.
1901	30·15	27·68
1902	38·47	32·40
1903	36·38	27·96
1904	24·61	26·70
1905	28·82	27·07

As shown above, the birth-rate of Auckland City, 30·06, compares very favourably with that of the other chief cities, more especially Dunedin. This statement, however, should leave no complacent feeling in any Aucklander's mind, for while we have the highest birth-rate yet we also see in the death-rate of infants that we, compared with the other centres, lose a larger number of those that are born before they reach one year. We learn that 1,165 little bodies arrived into the world of Auckland City (38,754) during 1905, but of these from the percentage figures of the year we may foretell that 118 —67 boys and 51 girls—will never see the first anniversary of their birthday. The figures for Dunedin (38,366) are, total births during year, 917 ; but, arguing on same lines as above, only 66—that is, 40 boys and 26 girls—die before the end of a year.

Had Auckland with its vaunted large number of births been as careful of its infants as Dunedin it would be able to boast of thirty-four more lives at the end of a year. Instead of the waste of 118 little ones, she would have lost but eighty-four—thirty-four fewer mothers like " Rachel weeping for her children." And well may it be added, what avail all " the pangs and fears that women have " if the proudly proportionate pregnancies of Auckland City give this barren result ?

Causes of Deaths.

Deaths from Zymotic Diseases.

For the purposes of this report it will suffice to give the Registrar-General's returns with regard to deaths from zymotic causes in Auckland and the five suburban boroughs :—

	Deaths in Auckland and Suburbs.	Total of Four Centres.	Auckland Proportion of Deaths. Per Cent.
1901	70	209	33
1902	165	356	46
1903	86	256	33
1904	52	202	26
1905	45	115	39
Mean for five years	84	228	37

The 115 deaths from zymotic diseases may be analysed as follows :—

	Deaths in the Four Centres.	Auckland and Suburbs.	Auckland Proportion. Per Cent.
Diarrhœal diseases	44	21	48
Influenza	13	3	23
Typhoid	10	7	70
Scarlet fever	5	2	40
Diphtheria	8	3	38
Whooping-cough	2	0	..
Other zymotic diseases	33	9	27
	115	45	39

Thus Auckland centre had far more than its share in deaths from zymotic disease as compared with the other centres, and especially so in the case of diarrhœal diseases, typhoid, scarlet fever, and diphtheria. Still the actual number of deaths from these causes compares favourably with that of previous years, and maintains the improvement commented upon in last year's report as having characterized 1904. The atmospheric conditions then alluded to as probably being largely responsible for the smaller number of cases and lower death-rate in zymotic cases have continued with remarkable uniformity, as the following meteorological table exhibits :—

This table gives the rainfall and mean temperature as recorded in Auckland for the year ending the 31st March last :—

	Rainfall.		Mean Temperature.	
	1905.	Average.	1905.	Average.
April	3·20	3·15	59·4	61·4
May	2·29	4·21	56·3	57·1
June	6·00	4·79	53·2	53·8
July	3·88	4·86	50·1	52·0
August	3·05	4·22	51·6	52·4
September	4·48	3·39	54·0	54·8
October	5·87	3·34	55·3	57·0
November	2·20	3·23	59·3	60·4
December	2·96	2·64	61·9	62·4
	1906.		1906.	
January	1·17	2·69	62·7	67·1
February	2·25	3·50	63·0	67·4
March	1·80	2·36	62·1	64·3
	39·15	42·37	57·4	59·2

It is noticeable that only in June and October was there anything like excess of rain, and upon the whole year some 3·22 in. less than the average. The lower mean temperature is observable in every month of the past year. The previous year (1904–5) presented the same feature, every month except March, 1905, when the temperature was 0·1 above the average, showing a lower mean temperature than the average for the corresponding month during the past thirty-five years.

Deaths from Phthisis and other Tubercular Diseases.

The total deaths are as follows :—

	Auckland and Suburbs.	Total in the Four Centres.	Auckland Proportion. Per Cent.
1905	49	211	23

Auckland has fewer deaths by 9 than in the previous year, and the four centres 48 fewer.

Deaths from Cancer.

The total deaths are :—

	Auckland and Suburbs.	Total in the Four Centres.	Auckland Proportion. Per Cent.
1905	35	191	18

Deaths from cancer show a steady increase during the past five years, when the totals for the four centres are taken, though the figures for Auckland and its suburbs in 1905 are below the average for the five years.

Plague.

Bubonic plague has not made its appearance in 1905–6.

[N.B.—From this point the statistics are those covering the Department's year—1st April, 1905, to 31st March, 1906.]

INFECTIOUS-DISEASE NOTIFICATIONS.

(Whole health district.)

The marked reduction noted in last Report as occurring in 1904 has been more than maintained—the number in 1905 being 616, against 620 in the previous year. Thus :—

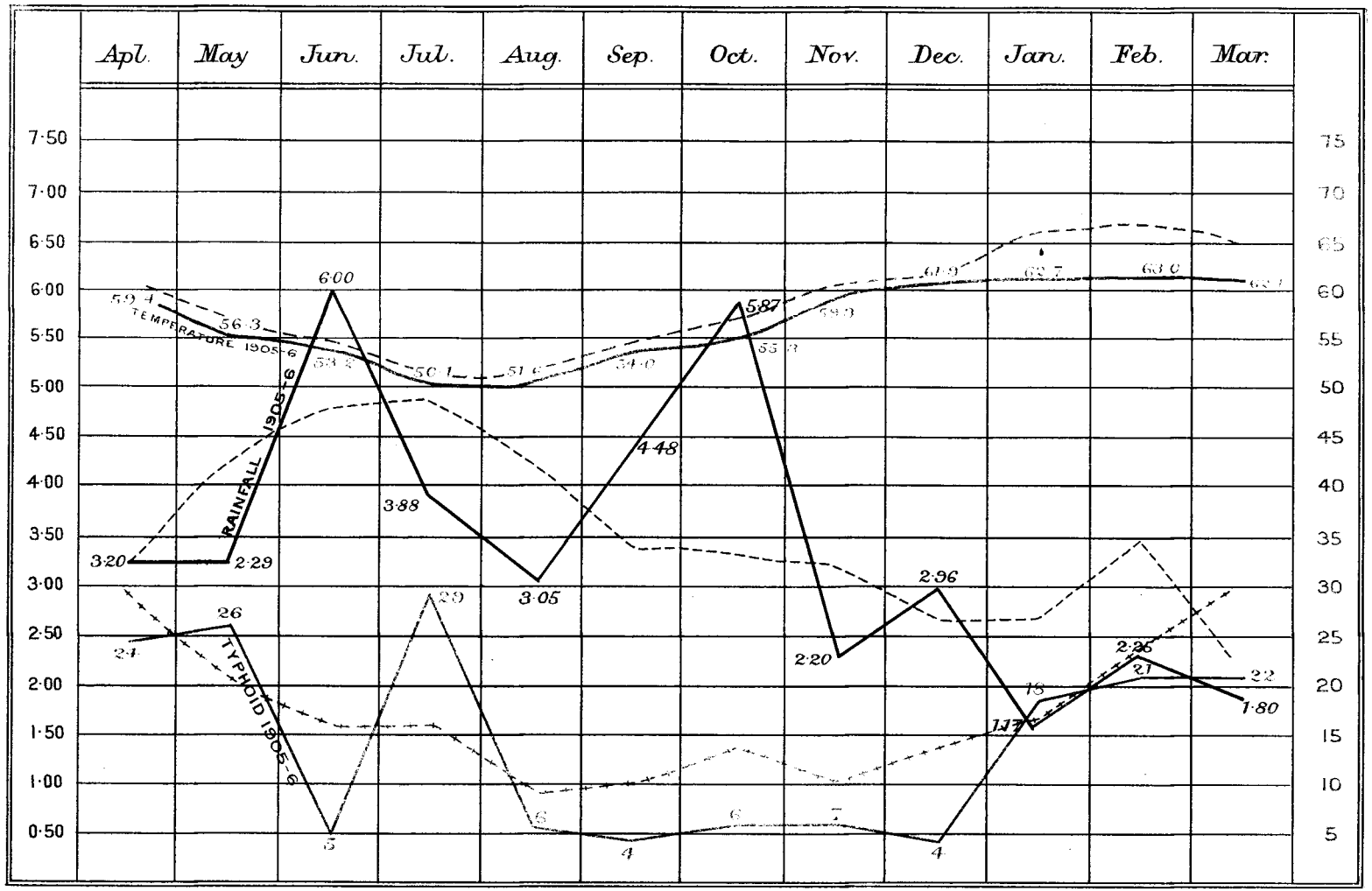
	1905–6.	1904–5.	Increase or Decrease, Present Year.
Enteric	172	180	— 8
Scarlet fever	240	273	—33
Diphtheria	97	63	+34
Tuberculosis	86	86	..
Blood-poisoning	21	16	+ 5
Plague	..	2	— 2
	616	620	— 4

The following table indicates the distribution of the cases :—

SUMMARY OF INFECTIOUS DISEASES NOTIFIED FROM THE 1ST APRIL, 1905, TO THE 31ST MARCH, 1906.

City, Suburb, or County.	Enteric.	Scarlet Fever.	Diphtheria.	Tuberculosis.	Blood-poisoning.	Total.
Auckland	34	47	26	18	5	130
Birkenhead Borough	..	..	14	1	..	15
Devonport Borough	..	3	3	2	..	8
Grey Lynn Borough	6	9	2	2	..	19
Newmarket Borough	3	4	4	2	1	14
Onehunga Borough	10	28	1	2	1	42
Parnell Borough	1	9	5	4	3	22
Arch Hill Road District	..	3	1	1	..	5
Avondale Road District	..	..	..	..	..	..
Eden Terrace Road District	..	1	..	..	..	1
Epsom Road District	2	4	2	..	..	8
Mount Albert Road District	1	2	1	2	1	7
Mount Eden Road District	2	10	4	1	1	18
Mount Roskill Road District	..	3	..	..	..	3
Mount Wellington Road District	..	1	..	..	..	1
One-tree Hill Road District	2	5	2	1	..	10
Point Chevalier Road District	6	..	..	2	..	8
Remuera Road District	1	4	4	..	..	9
Bay of Islands County	1	11	..	4	2	18
Coromandel County	..	2	2	..	1	5
Eden County	1	..	..	..	..	1
Hobson County	..	6	1	1	2	10
Hokianga County	1	..	..	..	..	1
Kawhia County	..	..	..	..	..	..
Manukau County	5	12	6	11	1	35
Mangonui County	15	..	..	..	..	15
Marsden County	..	..	..	..	..	..
Ohinemuri County	6	9	3	2	..	20
Opotiki County	2	..	..	..	..	2
Otamatea County	..	2	..	..	..	2
Piako County	2	1	..	..	..	3
Raglan County	2	..	..	..	..	2
Rodney County	..	5	1	1	..	7
Rotorua County	17	1	..	..	..	18
Thames County	1	5	1	5	..	12
Tauranga County	..	1	..	2	..	3
Taupo County	..	..	..	..	..	..
Waikato County	4	6	1	1	..	12
Waipa County	4	1	..	3	..	8
Waitemata County	2	1	3	1	..	7
Whangarei County	1	14	3	5	..	23
Whakatane County	2	..	..	..	..	2
Cambridge Borough	..	..	1	2	1	4
Hamilton Borough	6	10	1	3	..	20
Te Aroha Borough	1	2	2	..	..	5
Thames Borough	2	3	1	5	..	11
Waihi Borough	18	14	2	..	1	35
Rotorua Town	10	..	..	2	1	13
Shipping	1	1	..	..	..	2
Totals	172	240	97	86	21	616
City of Auckland	34	47	26	18	5	130
Suburban districts	35	86	43	20	7	191
Country districts	103	107	28	48	9	295
Totals	172	240	97	86	21	616

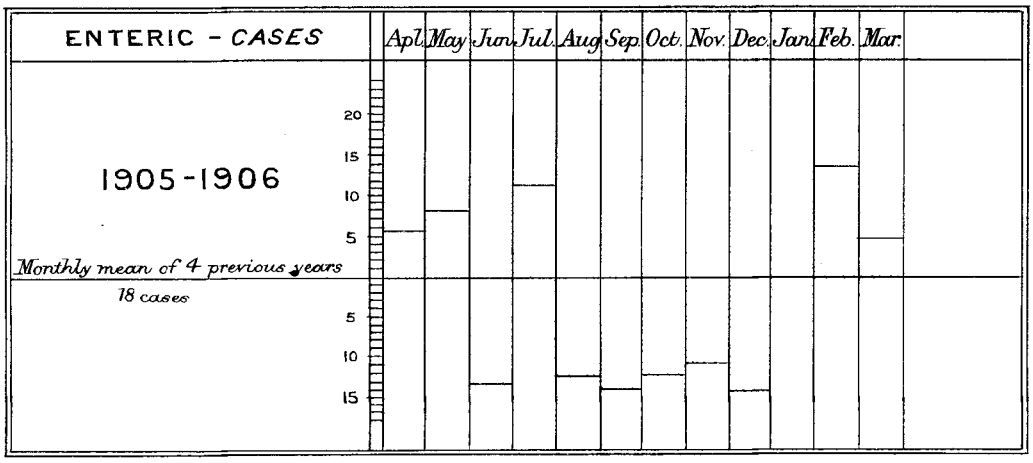
CHART A.—Showing Typhoid, Temperature, and Rainfall Curves, April, 1905, to March, 1906.



NOTE.—The Typhoid and Temperature Curves follow the figures in the right-hand column. The Rainfall Curve follows the figures in the left-hand column. The average Rainfall and Temperature for previous years are marked in dotted lines. The average number of Typhoid cases per month is shown by the Curve thus: + + + + + + + + +

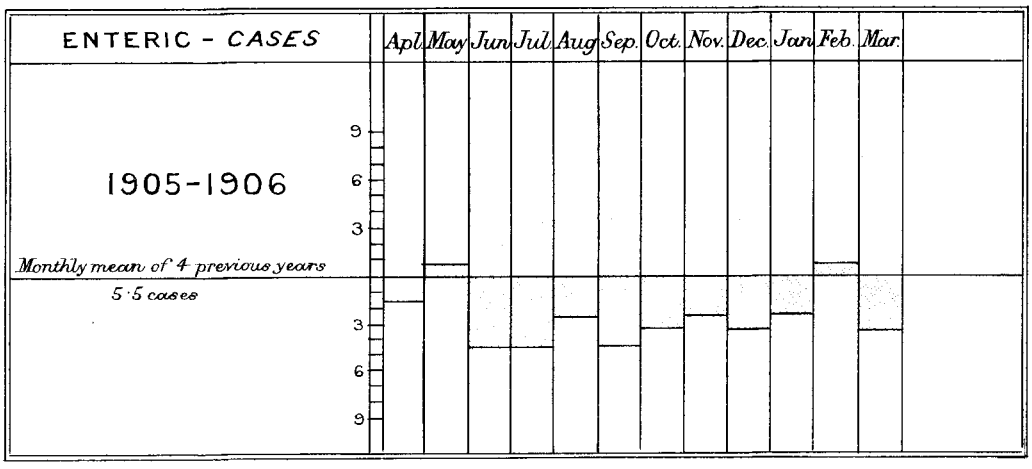
CHART B.

ENTERIC FEVER.



AUCKLAND HEALTH DISTRICT.

Table showing cases per month above or below a calculated mean throughout four years, of eighteen cases per month.



AUCKLAND CITY.

Table showing cases per month above or below a calculated mean throughout four years, of five and a half cases per month.

Monthly Table of Same Notifications.

—	Enteric.	Scarlet Fever.	Diphtheria.	Tuberculosis.	Blood-poisoning.	Total.
1905.						
April	24	25	6	6	2	63
May	26	40	10	6	1	83
June	5	28	15	8	2	58
July	29	25	22	7	3	86
August	6	37	10	9	1	63
September	4	14	3	5	1	27
October	6	9	5	7	1	28
November	7	7	1	7	3	25
December	4	7	7	3	1	22
1906.						
January	18	6	6	8	3	41
February	21	18	6	5	2	52
March	22	24	6	15	1	68
	172	240	97	86	21	616

The attached table gives the monthly analysis of the deaths for the year 1905–6. In the column for "Zymotic Diseases" we see that Auckland had 42 per cent. of the total deaths from this cause. In the "Total Mortality" column and the "Infant Mortality" column Auckland shows to disadvantage when compared with the other centres.

—	Total Mortality: Death-rate per 1,000.			Zymotic Diseases: Deaths.				Infant Mortality: Deaths under Five Years.			
				Auckland and Suburbs.				Auckland and Suburbs.			
	City of Auckland.	Auckland and Suburbs.	Mean of Four Centres.	Under Five Years.	Over Five Years.	Total for Four Centres.	Proportion per Cent. Auckland and Suburbs.	Acute Intestinal Inflammatory States.	Total.	Total for Four Centres.	Proportion Per Cent. Auckland and Suburbs.
1905.											
April ..	1·22	0·99	0·83	4	2	12	50	13	24	73	33
May ..	1·30	1·06	1·00	4	2	12	50	11	24	68	35
June ..	1·04	1·01	0·88	..	2	8	25	1	14	50	28
July ..	1·28	1·16	0·98	2	3	10	50	2	13	48	27
August ..	0·99	0·80	1·06	..	2	10	20	1	11	56	20
September ..	0·89	0·82	0·97	2	2	10	40	6	10	49	20
October ..	1·04	0·90	0·87	3	2	10	50	4	10	41	25
November ..	0·55	0·63	0·85	1	3	7	57	..	10	43	23
December ..	1·15	0·96	0·83	2	1	6	50	7	18	57	32
1906.											
January ..	1·35	1·16	0·86	2	..	8	25	1	25	50	50
February ..	0·92	0·71	0·77	1	3	11	36	7	15	53	28
March ..	1·18	0·98	0·78	2	3	11	46	8	21	49	43
	12·51	11·38	10·88	23	25	115	42	61	195	637	30
Mean ..	1·04	0·95	0·91								

Enteric Fever.

The notifications of enteric fever recorded throughout the district for the four past years have been:—

1902–3	217
1903–4	231
1904–5	180
1905–6	172

the last two years being a very satisfactory record, which would last year have been more striking but for a number of cases among Natives in the County and Town of Rotorua and in the County of Mongonui during the month of July, and in Mongonui County in January, 1906. With the exception of the months so affected a very even case-curve would have been formed, falling gradually from a maximum in April, 1905, to a minimum in September and October, and rising to the maximum again in March, 1906. While the very favourable atmospheric conditions already alluded to may have contributed to the diminution of the enteric case-rate, it is not possible to accurately measure the effects of the varied efforts of the Department or of such improved sanitary methods as have been engaged upon of late years in contributing to this more pleasing report. The uniform low rainfall and low temperature have meant low case-rate under the head of typhoid and other zymotics. Chart A exhibits the district typhoid curve in its relation to rainfall and temperature, and also a comparison of these three curves with their "averages." Chart B exhibits how the case-rate for the year is above or below a line indicating the mean for the previous four years in the whole district, and in Auckland City alone. Comparison with similar charts published in last year's report will quickly show how the present twelve months stand in relation to previous forty-eight months.

DISTRIBUTION OF CASES ACCORDING TO LOCALITY.

The City and Suburbs (Auckland and Suburban Boroughs).

The notifications, 44, are only about one-half of either of any previous years' records. The deaths, 7, exhibit a higher mortality-rate per case, but still a low death-rate, 0·120 per 1,000 living; that of England and Wales being 0·175. In the city 34 cases were notified—the low rate, 0·87 per 1,000, of the city population. I am indebted to my colleagues of the other districts for the additional information below given:—

	Cases.
Auckland City (38,754)	34
Wellington City (54,416)	33
Christchurch City (49,694)	4
Dunedin City (52,418)	11

If the disease-rate which it is to be regretted holds good for Auckland City were maintained in the other cities they would be astounded at the following deductions: Auckland having 34 enteric cases—to be as bad, Wellington, with its population, would have had 47 cases, instead of 33; Christchurch would have groaned at having 43 cases, instead of 4; and Dunedin would have fashed herself had she 46 cases, instead of 11. These figures emphatically show how much yet remains to be done to make Auckland City more sanitarily safe and healthy.

What might be hoped for if Auckland City will only satisfy herself that her drainage system possesses hidden secrets of defectiveness may be anticipated from the example of Devonport. As a sequel to the drainage-installation there we have these figures:—

1902–3	10 enteric cases.
1903–4	Nil.
1904–5	2 cases.
1905–6	Nil.

Parnell last year had no case, and now escapes with 1 case only; this, however, upon investigation by Inspector Grieve, was shown to have its source elsewhere than in Parnell. The two references are important as showing the fallacy of a statement frequently made that most of the Auckland City cases are importations. It is not possible to argue that all sickening persons seek residence within the actual city boundaries, and avoid the more salubrious Devonport or the equally accessible Parnell.

Onehunga had 10 cases. This is deplorable, though not out of keeping with the unenviable reputation already established. The figures in the past are—1901–2, 6 cases; 1902–3, 7 cases; 1903–4, 17 cases; 1904–5, 5 cases. Unfortunately, Onehunga, like Auckland, possesses a population who will not wake up and endeavour to remove this badge of sanitary unprogressiveness. A drainage scheme has two years ago been approved by this Department.

The 6 cases credited to Point Chevalier all occurred at the Hospital for Mental Diseases—a remark which also applied to the 2 cases of scarlet fever, the only other cases of infectious disease in that district.

Country Districts.

Mongonui County has 15 cases—exactly the same number as in the previous year; but of the cases notified this year subsequent investigation by Dr. Pomare raised some doubt as to their being true cases of typhoid.

Ohinemuri County.—The satisfactory improvement in Ohinemuri County continues, the number of cases for the past five years being respectively 13, 15, 15, 10, down to 6 this year. In the Borough of Waihi, however, the large number of 18 cases have occurred. The rapidly increasing population of Waihi have quite failed to grasp the wisdom of these modern times that a carefully graded and expensive road system such as theirs is of but little avail unless at least at the busiest centres that most important feature—a sewer—is available.

Rotorua County has to be credited with 17 cases of typhoid, and the Town of Rotorua with 10. Fourteen of these in the county were of Maoris.

Cambridge Borough keeps up its reputation for a "Nil" return, which extends over the five years of the Department's records.

Hamilton Borough, on the other hand, has the record 1, 6, 11, 3, 6 cases. Nothing short of a still greater number of cases will, I fear, arouse Hamilton people from helpless apathy.

The other localities do not incite any comment.

SCARLET FEVER.

Though, as with other febrile diseases, the number of scarlet-fever cases was less last year, this reduction is probably accidental and temporary. I have reason to believe that there is a disposition to extreme carelessness on the part of parents both in failing to divulge the incidence of the disease and in permitting the exposing of patients to contact with others and so leading to the dissemination of contagion.

The cases for the past five years are :—

	Auckland City.	Suburbs.	Country Districts.	Total.
1901–2	35	33	49	117
1902–3	86	94	138	318
1903–4	110	112	145	367
1904–5	68	93	112	273
1905–6	47	86	107	240

Grey Lynn, 9 ; Parnell, 9 ; Mount Eden, 10—each has more than its due number of cases ; while Onehunga, 28, has experienced something like an epidemic. The heavy rate in Coromandel, 16, noted last year has given place to a " Nil " return, the epidemic having been stamped out.

In Hamilton and Waihi scarlet fever has got a hold, the former having 10 cases and the latter 14. In Bay of Islands (11) and Whangaroa (13) scarlet fever is too prevalent.

Diphtheria.

Though not reaching the figuring of 1902–3 in any portion of the district, diphtheritic affections of the throat have been a distinct feature of the past year's conditions.

Diphtheria Cases.

	Auckland City.	Suburbs.	Country Districts.	Total.
1901–2	27	15	9	51
1902–3	68	49	34	151
1903–4	18	24	29	71
1904–5	28	24	11	63
1905–6	26	43	28	97

In Auckland City the cases may be taken as normal in number. Several cases occurred in the western end of the western suburb, and seemed to have a school connection ; otherwise the city would have had a very favourable record.

The high case-rate in the suburbs is mainly accounted for by an epidemic in the Birkenhead District, three cases of which terminated fatally. It may, however, be doubted whether some of those notified as diphtheria or suspected diphtheria should ultimately have been diagnosed as actual diphtheria.

Devonport, Newmarket, Mount Eden, and Remuera had a full share of cases of this disease. Of Manukau's 6 cases, 4 occurred in and around Waiuku, where diphtheria has appeared at intervals during the years 1903–4–5. In May last Inspector Winstanley very thoroughly disinfected the public school, since when no fresh cases have arisen.

Tuberculosis.

Notifications of tuberculosis from Auckland City show a marked reduction extending over several years—31, 38, 23, and 18 being the past four years' records.

In Manukau County several of the cases were of Maoris. In Bay of Islands all the cases were those of Natives.

As remarked in previous reports, the notification list is, owing to the insidious nature of these complaints, far from being an accurate index of the prevalence of the various forms of tuberculosis.

Blood-poisoning.

Twenty-one cases were notified. Of these, 3 were known to be puerperal septicæmia—viz., Newmarket, 1 ; Mount Eden, 1 ; Waihi, 1 : 4 were tetanus—City, 1 ; Onehunga, 1 ; Parnell, 1 ; Mount Albert, 1. One case, at Coromandel, was at first supposed anthrax, but this was not supported by the final diagnosis.

Ptomaine Poisoning.

On Saturday, the 17th March, 1906, a race meeting was held on the Paeroa Racecourse, and repeated on the following Monday. On that evening it was learnt that very many people who had partaken of lunch on the racecourse were ill, with all the usual symptoms pointing to ptomaine poisoning. Most of those markedly affected—probably about thirty-five persons—took ill within a short time—an hour—after dining. I am indebted to Dr. Gilbert Smith, of Paeroa, who attended the patients when first taken ill, for the following description of the attack : " The symptoms observed in the cases of ptomaine poisoning were in nearly every case similar, though of course varying in severity. The first symptom appears to have been a state of collapse quickly followed by vomiting, then epigastric pain with almost continual retching, succeeded by abdominal pain and diarrhœa. This last was not present in all cases. The collapse in some cases was extreme, but the diarrhœa was not as a rule severe, and in some cases only slight. The sequelæ were also similar in the various cases—great prostration (both muscular and nervous) and epigastric pain, in some cases lasting for five or six weeks."

Investigation of the cause seemed to point to the ingestion of pressed beef tongue. Seventeen sick persons were interrogated, what they had eaten was tabulated, and only one of them was found not to have eaten tongue—and she was not sure. Nevertheless, at least three persons were emphatic that they had eaten plentifully of the same tongue and yet suffered nothing. The butcher who supplied the tongue and the caterer gave me every assistance in trying to solve the problem of cause. I learnt that

thirty beef tongues had been received from a prominent Auckland firm in salt-bags on Tuesday, the 13th. A fresh pickle was then made, and the tongues were put into this and placed in a cool-chamber. On Thursday evening sixteen tongues were left unsold. These were boiled in two coppers, eight in one and eight in the other, and pressed in butter-boxes that evening. One set of eight were delivered, and from these no ill effects resulted. The other eight were given to the racecourse caterer on the morning of the 17th. I obtained details of other meat supplied, but I will omit these as of no consequence as the sequel will show. From the caterer I obtained information as to ham, salad, dressing, bread, and examined the mustard, sugar, salt, and sauces used. It is important to note that when the poisoning was so pronounced on Monday more than one person acknowledged to having felt "queer" after lunch on the Saturday. Sunday was an extremely close and hot day, and I am told the tongues uneaten on Saturday remained on the table till the Monday. Any doubt of the article of food at fault was set at rest by inquiry from one of the families to whom Dr. Smith directed me. The father was at the racecourse on Saturday, but lunched at home. On Sunday, as he lived alongside the course, he went over to the booth and gave the waiter who was tidying-up some assistance. He was asked to take away with him a little of the cold tongue he saw; he took three slices, and did not touch anything else there. Arriving home about 1.30, the family, three in number, indulged in the tongue. At 4.30 they were all ill with the very symptoms which next day were evidenced by so many others. Having other food as well that day, I need hardly say it never dawned on them that the tongue was at fault. Samples of the tongue were taken and submitted to the Bacteriologist, Dr. Makgill, for investigation. Decomposition, however, was by this time so far advanced that it was "impossible to say whether the organisms found were present in the tongue as originally eaten or were the result of subsequent decomposition."

LOCAL SANITATION.

Auckland City.

Generally speaking it will be shown here that towards sanitary matters during the year the City Council have evinced a *laissez faire* when not a definitely retrograde tendency. Nothing whatever has been done towards the provision of workmen's dwellings or accommodation for those others who are best described in the generic term "very poor." The worst of the dilapidated and insanitary buildings have been removed; there are others requiring similar treatment, but while the city authorities fail to provide housing for those turned out of these hovels it is unwise to force removal, the doing-so only tending to cause congestion in other buildings verging upon the condemning stage. In September, twenty-two cases of condemned buildings were listed by the City Council for Court proceedings. Ultimately, however, these were reduced to six, the owners in the other instances either having effected radical improvements or promised to remove the buildings. It is to be hoped the Council will become progressive enough to make some provision for those who either must or for preference will live near the central streets—be they genuine workmen or the very poor. The wharf labourer, the shoeblack, and the sandwich-man typify the classes to be catered for. A Town Hall to cost over £50,000 is on the *tapis*: the bare necessities of the many are to give way to *éclat* and benefit to a few.

The junction of Karangahape, Ponsonby, Newton, and Great North Roads is a very busy centre, and much traffic passes to and fro. At one corner is the reservoir from which the greater part of the city is supplied. Galvanised-iron roofing exists over each chamber of the reservoir. The roofs are low, and readily collect all the dust—desiccated street-sweepings—wafted up from the street; an open urinal stands at one corner. When Nature's rain falls, by the ingenuity of man the spouting has been so arranged that all the watery "extracts" from the filth collected on the roof passes into the drinking-water of the citizens. One would have thought that, as there was no denying the facts, the Council would have at once ordered an effective remedy. But not so; my report was received with jocosity and gibes, and much valuable time was lost in obtaining analyses—which at the most could only prove that what was admitted passed into the water was actually there.

I received from Dr. Makgill the following details of the result of the bacteriological examination of the Auckland water-supply held during November and December, 1905:—

"*Quantitative Examination.*

"1. Samples were taken from the tap at the Laboratory in Chancery Street on the 26th November. The tap was allowed to run ten minutes before samples were taken, to insure the water being drawn from the main. This water is drawn from the Ponsonby Reservoir.

"In gelatine plates grown for four days at normal temperature portions of the water from 0·01 to 0·1 of a cubic centimeter were taken. Some difficulty was experienced owing to the large number of rapidly liquefying organisms present; but the average number was 340 organisms per cubic centimeter, placing it among the medium waters. It is evident, therefore, that there is no very extensive pollution of the water.

"In agar, incubated two days at 35° C., 206 organisms per cubic centimeter developed. This is perhaps a somewhat high proportion of organisms growing at this temperature, and indicates the presence of organisms other than those normally found in water. This indication is borne out by the rapidity of the liquefaction of the gelatine and by the extremely fœtid odour which was produced during the process by some of the organisms, both being suggestive of the presence of organisms of the Proteus group, which are found in water polluted by sewage and animal excreta, &c.

"2. Samples taken on the 23rd December from the reservoir at Ponsonby:—

"Gelatine plates gave an average of 130 organisms per cubic centimeter—less than half those found in the mains, as might be expected. There was in these plates more than usual rapid liquefaction, and the same fœtid odour found in those taken from the tap.

"*Qualitative Analysis.*

"Search was made for harmful varieties by passing 12 gallons of water through a sterile Pasteur filter and examining the resulting deposit. The sample thus taken represents water in the mains during the 22nd and 26th November. *Bacillus coli* was sought for and found by the neutral red method. The number per cubic centimeter probably is not high, as even in the deposit the reaction was delayed for five days. Still, the significance of the presence of this organism must not be overlooked.

"Klein's method of anaerobic milk cultures was adopted for the detection of organisms of the *Bacillus enteritidis sperogenes* type, and by this means an organism was isolated causing butyric fermentation in milk, but not fatal to guinea-pigs. It is not the bacillus of Botkin, but of the same nature, and doubtless has the same significance.

"*Interpretation of Results.*

"So far as number of bacteria is concerned, the Auckland water this year remains much as it is generally—*i.e.*, a water containing from three to four hundred organisms per cubic centimeter, which places it in the class of waters of medium purity. This result has been obtained at any analysis of tap-water made during the past five years. During the autumn of 1898 the water was of bad quality, probably a result of the use of an auxiliary spring during the dry weather, when the organisms sometimes numbered two to three thousand per cubic centimeter; but this was exceptional.

"It is interesting to compare my results this year with those of Mr. Pond, whose samples were taken about the same time as mine. The main spring showed only twenty-five organisms per cubic centimeter, and this is bacteriologically a very pure water at present. Probably in very wet weather, when a greater share is thrown upon the scoria beds over the catchment-area, this water would be less satisfactory; but at present the chief source from which the bacilli are derived is the Nihotupu water, which Mr. Pond found to contain 236 per cubic centimeter. This is not unduly high considering the distance it has come and the nature of the ground from which the water has been collected. In the Ponsonby reservoir he found only 67 per cubic centimeter, which suggests that at the time he took the sample only a small proportion of Nihotupu water was being pumped, and the chief source was the main spring. A month later I found 130 organisms; this would be about the proportion were the Nihotupu and main spring waters equal in amount in the reservoir. The difference between our observations is not too great to be accounted for by some variation in the proportion of the sources. Any water repeatedly observed shows great fluctuations in the numbers of organisms, often varying to the extent of several hundred per cubic centimeter in a short time.

"Judged merely by numbers, the water is fairly satisfactory, but when we come to consider the nature of the organisms present it is more disquieting. The presence of the *Bacillus coli*, though not necessarily sufficient ground for condemning a water outright, is at least enough to make us inquire very carefully into the sources from whence this organism can be derived, as it undoubtedly indicates animal pollution, and where it is present other organisms of an animal origin and of a more serious nature may also find their way. So, too, with the milk-curdling anaerobic bacillus and those forming putrid decomposition in the gelatine. None of these should be found in a really pure water—yet here we have them in a water which is chemically, and according to numerical bacterial analysis, satisfactory. This indicates that the source of origin of these harmful germs is small in quantity. Were there any large source of pollution the number of germs would be thousands rather than hundreds per cubic centimeter.

"It is evidently not at the main spring; for this source of supply, though indubitably in a dangerous position, is according to Mr. Pond's observations very pure at the present time. If the scoria-beds through which the water for this spring percolates were admitting the *Bacillus coli* other organisms would probably be present in larger amount also. The Nihotupu water, though it has a fair number of organisms, comes from a catchment-area where one would not expect to find organisms of the type found in animal excreta, &c. The pipes which pass through the pond at the western springs are liable to leakage, and in water drawn from the pond one might well expect to find *coli* and the other undesirable ingredients; yet were they to come from this source the water drawn from the pumping-well at the Western Springs would give an indication of such pollution, and Mr. Pond's analysis done on the 1st November shows this water to be if anything purer than that in the main spring.

"I conclude that the pollution is derived from a source after the water has passed the pumping-station, and this I take to be the very faulty construction of the roof at the Ponsonby reservoir by which all the dust from the street which lodges on the roof is washed by the rain back into the tank. It is difficult to see what advantage is gained by this arrangement, yet the attention of the Council has been drawn to this defect, both by yourself and formerly. The *Bacillus coli* and other bacteria might well be derived from horse-droppings and from the house-refuse blowing about the street. Such a source would give just the proportion of undesirable organisms as was found—no widespread pollution, but sufficient to be detected—by the methods of analysis adopted, and sufficient also to cause disturbances of the digestive organs, more especially in young children using this water unboiled, since organisms of the *coli*, *proteus*, and gas-producing types are each in themselves known to have been the cause of outbreaks of diarrhœa, enteritis, and so forth.

"In order to test this supposition that the Ponsonby reservoir roof might be the fault in the system at which the contamination gains entrance, I made examination of some of the muddy water found in the gutter running along the western aspect of the reservoir. In this mud a gas-producing organism was found identical in every respect with that found in the tap-water, while the *Bacillus coli* was also present. As this mud would wash down into the reservoir at the first rain, it seems to me conclusive that at least a portion of the pollution comes from this source; and I consider you would be justified in laying before the Council this further evidence of the necessity for removing this very insanitary arrangement."

In forwarding the Bacteriologist's report to the City Council I said, " The presence of the *Bacillus coli* shows that matter of an excremental character gains access to the water-mains, presumably from the dust from street-deposits which collects on the roof of the Ponsonby reservoir. It is therefore for your Council to decide whether it would not be as well to have the drainage from the roof of the reservoir diverted from its present course, or, better still, to remove the reservoir from the centre of the densely populated portion of the city, where it is always liable to pollution, even though by efficient covering this risk be reduced to a minimum."

It is gratifying to be able to say that plans have since been submitted to the Department whereby the first suggestion will be carried out.

In my last report I referred to the pumping-up of polluted sea-water from the harbour to the Albert Street Baths. Then the matter waited, " With a strong recommendation to the incoming Council that the report of the City Engineer and Waterworks Engineer thereon be adopted." That recommendation was not accepted. Once again a *laissez faire* is adopted, and this is the reply I receive : " In reply to your letter of the 20th July asking the Council's intention as to obtaining salt water for streets and baths, I have the honour to inform you that, while approving of the proposal to obtain the cleanest salt water possible, yet in view of the contemplated works of the Harbour Board in regard to the wharves the Council cannot see its way in the meantime to incur any large expense in extending the water-pipes under the wharves." In the meantime, while no single Councillor would himself bathe or allow his children to bathe near the dock-entrance, the intake of the salt water, yet the same water after deleterious incubation—not the cleanest salt water possible—is considered still to be good enough for the frequenters of the City Baths.

The smoke nuisance is a perpetual annoyance. The Stipendiary Magistrates, Messrs. Kettle and Dyer, wrote, " When the wind is blowing from the east this building—Magistrate's Court—is enveloped with smoke, and we are therefore unable to open the Court windows for the purpose of ventilation. At present the matter is being dealt with by the Council, but in the meantime an extension of time of six months, dating from November, 1905, has been granted to enable offenders to apply remedial measures."

In connection with the effecting of improvements when necessary where infectious disease had been notified the same tendency to *laissez faire* by the city sanitary officers was evidenced. A more enlivened state of things now exists as the result of frequent attention being drawn to details which had not in my opinion received adequate recognition.

In August, 1905, I wrote drawing attention to the offensiveness and nuisance caused by want of proper cab-stands. I continued, " What is required are central cab-stands properly built, with drainage towards a central channel conducted to a central trapped sewer-inlet, and access to a water-pipe at some point beneath the cab-stand to which a hose-pipe can be conveniently attached, so that the stand may be flushed down at intervals." A reply was received which, while not denying the statement made, yet put off the matter on account of the possibility of laying down the streets in question in asphalt, and because no provision had been made on the estimates for the extra work. A second appeal, in February of this year, procured me the information that " In view of the possibility of an early consideration of the advisability of extending the Neuchatel asphalt in Fort and other streets in the vicinity, the matter of laying down new cab-stands is deferred meantime."

Last year I said, in connection with the then initiated nightsoil contract, " Nine months almost have passed, and yet the contractor has not fulfilled these conditions in their entirety : how much has really been done properly it is hard to tell." The succeeding twelve months have shown a complete absence of success on the part of the City Council in compelling the contractor to accurately fulfil the terms of his contract with them—not that the desire to do so was ever masterful. Fines amounting to £60 10s. in eighteen months have been of no avail. It would be tantamount to untruth to say clean disinfected pans have been returned to the householders during the year. The circulation of indifferently cleaned pans which have at any time become infected by typhoid stools may contribute to the enteric-fever rate. I quote from the Press report of one of the Councillors' remarks at a Council meeting in February, 1906. He said, " That the health of the community was menanced by the manner in which the service was carried out. It was useless to wait for a drainage scheme, since that matter might be hung up for years. Every night complaints were being made. Fines were inflicted, but what was the use of it ? " The question of the taking-over of the service by the Council has received consideration, but again no satisfactory decision has been arrived at.

Many complaints were received by the Waitemata County Council as to the nuisance caused by the disposal of the nightsoil at Harkin's Point. In response to their request legal action was taken by me with a view to proving to the contractor that he was not lawfully established at that place. This case was withdrawn on his admitting the contention and paying the amount of legal costs asked for. At Christmas, however, an abominable state of things was caused in the upper reaches of the Waitemata by the tipping of nightsoil into the river. Again action was taken, the contractor pleaded guilty to four charges, and was convicted and fined £20 10s., and costs amounting to £13 18s. 6d. The contractor has signified his inability to carry out the first and most important of thirteen requirements made by me, and I so far see no other course but to stop the use of Harkin's Point before next summer.

After nearly five years' delay the destructor has been in working-order for some time, and so far fulfils the essential requirements of effectually disposing of the rubbish and without nuisance. Large volumes of steam have been allowed to go to waste, much to the annoyance of the residents. This could have been used for steam disinfection. A disinfector was included in the proposals for the erection of the destructor, but was deleted by the Council. I have asked that such be provided. I reported *inter alia* as follows : " I am not at all satisfied that the disinfection of infected things can ever be satisfactory without an efficient disinfector. Fortunately, the infectious-disease rate at present is extremely low ; but your Council will appreciate the crude methods which are at present only available,

when it is on record in this office that during the past six months five loads of bedding were attempted to be properly disinfected by sulphur-fumes in an old police cell, the openings of which were stopped by paper pasted over them. This disinfection, or attempted disinfection, was required to prevent the spread of ringworm in a certain institution." In view of the general tendency in sanitary matters, of which indeed this report must unavoidably be one continuing reiteration, I was not surprised to learn that the Council were satisfied with the present means of disinfection, which I admit are the best possible with the poor facilities at hand, but certainly unworthy of a place of Auckland's importance. The reply of the Council was as follows: "In view of this fact the Council do not consider it necessary to erect a building and provide a disinfector plant." Are then the things which other towns worry themselves about—the relative advantages of saturated, current, and superheated steam for disinfection purposes—mere useless figments?

The third part of the rubbish service also received my attention. I recommended and endeavoured to obtain the Council's co-operation in defining a "sufficient" dust-bin, with a view to uniformity; a great factor in effecting a clean and easily conducted system. A by-law was passed—without consulting me, needless to say—under which an old iron cooking-utensil will pass. It need not be watertight provided the leak is not so large as to allow "matter of any kind to soak therefrom so as to be injurious or dangerous to health, or so as to cause an offensive smell." It will be "sufficient and suitable"—the words in the by-law—provided it is so to its owner, the by-law does not say it should be suitable in the opinion of any one in particular, and it will be covered with a lid.

Rubbish collection: At first the carts in use were covered. In January I drew attention to the fact that the covers had disappeared, and I evidently must continue to see them so "pending the procuring of a more workable one which he—the Engineer has in hand." Already months have passed, and the carts appear in all their nakedness and nauseousness, sifting particles about the streets.

As will be seen below, the suburban bodies have freely made use of the powers given them under the Public Health Act to insure plenty of open-air space and incidentally prevent overcrowding. Auckland City, on the other hand, has taken the retrograde step of reducing by by-law the distance necessary between buildings from 8 ft. to 4 ft. The by-law in question is of course really a fire-prevention by-law. Many amendments would, however, have been feasible without actually encouraging—as the new 4 ft. limit—the overcrowding of houses and the inroads of the speculator and jerry-builder. Is it any wonder the outside local bodies are so chary of joining the city? It was pleaded that the working-man could not build on a small section in view of this 8 ft. rule. I am not aware of any evidence being brought forward as to how many genuine working-men held these sections.

The abattoir problem has been advanced another step by the selection of a site next Hellaby's Freezing Company's works at Otahuhu, and plans are in course of preparation.

At the request of the Council, Mr. Midgley Taylor has reported upon Mr. Mestayer's scheme and submitted an alternative sewerage scheme for Auckland. Briefly, this is to connect all the existing sewers to a main intercepting sewer following roughly the beach-contour, this latter to terminate in a balancing-tank situated at Okahu Point, the sewerage therefrom to be discharged at ebb tide. The storage-tanks would be designed to limit the discharge of sewage to the exact period which would be determined from a consideration of certain float experiments which he advises should be undertaken. One statement made in Mr. Taylor's report, however, is open to very much question. He says, "As far as we can gather from the information available the existing sewers are in fair order and generally sufficient for the purpose they have to serve." At much too frequent intervals large holes have suddenly appeared in the main streets. The facetious individual speaks of these as indicating an underground spring; leaking drains and sewers would seem a much more tenable explanation. How many house-drains which have been down for more than ten years and have been exposed for any cause during the past year would the City Engineer be prepared to pass as thoroughly sound? I think Mr. Wrigg's answer would be found to be nearer none than some. If this be so for the house-drains, it is difficult to imagine that the main drains and sewers can be in "fair order."

In pursuance of the sections of the amending Act of 1904 relating to morgues, I have advised the City Council upon the need for a proper morgue, containing a *post-mortem* room, mortuary, Coroner's-inquest room, waiting-room, and accessories. Plans are in course of preparation. The site selected and approved is at the corner of Union and Patteson Streets. On this section also stands the destructor. It is likely the surrounding boroughs will be asked to contribute in accordance with the provisions of the Act. In my report I referred also to the desirability of erecting a crematorium. During the year a Cremation Society has been formed in Auckland, and at their request I have written the following for the pamphlet issued by them—"What is it we fear in regard to our unburied and buried dead? Is it not that the answer entirely lies within the pale of the interests of the public health? We fear that perchance our unburied or buried dead may be a source of danger to the health and welfare of our living. It will be admitted this danger can be present. What constitutes any such danger? One word, infection, and the thought is with us that this infection may spread from our buried dead. Disinfection signifies the destruction of infection—of infectious or disease-producing material—and the process may be natural or artificial. Nature employs numerous living organisms as her agent in effecting disinfecting processes; her methods are complex beyond the reasoning or knowledge of present-day *savants*, burdened in the case of earth-burial with a slowness or rapidity dependent upon meteorological conditions, and the chemical, physical, and bacteriological content of the soil in which the body is buried, and *en fin* only insuring a certainty of completion dependent upon these immeasurable, indefinite, and uncontrollable conditions, consequently always implying to the living an ever-existing risk that ultimate disinfection may not in years, if ever, be reached. Fire is a natural phenomenon. Man for all time has regarded fire as the most effective means of destroying what, even in his most untutored state, he regarded as noxious or offensive. By the cremation of our dead we but employ what common knowledge, what scientific investigation, regards as our simplest and most rapid way of insuring the destruction of infection, and that, too, with a tangible certainty of safeguarding the health of our living."

Auckland Suburbs.

Sanitary measures of any moment in the suburbs have been deferred to await the result of the Greater Auckland scheme, which His Worship the Mayor of Auckland has placed before the surrounding local authorities. Little enthusiasm is evinced, however, by the outside bodies, and this in a great measure is due to the fact that the things of greatest importance in their opinion are improvements in drainage and sanitary services; and that while Auckland City displays such an unsatisfactory spectacle in these matters within her own restricted limits the prospect of gaining their own requirements by such a union does not seem hopeful. A scheme to place a septic tank in the Arch Hill Gully and empty therein the nightsoil collected in the Arch Hill, Eden Terrace, and Mount Albert districts was not approved by me, and in this I had subsequently the support of Dr. Valintine, Acting Chief Health Officer.

Grey Lynn Borough.

The Council is still forced to make provision for the disposal of nightsoil within the borough precincts. The introduction of water-closets has been proposed, which would necessitate the placing of a septic-tank at the outlet of the sewer. Plans of the tank have been submitted to me, but the conclusion has been deferred pending information as to the possibility of connecting with the drainage system to be decided upon by the City Council.

Parnell Borough.

Water-closets have been made compulsory by by-law throughout the borough. Frequently the plumbing-work in connection therewith has been effected in a manner quite in keeping with such work generally in the borough—that is, of none too high a standard.

Newmarket Borough.

The sewerage scheme referred to in last report has been completed. Some little difficulty arose between the Council and myself as to the carrying-out of the scheme exactly in accordance with the plans and specifications submitted to the Hon. the Minister when the loan was sought. Ultimately I gained my point with satisfaction to every one concerned.

Onehunga Borough.

The excessive amount of enteric fever in this borough has already been referred to. The Council believing that there was no hope of getting the ratepayers to support a complete drainage scheme endeavoured to offer some solution of the difficulty of disposing of nightsoil by proposing to empty sealed pans into a septic-tank installation to be placed on the foreshore of the Manukau Harbour. Very great opposition was offered to this proposal, not because of any defectiveness in the scheme from a sanitary standpoint, but mainly that an old condemned rifle range runs near the proposed tank-site, and the few persons who use it could not be asked to walk about another mile and a quarter to the authorised Penrose Range in order that the majority of the Onehunga people might enjoy some more decent and less offensive sanitary conveniences.

Mount Eden Road District.

During the year a movement has taken place to convert this road district into a borough. The necessary petition has been presented to the Governor, and will probably be favourably acceded to. The borough will probably have the largest population of any around Auckland, and it is to be hoped will take a more active part in sanitary measures than has been the custom with the decadent Road Board.

Mount Roskill Road District.

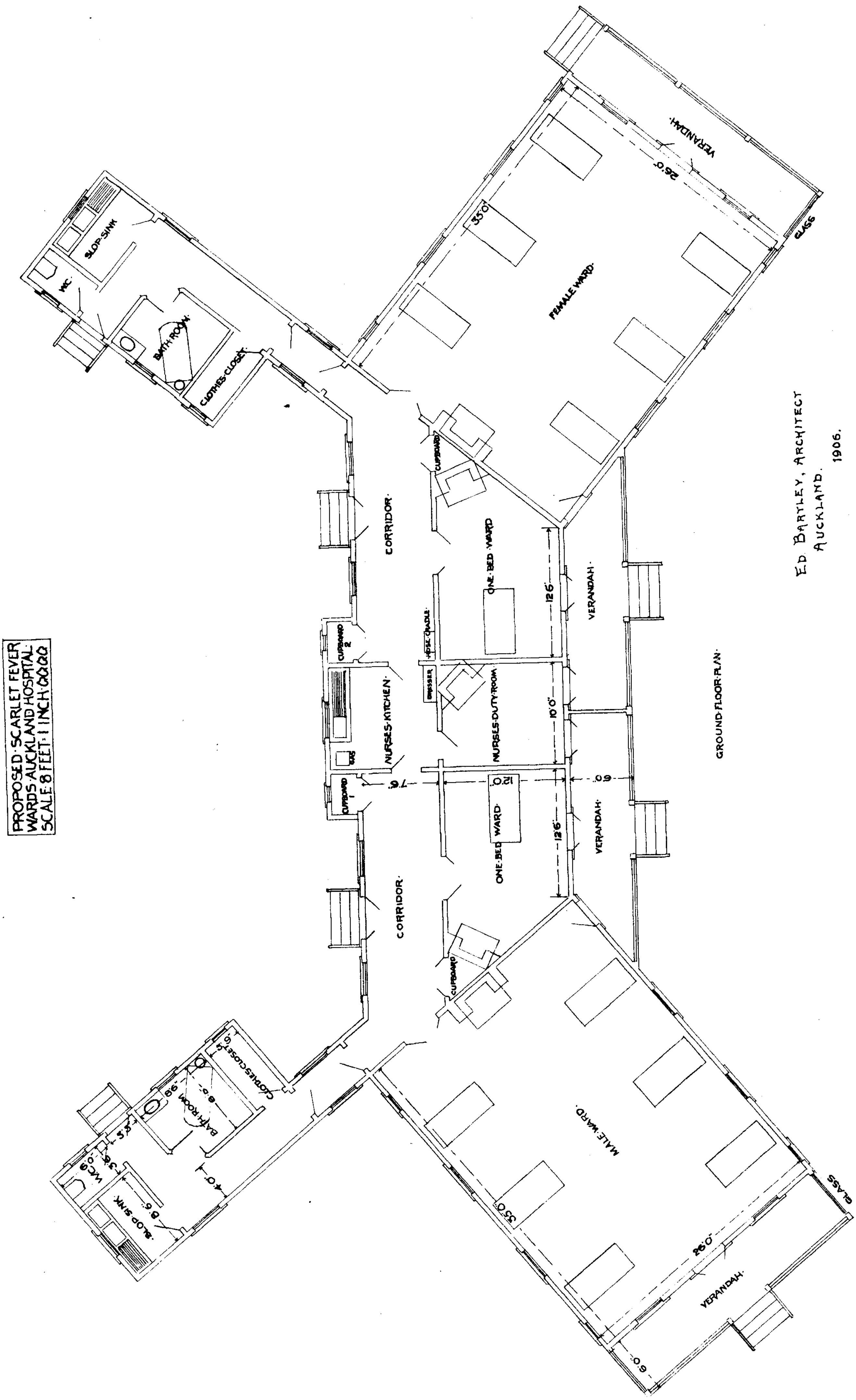
I have approved a set of by-laws for this district relating to the preventing of overcrowding, by defining the area upon which a house may be built and the size of dwelling-rooms.

Mount Albert and Epsom Road Districts.

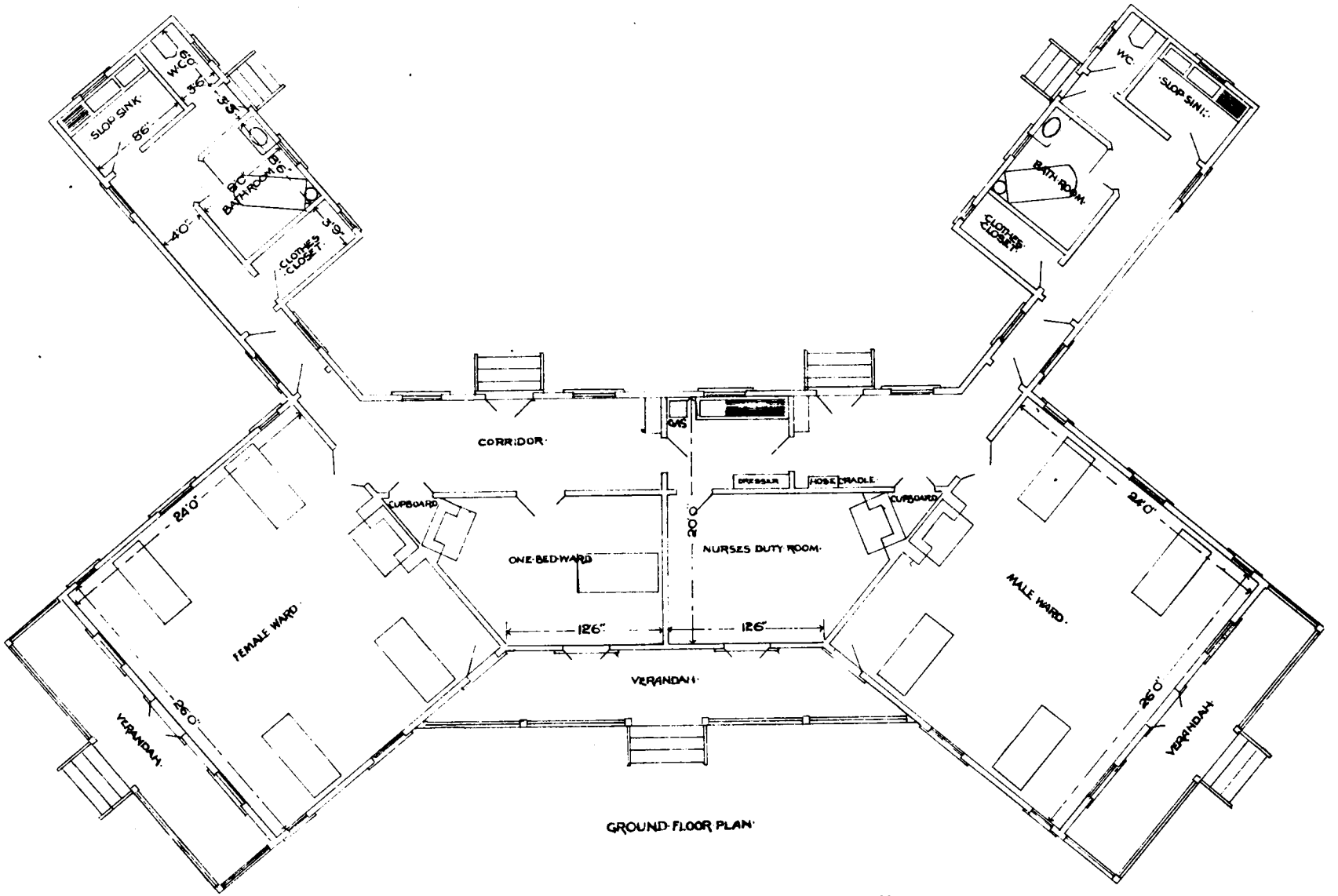
By-laws almost identical with those for Mount Roskill were approved. For these districts the minimum size of section agreed upon by the Mount Albert Board was 4,000 superficial feet, while the Epsom section thereon reads as follows:—

"B 1. Except as provided by By-law No. B 2 no person shall erect a new house in the district upon a site of a less area than one-quarter of an acre and unless such site shall have a frontage of at least 66 ft. to a road.

"B 2. By-law No. B 1 shall not apply to prevent the erection of one new house on an allotment, lot, or section which does not comply with the requirements of By-law No. B 1, but which is shown on any public plan or on any plan lodged or deposited in the Deeds Registration Office or the District Land Registry Office at Auckland prior to the coming into operation of these by-laws or on a site at the date of these by-laws by a person not owning any adjoining land, or to prevent the erection of a shop with dwelling-rooms attached upon any site having frontage to the main Auckland-Onehunga Road and situated within the 'special area,' provided that in the erection of such shop provision shall be made for the disposal of sewage and offensive matter from such shop and dwelling-room thereto attached in accordance with any general conditions for such disposal which may be made by the Board in respect of the special area, or such portion thereof, in which such shop is intended to be erected, as the case may be."


PROPOSED·SCARLET FEVER
WARDS·AUCKLAND HOSPITAL
SCALE 8 FEET: 1 INCH
GROUND·FLOOR·PLAN
ED. BARTLEY, ARCHITECT
AUCKLAND.
1906.
FEMALE WARD
MALE WARD
VERANDAH
GLASS
CORRIDOR
ONE·BED·WARD
NURSES·DUTY·ROOM
NURSES·KITCHEN
CUPBOARD
DRESSER
BATH·ROOM
CLOTHES·CLOSET
SLOP·SINK
W.C.
26'0"
35'0"
12'6"
10'0"
12'0"
7'6"
6'0"

DIPHTHERIA WARD FOR THE AUCKLAND HOSPITAL. ⅛ SCALE.



GROUND FLOOR PLAN.

ED. BARTLEY
ARCHITECT
AUCKLAND. 1906.

2500-4/06 6/3

Remuera Road District.

A poll of the ratepayers of a portion of the district on the city side was taken to decide if a sewerage scheme therefor be proceeded with. This has been carried, and now Mr. Metcalfe, the Engineer for that portion, is engaged upon a scheme for the completion of sewerage throughout the district.

Northcote.

At the request of the Chairman of the Waitemata County Council and some of the inhabitants of Northcote I delivered a lecture on "Sanitation" there on the 5th September, 1905. The attention given me by a large audience was pleasing evidence of the interest taken therein.

Country Districts.

Waihi.—The Borough Council have taken over the nightsoil service, and an improvement is shown, though the system is as yet very far from satisfactory. The Council have practically decided to avoid the needful sewerage scheme, and propose adopting that poor substitute—the system of drainage to a concreted side channel.

Hamilton.—Despite the warnings already given by my predecessor and myself, there is as yet no sewerage in the borough. The scheme referred to in my last report was not proceeded with, and now a third is being prepared by the Borough Engineer. The people of Hamilton West seem oblivious to the fact that any of these systems would be infinitely preferable to no drainage at all. I have already remarked on the excessive numbers of enteric-fever cases from this town. Instead of attacking every likely cause of infection and minimising or removing it, much valuable time is wasted by Council and burgesses in listening to the oft-repeated question, "What is the cause?" A set of sanitary by-laws have been drawn up for the Borough and passed by the Council. I submitted a draft to the Borough Solicitor. Much time was given up to consulting with the Borough Solicitor on the many points in the by-laws. Ultimately he has evolved a set which has many striking and valuable features.

Cambridge.—In marked distinction to the vacillating ways of the sister Waikato town, a small drainage scheme is under consideration by the Council, and is likely to be completed before this year is ended. The saleyards in the centre of the town continue to be an increasing nuisance. New saleyards outside of the town are proposed, but there is much agitation against this intention.

QUARANTINE REGULATIONS.

Consultations were held with Dr. Sharman, Port Health Officer, on four occasions. The decision arrived at in each case did not warrant special measures being undertaken.

HOSPITAL FOR INFECTIOUS DISEASES.

Regarding the accommodation necessary for the treatment of scarlet fever and diphtheria at Auckland, a finale has now been arrived at by the selection by Dr. Valentine, Acting Chief Health Officer, with the unanimous concurrence of the Hospital Board, of a site on the present Hospital grounds, and the approval of the plans for the buildings necessary. These are to consist of a pavilion for scarlet fever containing twelve beds in two main wards and two single-bed wards. For diphtheria two main wards containing eight beds, and one single-bed ward. Nurses' quarters are also provided in a single block, those attending upon the one disease, however, being walled off from the others. The formation of the ground and the limited space demanded this type of design. Each nurse will have a separate bedroom. The pavilions are designed on the right-angled triangle or "sun-absorbing-bungalow" style now being much favoured in house-construction. After much consideration this type was adopted; and I have to acknowledge my thanks to Dr. Hay, Assistant Inspector of Hospitals, for much help in arriving at that decision. Ultimately—when Auckland has increased in population—it is recognised that the treatment of infectious diseases must cease to be conducted on the General Hospital grounds. Having this in view, the structures above referred to are in wood. I enclose copy of the ground-plan. Its reproduction in this report will be of value to other Boards contemplating the building of wards for infectious diseases.

Plans almost identical in detail have been approved for a scarlet-fever pavilion at Waihi.

In January of this year the Controller and Auditor-General signified to the Auckland Hospital and Charitable Aid Board that, "It is unlawful to use the hospital and charitable funds for the purposes of an infectious-disease hospital," and that "the funds for such purposes should have been provided under and in the manner prescribed by the Public Health Act." The Board then requested me to take such action as was necessary under the provisions of the Public Health Acts to levy contributions from the contributory local bodies in the Auckland Infectious Diseases Hospital District sufficient to cover half the amount advanced and expended by the Board on infectious diseases up to the 31st December, 1905, the said amount being £2,910 9s. 1d. In consequence of representations made by the meeting of delegates held subsequently, this was reduced by the sum expended prior to the 1st April, 1904, and by the sums received by the Board on account of fees for the treatment of patients. I summoned a meeting of the local authorities, among whom, under date 30th May, 1904, the Chief Health Officer directed such expenditure should be apportioned, and this meeting was duly held in the City Council Chamber, by the courtesy of the Auckland City Council, on Friday, the 2nd February, Dr. Valentine, Acting Chief Health Officer, being voted to the chair, and the following resolution was agreed to by local authorities or their delegates then present: "That this meeting agrees to the percentage basis of allocations suggested by the Assistant Chief Health Officer for the construction and upkeeping of the infectious-diseases hospital."

OFFICE-WORK.

In addition to the daily routine of the office, with its necessarily considerable amount of correspondence and numerous applications for information on a great variety of matters, 520 notices in regard to cases of infectious diseases have been sent to local authorities, 76 orders in duplicate have been made out for the admission of persons to the Hospital for Infectious Diseases, and 922 tubes of vaccine lymph have been distributed to medical practitioners and public vaccinators.

Nine medical and physical examinations were made on behalf of the Post Office Department.

Fifty-four applications were received for admission to the Government Sanatorium at Cambridge, and the needful examinations and inquiries made in each case.

INSPECTORIAL STAFF.

Mr. R. Grieve took up the duties of an Inspector here in June last. I have assigned to him the investigation of infectious-disease outbreaks in and around Auckland, and the general sanitary inspection of the same area. He is a painstaking and careful officer, and has already amply shown his ability to deal with the work of this important centre.

Inspector Winstanley takes the remainder of the district, and has accomplished his work in the manner favourably referred to in former reports.

LABORATORY.

The following is a record concerning specimens submitted to this office for bacteriological and other examination :—

Date.	Specimen.	Suspected Condition.	Result of Examination, or Disposal.
1905.			
April 1	Testicle	General	Wellington report.
,, 1	Appendix	,,	,,
,, 1	Ovarian mass	,,	,,
,, 3	Smear	Gonorrhœal	Negative.
,, 4	Head of cat	Phosphorous poisoning	,,
,, 10	Smear	Gonorrhœal	,,
,, 26	Intestinal casts	Tubercular	,,
May 1	Sputum	,,	Abundant T.B.
,, 1	Smear	Gonorrhœal	Negative.
,, 5	Urine	Sugar and albumen	Albumen, nil ; sugar present.
,, 10	Sputum	Tubercular	Negative.
,, 10	,,	,,	,,
,, 16	,,	,,	,,
,, 16	,,	,,	,,
,, 20	Urine	Sugar and albumen	,,
,, 25	Sputum	Tubercular	Positive.
,, 29	,,	,,	Negative.
,, 29	Smear	Gonorrhœal	,,
,, 30	Fæcal matter	Blood	,,
,, 31	Smear	Gonorrhœal	,,
June 5	Urine	Tubercular	,,
,, 6	Sputum	,,	,,
,, 14	Growth *ex* palm of hand		Wellington report.
,, 16	Mass *ex* cervix uteri	Epithelioma	,,
,, 17	Sputum	Tubercular	Negative.
,, 28	,,	,,	,,
July 2	Swab	Diphtheritic	,,
,, 21	Sputum	Tubercular	,,
,, 22	,,	,,	Positive.
,, 25	,,	,,	,,
,, 25	,,	,,	Negative.
,, 31	Blood-smear	Typhoid	,,
Aug. 6	Mass expectorated		Wellington report.
,, 8	Sputum	Tubercular	Positive.
,, 9	,,	,,	,,
,, 10	,,	,,	Negative.
,, 18	,,	,,	Positive.
,, 22	Swab	Diphtheritic	Negative.
,, 23	Sputum	Tubercular	,,
,, 24	,,	,,	Positive.
,, 24	,,	,,	,,
Sept. 6	,,	,,	,,
,, 7	,,	,,	Negative.
,, 8	,,	,,	Positive.
,, 11	,,	,,	Negative.
,, 13	,,	,,	,,
,, 13	,,	,,	Positive.
,, 15	Section testicle	Malignancy	Wellington report : Carcinoma.
,, 15	Sputum	Tubercular	Positive.
,, 15	,,	,,	Negative.
,, 19	Cyst from lung	Hydatids	Wellington report.
,, 19	Cyst from uterus	General	,,
,, 19	Sputum	Tubercular	Negative.
,, 21	,,	,,	,,
,, 25	,,	,,	,,
,, 27	Suppuration from mouth	Actinomycosis	
,, 27	Tumour	Sarcoma	Wellington report.
,, 27	Sputum	Tubercular	Negative.

Date.	Specimen.	Suspected Condition.	Result of Examination, or Disposal.
1905.			
Oct. 2	Sputum	Tubercular	Negative.
,, 5	,,	,,	,,
,, 16	,,	,,	Positive.
,, 17	,,	,,	Negative.
,, 20	,,	,,	Positive.
,, 24	Urine	,,	Negative.
,, 25	,,	Tube-casts	Tube casts found.
,, 25	Sputum	Tubercular	Negative.
,, 25	,,	,,	,,
Nov. 2	Urine	Tube-casts	,,
,, 3	Sputum	Tubercular	Negative.
,, 7	Urine	Sugar	,,
,, 11	Smear	Spermatozea or gonorrhœal	,, (Court case.)
,, 13	Sputum	Tubercular	Negative.
,, 14	Urine	Albumen	,,
,, 18	Mice (five)	Anthrax	Wellington report.
,, 20	Subperiosteal tissue		,,
,, 22	Sputum	Tubercular	,,
,, 22	Placenta section	Malignancy	,,
Dec. 2	Vaginal discharge	Gonorrhœal	Negative.
,, 8	Sputum	Tubercular	,,
,, 9	Tumour of breast		Wellington report.
,, 10	Tumour		,,
,, 11	Spider	Identification	,, Not katipo.
,, 11	Cervix (*ex*)	Malignancy	Wellington report.
,, 11	Sputum	Tubercular	Negative.
,, 13	,,	,,	,,
,, 13	Water, Auckland City		Dr. Makgill reported.
,, 13	,, Manukau Trust		,,
,, 15	Urine.		
,, 16	Sputum	Tubercular	Negative.
,, 16	Bone-scraping	Tubercular or sarcomatous	
,, 18	Concretions *ex* bladder		Uric acid.
,, 19	Swab	Diphtheritic	Negative.
,, 22	,,	,,	,,
1906.			
Jan. 3	Sputum	Tubercular	Positive.
,, 3	,,	,,	,,
,, 5	,,	,,	,,
,, 6	,,	,,	,,
,, 6	Smear	Gonorrhœal	,,
,, 6	,,	,,	Negative.
,, 6	,,	,,	,,
,, 8	Sputum	Tubercular	,,
,, 8	Blood	Widal's test	No reaction.
,, 10	Sputum	Tubercular	Negative.
,, 16	,,	,,	Positive.
,, 17	,,	,,	Negative.
,, 17	,,	,,	,,
,, 19	,,	,,	Positive.
,, 30	,,	,,	Negative.
,, 31	,,	,,	Positive.
Feb. 8	,,	,,	,,
,, 12	,,	,,	Negative.
,, 12	,,	,,	,,
,, 19	,,	,,	Positive.
Mar. 2	,,	,,	Negative.
,, 5	,,	,,	,,
,, 6	,,	,,	,,
,, 6	,,	,,	,,
,, 8	,,	,,	Positive.
,, 8	,,	,,	,,
,, 12	,,	,,	,,
,, 14	Mass	,,	,,
,, 14	Tumour *ex* breast	General	Wellington report.
,, 12	Urine	Report	Reported.
,, 13	,,	,,	,,
,, 13	Tumour *ex* breast	,,	Wellington report.
,, 13	,,	,,	,,
,, 16	Mass *ex* gland of neck	Tubercular	Negative.
,, 16	Sputum	,,	Positive.
,, 20	Urine	Report	Reported.
,, 20	Sputum	Tubercular	Positive.
,, 21	,,	,,	Negative.
,, 21	Beef tongue	Ptomaines	Wellington report.
,, 21	Urine	Report	Reported.
,, 24	Sputum	Tubercular	Positive.
,, 24	Mass	General	Wellington report.
,, 26	Sputum	Tubercular	Positive.

During the year 443 rats have been collected and received, and have been subjected to examination.

On the 8th March two rats were found upon Hobson Street Wharf which seemed to show signs of the plague bacillus, and it was at the same time reported to me that rats had been dying in the neighbourhood during the previous few days. Specimens in the suspected instances were sent to Head Office for confirmation, and the authorities were communicated with here in Auckland. A number of rats were carefully examined from various parts of the town, and a more careful watch made, especially in the neighbourhood of the wharves, for rats dying under similar suspicious circumstances. The suspicion was not, however, entirely confirmed, but the mortality ceased. It was a noticeable feature that for some time afterwards very few rats were observed in the neighbourhood where the dead ones had been found.

As in former reports, Mr. Symons has compiled the statistical figures in this report, for which I must express my thanks.

The rapidly increasing population of this health district, and the more earnest desire of the people in the outlying and smaller centres for the adequate supervision of sanitary requirements by this Department, has greatly increased the work of this office, even in the two years I have administered it. I foresee a necessary increase of the staff of this office at a no distant date.

Jos. P. Frengley, M.D., D.P.H.,
District Health Officer.

HAWKE'S BAY DISTRICT.

Sir,— Department of Public Health, District Office, Napier, 1st April, 1906.

I have the honour to lay before you the fifth annual report of the Hawke's Bay Health District.

I am pleased to report that there has been a steady advance in sanitary matters over the whole district during the past year. The awakening of the local authorities in some of the smaller centres, which I alluded to last year, continues, and I am glad to report that they are now becoming fully alive to their responsibilities, and are taking an active interest in the sanitary welfare of their districts.

I am further glad to report that the work has been carried on with a minimum of friction. I can safely say that the advance in sanitary matters during the past year has been greater than in any previous year since the Department has been in existence, yet from the manner in which I have been treated by the local bodies and the public generally it has been a very comfortable and pleasant year for me. I do not think that I am too optimistic in taking the view that the Department is popular with the people in this district, and they do not look on the District Health Officer as a fiend who will pick their pockets or augment the rates by insisting on the carrying-out of useless fads, but as a counsellor and a friend who will assist them in their difficulties.

Many of the up-country settlers have sought my advice with reference to the sanitary requirements on their premises, and many of them have septic-tank installations. In every case where my advice has been sought I have insisted that the drain-laying and plumbing should conform to up-to-date sanitation; have had the work inspected and the drains tested before allowing the work to be passed.

The following diseases have been notified during the year :—

Erysipelas and Blood-poisoning.—Hastings, 1; Gisborne, 1; other districts, 1: total, 3.

Scarlatina.—Napier, 2; Hastings, 5; Waipawa, 1; Dannevirke, 1; Woodville, 4; Gisborne, 2; other districts, 10: total, 25.

Typhoid Fever.—Napier, 12; Hastings, 3; Woodville, 1; Gisborne, 26; Wairoa, 5; other districts, 8: total, 55.

Tuberculosis.—Napier, 10; Hastings, 1; Waipawa, 1; Dannevirke, 1; Gisborne, 14; Wairoa (chiefly among the Maoris), 34; other districts, 12: total, 73.

Diphtheria.—Napier, 15; Hastings, 8; Waipawa, 1; Waipukurau, 2; Dannevirke, 1; Gisborne, 7; other districts, 10: total, 44.

Notification of Infectious Diseases compared with Last Year.

Scarlatina.—In 1905, 38 cases; in 1906, 25 cases—a decrease of 13 cases.
Typhoid Fever.—In 1905, 43 cases; in 1906, 55 cases—an increase of 12 cases.
Tuberculosis.—In 1905, 67 cases; in 1906, 73 cases—an increase of 6 cases.
Diphtheria in both years was 44 cases—no alteration.

Analysis of the Above.

The decrease in the number of cases of scarlatina notified has little bearing on the sanitary condition of the district. The complaint depends on infection, and segregation aids its spread, but the presence of the epidemic has not such an important bearing on sanitation as that of many other diseases. Most of the children in the district are immune, from a previous attack in the widespread epidemic which visited the district three years ago, but it only needs fresh pabulum, and the introduction of a case to bring about another epidemic.

An increase of 12 notifications of typhoid fever is to be regretted, but the number of cases relatively to the population is very small, and notwithstanding the augmentation, the district is nevertheless to be congratulated on the paucity of the cases. Napier accounts for 12 cases, against 6 last year. The increase is to be regretted, but the number of cases relatively to the population is so small and so much less than has been experienced in comparatively recent years that the increase need give rise to no dissatisfaction or alarm. Gisborne is to the fore with 26 cases, an increase of 14 on last year.

When good water is supplied to, and drainage installed in, Gisborne, both of which should be completed in a very few years from now, this scourge should reach the vanishing-point, as it has almost done in Napier. Relatively to its population, Wairoa with its 5 cases is the highest in the district.

The increase in the number of notifications of tuberculosis—6 cases—is so infinitesimal as to be of no moment. I am glad to be able to report a smaller number from Wairoa, 34, as against 53 last year. From this I am led to hope that the efforts that are being made to improve the sanitary conditions of the Natives are beginning to bear fruit.

The aggregate number of cases of diphtheria notified for the whole of the district is the same for this year as last—viz., 44 cases. I regret to have to report that Napier is to the fore with 15 cases as compared with only 7 last year. It is difficult to account for the increase, for the town has progressed in sanitation. Hastings and Gisborne have fewer cases this year than last—8 and 7 compared with 19 and 9 in 1905. The decrease in Hastings is very satisfactory.

Deaths.

For the whole district: Total from all causes, 469, compared with 432 in 1905, 414 in 1904, and 452 in 1903. It will be observed that there is a slight increase over previous years, but the excess of 17 this year over the number in 1903 is probably not a relative increase, owing to the largely augmented population.

The number of deaths from typhoid fever is 5, from diphtheria 2, from cancer 22, from tuberculosis 32, from erysipelas and blood-poisoning 5, from other zymotic diseases 4. There is a slight decrease in the number of deaths from cancer—22 this year and 26 in 1905—but this small decrease has no significance. There is a satisfactory decrease in the number of deaths from tuberculosis—32 in 1906 and 56 in 1905: decrease, 24.

Napier.—Total from all causes, 150, 10 more than last year. From typhoid fever, 2; diphtheria, 1; cancer, 13—there were 14 last year; tuberculosis, 15, compared with 20 last year. The reduction of 25 per cent. of deaths from tuberculosis is satisfactory. The reduction of 1 in the number of deaths from cancer has no significance.

Hastings.—Deaths from all causes, 57, a marked decrease with an augmented population; the deaths from all causes in 1905 were 61, and in 1904 65. From cancer, 2; from zymotic diseases other than typhoid or diphtheria, 4.

Waipawa.—From all causes, 25. From cancer, 2; tuberculosis, 2; erysipelas and blood-poisoning, 2.

Waipukurau.—Deaths from all causes, 25. From cancer, 2; tuberculosis, 3.

Dannevirke.—Deaths from all causes, 41. From cancer, 1; tuberculosis, 3. This shows a slight total increase in the number of deaths from all causes in Dannevirke, but the town is increasing in population by leaps and bounds, and if it were possible to accurately estimate the augmented population I believe it would be found that the number of deaths is less in proportion to the population; and, at any rate, we may be certain that there has been no relative increase.

Woodville.—Deaths from all causes, 15. From typhoid fever, 1; tuberculosis, 1; erysipelas and blood-poisoning, 1. The number of deaths from all causes in Woodville is the same as in 1905, and 8 less than in 1904.

Gisborne.—Deaths from all causes, 106; there were 115 in 1905, and 91 in 1904: This is satisfactory when we consider the great increase that has taken place in the population in Gisborne and its environs. Deaths from cancer, 2; typhoid fever, 2; diphtheria, 1; erysipelas and blood-poisoning, 2.

Wairoa.—Deaths from all causes, 16. From typhoid fever, 1; tuberculosis, 2. Sixteen deaths from all causes is a high relation to the population of Wairoa, and the district should be a very healthy one.

Outside the larger centres the following are the principal nuisances that have been attended to during the past year: The abatement of a nuisance at Te Aute in connection with a dwellinghouse, and another in connection with the drainage at the hotel; the abatement of some nuisances at Puketapu; nuisances abated at Taradale; improvements made in the sanitary condition of the Havelock Hotel; drainage at the hotel at Tikokino has been attended to; at Norsewood some nuisances have been abated, and improvements in the water-supply of the school effected.

During this year, in compliance with orders from the Head Office, I inspected the various dairies supplying milk to the Borough of Napier, reported on them, selected a sample of milk from each, which, in accordance with instructions, I forwarded to the laboratory at Wellington. I am glad to state as the result of my inspection that some of the dairies were exceptionally clean, most were reasonably clean, but in a few there was much to be desired. The reply from the Acting Chief Health Officer, Dr. Valintine, was to the effect that the dairies supplying Napier compared favourably with those in larger centres, and the report on the milk that I forwarded generally bore out the matter in my report.

I regret to say that there is much to be desired in the manner in which the milk is distributed to the customers, and there is much carelessness in this matter, permitting of the possibility of defilement between the dairies and the houses of the consumers. I have written to the Borough Council on the subject on several occasions, but it seems impossible to interest them in it or to impress on them the need of legislation. When the consumers become alive to the importance of having clean milk, and are determined to have it, and take pains to find out where it can be procured, we may hope to see an improvement in the method of distribution, and dirty dairies will have to go to the limbo of obscurity.

Proceedings were instituted by the Hastings Borough Council, at the instigation of the Department, against the owners of a row of business premises in Heretaunga Street—the principal street in

the town—to compel them to supply proper water, drainage, and latrine accommodation. The prosecution was withdrawn at the last moment, the owners agreeing to pay all costs incurred, and undertaking to effect the reforms required. After some shuffling and delay the work was commenced, and completed to the satisfaction of the Department.

A prosecution at the expense of the Waipawa Road Board was instituted by the Department, and a conviction secured against a person who was keeping pigs in such a manner as to be a nuisance and a menace to health.

Several prosecutions have been threatened, but the threat has proved to be sufficient coercion.

Houses have been condemned in the following places: In Gisborne, 2; Napier, 5; Hastings, 2; Taradale, 1; Papakura, 1; Wairoa, 1. Most of these buildings have been repaired in such a manner as to make them habitable, and to the satisfaction of the Department; the others are standing empty. In the absence of retaliatory clauses in the Act, there seems to be a difficulty in getting condemned houses demolished.

In Napier, and in areas becoming congested in Gisborne, a watchful eye has to be kept to prevent clause 352 of "The Municipal Corporations Act, 1900," with respect to open spaces round houses from being neglected. I have insisted on this clause being rigidly enforced, and have curtailed the size of outbuildings in some residences to obtain the required curtilage. As we boast of belonging to an Empire on which the sun never sets, it behoves us to prevent the formation of slums into which the sun cannot enter.

Particulars as to the Condition of Various Centres of the District.

Napier.

The cleanliness of this town is the pride of the inhabitants and the admiration of visitors. Several nuisances that have been discovered have been improved out of existence during the past year. They have chiefly consisted in dirty stable and other yards, situated in the less-frequented portions of the borough, and faulty drain-connections to houses that were connected with the sewer in days gone by, when the work was not so well understood by drain-connectors and plumbers as it is at present, and when supervision was not so thorough as is now the case.

The town owes much to the Borough Councillors in the past for their intelligent appreciation of the necessity of sanitary requirements, and their readiness to seek the aid of the Department since it has been in existence, and to take the advice that is given. It is but fair to state that the Department is not wholly responsible for the creditable condition of Napier: thirty years ago the enterprise and intelligence of some of the prominent citizens of Napier gave the town an ample supply of magnificent water, and twenty-five years ago the drainage scheme was designed by the late Mr. Napier Bell, and has brought the town to a pitch of sanitary excellence which might well be envied and emulated by many larger centres. The chief work of the Department has been to paint the lily and gild refined gold by continuing and perfecting the work so ably begun by the people.

Mr. Kershaw's lectures on sanitary plumbing, which have been continued by Mr. Pickering, have borne good fruit, and the plumbers in the district—not in Napier only—are doing good work. From what I have observed during my recent visit to the Old Country, many large centres at Home are not so well served in this respect as we are.

During the latter part of 1905 Napier sustained a severe loss in the death of Mr. Waterworth, the Road Overseer, who has done as much as, perhaps more than, any resident in Napier to promote the general cleanliness of the town. The excellence of our streets are his best monument. "He rests from his labours, and his works do follow him."

I had hoped that by the time it came to writing this report the nightcart would have ceased to exist in Napier, but I regret that it is still in evidence, and pursues its odorous course, though the area that receives its attentions grows more and more restricted. On this head Mr. Pickering writes in reply to a communication of mine asking for information, "The number of water-closets fixed, including the construction of other sanitary work, between the 1st April, 1905, and the 31st March, 1906, was 237, against 359 of the previous year. The number of residences now served with the nightcart is 188. Striking a low average of twenty per month, which may easily be constructed, and allowing a little time for necessary sewer constructions, extensions, and connections for new buildings, the 31st March should see the nightcarts abolished in this town. If at that date only a few scattered exceptions remain, the nightsoil may be collected by the dustcart in sealed pans. The total number of water-closets in the borough on the 31st March, 1906, was 1,891."

I regret that Mr. Pickering has forwarded his resignation to the Borough Council. I trust for the sake of Napier that his successor may prove his equal, and I have pleasure in according my appreciation of the cordial manner he has always worked with the Department.

The reclamation of the swamp continues to proceed, and it is estimated that in a year from the present date it will be ready for the erection of buildings. The Borough Council has been wise in securing an area of 20 acres for a park, and the Caledonian Society have secured another 10 acres as a recreation-ground. These will form good "lungs" when the land is taken up and built over, as it will be in a few years. The acquisition of fresh building-sites in the immediate vicinity of Napier will do much to relieve the congestion which increased population is rendering acute.

A large amount of tinned salmon that was offered for sale in one of the auction-rooms was seized in compliance with my orders by Inspector Munro. Most of the tins were blown, and those which were opened proved quite unfit for food. The owners consented to the fish being destroyed, and the destruction was carried out under the supervision of Inspector Munro.

Two large shipments of currants were found to be infested with weevils, maggots, and larvæ to a large extent. I retained one lot in quarantine, and they were subsequently shipped to Wellington and dealt with by the authorities there. The other shipment was returned to Sydney by the consignees,

who did not care to face an investigation. I have been assured by certain interested parties that the fruit was not inferior to quantities that have been imported and sold in New Zealand on previous occasions. I replied that to prevent a recurrence of such matters is one of the *raisons d'etre* of the Department.

There are many small cottages in Napier that were erected many years ago occupying a miserably defective curtilage. As these fall into decay and are pulled down, care will have to be taken that they are not rebuilt, or, if re-erected, their proportions are restricted to permit of the proper amount of open-air space at the back or side of the dwelling.

On Christmas Day the Norwegian barque "Ivar Aasen," bound from the Marshall Islands to Valparaiso, put into the roadstead with the whole crew suffering from beriberi. Two of the crew had died, and the captain, with such a short-handed crew, and those in an invalid condition, found it impossible to navigate the vessel further. Dr. Moore, the Port Health Officer, boarded the vessel on arrival, quarantined her, and gave instructions for a supply of suitable fresh food to be provided. On the following morning he communicated with me, and we went off together. All the remaining crew were more or less affected, and the mate and two of the seamen were seriously ill, the mate being so ill that I was very anxious about his condition, and feared that we might not get him ashore alive. We brought these three ashore, and sent them to the isolation ward at the Napier Hospital, where they all made a good recovery, but at the date of the vessel's sailing the mate had not sufficiently recovered to go with the ship. The origin of the complaint is a mystery; the captain is not aware that there were any cases at the Marshalls, and the ship was well found and provided with good provisions.

Clive, Meeanee, and Taradale.

These townships have progressed, some of the old buildings being demolished, and better residences being erected in their place.

The buildings in Taradale are generally good, and with the concrete channellings and well-laid-out roads this pretty township presents a cleanly and prosperous appearance.

Greenmeadows may be considered a suburb either of Taradale or of Napier. It is being built over with comfortable dwellings, and is a very pretty township. Like Taradale and Meeanee, it possesses some fruit-farms and vineries, which are well laid out and tended.

Many of the dairies supplying Napier with milk are situated in these townships, and the excellence of the soil and the consequent richness of the pasture is a factor favourable to the quality of the milk.

When the swamp is fully reclaimed and built over, these townships will be practically part of Napier —it will be difficult to say where one begins and the other ends. Probably in a few years' time, they will be incorporated in the borough.

When we consider the advantages possessed by Napier and its environs, we need not be surprised at the healthiness of the inhabitants. With such an excellent climate, and a supply of as good water as is possessed by any place in the world, it would require much sinning in the way of filth to cause much sickness. The typhoid and dysentery that once scourged these parts were entirely due to dirty surroundings, dirty milk, *et hoc genus omne.* Happily the one has become rare, and the other is almost unknown.

Havelock North.

This township has improved during the past year, through the erection of some pleasant and tastily designed houses, both on the hills at the back of the township and fronting the main street. Some of the old cottages have disappeared. The hotel has been improved, and the sanitary arrangements brought up to date.

Hastings.

This town is growing in size and importance, and is still free from any sign of overcrowding. Considering the amount of land still available for building, it should be many years before the danger of slum dwellings becomes acute.

Much has been done in Hastings during the past year, much still remains to be done, and careful supervision will be required each year as the town grows in size and importance as it bids fair to do at a rapid rate. Many faulty house connections have been replaced with up-to-date appliances, and thirty-four houses have been connected with the sewer during the year. Notices have been served on others calling on them to connect. Some of those notified seem inclined to be obdurate, and it is more than possible that prosecutions to compel compliance with the borough by-laws and sanitary requirements may be instituted. The members of the Hastings Borough Council are for the most part an intelligent body of gentlemen, have the interests of the town at heart, and are fully alive to their responsibilities. They are not as ready as some might wish to prosecute recalcitrants who are inclined to set at naught their demands, prefering to gain their end by moral suasion, rather than by the exercise of brute-force. Perchance in this display of the gentleness of the dove there may be combined the wisdom of the serpent.

It will not be long before an extension of the sewer-area will have to be faced, but in the outskirts of Hastings the sewer will not be needed for many years owing to the scattered nature of the holdings, and the extended area on which they stand. To settlers who have sought my advice, and where the land is too flat to admit of the installation of septic tanks, as it is in many cases, I have recommended the Vivian Poore method of disposing of the nightsoil. When this becomes general it will require some inspection on the part of the Borough Council, but I do not apprehend any difficulty under this head. The Inspector of Nuisances for the borough, Mr. F. Cook, is an intelligent gentleman, who takes great interest in his work, always shows a disposition to work pleasantly and cordially with the Department, and has been prompt in carrying out my recommendations.

Kaikora North.

This place still enjoys the enviable position of being a healthy and prosperous little township, requiring no attention from the Health Department.

Waipawa.

The present Town Board seem alive to the necessities of sanitation. Several connections with the sewer have been made during the past year and schemes are being discussed for a public water-supply, which seem likely to eventuate in this desirable end. With further sewer-connections, and the general introduction of water-closets which must result when water becomes an accomplished fact, the outfall on the river-bank will have to be attended to. It will be desirable, I should say imperative, to pass the sewage through a septic tank before permitting it to enter the river.

I regret to say that in Waipawa there are several dwellings erected on insufficient curtilage. This blot cannot be remedied for some years to come—till the houses decay and are demolished. But care must be taken that the error is not perpetuated in the future.

Waipukurau.

This pretty township is moving ahead. Some new buildings have been erected during the past year. The Road Board has given place to a Town Board, the members of which seem to be alive to their responsibilities, and to be desirous to improve the sanitary condition of this much-favoured village. Many nuisances have been abated, and it seems that it will only be a matter of a little time when money will be raised to improve the defective condition of the sewers.

Ormondville, Makotuku, and Norsewood.

These are scattered and open townships, standing at an elevation of about a thousand feet above sea-level. There is no over-crowding, and very little sickness, and not much that claims attention.

The hotel at Ormondville, which was a straggling ramshackle structure, has been almost entirely rebuilt, and provided with up-to-date appliances. It is one of the most comfortable and well-conducted up-country hotels in the district.

Dannevirke.

The drainage has been commenced during the past year, and is approaching completion. There has been delay in obtaining the land from the Natives that has been selected to receive the effluent from the septic tank, and the difficulty has not yet been overcome. The Borough Council accepted the engineer who designed the works as contractor to carry them out, and failed to appoint a clerk of works to supervise the works and safeguard their interests. A recommendation from me to that effect was not favourably received. Without reflecting on the integrity or ability of the engineer-contractor, it must be admitted that such apathy of a public body on such an important matter is not in the best interests of the ratepayers whom they represent.

Dannevirke possesses an ample supply of excellent water, the soil around is porous, and the town stands at a high elevation, about 700 ft. above sea-level; it is well wind-swept, has a fair share of sunshine, and when drainage is an accomplished fact, the health of this favourably situated town should attain even a higher standard than it at present enjoys.

The new Hospital is fast approaching completion, and early in the present year should be in full swing. As there is much bush-felling and milling going on around Dannevirke, accidents are deplorably frequent, and the new Hospital should prove an acquisition to sufferers, who will be able to be attended to on the spot, instead of having to be transported to Waipukurau or Pahiatua as is the case at present.

Tenders have now been called for the erection of up-to-date abattoirs. There has been much unnecessary delay in this important work, which does not reflect credit on those concerned. The experience of Napier, Hastings, and Gisborne is in evidence of the benefits that accrue from properly conducted institutions of this kind.

Woodville.

This little borough stands much where it did, both in matters of sanitation and population. It has an abundant supply of water of excellent quality, which was installed some years back, and has drainage of a kind that would be a source of danger to a more crowded community. The plans for an up-to-date drainage scheme that were submitted to the Borough Council by Mr. Metcalf, C.E., about two years ago, have not yet been given effect to. The ratepayers were scared at the expense, and refused to vote for the loan. The Mayor, Mr. Burnett, informs me that he hopes to be able to reduce the rates shortly, when he believes that the ratepayers will consent to extra taxation for drainage purposes. As occasional cases of diphtheria and typhoid have cropped up in Woodville, which were strangers to the town previously, it is to be hoped that the ratepayers will see their way to pay the interest on a loan sufficient to carry out the works designed by Mr. Metcalf.

It must be remembered to the credit of the people of Woodville, that on their own initiative, and without any pressure from outside they have saddled themselves with the cost of £10,000 for a water-supply.

Gisborne.

I am glad to say that the scheme for the introduction of water into this borough, designed by Mr. Hay, is now *en train*, and I hope that when the time again comes round for me to write the annual report, it will be *un fait accompli*.

Gisborne still continues to suffer the unenviable notoriety of having more typhoid and diphtheria than any town in my district, and, with the backward state of its sanitary appliances, the people may be congratulated that the amount of preventable disease is not greater. Its broad streets, its large amount of sunshine, are great factors in counteracting the sanitary evils.

When water is installed, drainage will, I hope, follow quickly, and the scheme designed by Mr. Mestayer having been so favourably reported on by other engineers will probably be the one decided on.

Gisborne is now seriously considering the building of an isolation ward for the treatment of infectious diseases. The non-existence of such a building, or any place where such cases could be effectually housed and treated, and the inconvenience entailed on the sick, combined with the danger to the community generally, are the reverse of creditable to those responsible for the neglect.

A suitable site for a new cemetery has been chosen on the Waikanae, but has not yet been made use of.

The abattoirs are in full swing. The building and conveniences are up to date in every particular, and the work is conducted in a cleanly and reputable manner.

A tendency to crowd houses on an insufficient area is beginning to make itself felt in Gisborne, and a watchful eye will be necessary to insure that the provisions of clause 354 of the Municipal Corporations Act are properly observed.

Tolago.

The small township of Tolago is increasing in size and importance owing to the closer settlement that is taking place in and around the town, and in the near future will claim attention.

Tokomaru, Waipiro, Tuparoa, and Wainui.

The smaller townships of Tokomaru, Waipiro, Tuparoa, and Wainui, still further north, require little attention. They are scattered townships, all placed on hills sloping towards the sea, the soil is light and porous, and at present there is nothing to make them unhealthy.

Te Puia.

The hot springs situated at Te Puia, about four miles from Waipiro, are growing slowly in popularity, but they are not as much known or made use of as their excellent medicinal properties would warrant.

Clyde, Wairoa.

Both the Town Board and County Council seem to be more alive to their duties as to sanitary reform than has previously been the case. Some reforms, both in the township and county, have been effected during the past year, but there is still room for more improvement, as is evidenced by the high death-rate, sixteen, with a population of less than seven hundred in the township and probably three or four hundred more in the county, and the number of cases of typhoid fever notified, five, rather less than half the number notified in Napier, with more than fourteen times the population. When we consider the natural advantages of the town and district, these facts have a sinister signification.

The new Hospital is now in full swing, and is a credit to the district. Some difficulties arose in connection with the drainage of the institution. I gave full directions how the matter was to be carried out, and requested to be advised when the drains were being laid and the plumbing-work done, that the Department might supervise the work and test the drains. This I was careful to inform the Committee would be undertaken free of charge. For some reason with which I have not been made acquainted, the whole work was completed without my receiving any communication. Some time after the Hospital was opened I was informed that the drains were causing a nuisance, and that sewer-gas was making its presence felt in the Hospital. Inspection proved that all necessary steps to insure the proper ventilation of the drains and prevent the entry of sewer-gas were ignored, and when the drains were tested they were found to be leaky. The plans supplied had been departed from in several important particulars. The excuse given was that they had never done work of the kind before and, therefore, could not be expected to understand it. When asked why the plans had not been adhered to, or the advice of the Department sought, no satisfactory answer was forthcoming.

Mohaka.

The new hotel is now completed, and its appointments are comfortable. It is doubtful if a better appointed hotel exists in any up-country place, certainly there is none so good in this district. The present licensee does his best to give full effect to the advantages of the house, which is cleanly kept and everything done to make the guests comfortable. The hotel is supplied with a high-pressure water-system, which is brought down from a hill on which a spring of pure water is found. Water-closets have taken the place of pit-closets, and the drainage has been carried out under the supervision and to the satisfaction of the Department.

Nothing has been done to remedy the defects of the present schoolhouse, which is a ramshackle structure, deficient both in light and ventilation. There are some difficulties with the Natives in the way of reform, but I should not think that they are insuperable, and it is much to be regretted that steps are not successfully taken to clear away the difficulties that exist.

Two houses that have been condemned have been repaired in such a manner as to render them habitable.

Owing to the large increase in the population since the last census was taken, any attempt to give vital statistics would be useless, as the calculations would be based on erroneous figures, and the conclusions would be necessarily fallacious.

I have, &c.,

FRED. DE LISLE, L.R.C.P., D.P.H.,

J. Malcolm Mason, M.D., D.P.H., Chief Health Officer, Wellington. District Health Officer.

WELLINGTON DISTRICT.

Department of Public Health, Wellington, 9th April, 1906.

Dr. Mason, Chief Health Officer.

I HAVE the honour to present my annual report for the year ended the 31st March, 1906.

In the early part of the year much time was devoted to lecturing, and addressing local bodies and meetings, in connection with the anti-consumption movement, which has been most successful and in all probability will be well taken up throughout the colony. I particularly draw your attention to the success which has attended Dr. Finch's efforts in this direction in the Canterbury District, and I trust that legislation may be introduced to allow the local bodies outside the North Canterbury Hospital District to contribute to the sanatorium which it is proposed to erect in the neighbourhood of Christchurch.

For the first four months following your departure from the colony, the greater part of my time was naturally devoted to Head Office work, though at times I was enabled to make visits of inspection, particularly to some of the dairies surrounding Wellington. Information gained by the latter, and also from the reports of the various District Health Officers, is embodied in the attached report on the milk-supply.

Each health district was visited.

Three separate visits were paid to the Cambridge Sanatorium.

Three separate conferences of local bodies agreed to the respective allocations made by the Department for the erection and upkeep of infectious-diseases hospitals.

Details of the above and other matters are referred to at greater length in another portion of this report.

I trust that the construction of the new offices will be pushed on. During the year no less than seventeen officers have been absent from duty on account of ill health. Sore throats of a septic nature occurred among three members of the Head Office staff. I cannot but regard this unusual proportion of illness as due to the unhealthy condition of the present offices.

I take this opportunity to record my appreciation of the manner in which the various officers have assisted me during the seven months I was in charge of the Department.

My special thanks are due to Dr. Makgill, who, despite his many and onerous duties as District Health Officer, Bacteriologist, and Superintendent of Vaccine, was at all times ready to help me with his valuable advice. I sincerely hope the Hon. the Minister will recognise the excellent work being done by this officer, who, to keep pace with the demands on his time in connection with his laboratory and vaccine work, has had to do a great deal of work out of the ordinary office-hours. I particularly draw your attention to the reports of the Public Vaccinators on the excellence of the vaccine lymph prepared by Dr. Makgill.

To the Chief Clerk, Mr. Grix, for his careful and conscientious work and knowledge of routine, I am also very much indebted.

CONTRIBUTIONS OF LOCAL AUTHORITIES TO INFECTIOUS-DISEASES HOSPITAL.

During the past year I have attended four meetings of local bodies cited under section 4 of "The Public Health Amendment Act, 1904," to settle the proportion such local bodies should contribute towards the construction and maintenance of the infectious-diseases hospitals. The representatives of the local bodies contributing to the Palmerston, Wairarapa, and Auckland Boards unanimously agreed to the allocations suggested by the Department. Unfortunately, owing in some measure to local influences and to an error in citation, the representatives of the local authorities contributing to the Southland Hospital would not agree to the allocations suggested: hence the matter will have to be decided by the Resident Magistrate.

Naturally in these allocations care has been taken to place the larger contributions on those local authorities likely to receive most benefit from an infectious-diseases hospital. Of necessity it follows that residents in these local authorities' districts immediately surrounding the infectious-diseases hospital derive most benefit from such an institution. Much depends upon the prompt isolation of an infectious case in a thickly populated borough or district, whereas, on the other hand, in sparsely populated country districts an infectious case should not prove so great a danger to the community as in the former. Again, except under exceptional circumstances, it would be in the highest degree unwise for infectious cases from country districts to be moved into infectious-diseases hospitals situated in towns, and thus open up additional avenues for the distribution of infection.

Appended is a list of the contributions agreed upon by the local authorities contributing to the Palmerston North, Auckland, and Wairarapa Hospitals:—

Palmerston North Infectious-diseases Hospital.

Name of Local Authority	Population.	Actual Proportion.	Per Cent. agreed upon.
Palmerston North Borough Council	6,534	$\frac{1}{3}$	50
Feilding Borough Council	2,298	$\frac{1}{8}$	11
Kairanga County Council	6,778	$\frac{1}{4}$	11
Oroua County Council	..	..	10
Manawatu County Council	3,000	$\frac{1}{9}$	10
Foxton Borough Council	1,211	$\frac{1}{24}$	2
Pohangina County Council	1,536	$\frac{1}{12}$	2
Kiwitea County Council	2,844	$\frac{1}{10}$	2
Halcombe Town Board	..	..	1
Rongotea Town Board	..	..	1

These allocations were unanimously adopted by the local bodies concerned.

Auckland Infectious-diseases Hospital.

Allocations of the cost and maintenance, distributed among local bodies as directed by the Chief Health Officer under date 30th May, 1904; the localities grouped according to distance from and means of access to Hospital, and debited with an amount of £2,910 9s. 2d., demanded by the Auckland Hospital Board, less £95 7s., being amount brought forward from the 31st March, 1904, and £102 1s. 9d., the amount received as fees for treatment of infectious cases during the period covered by said sum; the final sum distributed in equitable shares as agreed at a meeting of the local bodies interested, convened in pursuance of section 4 of "The Public Health Amendment Act, 1904," and held at the City Council Chamber, Auckland, 2nd February, 1906, was:—

Group A.

				£ s. d.		£ s. d.
Auckland	...	34,213,	70·34 per cent. of	943 19 0	=	663 19 5
Parnell	...	4,566,	9·39 "	"	=	88 12 10
Newmarket	...	2,060,	4·24 "	"	=	40 0 5
Grey Lynn	...	4,110,	8·45 "	"	=	79 15 4
Arch Hill	...	1,671,	3·44 "	"	=	32 9 5
Eden Terrace	...	2,011,	4·14 "	"	=	39 1 7
		48,631 @	61·78* "	1,356 10 2		943 19 0
			=	838 1 0		
			+ 12·64 per cent.	105 18 0		
				£943 19 0		

Group B.

				£ s. d.		£ s. d.
Devonport	...	3,823,	19·78 per cent. of	299 16 10	=	59 6 2
Onehunga	...	3,015,	15·59 "	"	=	46 15 0
Birkenhead	...	1,057,	5·47 "	"	=	16 8 0
Epsom ...	...	750,	3·88 "	"	=	11 12 8
Mount Albert	...	2,085,	10·79 "	"	=	32 7 1
Mount Eden	...	5,129,	26·54 "	"	=	79 11 7
One Tree Hill	...	1,283,	6·64 "	"	=	19 18 2
Remuera	...	2,186,	11·31 "	"	=	33 18 2
		19,328 @	24·56 "	1,356 10 2		299 16 10
			=	333 3 0		
			− 10 per cent.	33 6 4		
				£299 16 10		

Group C.

				£ s. d.		£ s. d.
Avondale	...	1,075,	18·45 per cent. of	70 5 1	=	12 19 2
Mount Roskill	...	581,	9·97 "	"	=	7 0 0
Mount Wellington		954,	16·37 "	"	=	11 10 0
Orakei ...	...	21,	0·36 "	"	=	0 5 0
Point Chevalier	...	684,	11·74 "	"	=	8 5 0
Howick ...	...	224,	3·84 "	"	=	2 14 0
Mangere	...	702,	12·05 "	"	=	8 9 4
Otahuhu	...	1,211,	20·78 "	"	=	14 12 0
Tamaki West	...	375,	6·44 "	"	=	4 10 7
		5,827 @	7·40 "	1,356 10 2		70 5 1
			=	100 7 7		
			− 30 per cent.	30 2 6		
				£70 5 1		

Group D.

				£ s. d.		£ s. d.
Waitemata	...	3,641,	73·90 per cent. of	42 9 3	=	31 7 5
Tamaki East	...	580,	11·77 "	"	=	5 0 0
Papatoitoi	...	176,	3·57 "	"	=	1 10 4
Pakuranga	...	271,	5·50 "	"	=	2 6 10
Panmure	...	259,	5·26 "	"	=	2 4 8
		4,927 @	6·26 "	1,356 10 2		42 9 3
			=	84 18 5		
			− 50 per cent.	42 9 2		
				£42 9 3		
Grand total	...	78,713				

* Group's percentage of total population.

Wairarapa Infectious-diseases Hospital.

Suggested Apportionment of the Cost of providing and maintaining Hospitals for the Reception and Treatment of Infectious Cases under Section 4 of "The Public Health Act Amendment Act, 1904."

Contributory Local Authority.	Population.	Proportionate Share of Cost on Population Basis, per Cent.	Percentage for Facility of Access.		Total suggested Share, per Cent.
			Added.	Deducted.	
Masterton County ...	3,123	9·0	1·0	...	10·0
Wairarapa South County ...	...	8·0	1·0	...	9·0
Featherston County ...	5,419	8·0	1·0	...	9·0
Pahiatua County ...	3,600	10·5	1·0	...	11·5
Eketahuna County ...	2,332	7·0	...	1·0	6·0
Akitio County	1,048	3·0	...	2·0	1·0
Castle Point County ...	457	1·5	...	1·0	0·5
Mauriceville County ...	1,127	3·0	...	...	3·0
	17,106	— 50			— 50
Masterton Borough ...	4,000	26·0	...	...	26·0
Carterton Borough ...	1,205	8·0	...	1·0	7·0
Greytown Borough ...	1,122	7·5	0·5	...	8·0
Pahiatua Borough ...	1,300	8·5	0·5	...	9·0
	7,627	— 50			— 50
		100			100

The above computations are based on the assumption that the boroughs should (owing to the extensive use made by them of infectious-diseases hospitals) contribute 50 per cent. of the cost which has to be borne locally.

Sanitary Inspection.

At present there are twelve Inspectors in the pay of the Department, receiving the following salaries :—

	£	s.	d.
Auckland—			
Inspector Grieve	150	0	0
,, Winstanley	160	0	0
Napier—Inspector Monroe	160	0	0
Wellington—			
Chief Inspector Schauer	200	0	0
Inspector Brownlie	160	0	0
,, Miller	150	0	0
,, Bennett	150	0	0
Nelson—Inspector Middleton	170	0	0
Canterbury—			
Inspector Kershaw	170	0	0
,, McKenzie	160	0	0
Otago—Inspector Gladstone	156	10	0
Southland—Inspector Cameron	170	0	0
	£1,956	10	0

There are also seven other Inspectors under the control of the Department, but a proportion of their salaries is paid by the local bodies. When these Inspectors were appointed the whole of their salaries was paid by the local bodies, but unfortunately the agreement with the local bodies depending solely on a mutual understanding between the Department and them, many have ceased to pay their contributions towards the Inspectors.

This is the present position, showing amount of contributions paid by local bodies in the following districts :—

	Total Salary.	Contribution by Local Authorities.		
	£	£	s.	d.
Tarnanaki—Inspector Gardiner	150	70	13	0
Wanganui—Inspector Sargeant	150	135	0	0
Rangitikei—Inspector Wilson	160	130	0	0
Palmerston North—Inspector Perry	20	..		
Feilding—Inspector O'Brien	160	111	3	4
Wairarapa—Inspector Dorizac	160	144	5	8
Blenheim—Inspector Johnston	160	78	0	0
Totals	960	669	2	0

To this has to be added Inspectors' travelling-expenses, which last year amounted to £973 17s. 9d.

The total cost to the Department of sanitary inspection therefore amounts to £3,220 15s. 9d., viz :—

	£	s.	d.
Salaries of twelve Inspectors wholly paid by the Department ..	1,956	10	0
Salaries of seven Inspectors partially paid by the Department ..	960	0	0
	2,916	10	0
Less contributions of local bodies' to salaries of latter	669	2	0
	2,247	8	0
To the above must be added Inspectors' travelling-expenses	973	17	9
Total cost to the Department of sanitary inspection ..	£3,221	5	9

I have long come to the conclusion that an efficient and economical system of sanitary inspection throughout the colony would be best attained by subsidising local authorities—in some instances to the extent of pound for pound—towards the appointment of properly qualified Inspectors. I think such a suggestion would be favourably met by many of the local bodies. If my anticipations prove correct, such a mutual agreement between local bodies and the Department might subsequently become law, and thus do away with the troubles that are bound to crop up if, as in the past, such an agreement is not binding for any length of time. My proposal would only apply to boroughs and those country local bodies with considerable urban population. It would be clearly laid down to any local body receiving the subsidy from the Department that the appointment of an Inspector must meet the approval of the Department, and that such an Inspector's services could not be dispensed with without the mutual concurrence of both parties.

On the 13th January I issued a circular to District Health Officers asking their opinion as to how many Inspectors they would require for the efficient inspection of their district on the lines I have above indicated, and, if appointed, where such Inspectors would be stationed. I received replies to this effect :—

	Inspectors required.
Auckland District	5
Wellington District	5
Napier District	2
Nelson District	1
Westland District	1
Blenheim District	1
Canterbury District	5
Otago District	5
	25

In addition to the twenty-five Inspectors subsidised, I would suggest that Inspectors Schauer, Middleton, and Kershaw be retained on the permanent staff at headquarters as general supervisors of the work of the twenty-five subsidised Inspectors.

The total cost of the proposed scheme would be as follows :—

	£
Salary of Chief Inspector Schauer	200
,, Inspector Middleton	170
,, ,, Kershaw	170
	540
,, twenty-five Inspectors at £160	4,000

Of this amount £2,000 would be contributed by local bodies.

Under this scheme the total cost to the Department of Inspectors' salaries would amount to £2,540, or £294 more than the present system, but against that must be put the saving that would be effected by the reduction in the Inspectors' travelling-expenses. Under the proposed scheme Inspectors would not have to work over so large an area; travelling-expenses would therefore be immediately reduced, and should not amount to more than £25 a year for each Inspector—thus :—

Proposed Scheme.	£
Salaries	2,540
Travelling-expenses—28 Inspectors at £25 per annum	700
	£3,240

£20 more than the present system costs.

I should like your authority to put this scheme into operation.

Plumbers' Registration Bill.

On the 1st September a deputation consisting of the Directors of the Wellington and Auckland Technical Schools, and representatives of Wellington, Dunedin, Auckland, and Napier plumbers waited upon me concerning the above Bill. The deputation clearly showed that if the Bill were passed in its present form, it would be liable to militate against that improvement in plumbing which has lately been so noticeable in certain boroughs. Section 3, subsection (*a*), and section 4 would allow incompetent men to register, and in some measure force the local authorities to employ them, and thus undo the good work that is now being done in those boroughs whose Councils have adopted stringent plumbing by-laws.

The deputation submitted a draft of the Bill, which with a few alterations (which we mutually deemed advisable) is well worthy of your consideration.

In connection with this subject complaints have been received from the Wanganui and Napier Education Boards that the certificates of plumbers who have passed the examination of the above Boards are not recognised by the authorities in Wellington and Christchurch. As the examinations held by the Wanganui and Napier Technical Schools are thorough, both in the practice and theory of plumbing, the attitude of the Wellington and Christchurch authorities seems hardly reasonable. I believe that there is every chance that the Wellington Plumbers' Board of Control will reconsider its objection at an early date.

THE MILK-SUPPLY OF THE COLONY, NOTABLY OF WELLINGTON AND THE LARGER CENTRES.

"No mention is made of infant-feeding, and looking to the thoroughness of the rest of the memorandum, we are tempted to hope that the milk-supply of New Zealand is in a more satisfactory state than that of Great Britain."

In these words the editor of the *British Medical Journal* concludes his review on the pamphlet on "Child-life Preservation," issued last year by the Right Hon. the Premier.

Last September circulars were issued to District Health Officers directing them to report on the milk-supply of the larger towns of their respective districts. I personally inquired into the milk-supply of Wellington.

The Secretary of the Agricultural Department kindly placed the services of some of his Inspectors at the disposal of the above-mentioned officers. The Chief Veterinarian also gave all possible assistance.

Specimens of milk were forwarded by the District Health Officers to the Bacteriologist of the Department.

You will note that the milk-supply of Wellington is worse than that of any of the other large towns. This is largely due to the fact that as compared with the other towns, there is little land surrounding the city available for dairy farms; hence milk has to be brought into town from long distances.

The best supply is that of Christchurch, where dairy farms are within a few miles of the city, and, without exception, are provided with an excellent and abundant supply of water.

With the commercial importance to New Zealand of a milk industry conducted under the best possible conditions this Department has no direct concern. There are, however, four cogent reasons why the Department should advocate substantial reform in the treatment of milk for human consumption—viz., (1) the decline in the birth-rate; (2) an infantile death-rate largely due to diarrhœal and dietetic diseases; (3) the infection of certain diseases being undoubtedly milk-borne; (4) an increasing disability on the part of mothers to suckle their young.

(1.) *The Decline in the Birth-rate.*

Not only do statistics show a serious diminution in the birth-rate of the United Kingdom, but also in the majority of her more important colonies. So serious is this diminution in the birth-rate regarded by authorities in New South Wales, that the Government of that colony recently appointed a Royal Commission to inquire into the decline of the birth-rate. It is not necessary here to go into the report of this Commission and dwell on its findings. It is enough to state that the chief causes of the decline were stated to be (1) a decrease in the fecundity of marriage; (2) a decrease in the proportion of married women at fertile ages.

There is unfortunately no reason to doubt that similar reasons are the causes of the diminution in the birth-rate of other parts of the British Empire, including, I regret to say, this colony. At the present rate it must be inferred that apart from immigration the population of the United Kingdom will become stationary, if not diminish, and it behoves us in the colonies to recognise that the population to open up our colonies must come from the colonists, and no reliance must be put on the stream of immigration which has in the past, and is now to some extent, flowing towards these shores.

The reduction in the Australasian birth-rate is indeed striking and fraught with extreme danger to our Empire, and I cannot do better than quote the following extract from the report of the New South Wales Commission:—

"174. From time to time in recent years public men, seeing in the establishment of the Australian Commonwealth the first step in the construction of a great nation, and anticipating therefrom a rapid increase of national prosperity and progress, have referred hopefully to the day when Australia with her teeming millions will hold a commanding place among the peoples of the world. The patriotic ardour inspired by this hopeful anticipation is, however, destined to be cooled in the contemplation of the fact that, while Russia and Japan, prospective rivals of Australia for supremacy in the Western Pacific, are already seeking outlets beyond their own borders for the energies of their ever-growing people, *it will be forty-six and a half years before Australia, with her three and three-quarters millions of inhabitants*, and dependent alone on her natural increase (if this even be maintained at its present rate), will have doubled her population: 113 years before she will have twenty millions of people; and 168 years before her numbers will have reached the present population of Japan.

"175. In whatever way the waning birth-rate of New South Wales is viewed, whether in its effects on the health, character, or social worth of individuals; on the value of the family as the basis of national life; on the quality and dignity of civic life; on the character of the people; on their social, moral, and economic progress; on their national aims and aspirations; or on their capacity to survive in the rivalry of nations; and whether it is viewed in the light of history or of science, it is seen as a grave disorder sapping the vitals of a new people, dispelling their hopes, blighting its prospects, and threatening its continuance."

As population in Britain and her self-governing colonies shows a tendency to decrease, it is all the more necessary—apart from sentimental reasons—to take all possible measures to protect the lives of our infant population.

One of the many recommendations made by the Commission with a view to lower the infantile death-rate (admittedly higher than it ought to be) was that the milk-supply should be placed under a rigid supervision, and all possible means taken to insure that this, the staple food of young children, should be collected, stored, brought into town, and distributed under the very best possible conditions.

Again, in a discussion on physical deterioration recently held in the Old Country, it was unanimously agreed that one of the chief causes of such deterioration was due to the polluted milk supplied to children.

(2.) *An Infantile Death-rate largely due to Diarrhœal and Dietetic Diseases.*

A glance at the vital statistics of the colony will show that the mortality-rates are very low as compared with those of other countries. Whereas the death-rate for the last decade in the United Kingdom was 16 per 1,000 living, it was only 10 per 1,000 living in New Zealand. The infantile death-rate of the colony is also comparatively low. In the United Kingdom during the decade 1894–1903 the infantile mortality was 143 per 1,000 births against 80 per 1,000 births in New Zealand during the same decade.

So far, so good. But when we come to compare the infantile mortality of our chief centres with those of the larger towns of England the comparison is by no means favourable. Attached is a table showing the infantile mortality of our chief centres during the decade 1894–1903. It will be seen that Auckland heads the list with a mortality-rate of 134 per 1,000 births, followed by Christchurch with 112, Wellington with 105, and Dunedin with only 74. Compare these with the death-rates of some of the larger towns of the United Kingdom. In London for the same decade the death-rate was 158. In 1903 it was only 131 in that city. In Bristol it was only 116.

When the natural advantages of the colony as to climate and social conditions are taken into consideration, it must be admitted that the infantile death-rate of our cities is far too high.

A glance at the two following tables will show approximately the causes of death in infants under one year. For the decade 1894–1903, of 15,667 deaths, 17 per cent. were due to diarrhœal diseases and 12 per cent. to atrophy, debility, and inanition—practically 31 per cent. to dietetic disease.

Infantile Deaths : Average per 1,000 Births for Ten Years, 1894–1903.

Year.	Auckland and Suburbs.	Christchurch and Suburbs.	Wellington and Suburbs.	Dunedin and Suburbs.
1894	139	103	94	70
1895	141	116	124	60
1896	162	128	96	72
1897	125	112	98	63
1898	151	91	131	80
1899	141	143	117	92
1900	128	108	73	79
1901	99	110	100	79
1902	140	117	130	89
1903	121	101	93	62
Mean total for ten years ...	134·7	112·9	105·6	74·6

Deaths of Children under Five Years for the Ten Years 1894–1903 from the Undermentioned Diseases.

Nature of Disease.	Auckland.	Wellington.	Christchurch.	Dunedin.	Total.
Inflammatory diseases of the digestive tract	821	380	371	207	1,779
Dietetic diseases	485	329	347	192	1,353
Tubercular	101	119	75	48	343
Premature births	188	262	251	239	940
Bronchitis and pneumonia ...	196	185	161	169	711
Accident	49	53	58	56	216
From other causes	395	302	235	179	1,111
Total deaths	2,235	1,630	1,498	1,090	6,453
Average for ten years	223·5	163	149·8	109	645·3

NOTE.—"Inflammatory diseases of the digestive tract" include diarrhœa, cholera, enteritis, and acute gastric catarrh. "Dietetic" include marasmus and convulsions. Percentage of deaths caused by inflammatory diseases of the digestive tract and dietetic diseases: Auckland, 58·48; Wellington, 42·88; Christchurch, 47·98; Dunedin, 36·60: four centres, 48·53.

This table is a record of deaths in children under five years occurring in our four chief centres during the same decade. Again Auckland heads the list, and again the chief causes of death are diarrhœal and dietetic diseases, no less than 58 per cent. of the deaths in Auckland in children under five years being due to these diseases; Chistchurch, 47; Wellington, 42; Dunedin, 36: average for four centres, 48. The diarrhœal and dietetic diseases have been taken together because both are probably due to some error in dietary.

What is the cause, or what are the causes of this large mortality from diarrhœal and dietetic diseases in children? Health Officers in the United Kingdom and in the colony agree that a polluted milk-supply is one of the chief causes of infantile mortality—a preventable cause.

In Brighton in 1901, Dr. Newsholme states that of 226 deaths from diarrhœa in children, it was possible to trace 191 of these fatal cases to the milk-supply.

(3.) *The Infection of certain Diseases being Milk-borne.*

Typhoid Fever.—It was as long ago as 1857 that Dr. Michael Taylor, of Penrith, first declared that the infection of typhoid could be carried by milk. Since that date no less than 160 epidemics of this disease have been traced to that source in the United Kingdom. Certainly two outbreaks of typhoid in this colony have been due to milk. It is stated that 17 per cent. of all typhoid epidemics are due to milk. The germs of this disease are contained in the excreta, urine, expectoration, and sweat, so that it can be easily understood how infection may be propagated by a milker suffering or recovering from the disease.

Typhoid infection may be transmitted by milk by the following means: (1) By infection from typhoid patients; (2) by washing cans with water infected by typhoid excreta; (3) by the fraudulent addition of infected water to milk; (4) by dust from dried excreta containing the bacilli; (5) by contaminated clothes; (6) by cooling milk by placing it in infected water. (Swithinbank and Newman.)

Of the two epidemics of typhoid fever transmitted by milk in this colony, the first recorded was in Wanganui in 1897, when some thirty cases were traced to a dairy where a case of typhoid fever had occurred in one of the employees. When the milk-supply from this diary was stopped the epidemic ceased.

In 1901 Dr. Makgill, Health Officer for the Auckland District, investigated an epidemic of typhoid fever at the Thames, where forty-three cases occurred in thirty-seven houses. This epidemic was manifestly due to an infected milk-supply from a dairy where the first case of typhoid occurred; cutting off the milk therefrom speedily arrested the epidemic.

Scarlet Fever.—It was Dr. Michael Taylor also who first reported that the infection of scarlet fever could be borne by milk. Some 100 epidemics are known to have been caused by this means. In 1903 in Wellington a good many cases of scarlet fever were traced to an infected farm in the suburbs, whence milk was being distributed.

"Throughout the year attention was paid to the possibility of this means of disseminating the disease, and the dairies supplying milk to the city were carefully watched. It was not till the 24th December that anything happened to throw suspicion on milk as the means of carrying infection. On that date seven cases were notified in houses which were all supplied with milk from the same dairy. Inspector Watson was accordingly despatched to the farm, where he found that one of the employees who had been milking until quite recently had been ill with a sore throat—he was subsequently found to be 'peeling.' Another employee developed a rash and sore throat on the following day. The milk was seized and the dairy closed that afternoon."—*D.H.O.'s Report*, 1903.

Altogether fourteen cases were subsequently traced to this dairy.

"In September there was an outbreak of about twenty-five cases in the Papanui district, which was certainly caused by infected milk. The cause of the outbreak was carefully inquired into by me, in conjunction with Inspector McPherson of the Stock Department, but the source of infection could not be found. From the incidence of cases I was inclined to believe that the cases were infected on the same day, and that there must have been some accidental source of infection in the distribution of the milk, and that the infection did not occur on the premises of the dairy."—*D.H.O.'s Report*, 1904.

Diphtheria.—Many epidemics of this disease have been reoprted as having been caused by milk, which is particularly favourable to the *Bacillus diphtheræ*. This organism lives and thrives in sterilised milk. In ordinary milk the organism is often crowded out by other bacilli. There are a few cases, however, in which the actual bacillus has been isolated from the suspected milk (Bowhill, Ayre, and Dean), and the organism so isolated has been injected into guinea-pigs with fatal results.

It is questionable how milk becomes infected by the diphtheria bacillus. It may possibly gain entrance by means of dust, but almost always by means of persons suffering from mild attacks of diphtheria. There are about forty recorded epidemics of milk-borne diphtheria. In this colony one striking epidemic is recorded by Dr. Finch, District Health Officer for Canterbury:—

"In consequence of diphtheria being reported from time to time in Lyttelton, and a large proportion coming from one milk-supply, I asked the Dairy Inspector, Mr. McPherson, to inspect the dairy and send some samples up for bacteriological examination to Wellington. This was done on the 14th July. He informs me that in the samples from one cow there was distinct evidence of suppurative mammitis. The milk-supply from that cow was stopped, and up to the present there have been no more cases reported in Lyttelton."

Sore Throats.—It is well known that many epidemics of sore throat have been caused by milk. Instances of this have occurred in this colony, the cause of the disease being the drinking of milk from cows suffering from a particular form of inflamation of the udder—mammitis, which is very prevalent in the colony. (See Chief Veterinarian's Report, 1904.)

Evidence goes to show that the chief danger exists in the cream from such cows. In the United Kingdom several fatal cases of sore throat have been traced to this cause.

Epidemic Diarrhœa.—This is a disease which is almost universally propagated by means of tainted milk, as has been the case on more than one occasion in the colony—in fact, it is not too much to say that the summer outbreaks of diarrhœa which occur in our chief cities, and which are most fatal to children under one year of age, are due to this cause.

Drs. Hope, Newman, Richards, and others find that 79 per cent of the children under one year who die of epidemic diarrhœa are fed on artificial or cow's milk, or milk exposed to contamination.

Tuberculosis.—The possibility of the transmission of this disease by means of milk has been recognised by authorities for some years. At the recent Congress on Tuberculosis held in London the possibility of transmitting tuberculosis from animals to man was contested by Professor Koch. Since then recent British, American, and German reports entirely support the intercommunicable theory. It is questionable, however, whether the milk from a cow suffering from tuberculosis in other parts of the body than the udder can transmit the disease, but there is no doubt that in a cow with a tubercular deposit in the udder the power of infection is a most potent one. Hence it is of the greatest importance that udder-disease in a cow should be recognised as early as possible, and without doubt mammitis, whether due to inflammation, streptococcus, or tubercular infection, should be made a notifiable disease.

According to the Chief Veterinariar's estimate, about 15 per cent. of our milch-cows are affected by tuberculosis, and as each cow gives some 400 gallons of milk a year, some extent of the danger of propagating the disease by this means may be understood.

And here again is another danger. In New Zealand as in other parts of the Empire there is a tendency on the part of the population to flock to towns. By this tendency therefore a gradually increasing proportion of the population suffers from the unnatural conditions of milk supply and storage which are bound to occur in towns where the source of the milk-supply is comparativey remote. In 1896 to every 100 persons living in the counties there were 78 living in boroughs, whereas according to the census of 1901 the latter had increased to 84.

(4.) *The Increasing Disability of Mothers to suckle their Young.*

This disability has become very noticeable during the last two decades, and unfortunately is not confined to the Anglo-Saxon race.

With the help of his pupils—medical practitioners in Austria, Germany, and Switzerland—Professor V. Bunge has been able to collect particulars of some two thousand families. The Professor states that most of the mothers who do not suckle are physiologically incapable of doing so, and he attributes this defect to degeneration in the parents. A well-known American authority, Dr. Holt, states that 25 per cent. of mothers are unable to suckle their infants for the first three months, and that it is quite an exception to find a mother who can "nurse" her child for a year.

It is often stated that this disability to suckle is largely confined to women of the upper classes, who, owing to the demands of society on their time are unwilling to feed their infants naturally. Without doubt this is true in a small percentage of cases, but this selfishness on the part of mothers is by no means so common as is generally supposed. Moreover, this disability to suckle is not confined to women of the leisured classes—it is noticeable in women of all classes in this colony.

As time goes on therefore we are gradually becoming more and more dependent on cows' milk as a food for our infant population. At the same time the present tendency to urbanisation makes the public more dependent on, and increases the difficulties of obtaining, a pure milk-supply.

COMPOSITION OF MILK.

Not only does milk possess all the constituents of food for man, but also for the lower forms of animal life. Bacteria will thrive in it and multiply rapidly.

Bacteria require for their diet nitrogenous matter, proteids, non-nitrogenous matter containing carbon and hydrogen—carbohydrates; also salts. All these constituents are found in milk—proteids represented by casein and lactalbumen; carbohydrates represented by lactose; fat as palmitin and olein; salts as potassium, calcium, phosphates, &c. Moreover, the reaction of milk neutral or alkaline is suitable for the growth of bacteria. Strongly acid or alkaline solutions hinder their growth. Milk is therefore a particularly favourable medium for the growth of bacteria.

It is certainly true that when fermentation occurs changes rapidly set in in milk, and the growth of bacteria is hindered. Foster and Cunningham have also shown that fresh-drawn milk has a decided germicidal action on certain bacteria, but this germicidal power is rapidly lost when the milk is dirty, especially when its temperature is over 60° Fahr. Hence the importance of taking every possible precaution to prevent the entrance of bacteria to a medium so favourable to their growth and development.

It now remains to consider to what milk is subjected in its collection, storage, and distribution.

Before discussing the means by which milk is polluted, I may be pardoned for stating that for some years I practised my profession in a district exclusively devoted to dairying. With profit and instruction to myself I was the possessor (for some three years) of a herd of fifteen cows. I am therefore not without practical knowledge of the difficulties of dairying, and flatter myself that this report contains no unreasonable or unpractical demands on those concerned in the trade.

During last summer I personally inspected some ninety dairies. Of the 259 dairies supplying Wellington I inspected 58. Of the latter only 11 were satisfactory. In only 3 were the conditions as good as possible under the circumstances surrounding them.

Milk is liable to pollution (1) at the time of milking; (2) in preparation; (3) in storage (at the farm); (4) in transit to town; (5) in collection and storage—(*a*) by the middleman, (*b*) by the householder.

(1.) *Pollution at the Time of Milking.*

This may be caused by the cow, the shed, the milker, or the milk-pail.

(*a.*) *The Cow.*—It has already been stated that the cow may contaminate milk with certain germs, such as those of tuberculosis and suppuration. In rare instances foot-and-mouth disease has been known to cause peculiar clinical symptoms in persons who had partaken of the milk. But in this portion of the report we are more immediately concerned with pollution of milk by healthy cows. It must be patent to the most casual observer how this can be done. Witness a cow driven into its bail from a dirty stockyard, with mud and dung on its flanks, tail, and udder. Rarely are such cows properly cleaned. In some instances the udder is wiped with a dirty rag; still rarer is it to see the tail tied.

Last November I inspected a dairy that was well kept, the yard, shed, and utensils being extremely clean. The milker carefully, and possibly a little ostentatiously, washed his hands and the cow's udder, and *then* took hold of the dung-begrimed tail to tie it preparatory to milking. I suggested he might have tied the tail before washing his hands. He laughingly assented.

It is not to be wondered at that fifty per cent. of the specimens of milk examined by the Department contained excrementitious organisms. Dr. Backhaus estimates that no less than 300 cwt. of dung is daily consumed in Berlin in milk. Cow's hair will also convey germs to the bucket. Witness the number of hairs that can be seen at a first straining.

(*b.*) *The Shed and Yards.*—The latter are often indescribably dirty. It is not unusual to see cows up to their hocks in mud. Very few yards are properly paved. The air of cow-sheds is often dusty and foul, owing to bad ventilation. Dust naturally settles in the milk, especially where fodder is used in the byre. It is quite unusual to find a clean shed. The majority are very low and dark—the interior of the roof covered with cobwebs. A space can always be seen between the bails and the external wall. This space over which the cow's head hangs is too small to be cleaned. An accumulation of rubbish is always to be found here consisting partly doubtless of the dried saliva of the cow.

(*c.*) The milker often wears very dirty clothes. "Good enough for milking in" is a very common saying. He rarely washes his hands before starting to milk and if he does only in doubtful washing-water. Often a little of the first milk is squirted on the hands.

(*d.*) *The Milk-pail.*—As a rule these pails are well kept, but care is not taken to prevent dust and filth from getting into them.

(2.) *In Preparation*—i.e., *in Straining and Cooling.*

As a rule the strainer is cleanly kept. It is quite the exception to find a dirty one. In cooling, however, there is another tale to tell. In a great many instances no attempt is made to cool milk. To delay the development of bacteria it should be cooled below 60 Fahr. as soon as possible after milking. Sometimes the cans are placed in a running creek, at times in the creek in which the stockyard drains. At times the milk is cooled in dirty stagnant water, yellow or green with old spillings.

It is not unusual to find dirty cans, especially in the neighbourhood of Wellington where a delay of some three days to a week sometimes occurs before the cans come back to the farm. Some of the receiving firms cleanse the cans before returning them, but that is the exception. One large supplier told me that sometimes his cans had been returned from town with maggots in them. Some farmers use coolers of various descriptions. In only one instance did I find the temperature of milk below 60°, when it was 59°. The coolers are well kept as a rule. Some farmers possess but do not use them.

(3.) *In Storage* (*at the Farm*).

The extent to which milk is polluted in storage naturally depends on the cleanliness of the dairy and utensils. In the course of my inspections there was little to find fault with in the general state of the dairies, but some of them were ill ventilated and foul-smelling, and contained articles that have nothing to do with the business, such as old sacking, soiled linen, harness, machinery, &c. With few exceptions, the containing utensils were fairly clean. The nearness of a foul drain or privy was occasionally discovered.

(4.) *Pollution in Transit.*

The suitability of milk as a medium for bacteria has already been discussed. It can be truly said that the conditions under which milk is collected and transmitted to Wellington are favourable for the growth of such organisms. Of all the chief towns, Wellington labours under special disadvantages as regards its milk-supply. Unlike other towns in the colony, there are few farms immediately adjoining the city. Of the 4,000-odd gallons brought into the city only 750 are brought in by cart. Some 3,300 gallons are brought in by rail—in some instances from over sixty miles. Consequently some of the milk is over twenty hours old before it gets to the consumer, and bacteria have plenty of time and every opportunity to develop. To emphasize this I cannot do better then quote the following extract from a report of Professor Delapine:—

"Of specimens of mixed milk coming from a short distance and examined within ten hours of milking 75·68 per cent. were good, whereas specimens from a long distance and kept from twenty-four to sixty hours only 39 per cent. were good. *When the mean temperature in the shade was* 55°-60° *not one of the samples from a long distance was good, whereas* 88 *per cent. of those from a short distance were.* In both sets of specimens the higher the temperature of the air, the smaller the percentage of milk which could be pronounced good. Therefore time and temperature must be taken into account for what is produced in a few hours in summer may occur also in winter when the milk has been kept a long time."

During the past summer I specially detailed Chief Inspector Schauer and Inspector Miller to follow some of the milk in from outlying farms. Some of the Wellington milk is brought from Longburn and Opaki, about eighty and fifty miles respectively.

It has been stated before that the farmer seldom cools his milk below 60°. Passengers by the Government or Manawatu lines can hardly fail to notice milk-cans awaiting the trains often standing in the full glare of the sun. What wonder then that the Inspectors' reports show that the average temperature in the morning trains was 58° and in the evening trains 69°. The average temperature of the vans was—in the morning trains 67°, in the evening trains 75°. In some instances the temperature of the milk was over 80°, in one instance no less than 90°. Some trains have no special milk-vans, the milk being placed in the ordinary luggage-vans, and the cans used as shelves for other articles. It is not unusual to see other articles such as bicycles, &c., taken out of the proper milk-vans. Note Dr. Frengley's report, where he states that the top of one can was found covered with blood.

(5.) *Pollution in Collection and Storage.*

(*a.*) *By the Middleman.*—There are sixty-nine milk-shops in Wellington. In only twenty-four of these is dairy-produce exclusively sold. In the remaining forty-five other goods, such as vegetables and general stores, are sold as well. This is not desirable. Inspector Miller's report shows that the condition of these shops is fairly satisfactory. It is stated that at some shops the milk is pasteurised and then cooled down to 40°.

Some dairy-shop men receive milk from distributors that the latter do not require, or which they do not consider it desirable to give their customers.

(*b.*) *Storage by the Consumer.*—I cannot do better than quote Inspector Miller's report on the subject:—

"So far as my investigations went I did not find a single instance of milk being properly looked after by the consumer. The usual practice is to leave a jug or other vessel outside overnight, without cover or protection, very often dirty with a ring of scum round the sides from previous days. The receptacle is exposed to all sorts of filth blown about during the night, and when the milk is finally taken in it is usually stored in a cupboard along with a heterogenous collection of articles and vegetables, meat, fish, &c."

This is confirmed by many milkmen. Of what avail their trying to keep it clean, if it is to be exposed to pollution in this manner? One milkman told me that it is not an unusual thing for mothers to bring out their babies' bottles, which had the remains of sour milk in them, to be filled.

In Dr. Finch's report he states that the storage of milk is seldom satisfactory.

BACTERIOLOGY.

Practically all bacteria in milk come from without. Some organisms such as those of tuberculosis and sepsis may gain entrance through the mammary gland. Conn has isolated over 200 different kinds of bacteria in milk. Many of these organisms are comparatively harmless.

According to Richmond, the following varieties of bacteria are found: (1) Micro-organisms acting on milk-sugar causing fermentation (*a*) with the production of lactic acid, (*b*) with the production of butyric acid, (*c*) with the production of alcohol; (2) micro-organisms acting on proteids (*a*) curdling milk without acidity and not dissolving the curd, (*b*) curdling the milk without acidity and afterwards dissolving the curd, (*c*) peptonising the proteids without curdling the milk; (3) micro-organisms producing colouring-matter; (4) micro-organisms having no direct action on milk; (5) micro-organisms that are pathogenic, giving rise to special pathological conditions. It is with the latter forms that we are chiefly concerned.

Bacteriological reports show that in fifty per cent. of examinations of milk from varous parts of the colony the *Bacillus coli communis*, or the organism showing the presence of excremental pollution, was found, to say nothing of other filth organisms. If such organisms were found in a water-supply the municipal authority would deservedly be liable to considerable criticism, but the householder will cheerfully put up with these organisms in his milk-supply without comment. "Milking is a dirty trade," said a Mungaroa farmer. His own shed and yards gave ample testimony to his statement, but those of some of his neighbours belied him.

Soxhlet has truly said that in judging the quality of milk we should consider not so much what the cow fed on, as rather what kind of dung the milk contains. Much of our milk contains cow and horse dung. The former gains entrance at the farm, the latter from the dust that gains access to the householder's receptacle placed out overnight as stated in Inspector Miller's report.

It is not unusual for milk to arrive in Wellington in such a dirty condition that it is not considered advisable to distribute it before subjecting it to special preparation—such as scalding or pasteurisation. Pasteurisation cannot clean a dirty milk. "Investigations show that it is not by any means only the living bacteria in food which produce gastro-intestinal disturbances in the infant, but that the toxins resulting from bacteriological products, whether alive or dead, exist in the milk and cannot be destroyed by heat."

We must endeavour to produce a sterile food without sterilisation. Reform in this direction has been brought about in Copenhagen and other cities with the best of results: why not in Wellington?

WHO GETS THE VERY DIRTY MILK?

Last November I happened in the course of my inspections to come across an exceedingly filthy dairy. The cows, the milkers, the yards, the byres, and the utensils were all dirty in the extreme. Inquiry discovered the destination of the milk. I interviewed the managers of the receiving company next day. They owned that the milk from this farm generally arrived in a filthy condition, but denied that it was ever allowed to supplement the supply of an important institution for which they were contractors. What do you do with it then? "Oh," naively replied one of the managers, "we send that milk on our ——— Street round, where the people are mostly bad marks." The manager realised his mistake too late. "Do you retail it at the same price at you charge for good milk?" "Oh, yes."

The poor of our cities have to pay for dirty milk not only in cash, but in the lives of their children.

PRESERVATIVES.

The chief preservatives used are boracic and salicylic acids and formalin; the former being infinitely the most popular. We often hear that Mr. X's milk keeps very well: we then know that such milk has been "doctored." (Dr. Makgill kept some specimens of milk for two days at blood-heat before curdling began.)

It is urged by some that the amount of boracic acid added to milk can do little harm to an infant it must be admitted that at the very least the argument is debatable. Preservatives undoubtedly delay the coagulation of milk. Is it good for a child for such coagulation to be delayed in its stomach? Of necessity delay in the coagulability of milk must render it less digestible. Milk collected under filthy conditions will soon undergo coagulation and fermentation, and in such a condition will be recognised by the most ignorant mother as unfit for her child, but preservatives delay the natural processes in filthy milk, and hence disguise its dangers. This is the real danger of preservatives.

In connection with adulteration, the following extract from Dr. Finch's report is of interest: "At present adulteration is very prevalent in Christchurch. If after a lot of trouble a conviction is obtained, the offender is fined about £5; he makes up the amount of this fine by the amount of water he puts in the milk next morning." Again, "It is significant that, when a milk-supplier has been fined for adulteration, it apparently makes no difference in his custom."

It now remains to be considered what can be done to bring about reform in the "trade." Truly the problem presents many complexities. But first and foremost the inspection of milk should be placed under the control of one Department. As the law now stands the responsibility of milk-inspection now rests with the Stock and Veterinary Branches of the Agricultural Department, chiefly with the former. To some extent the Health Department is concerned, as are also the municipal authorities. What wonder then that the traffic is not under a comprehensive system of control? And yet a systematic inspection of milk is the corner-stone of food-inspection.

Milk-inspection must be conducted by skilled men, not only well versed in all its scientific branches, but also in all the tricks of the trade.

Professor Park, of the New York Health Department, states that the prevention of the bacterial contamination of the milk of cities can be brought about without putting an undue strain on the trade. To some extent I concur with the Professor's statement. Nevertheless in some instances the enforcement of rigid regulations will undoubtedly inflict hardship, notably about Wellington, where the majority of farmers are leaseholders, sometimes at very high rentals. A Hutt dairyman told me that owing to the unprecedented rise in the price of land, some of the farmers in the Hutt district are paying as much as £3–£4 per acre rental, and only holding the land on very short leases. Farmers holding land under such conditions can hardly be expected to erect model buildings, or embark in the expense of up-to-date machinery and utensils, which are considered essential in a modern dairy. I can quite bear out Dr. Finch's statement that the best-conducted dairies are those where the farmer owns the land. The uncertainty of labour is another drawback, and, to some extent the varying demands made by the retailers as to the amount of milk required. In summer it is not unusual for a farmer to receive short notice from the retailer that only one-third of the quantity of milk he has hitherto been supplying will be required, and under the terms of contract the farmer appears to have no means of redress. At a short notice, therefore, he has either to spill his milk or make it into butter. At the same time, I know of no farmer who conducts his dairy properly who has been so treated. Nevertheless, despite these drawbacks, farmers can reasonably be expected to be cleanly in their methods. An expensive shed is not necessary, especially in those climates where the cows have not to be housed. But what shed and yard there is should be clean. The water-supply should be above suspicion; the cows should be groomed; the hands of the milkers, and the cows' teats, should be washed before milking; cows should not be fed in the shed where they are milked; milk should be cooled below 60°; the dairy and utensils should be kept scrupulously clean. Surely the farmer may be expected to do all this, and he undoubtedly will if the public insist on it.

It is often argued by some dairymen, "Oh, we would be only too willing to do all you require, but the public don't care, they won't pay a halfpenny more per quart for clean milk. Mr. X over there who takes no trouble with his sheds or cows gets just the same price as I do." The same remark is often made by the middleman who has adopted up-to-date plant. He complains because he cannot get any more for his milk than his less scrupulous rival. These arguments cannot be denied. Regulations may be made, but after all the remedy rests with the public. What the public demand the trade will supply, and if householders would only insist on receiving none but the best of milk from the best-conducted dairies regulations would be practically needless. In effect, in place of stringent regulations setting forth a prescribed shed and yards and a hundred-and-one other things that may appear to be needed, the experiments of education and competition, should first be tried. When the public once realises that it is not getting what it is paying for—namely, pure milk, and that the dirty milk supplied is particularly dangerous to infant-life—a step will have been made in the right direction. All this can be accomplished without great hardship to the farmer. Consider the number of milk-carts running into our cities every morning, many coming from the same districts. What is to prevent farmers living in the same localities from combining and sending their milk to town by special carts, and thus saving to a large extent the cost of transport. The cost of such transport must be enormous, and the money saved by such combination would soon pay for model buildings and machinery. I am told farmers will not combine. Nevertheless, this disinclination on their part must not prevent the public from being able to obtain clean milk.

A Mungaroa farmer informed me that a dairyman could afford to erect up-to-date sheds and follow out all the recommendations of the Department if he could obtain 5d. per gallon for his summer and 8d. for the winter supply. Some farmers already obtain 5d. and 7d. respectively. Surely a penny a gallon might be saved farmers if they combined for transport.

For educative purposes lectures might be undertaken by the Department concerned, and by the establishment of model dairy farms immediately adjoining each of our chief centres.

A healthy competition might be engendered by the classification of dairies. For instance dairies might be classified A, B, C, D (according to conditions). A dairy should only receive an "A" certificate when the following had been pronounced as thoroughly satisfactory: (1) The health of the cows—after testing and examination by a veterinary surgeon; (2) the condition of the yard, byre, shed, dairy, and utensils; (3) the operation of milking—cleanliness of milkers (hands washed, clean clothing), grooming of cows, and cleaning of udders; (4) the water-supply, and means of cooling the milk; (5) the means of transit—suitable and clean carts.

Railway companies might also do their part: (*a.*) By erecting special shelters at the stations for milk awaiting trains, so that it would be kept in the cool and out of the dust. Such shelters need only be of the simplest character. (*b.*) By providing special trains and vans for the carriage of milk only. Such vans to be provided with proper ventilation and cooling arrangement, so that at any rate the temperature of the milk should not be likely to rise when contained therein. The special vans now in use do not keep the milk cool.

Municipal authorities might assist by adopting and enforcing by-laws relating to the following matters: (1.) The conduct of dairies, and retailing of milk: Suitable buildings should be insisted on and milk should not be retailed in the same building as other articles of food. (2.) Proper cooling arrangements: small bottles in place of the old-fashioned cans, &c., as already adopted in some parts of the colony. (3.) The establishment of municipal receiving-stations, having in view special arrangements for the cooling, straining, and bottling of milk; also for the modification or humanisation of milk to suit infants of varying ages, on the lines suggested by Dr. Holt and Professor Rotch. In connection with the above, it might be as well to say here that little good is likely to result from municipal authorities establishing such receiving-stations unless they have complete control over the farms supplying them. The reason of this is evident.

By such means I am confident that the milk-supply—at any rate of our larger towns—can be readily improved, with little hardship to the farmer. Many farmers err only from ignorance and want of capital. No mention has been made of many excellent men who, terribly handicapped by want of capital and opportunity, are nevertheless doing what they can to improve the present unsatisfactory state of affairs.

By efforts such as depicted above, we may hope not only to reduce in some measure the infantile mortality, but also to stem, by early recognition, one of those evils to which observers attribute the physical deterioration of our race.

The remedy lies with the public: a demand for a clean article will entail a clean supply. An endeavour has been made to show that the fault is not entirely with the farmer: all concerned in the traffic are more or less to blame, and not the least is the householder.

By co-operation farmers may do a great deal, and may yet prove that the milk industry can be conducted under the best possible conditions and at the same time prove a by no means unprofitable trade.

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SUGGESTIONS AS TO THE FEEDING OF INFANTS.

Statistics as to infantile mortality and its chief causes are discussed in another portion of this report.

With a view to checking in some measure deaths from dietetic disease of infants under one year, it was thought advisable to draft some simple suggestions for the guidance of mothers as to the upbringing of their young. It has been recognised by authorities that to be of real value suggestions of such a nature must be plain, and couched in simple language that can be readily understood and followed out by the most ignorant mother. Suggestions were framed accordingly and submitted to general practitioners for comment. With one or two exceptions, the criticisms received were most favourable. The weightiest opponent of the departmental suggestions, however, was of the opinion that in the endeavour to render the suggestions as simple as possible, much detail of vital importance to the infant had been practically ignored. It was strongly urged that some explicit details as to percentage feeding on the lines laid down by Professor Rotch, should be embodied in the pamphlet. With all deference to Dr. Truby King, who it must be admitted has made exhaustive scientific investigations on the subject, and whose opinion therefore is worthy of every consideration, it is very much to be doubted if real good would result from the advocacy of percentage feeding in the proposed pamphlet. Authorities in the United Kingdom, America, and Germany are very much divided as to the real value of percentage feeding, and without more evidence as to its absolute necessity, it might be unwise to advise mothers to adopt a system of feeding their children which would be anything but simple, and which would require an amount of intelligence and time which can hardly be expected of the average mother. It is true that if in the larger centres it were possible to engage specially qualified nurses to give personal demonstrations on percentage feeding, good might result, but short of this a few simple directions as to the preparation and dilution of milk as embodied in the proposed pamphlet are far more likely to be carried out by a mother who has other duties to attend to besides feeding her infant. The pamphlet moreover, distinctly directs that no time should be lost in taking children to the family doctor when they do not seem to thrive on milk diluted according to age.

At the last meeting of the New Zealand Branch of the British Medical Association Dr. Truby King's excellent paper on the subject evoked much discussion, and subsequently a subcommittee was appointed to confer with the officers of this Department with a view to drawing up a pamphlet on infant-feeding which would be generally acceptable to the medical profession. Short of this a pamphlet would be of little real value.

T. H. A. VALINTINE,
Assistant Chief Health Officer

SIR,— Department of Public Health, Wellington, 30th April, 1906.

I have the honour to present my annual report for the year 1905–6.

The duties of Chief Health Officer having fallen upon Dr. Valintine in your absence, it is necessary for me to undertake the report on the general work of the district. Owing to the somewhat varied nature of my duties, a fair portion of my time has been taken up with matters affecting other districts —such as the bacteriological analysis of the principal water-supplies, the examination of rats in Auckland, and the plans and site for the consumptive annexe at Christchurch. Owing, however, to the excellent results obtained from the system of sanitary inspection which has been established in the greater part of the Wellington Province, the work of the district has been overtaken in a fairly satisfactory manner. The appointment of Mr. Schauer as Chief Inspector has relieved me of much of the routine work, such as the supervision of the reports and recommendations from Sanitary Inspectors, while many of the special inspections I can safely refer to so capable and reliable an officer. As regard the bacteriological-laboratory work, I am of course unable to devote as much time to this subject as I should like, or as its importance demands. There are many sanitary questions which offer a useful field for research-work in the laboratory, but these cannot be touched on unless one has an opportunity of devoting the whole of one's time to the subject. As it was, the scientific side of my duties was crowded too much into the background, and would have been wholly beyond my reach but for the skill and enthusiasm of my assistant, Mr. Hurley, whose work I cannot too highly praise. How much I depend on him I learnt especially during his absence on a brief holiday—a period which meant for me not infrequent vigils on towards the small hours of the morning.

The officers of the Department in general, both clerical and in the field, have, by their loyal co-operation, greatly assisted in making the work of a heavy year run smoothly.

VITAL STATISTICS.

It is greatly to be regretted that we have not available complete statistics for the various parts of the district. The Registrar-General's returns only give general details for the whole colony, and for the four larger centres. It is most essential that we should be able to have before us the death-rate returns for each division of the district. A slight advance has been made during the past year, in that we now receive notices of deaths from zymotic diseases in the larger districts.

It is to be hoped that the very important information to be gathered from complete statistics may shortly be placed within our reach.

BIRTH-RATE.

The birth-rate for Wellington during the year 1905 was 29·72 per 1,000 of population, showing a marked increase on that for 1904, which was 26·77. The average in the four centres was 28·34.

DEATH-RATE.

The death-rate for both Wellington City and city and suburbs shows a satisfactory decrease this year, both being below the average for the four centres, as the following tables show :—

Table I.—Death-rate for the Whole Colony per 1,000 *Population.*

	Wellington City.	Wellington and Suburbs.	Average of Four Centres, including Suburbs.
1901	10·66	10·29	11·50
1902	12·58	12·24	12·74
1903	11·30	10·93	11·73
1904	10·75	10·43	10·73
1905	10·55	10·21	10·42
Mean for five years	11·16	10·82	11·42

Excluding children under one year, the drop is even more marked :—

Table II.—Death-rate, excluding Children under One Year.

	Wellington and Suburbs.	Average, Four Centres.
1901	7·59	8·96
1902	8·86	9·56
1903	8·27	9·14
1904	7·89	8·30
1905	7·38	8·02
Mean average for five years	7·99	8·79

Infant-mortality.

As regards infants under one year, Wellington does not show up in so satisfactory a light, the mortality having risen to 10·01—above what it was in 1903 or 1904—while compared with the other four centres it is above the mean.

Table III.—Infant Mortality (to every 100 Births).

	Wellington City.	Wellington and Suburbs.	Mean in Four Centres.
1901	10·43	10·30	9·68
1902	12·97	13·02	12·08
1903	9·28	9·27	9·61
1904	9·55	9·53	8·94
1905	10·01	9·62	8·66
Mean average for five years ..	10·44	10·34	9·79

Taking the percentage of deaths under five years to total deaths, we have a percentage of 33·39 for Wellington, as against an average of 27·07 for the four centres. In one-third of the infant-deaths the cause is shown to be from dietetic troubles leading to such complaints as marasmus, diarrhœa, enteritis, and so on. There is no doubt but that the unduly high rate as compared to other centres can in a great measure be attributed to the very defective quality of the milk-supply in Wellington.

Zymotic Death-rate.

During 1905 the zymotic death-rate was extremely low, only 34 deaths in all being recorded, while the mean during the past five years was 61, as the following table shows :—

Table IV.

	Deaths in Wellington and Suburbs.	Total of Four Centres.	Proportion of Deaths in Wellington Per Cent.
901	46	209	22
1902	108	356	30
1903	52	256	20
1904	65	202	32
1905	34	115	29
Mean for five years	61	227	26

The death-rate from this class of disease throughout the colony was very low during 1905, and Wellington, though the number was small, bore a slightly higher proportion than usual.

As regards diphtheria, scarlet fever, and diarrhœa, the proportion in Wellington was higher than in other centres. However, the total number dying from each of these diseases was too small to call for much comment, while the drop in deaths from diarrhœal complaints from 30 in 1904 to 12 in 1905 is very satisfactory, though the somewhat cold, wet year no doubt is in a great measure the reason for this falling-off.

The causes of the deaths from zymotic disease are shown as follows :—

Table V.

Diarrhœal.—Twelve in city and suburbs, total in four centres being 44 (27 per cent.). Eleven deaths out of the 12 occurred in children under five years. Last year there were 30 deaths under this heading.

For strict accuracy, to these figures should be added 33 deaths from gastritis and enteritis, all being in children under five years of age.

Measles.—No deaths, as against 4 in 1904.

Diphtheria.—Four deaths, as against 8 in the four centres. There were 56 cases of diphtheria in Wellington and suburbs, case death-rate being 7·14. Last year this disease caused 5 deaths.

Influenza.—Three, against 13 deaths in four centres. In 1904 there were 5 deaths.

Typhoid.—Three, against 10 deaths in four centres, case death-rate being 5·88. In 1904 there were 4 deaths from typhoid.

Scarlet Fever.—Three, against 5 deaths in four centres, case death-rate being 2·54.

Whooping-cough.—No deaths ; nor were there any in 1904.

As regards deaths from diseases other than zymotic, the only point worth noting is the drop in deaths from tubercular disease in Wellington from 68 in 1904, to 42 in 1906. Cancer, on the other hand, has slightly increased, being 47 this year against 44 the year before.

The extremely low case-mortality rates in diphtheria, typhoid, and more especially scarlet fever, are worthy of note.

Notifications of Infectious Disease.

The following table shows the returns of infectious cases in the various centres in the Wellington District :—

Table VI.

—	Scarlet Fever.	Enteric Fever.	Diphtheria.	Tuberculosis.	Blood-poisoning.	Totals.
Boroughs—						
Wellington	113	33	55	37	4	242
Palmerston North	26	2	13	2	..	43
Wanganui	18	30	9	2	..	59
New Plymouth	2	5	8	5	..	20
Pahiatua	2	..	33	2	..	37
Petone	20	1	1	2	..	24
Masterton	8	3	5	3	1	20
Marton	1	..	..	..	..	1
Carterton	8	..	1	..	..	9
Feilding	6	..	1	1	..	8
Lower Hutt	3	1	3	1	..	8
Hawera	5	4	4	2	1	16
Patea	..	5	..	3	..	8
Foxton	1	..	..	2	..	3
Eltham	34	3	1	..	..	18
Waitara	..	..	1	1	1	3
Stratford	9	..	..	..	..	9
Greytown North	2	..	..	..	..	2
Inglewood	2	..	..	..	..	2
Onslow	5	1	..	2	..	8
Karori	..	..	1	1	..	2
	245	88	136	66	7	542
Town Districts—						
Waverley	..	..	..	..	..	..
Opunaki	..	..	..	1	..	1
Featherston	..	..	3	..	..	3
Bull's	..	1	..	..	..	1
Halcombe	..	..	..	2	..	2
Manaia	..	1	..	..	..	1
Eketahuna	..	..	7	..	..	7
Martinborough	9	1	2	1	..	13
Johnsonville	..	2	1	..	..	3
Kaponga	2	3	..	1	..	6
	11	8	13	5	..	37
Counties—						
Kiwitea	1	..	..	1	..	2
Rangitikei	18	1	4	2	1	26
Taranaki	1	2	1	..	..	4
Oroua	9	6	1	3	..	19
South Wairarapa	2	..	..	2	..	4
Pahiatua	3	3	15	2	..	20
Horowhenua	1	2	1	3	2	9
Hutt	5	8	..	4	..	17
Manawatu	1	1	..	4	2	8
Wanganui	1	..	..	..	..	1
Masterton	5	..	1	..	..	6
Eketahuna	1	..	1	..	..	2
Waitotara	..	1	1	..	..	1
Stratford	..	1	..	..	..	1
Wairarapa	..	..	..	1	..	1
Akitio	1	..	..	1	..	2
Clifton	..	..	..	1	..	1
Hawera	1	1	1	..	..	3
Castlepoint	3	..	..	..	..	1
Patea	..	..	..	..	..	..
Mauriceville	..	..	1	..	..	1
Kairanga	..	..	..	1	..	1
Egmont	..	..	..	..	1	1
	53	23	27	25	7	135

Summary of Table VI.

Boroughs	254	88	136	66	7	542
Town districts	11	8	13	5	..	37
Counties	53	23	27	25	7	135
Totals	309	119	176	96	14	714

Comparing this with the return of last year it will be seen that there is a marked diminution in scarlet fever—from a total of 370 in 1905, to 309 this year. Typhoid has slightly increased—by 19 cases, and diphtheria by 36 cases.

Scarlet Fever.

The cases of this disease which have occurred have mostly been more or less isolated, and with the exception of small outbreaks at Carterton, Eltham, and Martinborough, nothing in the form of an epidemic has taken place.

At Carterton in November six cases arose, apparently due to milk-borne infection, as all were supplied by the same dairy. However, no case could be found to have occurred at the dairy, and the origin was not discovered.

In Wellington City there has been a marked decrease—from 164 last year to 113. It was not found necessary to close any of the schools, the outbreaks being localised generally to a few children living in adjacent houses or playing together at their own homes.

Of the boroughs, Petone and Eltham alone show any marked increase from last year, the figures for the former being 7 in 1905, and 20 in 1906, and for the latter none in 1905, and 14 this year. Palmerston North shows a small increase from 19 to 26.

The town districts, with the exception of Martinborough, show a gratifying freedom from infection, while the counties also show a like diminution.

This disease is generally of a mild type in New Zealand, and this leads people to carelessness in regard to the spread of infection. In one case it was found necessary to prosecute a patient who appeared to have travelled by rail while in an infected state. The case has not yet been completed.

Enteric Fever.

Owing to the wet and cold season one might have expected a marked decrease in typhoid during the year, but the reverse has been the case to a slight extent. The only marked outbreak during the year has been at Wanganui, where the return shows 30 cases, against 8 last year. The majority of these cases can be attributed to one outbreak in November, when 11 cases arose within a week or two of one another, all but 2 being directly traceable to the milk supplied from an unregistered dairy. This dairy was situated in a block which for many years has been subject to outbreaks of typhoid, and this year was again responsible for many of the cases.

The history of two of these cases is of interest, as it suggests the possibility of the life of the typhoid bacillus in polluted soil for many years. We know from the experiments of Dr. Sydney Martin and Dr. Robertson that such a saprophytic life does take place in soil soaked with organic matter, and in the case in point the environment was in every way suitable for the growth of the germ. Some eight years ago Dr. Valintine dealt with an epidemic in Wanganui in the same area as that affected in 1905. In tracing back the history we found that two of the sufferers in the present outbreak lived in a house in which a case had occurred in the epidemic of eight years ago. The infected stools from this case had then been buried in a pit-privy in the garden, and by way of precaution the pit had been filled up and the privy removed. The ground had lain undisturbed till last year, when the present occupier had started gardening operations, in the course of which he dug into the old cesspit. A week or so after he was attacked by enteric, and his neice—a child who had been playing about him when he turned over the polluted soil—was also affected. This, though not of course conclusive, is strong evidence as to the viability of typhoid bacilli in a soil impregnated with filth.

Another point worthy of note is that this garden abutted on the dairy referred to above, which was the means of spreading the disease. It seems probable that the infection could have been carried from the soil to the milk in the form of air-borne dust or by flies, the conditions under which the milk was stored offering ample opportunities for such process of inoculation.

The only other definite outbreak of this disease was a very localised one in Wellington City, where 7 cases occurred in one block of houses. No cause could be found for this, but as we could exclude milk- and water-borne infection, it seems probable that there is some focus of contagion in that neighbourhood. Otherwise there has been a slight decline in the number of cases in the city, though it would be more satisfactory to be able to record the practical extinction of this disease. This, however, is not likely to be the case so long as there are weak spots caused by the lack of drainage in some of the suburbs. It is also possible that some cases have received the infection about certain of the foreshores where drain-outfalls exist which, although reputedly storm-water only, seem to possess properties not generally found in mere surface drainage.

In the country districts generally there has been a decline in the number of enteric cases—especially marked in the Hutt County, where the number is only half that of last year. A certain number of cases seem to arise in the Hawera and Eltham districts, of which many may be traced to the Township of Kaponga, where there is a very marked focus of infection, due, doubtless, to the primitive sanitary condition in that small centre. The repeated cases which can be traced to one house here are probably accounted for by the method which was in vogue of digging up the buried nightsoil and spreading it about as manure, close to where the milk and food was stored. This seems to be further evidence of the influence of polluted ground and of how easily infection may be air-borne.

Diphtheria.

There has been a marked epidemic of this disease at Pahiatua, both in the borough and in the country, the figures being 33 in the borough this year as against 7 the previous year, and 15 in the county which last year was free from the disease. The cause for this is doubtless the absence of facilities for disposal of slop-waters in the borough, but the adoption of the sewerage system, which is rapidly being carried forward, should go far to remove this reproach in the future.

In Eketahuna a slight outbreak can probably be traced to the same cause.

In Wellington City there has been a decrease, but not so much as one could wish to see, as 55 cases were recorded. Here we cannot blame the undrained suburbs, for, as was the case last year, this disease showed itself all through the city, and has again baffled our efforts to trace the majority to any definite source.

With the exception of Pahiatua and Eketahuna, the country districts have been remarkably free from diphtheria.

QUARANTINE, AND DANGEROUS INFECTIOUS DISEASE.

We have fortunately not been called on to take any special precautions against oversea infection. One or two cases having symptoms suggestive of small-pox have been kept under special observation, but fortunately have proved in the end to be diseases of a milder nature. One of these was discovered on one of the Sydney boats by Dr. Pollen, Port Health Officer, and a consultation was held, but further investigation proved it to be a somewhat obscure skin-disease, and the ship was released.

Another case with very suspicious symptoms was reported from Shannon in a man who had recently come over from Australia. It was advisable in this case to keep the man isolated for some three weeks, and a hut was found on the outskirts of the township which was transformed into a primitive isolation hospital. The children in the vicinity were vaccinated, and all precautions taken, and in the end the bulk of the evidence was against the diagnosis of variola.

At Picton a child who showed suspicious symptoms was brought to the Hospital from the Pelorus district. Dr. Valintine and I visited the patient and proceeded to the district from which she came, where the other members of the family and the children of the district school were inspected. Evidence was there forthcoming of an epidemic of varicella, and in the end it was found that the patient was suffering from an exaggerated form of this disease. Several similar cases were reported in Wellington City—one at Newtown and two or three in a denominational school. All these were made the subject of special observation until the diagnosis of the complaint was assured.

GENERAL SANITARY MEASURES.

Infectious-diseases Hospitals.

Owing to the absence of any general epidemic of infectious disease this year, we have not had so much before us the perplexing question of the disposal of such cases as require removal from their houses.

For economic reasons it is of course impossible to provide permanent accommodation for any possible epidemic, yet it is necessary to have attached to each general hospital sufficient provision for such cases as are likely to arise annually, for there always are a certain number of patients suffering from scarlet fever, diphtheria, and so on, who must be removed to the hospital, perhaps from hotels and boardinghouses, or from cottages where home isolation cannot be observed. The difficulty in planning accommodation for these is to combine economy with efficiency. It is obviously undesirable to treat scarlet-fever and diphtheria cases in one ward, and as fate generally contrives to send a fair sprinkling of both these diseases concurrently, it becomes necessary to design the buildings in such a way as to allow of isolation of the two varieties one from the other. This of course entails a separate building for each, and, if the strict rules were to be observed, separate provision for the nursing staff, and for the preparation of food. To this must be added the further subdivision of the wards for the different sexes. But consideration for the long-suffering ratepayer demands some relaxation of such strict observances, theoretically correct as they no doubt are. Accordingly a design for a small two-ward hospital has been prepared, two beds being in each ward, with two administrative rooms—kitchen and nurses' sitting-room—in the centre. The latrines are placed back to back, and access is obtained to them from a verandah divided by a wooden partition. Where only one disease is present the wards can be apportioned one to each sex, but by locking and sealing certain doors a fair degree of isolation between the wards can be obtained, should it be necessary to deal simultaneously with diphtheria and scarlet fever. The separation of the sexes in such a case would be impossible, and the medical officer in charge can only hope that Providence will be considerate enough to send cases of the same sex in each disease, or of such an age that separation is not necessary.

Of course such a makeshift hospital is only suitable for very small populations, and would be of little use in widespread epidemic. Where the population warrants it a separate building for diphtheria should be provided, and as this disease fortunately does not often occur in the country in general epidemics, two or three beds should suffice for the smaller centres, and if due precautions be observed the nurse in charge can sleep and have her meals with the general nursing staff, thus obviating the expense of extra nurse's accommodation.

Very small hospitals in districts where infectious disease is less common, and where most of the cases can be isolated in their own homes, should content themselves with having at hand a good tent with a wooden floor in easily handled sections, or by securing the use at short notice of a cottage in a convenient position. In most small towns probably the use of such a cottage—tenanted, perhaps, by an elderly woman—could be secured for the payment of a small retaining-fee. So long as it was clean, fairly isolated, and no children lived there, it would serve the purpose quite efficiently. Even in large centres with a well-equipped infectious hospital it would be reasonable to ask the Hospital Board to earmark some extra accommodation of this sort, or have the means at hand of putting up a few floored tents in case of severe epidemics.

During the past year Palmerston North Hospital Board has made special provision for diphtheria cases by erecting near the scarlet-fever ward a small two-bed ward with dining-room attached. This, in addition to the commodious scarlet-fever block, should prove sufficient for all ordinary emergencies, and will prove infinitely more efficient than the alternative proposal to subdivide the latter building so as to enable them to take both diseases in the same block.

At Greytown the Board adopted the simpler system outlined above, and is now erecting a four-bed infectious block on a site which I visited and approved. This should prove sufficient for this district for some years to come.

The Hokitika Board applied for plans of an infectious-disease ward, but its resources were so limited that I advised the tent or cottage system as sufficient for the needs of that town.

Nelson, I regret to report, remains *in statu quo ante*, and we have again had some slight difficulty in persuading the Board that it is its duty to accommodate certain cases of infectious disease. As all the legal steps have been taken to apportion the cost—as reported last year—it is time that pressure was brought to bear on the Board to carry out the terms of the Act.

Sanatoria for Consumptives.

While there has been but one new sanatorium (that at Nelson) opened during the year, there has been a considerable amount of work done at this office towards increasing the accommodation for consumptives.

For Wellington a suitable site for a sanatorium has been chosen at the back of the General Hospital; the plans prepared by Messrs. Crichton and McKay have been inspected and approved by Drs. Newman and Ewart and myself, and the work is now nearing completion. Accommodation for fourteen patients will thus be available.

At Otaki, owing to the gratifying result of the appeal for funds, it was found possible to increase the original plans for a sanatorium for sixteen patients to one containing thirty beds. The result of this was that the site originally chosen was found to be too cramped, and after a consultation with the architect, Mr. Clere, it was decided to recommend the Hospital Board to purchase some land to the north of the original site, where a very suitable position was found. To this the Board readily assented, and although it has entailed a good deal of delay from legal difficulties, and extra expense in removing the building already erected, I am sure the result will justify the action. The new site is on a sunny slope well sheltered from the prevailing wind, with a dry sandy soil and a pleasant outlook. The Government, at the instigation of the Board, has set aside a special grant of £1,000 to enable the alteration to be made without increasing the burden on the Hospital funds. The plans have been inspected and approved by Drs. Newman and Clay and myself, and the work is now rapidly proceeding.

Special mention should be made of the untiring energy of Dr. Newman and Mr. J. P. Luke, Chairman of the Board, who have successfully piloted the scheme through many obstacles, with the result that between Otaki and Wellington annexes we shall shortly have sufficient accommodation to deal with all those cases of consumption in the neighbourhood more urgently in need of relief.

At Nelson the Hospital annexe has been completed, and was opened on the 21st October. I inspected it in December, and was pleased with the result. The administrative block is convenient and by no means unsightly, and the shelters are, I consider, a distinct advance on those in use at Cambridge, in that they afford a much greater wall-area which can be opened.

I am more than ever convinced that simplicity is the greatest desideratum in these shelters: a roof sufficient to keep off the rain and protect the patient from the burning sun, a floor well off the ground to avoid dampness, and enough wall to shelter the patient from wind and driving rain are the essentials. For the roof, the use of asbestos slates at Nelson is proving satisfactory, the appearance being pleasing, while they afford excellent shelter from the hot sun. As they are not unreasonably costly, I think their use can be generally recommended for shelters.

A simple inexpensive wall is the most difficult point to decide, and it is not always easy to get the architect to alter preconceived notions and adopt a method which admits of the wall being as far as possible only existent on the windward side of the building. Personally, I believe canvas walls which could be rolled up when not required would prove ample, but I have not succeeded in getting any one to agree to so primitive a style. At Nelson the upper half of the wall to the full length of both the long sides of the shelters can be opened, as it consists of a series of sashes covered with painted canvas which can be lowered into the lower solid half. There is also a gauze-covered space between the top of the wall and the eaves. This is an improvement on the Cambridge and New Plymouth shelters; but it would be desirable to have the lower half of the wall also removable at will, so that the patient can in suitable weather have only the roof over his head. At the Wellington Hospital annexe the system adopted is the use of a series of French doors, the upper and lower halves of which open separately, thus allowing of the wall from eaves to floor to be open; but of course there still remains the solid part of the wall, against which the outfolded door rests. The plan devised by Mr. Clere, and in course of adoption at the Otaki annexe, seems to me to afford the nearest approach to my ideal of, when weather permits, a walless shelter. Here the wall is in a series of panels sufficiently small to be readily handled, the top and lower sections of which are separate, the former hinged at the upper margin and pulling up and out to the wide eaves by means of a pulley, while the lower segment (also hinged) folds down and out to form a sort of verandah floor. In this way the wall can be made practically non-existent, or if the weather be unpleasant the lower half can be fastened up as a dado, while in case of driving rain the whole wall to windward can be made weather-tight and the leeward side opened. It remains to be seen how this innovation will stand the test of practical use, but so far I can see no reason to doubt its success.

At the request of Dr. Finch, I accompanied the Committee for the Christchurch Sanatorium in the search for a suitable site. Several places were visited, and an excellent situation found. Preliminary plans have been submitted by Mr. Seager, and these are now under consideration by the Committee. The limited area of level ground presents a problem in the laying-out of the institution, but doubtless in such able hands this difficulty will not be insurmountable.

Assistance has been given to two applicants in designing shelters for private treatment by the open-air method.

The question of dealing with indigent cases who have improved under sanatorium treatment, but who will require years of open-air life to complete the cure, still remains to be dealt with. I need not go into the difficulty of disposing of such cases as come out of the Cambridge Sanatorium, since you dealt with the matter fully in last year's report. Without some provision for these, the whole of our work against tuberculosis remains but half done.

Admission of Patients to Cambridge Sanatorium.

The following table shows the number of patients applying for admission to Cambridge, and the manner in which they were disposed of:—

Table VII.—Total Applications dealt with during Year 1905–6.

	184 (M. 119+F. 65.)	
Applicants on register, 1st April, 1905: 25 (M. 15+F. 10.)		New applications received during year 1905–6: 159 (M. 104+F. 55.)
Applicants placed on register during year 1905–6: 119 (M. 72+F. 47.)		Applications deferred, withdrawn, &c.: 40 (M. 32+F. 8.)
Admitted to sanatorium during year: 143 (M. 85+F. 58.)	Awaiting admission, 31st March, 1906: 1 (M. 0+F. 1.)	

It will be seen that the number placed on the register (119) is almost exactly the same as last year (118), but the number admitted (142) is fifty in excess of last year; therefore we have the gratifying result that during the past twelve months there has not been a great accumulation of applicants awaiting admission, and on the 31st March only one remained.

We still have a very large number of applications from cases which are too far advanced to hope for cure. The importance of early treatment does not yet seem fully appreciated. A considerable number of doubtful cases have to be sent up, as it is impossible at certain stages to foretell whether they may improve under treatment, the only solution being to give them a few weeks' trial. This of course often leads to disappointment, but it is on the whole better to afford them the chance at least of seeing what the open-air treatment may do. The problem of providing for the rejected ones remains as acute as before. We have constantly before us incurable indigents, and no place to send them. The work of the Nursing Guild in treating many such cases is worthy of the highest praise.

During this year it was found advisable to leave in the Medical Superintendent's hands the actual admission of the patients; we now send him the names on the list, and he arranges when they are to go in. This system has resulted in an avoidance of delay and confusion.

The number of patients presenting themselves for medical examination at this office during the year was thirty-six.

Licensing of Private Hospitals.

The following is a record of the work done in regard to private hospitals during the year: New licenses issued, 56; licenses renewed, 48; licenses refused, 4; licenses withheld pending repairs and alterations, 15.

Beyond an annual inspection of the sanitary condition of these houses it cannot be said that we are exercising much supervision of the conduct of private hospitals. It is very evident that as regards the internal management, only a medical man is competent to offer an opinion, and it is quite out of the question for the District Health Officer to find the time to inspect the nursing-homes even in the larger centres.

Habitations.

The following list refers to the buildings condemned as unfit for habitation, or as being dangerous to public health. The figures do not refer only to habitable houses, but include stables and stores which have fallen into disrepair: Wellington City, 18; Wanganui Borough, 18; Petone Borough, 4; Hutt County, 1; Manawatu County, 1; Picton Borough, 1: total, 43.

The following have been allowed to remain after extensive repairs have been effected, or on condition that they shall be used as store-sheds, &c., but not as habitable houses: Wellington, 7; Feilding, 1; Petone, 1: total, 9.

These figures show a falling-off in the returns for last year, especially in Wellington City, chiefly attributable, I presume, to the fact that the worst of the habitations have been eliminated. A certain number remain, the condemnation of which has been suspended to enable leases to lapse or to suit the business arrangements of the owners or occupiers, since, unless the matter be very urgent, it is

only fair that we should as far as we can study the convenience of the people most affected by the removal of these properties. It is interesting to note that such efforts to temper justice with mercy sometimes lead us into trouble from unexpected directions, for while you naturally look for opposition from the unlucky owner of the building which has fallen under the ban, one is less prepared to deal with an attack from your own side of the fortification. Under such circumstances, should the District Health Officer unjustly recall memories of one Naboth, who owned a vineyard, he may perhaps be pardoned on the ground that experience has not led him to expect such zealous allies under the public-health banner.

A fruitful source of decay in houses is the habit so common among builders in this country of leaving as small a space as possible between the plates and the ground; often the ground-level at one or more sides of the house is higher than the floor, and seldom is there any free ventilation of the foundation. It is difficult to see what is gained by placing a house squat down on the ground and then boarding round closely so that the damp must be drawn up into the house; yet this seems to be the accepted method of building wooden houses, with the result that they become decayed and unfit for habitation when they should be still perfectly sound. Building by-laws cannot be regarded as complete unless they provide for a dry foundation and free ventilation below the basement-floor.

Overcrowding.

In my report last year I made some mention of the overcrowding in Wellington and suburbs, and drew attention to the insufficiency of the Municipal Corporations Act as regards the provision of open spaces for houses. The following figures show the actual amount of population per acre in the centres and their suburbs: Auckland and suburbs, 19·4 persons per acre; Wellington and suburbs, 39·6; Christchurch and suburbs, 14; Dunedin and suburbs, 18·8. Wellington has thus more than twice the crowding found in the other centres.

While we have reluctantly to accept a minimum so low as 300 square feet of yard-space per house in the crowded parts of Wellington, it is manifestly absurd to permit houses to be so crowded together in the outlying suburban portion of the city—such as Melrose. The condition of affairs at Kilbirnie, where may be seen rows of jerry-built cottages jammed close together with acres of unoccupied space all round, forms a good example of the present evil and has stirred the City Council to frame a building by-law (now under consideration), which it is hoped may in a measure check the evil.

Bad as such a condition is in a suburban area, it is infinitely worse to find a similar state of affairs arising in small backblocks townships. To take particular instances which have come to our notice during the year, we have found at such places as Kaponga and Taihape that houses exist with back yards which would not meet the requirements of the regulations for air-space in a London slum. If such a condition is permitted during the infancy of these townships, what will be their state when they arrive at old age? At Taihape especially, slum dwellings are already to be found—miserable shanties crowded together on small sections—the outcome of the land speculator's desire to make the most of his investment.

A local authority, if a borough, under section 404 of the Municipal Corporations Act, may now make by-laws regulating frontage to streets and preventing overcrowding of land with buildings—privileges which have by section 11 of "The Public Health Amendment Act, 1903," been extended to all local authorities. But it is not always easy to persuade a local body as to the necessity for such regulations. They have for one thing been hampered by the fear of legal difficulties, as the by-law would seem to clash with the provision in the Municipal Corporations Act as to yard-space. It is satisfactory to have the authority of the Crown Law Officer that by-laws made under section 404 of the Municipal Corporations Act are, where the limitation is reasonable, in no danger of being quashed as *ultra vires*. Attempts have been made in this direction in certain boroughs which have adopted reasonably strict by-laws on the subject—notably, Petone and Miramar.

But it would be better to have more definite legislation on this matter, and an amendment in the Public Health Act is much needed which shall definitely override the limitation of the Municipal Corporations Act and be compulsory on all local authorities. Of course, care would have to be taken to allow of a gradation of the limitation according to value of land, already existing conditions, and so forth. It should not, however, be difficult to arrive at a standard—for instance, in unsewered townships a sufficient area should be allowed to each house to enable the occupier to dispose of the slop-waste waters in a sanitary manner; and for this purpose one could say broadly that ¼ acre is required. A smaller area might be permitted in small towns provided with sewers, and so on till we come down to the 300 square feet, which it may perhaps be necessary to admit for the crowded parts of the larger cities; but a clause should be added making it possible in a city to draw a distinction between the populous centres and the still clean and airy suburbs.

The question of shops with residential quarters in the upper stories also requires consideration, as it is evident that such cannot be treated on the same level as purely business premises.

Such details as the above could be left for settlement by the sanitary authorities, so long as the main object is secured—that of insuring pure air and unobstructed sunlight for every home. Fresh air and light are perhaps the most valuable of all sanitary commodities, therefore anything which tends to the deterioration of these must be regarded as the worst of all sanitary crimes.

Overcrowding in Dwellings.

Probably it is only in Wellington City that we can find any very general overcrowding of persons within the dwellings, still, even in up-country places, we drop across more or less isolated cases where a large family is occupying some miserable shanty to the detriment of their health and to the public danger. At some of the country hotels, too, overcrowding may be found in the bedrooms, there being in this instance, however, the excuse that the rooms are generally occupied for only a night or two.

Unfortunately we have no very definite legislation to enable us to check this condition. In the Public Health Act it is true we have included under the list of nuisances a dwelling or part of a dwelling so overcrowded as to be injurious to the health of the inmates; but this leaves the onus on the District Health Officer of proving that in each individual case the condition was injurious to health—not always an easy matter when there are perhaps half a dozen other possible causes of ill health to be found which may be equally responsible. What is required is a definite pronouncement by the Department as to what shall be regarded as the miniuum amount of air-space per occupant for bedrooms and living-rooms; and in so doing due care must be taken to avoid causing the wholesale eviction in a place like Wellington of the many hundreds of dwellers in rooms which only border on the distinctly insanitary. In a report dated the 4th October, prepared in response to a circular from Dr. Valintine on this subject, I suggested 420 cubic feet as the minimum for adults; but it is evident that due consideration should also be given to securing adequate floor-space, as the necessary cubic space might be obtained chiefly in a vertical direction, thus permitting serious overcrowding in a very high room. My proposal was to take advantage of clause 101 of the Public Health Act, and gazette a regulation as follows:—

"In pursuance of section seventy-two, subsection four, it is hereby enacted that any house or part of a house shall be deemed to be overcrowded so as to be injurious to the health of the inmates where any room used as a sleeping-room shall have a mean height less than seven feet from floor to ceiling, or where in any such room there shall be floor-space of a less area than sixty square feet for each and every bed situated in that room."

This would apply to houses in existence; but to prevent having in the future to permit so low a minimum as this, a further regulation might be passed which would apply to buildings "hereafter erected," by which a minimum mean height of 8 ft. from floor to ceiling might be fixed for any room intended for use as a sleeping-room, together with 60 ft. of floor-space for occupied beds, and 550 cubic feet for every occupant. It does not avail the health of the factory-worker much if, while we carefully prescribe a minimum of air-space for him while at work, we permit him to spend one-third of the twenty-four hours under conditions to which the traditional barrel of herrings forms the only suitable comparison.

Inspection of Food.

Under this heading there is as usual but little to report—an occasional seizure of unsound food when it happened to come under the notice of the officers of this Department, with perhaps a prosecution or two as a result; a few instances of co-operation with the Inspector of Factories in obtaining some improvement in the sanitation of places where food is prepared or sold; and the formal reference to the Stock Department of certain dairies more than usually filthy in their surroundings: this represents the efforts of the Department towards securing sound food.

There is no possibility yet of systematic inspection either of the foodstuffs themselves or of the conditions under which they are carried, prepared, and sold. The division of this work between the Labour, the Stock, and the Health Departments, and the vague position occupied by the local authority, are against any satisfactory control. The various officers concerned should be under one head. The condition of the milk-supply continues to form a lamentable example of how good broth may be spoiled when there are too many cooks. It has already been dealt with in previous reports.

Some little attention has been given this year to the carriage of fish, meat, and milk on the railways, and the observations made show how great is the need for special vans being set apart for this purpose. Milk cannot be expected to arrive in a first-class condition after being carried for many miles in a hot van, with perhaps a few semi-decomposed sheep-skins hung over the cans; nor can fish be regarded as appetising when one knows it has travelled for half a day in a dirty sack lying on the floor of a van amongst, let us say, sacks of blood and bone manure, and trampled on by a heavy but energetic porter. The difficulty of the railway authorities is that in most cases these commodities are sent in lots too small to warrant having a whole van to themselves. It would seem necessary that special trains should be fixed and special days set aside for the shipment of such things as fish and meat. For milk, of course, a daily train must be provided.

Legal opinion was obtained as to our powers to compel consignors to pack their goods in a satisfactory manner. The reply unfortunately showed that our position was very weak in this respect.

The following represents the work done during the year:—

Food condemned: Shipment of bananas, 20 tons; potatoes, 17 sacks; hams, 66; eggs, 4 cases; fish, 2 cases, a few small amounts of vegetables and fruit in retail shops.

At the instance of the Department one dairy was closed, and the herd removed from another where typhoid infection was suspected.

In connection with the supervision of foods, the sanitary condition of 2,042 food-shops—such as butcher's, bakers, &c.—has been inspected, and in 589 cases improvements have been requisitioned.

Prosecutions under the Public Health Act, Wellington District, during the Year ending the 31st March, 1906.

No. 1. 7th February, 1906. Carrying on offensive trades without D.H.O.'s permit. Fined 5s., and costs 9ls.

No. 2. 7th February, 1906. Carrying on offensive trades without D.H.O.'s permit. Fined 5s., and costs 9ls.

No. 3. 13th March, 1906. Exposing unsound fruit for sale. Fined 20s., and costs 86s. 6d.

No. 4. 13th March, 1906. Exposing unsound fruit for sale. Fined 20s., and costs 86s. 6d.

Prosecutions under the Adulteration Prevention Act.

No. 1. 9th October, 1905. Adulteration of milk with boracic acid. Fined 100s., and costs 7s.

Prosecutions by other Departments at Instigation of Health Department.

Unregistered dairy, Wanganui, 1.

Drainage, and Disposal of Refuse.

Considerable progress has been made in many of the country towns as regards drainage, and many of these are now models of what modern sewerage should be.

At New Plymouth and Palmerston North the septic tanks are now in working-order, though in the latter, since few of the houses are as yet connected, only part of the plant is in use. Both these have been inspected, and they appear to be working satisfactorily.

At Stratford the tank continues to give the most ideal results as regards effluent.

At Feilding the tank is not yet at work. At the request of the Council I visited the site to advise them as to the possibility of nuisance being caused to a neighbouring house. This matter was satisfactorily arranged.

The work of laying the sewerage is approaching completion at Feilding, Carterton, Pahiatua, and Lower Hutt, and plans for small schemes have been submitted and approved for Eketahuna and Kaponga. At the latter place the work is completed, having been done under the supervision of Mr. Schauer, Chief Inspector. In most of the places where sewerage is being laid the District Inspectors test the work as it proceeds, while all house-connections are made under their supervision.

At Nelson I inspected and approved the proposed site for the septic tank.

Nightsoil-depots have been inspected and approved for Karori and Picton.

Rubbish reserves have been granted by the Commissioner of Crown Lands for Taihape and Kimbolton. Unfortunately for the latter place, the site granted proved quite unsuitable and a new position has been applied for.

Plans for private drainage schemes have been dealt with for the following places: Schools—Okaiawa; hotels, boardinghouses—Manaia, Opunake; milk-factories—Bunnythorpe.

For Picton Hospital, improvements in the present tank have been designed after inspection of the ground.

Improvements in the drainage have been carried out at the instance of the Department for 735 private premises.

The following list of inspections and reinspections have been made by the Inspectors throughout the whole district in connection with—Complaints, 362; legal actions, 20; infectious diseases, 514; butchers' shops, 381; bakers' shops, 275; dairies, 393; fruiterers' shops, 473; auction-rooms, 160; fish-shops, 151; factories, 189; foodstuffs, 58; houses, 4,071; hotels and boardinghouses, 809; schools, 174; back yards, &c., 1,584; pan-privies, sewers &c., 819; unclassified, 1,134: total, 11,567.

By-laws.

To meet the requirements of small boroughs and town Boards which have not attained to the luxury of a drainage scheme, a set of by-laws has been drafted which it is hoped may serve as models for the guidance of such bodies. These by-laws have been submitted to the District Health Officers in other districts with a view to obtaining suggestions and opinions thereon; they will then be submitted to you, and if approved will be sent to the Crown Law Officers to be put into legal shape. Meantime, I have supplied drafts to various local bodies in the district which are engaged in framing by-laws. They include clauses dealing with nuisances, buildings, air-space, nightsoil-removal, keeping of animals, and a few for the general guidance of people who are putting in private drainage, since, even where the means of disposal is of no more ambitious a design than a cesspit, there is no reason why the house-connections should not be made so as to avoid the more gross errors so commonly found in small communities. All are of necessity made as simple as possible, so as to suit the more primitive communities for which they are designed.

I have also in hand suggested models for larger communities, but unfortunately this work, owing to lack of time, progresses slowly.

By-laws have been submitted by the following districts: Feilding (drainage), Inglewood (general sanitary), Petone (structure of stables). These have been approved.

Draft by-laws have been forwarded to the following: Feilding (drainage), Eketahuna (drainage and general), Blenheim (nightsoil), Martinborough (general sanitary and nightsoil), Opunake (general sanitary), Kaponga (general sanitary), Picton (nightsoil, and for buildings), Horowhenua County (buildings).

Suggested amendments in the present by-laws have been forwarded to Carterton and Wanganui.

Examination of Water-supplies.

At the request of Dr. Valintine I began a systematic bacteriological examination of the water-supplies in the principal centres in New Zealand. As it is impossible, for accurate bacteriological work, to use samples which have taken perhaps several days in transit, it has been necessary to visit most of these places in person; and naturally this occupies a great deal of time, while to be of real value it will be necessary to do each at least twice a year. It is therefore impossible at present for me to carry on the work in the manner which its importance demands. The system I have used is to make the usual

plate cultures for quantitative results, while for qualitative I use a Pasteur filter, which is fixed to some supply-pipe and allowed to run till 20 to 30 gallons have passed through, when the resulting deposit is collected and brought to the laboratory at Wellington for more detailed research.

So far I have examined the following: Dunedin (Caversham), Lyttelton, Wellington, Wanganui, Auckland (City), Christchurch (main), Nelson, Masterton, New Plymouth, Auckland (Manukau Trust). In all but two the results were very satisfactory.

Sanitation of the Various Districts.

Wellington City.

Population, 58,552. Infectious diseases reported: Scarlet fever, 113; enteric fever, 33; diphtheria, 55; tuberculosis, 37; blood-poisoning, 4.

The general sanitary condition of the city proper is excellent. Of 10,000-odd houses all but seventy-two are now connected with the sewerage system. The house-connections are subjected to rigid inspection, and the errors which still remain from the older system are being rapidly eliminated. A certain amount of sewerage still finds its way into the storm-water drains, and there is some reason to suspect that to some of these outfalls—in the Oriental Bay direction especially—a few cases of diphtheria and typhoid may be traced.

The lack of drainage facilities at Roseneath, Kilbirnie, Island Bay, and Kelburne continues, to the danger of the residents in these districts. It is satisfactory to learn that at the latter place sewerage is now to be laid.

With so many important works in hand the Council can scarcely be expected to tackle the drainage of all the outlying parts of the city immediately, but the rapid growth of the population which the tramway extension is producing in the suburbs is quickly making this work one of necessity.

The money necessary for the reorganization of the refuse destructor having been voted, and the contract signed, we may look forward to seeing during the present year this important branch of sanitary work brought up to modern requirements. It is to be hoped that its benefits will then be extended to such suburban districts as Roseneath, Kelburne, and Kilbirnie.

Improvements in the water-service are being organized, and the mains are now being extended to the suburbs of Roseneath and Kilbirnie. The preliminaries are in hand for the construction of a new reservoir at Karori, after which it will be possible to include the high-lying districts of Kelburne and Brooklyn, and also Island Bay.

A report having gained currency that the water was not all that it should be in quality, at the request of the Engineer an elaborate examination both chemical and bacteriological was undertaken by the Department. The result showed that these rumours were unfounded. Some improvement, however, is needed at the intakes to eliminate by filtration or sedimentation the silt which washes down after very heavy rain. At present the water is sometimes unsightly, though the pollution is of a character not likely to be injurious to health.

Of the thirty-three typhoid cases, the highest proportion arose in the city proper. Although the figures are reassuring in point of numbers, it would be more satisfactory to see them still further reduced, but this cannot be expected until the storage and sale of milk and other foodstuffs is put on a sounder basis.

The diptheria-rate remains disappointingly high. Possibly the promised improvements in refuse-removal may assist in lessening this return; also the elimination of the too-numerous decrepit, ill-drained stables, which is being gradually effected. But I believe the greatest factor in the reduction of diphtheria cases will be found in the improvement of the milk-supply.

Another defect common in the city, which must have an influence towards increasing the diphtheria-rate, is the lack of control in the matter of house-foundations. As a result of the overcrowding, houses are built on all sorts of unsuitable positions, such as over old watercourses or partially reclaimed hollows, or on land which in winter is nothing more or less than a swamp. Sometimes after the house is built the land round it is raised, leaving a hollow below the house which cannot be drained. A by-law is required prohibiting the erection of a house on damp or polluted soil unless the foundation be asphalted or in some way rendered impervious to damp.

Some slight improvement has been effected in the smoke nuisance during the year, some of the principal offenders having introduced special methods of minimising the trouble; but until the legislation is altered to conform with the regulation in force in England, this trouble cannot be effectually dealt with.

As I have said elsewhere, the principal sanitary defect in Wellington is the overcrowding, the best remedy for which the Council is now supplying—*i.e.*, the extension of the tramway to the suburbs.

I gladly take this opportunity of thanking the officers of the City Council for their unfailing courtesy and co-operation in all matters in which the Health Department is concerned.

Karori Borough.

Population, 2,194. Infectious diseases reported: Diphtheria, 1; tuberculosis, 1.

The nightsoil service is being carried out in a satisfactory manner. A new depot was approved, but it has not been found necessary as yet to move the one originally chosen.

At the city end of the borough the growth of population is such as to demand an early establishment of sewerage—a matter which, owing to the broken character of the ground, presents considerable engineering difficulties.

Onslow Borough.

Population, 2,098. Infectious diseases reported: Scarlet fever, 5; enteric fever, 1; tuberculosis, 2.

I regret to report that the Onslow Borough Council has not yet fully awakened from the state of lethargy as regards the growing sanitary needs of its district. The condition of Wadestown especially demands a vigorous policy. A drainage scheme for the borough was drawn up by Mr. Mestayer some time ago, but so far no result has followed.

Negotiations with the city for the drainage of Goldie's Brae were opened, but the matter seems to "hang fire."

Miramar Borough.

Population, 952.

This little borough, though still an infant, shows encouraging signs of vigour. A nightsoil service has been established, and an excellent set of building by-laws has been adopted, including a very wise clause limiting building-areas to ¼ acre, and it is to be hoped that the Council will remain firm against any attempt to reduce this limit. It has the condition of Kilbirnie ever before it to act the part of "horrid example," and it does not need a very active imagination to picture the trouble which would arise on the Miramar flats were each house not provided with sufficient land to dispose effectually of the domestic slop-waters.

Petone Borough.

Population, 5,807. Infectious diseases reported: Scarlet fever, 20; enteric fever, 1; diphtheria, 1; tuberculosis, 2.

This borough deserves special commendation for the excellence of its nightsoil service, the only trouble being financial, owing to the technical difficulties in the matter of sanitary rates. The by-law limiting building-allotments to ⅛ acre is also a matter on which the borough may be congratulated.

Lower Hutt Borough.

Population, 3,404. Infectious diseases reported: Scarlet fever, 3; enteric fever, 1; diphtheria, 3; tuberculosis, 1.

An important step has been taken in the adoption of a drainage scheme which is now in course of construction. This will result in the removal of many weak spots in the sanitary armour.

Martinborough.

Population, 637. Infectious diseases reported: Scarlet fever, 9; enteric fever, 1; diphtheria, 2 tuberculosis, 1.

The Town Board of Martinborough has shown some activity in matters sanitary, and has established a nightsoil service, which was greatly needed. By-laws controlling the service have been supplied by the Department, and as the older pans and privies get replaced by more modern ones the service will prove of great benefit.

Greytown.

Population, 1,112. Infectious diseases reported: Scarlet fever, 2.

The water-supply problem is at present exercising the minds of the Council, the difficulty being the familiar one of cost. The irrigation trenches are certainly not to be considered as reliable sources of supply.

The Hospital Board is now engaged on the erection of an infectious-diseases hospital—small, but quite sufficient for the average needs of the district.

Carterton Borough.

Population, 1,407. Infectious diseases reported: Scarlet fever, 8; diphtheria, 1.

As a sequence to the installation of a water-service last year, the sewerage system is now practically complete, with the result that this borough may be regarded as having placed itself in a satisfactory sanitary position.

Drainage by-laws have been adopted in accordance with the standard suggested by the Health Department.

Some little trouble over the site of the septic tank occurred during the year, but has been overcome in a satisfactory manner from the point of view of the Council.

Masterton.

Population, 5,003. Infectious diseases reported: Scarlet fever, 8; enteric fever, 3; diphtheria, 5; tuberculosis, 3; blood-poisoning, 1.

Little progress can be reported in this town, since, owing to the Council withdrawing from the scheme for maintaining a District Inspector, the sanitary inspection has been done in a very casual manner. For a town of this size something more is required in this direction than a few hours a week given by an officer who has many other duties to attend to.

During December many complaints arose as to the quality of the water-supply. On investigation these proved well founded, as the lagoon used as an auxiliary water-supply was in a very foul condition. The ordinary supply, however, was very satisfactory as regards purity, and the Council has now obtained, in place of the original, auxiliary water from the gravel-beds on the upper reaches of the river. This water, like that of the lower intake, passes through a process of natural filtration, and it is improbable that any further cause for complaint will be found.

Pahiatua.

Population, 1,371. Infectious diseases reported: Scarlet fever, 2; diphtheria, 33; tuberculosis, 2.

The outbreak of diphtheria here indicates the need for improved methods in disposal of drainage. Fortunately the sewers are nearing completion, and already some of the house-connections have been made. Much still remains to be done, and owing to the absence of fall in some streets many difficulties have to be encountered.

The infectious-disease wards are not yet added to the Hospital, though the lack of them was much felt at the time diphtheria was prevalent. The Hospital Board cannot be congratulated on its energy in pushing on this very necessary work.

Eketahuna.

Population, 703. Infectious diseases reported: Diphtheria, 7.

Much trouble has been caused in this township by the absence of drainage and the difficulty experienced in getting the funds necessary for improvement while it remained part of the county. Eketahuna is now a Town Board with independent powers of rating, and the new authorities evidently intend to remove the unhealthy conditions as soon as possible.

A short sewer is now being laid, which will carry away the waste waters which formerly accumulated in an old creek-bed. This sewer will, I trust, shortly be extended so as to serve all the hotels and enable them to have drainage of an up-to-date character.

A water-supply will be required, but plans for this have already been prepared by Mr. Leslie Reynolds, showing that it can be provided at a fairly reasonable outlay.

By-laws for drainage, buildings, and sanitary control have been supplied by this Department, and I trust will shortly be adopted.

Horowhenua County.

Population, 6,606. Infectious diseases reported: Scarlet fever, 1; enteric fever, 2; diphtheria, 1; tuberculosis, 3; blood-poisoning, 2.

The establishment of Levin among the list of boroughs will considerably alter the position of affairs in the county, although it is too soon to report any advance from the sanitary standpoint.

The opening of the Boys' Industrial Farm at Werenga adds to the importance of securing better hygienic arrangements.

The appearance of a case suspiciously like small-pox stirred the County Council up to some extent, and improvements were effected at Shannon and some other places. A departmental Inspector was appointed for six months, and some good work was done. The county has now appointed an Inspector from its own staff, and we must hope that his efforts will be encouraged by the Council.

Palmerston North.

Population, 10,243. Infectious diseases reported: Scarlet fever, 26; enteric fever, 32; diphtheria, 13; tuberculosis, 2.

The sanitary state of the borough has been advanced in several directions during the year. The work of connecting the houses with the drainage system is steadily progressing, while the majority of the sewers have now been laid. The septic tank is in partial use, and so far promises satisfactory results.

The Hospital for Infectious Diseases has been completed, and a special annexe for diphtheria cases is in course of erection.

A new abattoir-site has been found and approved after inspection by Mr. Gilruth and myself.

Too many cases of diphtheria have still to be recorded, but it is to be hoped that as the new drainage replaces the old cesspits, this reproach will be removed.

The sanitary condition of the railway-station is unsatisfactory, and as the sewer is now laid past the gates no delay should be made in effecting improvements.

Feilding.

Population, 2,972. Infectious diseases reported: Scarlet fever, 6; diphtheria, 1; tuberculosis, 1.

This borough has been somewhat unfortunate, in that some of the sewerage-work put down at first proved faulty on inspection by our officers, and had to be renewed, thus causing delay. Under stricter inspection the work is now making satisfactory progress, and some of the houses are being connected up. The absence of by-laws controlling these house-connections at first caused some confusion, owing to builders and architects not having any guidance as to modern requirements. Models supplied by the Department were finally adopted by the Council, and the work is now under the supervision of the departmental officer.

When completed the drainage of Feilding will be on the best lines from the house to the outfall from the aerating beds.

Marton.

Population, 1,268. Infectious diseases reported: Scarlet fever, 1.

Improvements are now in progress at the railway-station, by which the somewhat insanitary arrangements formerly existing will be greatly improved.

The town has been in a healthy condition during the year.

Taihape.

Population, 1,269.

This is about to be constituted an independent borough. When this is done it is to be hoped that the new Council will take full advantage of its new powers to remove some of the present blots on its sanitary condition. Prominent among these is the extensive overcrowding and the presence of many shanties which were only intended as temporary abodes in the early days of settlement.

Building by-laws are needed, and especially a section controlling the size of allotments.

Wanganui.

Population, 8,216. Infectious diseases reported: Scarlet fever, 18; enteric fever, 30; diphtheria, 9; tuberculosis, 2.

The unfortunate outbreak of typhoid in this town has been already discussed. The cause was purely local, and there is no reason to believe that the water-supply was in any way affected—indeed the analyses both bacteriological and chemical of this supply showed satisfactory results. It must, however, be noted that there is need for filtration or sedimentation of this water, since in heavy rain a large amount of clay is sometimes washed down, making the water unsightly though not necessarily injurious to health.

The system of drainage into the river cannot so far be said to have produced any obnoxious results, but it must be borne in mind that with the growth of the town some method of treatment will be required before the effluent can be permitted to discharge into this tidal water.

The lack of an adequate system of refuse-removal has repeatedly been reported on, but so far without result.

A good deal of correspondence took place during the year on the subject of the necessary legal proceedings to secure the removal of ruinous houses condemned by the Department. It had been proposed that the Department should act for the borough in such cases, but this was found to be impossible when referred to the Crown Solicitor. Finally the Council undertook the work, as is done elsewhere, and a large number of unsatisfactory houses were pulled down, while others, where removal would cause hardship, are now awaiting the adjustment of financial arrangements of the owners before being demolished.

The removal of the Maori hostelry must be recorded with satisfaction.

Certain amendments in the drainage by-laws have been recommended by the Department, and it is hoped will shortly be adopted by the Council. These will chiefly be in the direction of securing a better class of plumbing.

The suburbs of Durie Town and Aramoho remain in the same unsatisfactory state as reported last year.

Eltham.

Population, 1,329. Infectious diseases reported: Scarlet fever, 14; enteric fever, 3; diphtheria, 1.

The house-connections to the sewer are now practically completed, and both septic tanks are giving satisfactory results. An extension of the system is now contemplated.

Stratford.

Population, 2,127. Infectious diseases reported: Scarlet fever, 9.

The main part of the sewerage may now be said to be completed, and there is some prospect of an extension to outlying parts of the borough. The septic tank continues to give most perfect results.

The drainage of the block of buildings on land leased from the Railway Department has been a source of trouble, as the length of the leases is too uncertain for the owners to undertake the cost of laying connections, while the Railway Department does not see its way to provide drainage for these tenants. Being in the centre of the town, some arrangement by which the difficulty might be got over is most desirable.

Manaia and Opunake.

Manaia.—Population, 441. Infectious diseases reported: Enteric fever, 1.

Opunake.—Population, 406. Infectious diseases reported: Tuberculosis, 1.

Various improvements have been effected in the drainage of the hotels at these places.

Model building and general by-laws have been supplied to Opunake, and are now being considered by the Council.

Kaponga.

Population, 278. Infectious diseases reported: Scarlet fever, 2; enteric fever, 3; tuberculosis, 1.

This township has been constituted a town district, and we have reason to hope that this will result in the removal of some of the worst defects in the sanitary arrangements. Owing to the repeated outbreaks of typhoid emanating from the district, it has not enjoyed the best reputation, but with a vigorous forward policy the new Board can easily restore it to favour. The completion of a short sewer to serve the hotel and boardinghouse was the first step in this direction, and this work has been accomplished on the lines laid down by and under the supervision of Mr. Schauer, Chief Inspector. A nightsoil service is the next item receiving attention, and the Board is now considering the question.

Kaponga has one natural advantage, in that a water-supply can be installed at a low cost, and when this is done and strict building by-laws have been adopted, little will be left to make the township one of the most healthy in New Zealand.

Inglewood.

Population, 1,552. Infectious diseases reported: Scarlet fever, 2.

The water-supply is now installed, and the drainage system is fast approaching completion. Many of the house-connections have been put in, all under the supervision of the Engineer and the District Inspector.

This town has been singularly free from infectious disease.

New Plymouth.

Population, 5,147. Infectious diseases reported: Scarlet fever, 2; enteric fever, 5; diphtheria, 8; tuberculosis, 5.

The septic tank has been completed, and is now working in a fairly satisfactory manner since the effluent-pipe has been made to dip below the surface of the stream receiving it.

There is much need to extend the sewerage system to the more outlying parts of the town, and it is to be regretted that the Council did not co-operate with the Public Works Department when the latter was laying down the prison drainage, as a large number of houses could have been connected to the proposed new sewer.

An analysis of the town supply made early in summer showed the water to be in a satisfactory condition.

Sanitary Inspection.

The system of having Inspectors for combined districts is working so well that it might be made compulsory on the local authorities, somewhat after the method in vogue in England. At present a local body may for various reasons withdraw from the combination, and if, as was the case with Masterton during the past year, it is a considerable contributor to the Inspector's salary it may upset the scheme for a large district. The value of this system was well established in the case of Feilding, where, but for the observations of Inspector O'Brien and the subsequent exhaustive tests made by Mr. Schauer, a considerable amount of very defective sewerage would have been installed. The importance of supervision by independent and trained men over all such work cannot be too much emphasized.

Negotiations are now in progress with the Nelson Borough Council towards the establishment of the system there.

The following changes took place in the staff: Inspector Middleton was given leave of absence to enable him to return to England to further study in sanitary science: it is satisfactory to learn that he has made such good use of his time that he has gained the silver medal in the Worshipful Company of Carpenters' examination for good work in sanitary building-construction. I regret that we have lost the services of so able a man as Inspector Dolby, who has taken up other work. Inspector Dorizac has been drafted to the Wairarapa District to take his place. Inspector Sargeant has been located at Wanganui, and Inspector Gardiner in the Stratford–Taranaki District. Two additional Inspectors have been appointed, both of whom have, after a period of probation, passed very satisfactory examinations and are now on the permanent staff.

With the view to obtaining an accurate record of the work done by the Inspectors I have drawn up record forms, on which details of the various duties performed are noted daily. These records are set in each week. In addition there is a monthly summary in the form of a table, showing the work classified under the various heads. Hitherto we have not had any systematic record, and I believe this will prove of some value. The scheme has only been in force for six months, therefore I cannot give as complete details as I should like, but the attached table is a fairly accurate summary, and gives some idea of the very large amount of work done by the Inspectors. This table does not include the very extensive list of special work done by Mr. Schauer, Chief Inspector.

The following list shows the special inspections made by the District Health Officer, and of houses reported for condemnation on sanitary defects:—

Houses reported for condemnation	92
Schools	4
Hotels	3
Stables	5
Food-shops	9
At instance of Factory Inspector	8
Proposed sites for sanatoria	8
Nightsoil-depots	5
Dairies	9
Cemetery-sites inspected (Linton and Pohangina)	2
Cases examined for suspected infectious disease	16
Applicants examined for sanatorium	40
Cases examined under the Immigration Restriction Act	3
Materials inspected for condemnation.	

Improvements in sanitation have been effected at 17 schools, 25 hotels, and 8 factories.

SUMMARY OF OFFICE-WORK.

The work for the district office is steadily growing, and especially as the scope of the District Inspector scheme increases, which entails a large amount of correspondence: Letters written, 1,922; notices served, 305; infectious diseases recorded, 714.

Special reports have been furnished on the subject of overcrowding, and on the occurrence of cancer at Motueka.

For the Education Department a list of simple drugs and their uses has been prepared for use in Industrial Schools.

LABORATORY-WORK.

It will be readily understood that the general duties of the district office greatly curtail my time for work in the laboratory, and between the pathological and the vaccine establishments I have found it impossible to undertake any special scientific research, though there is much in this direction which would prove interesting and of great practical value.

The removal of the veterinary laboratory to Wallaceville occurred at the beginning of the year, and the majority of examinations for human pathology has been done at Museum Street, as formerly. The preparation of media, however, is chiefly done at the Wallaceville Laboratory, and certain of the specimens have also gone there. Thus the majority of the samples of milk examined on behalf of the various District Health Officers and for Dr. Valintine's special investigation were referred to Mr. Gilruth, who has special knowledge of this work. He has also frequently taken up my duties when I have been absent from Wellington.

As already mentioned, special investigation has been made into the water-supplies of the colony. I also proceeded to Auckland to make an investigation into the cause of mortality among rats during March.

Details of the pathological examinations made appear in a separate report.

Vaccine Laboratory.

The work of preparing vaccine lymph is now in full swing, and on the whole very satisfactory results have been obtained. In July, 1905, we began to issue vaccine prepared at this laboratory, and have so far distributed 8,914 tubes. Twelve calves have been inoculated, and 1,114 cubic centimeters of lymph prepared.

With a view to keeping a check on the quality of the lymph issued, I have endeavoured to obtain from the Public Vaccinators reports on every tube used; and with this object have drawn up a form which shows details as to number of insertions, whether a primary or a secondary vaccination, results obtained, and so on. A form is issued with every package sent out, but we have great difficulty in obtaining replies from Public Vaccinators. Thus, of the 5,193 tubes sent out to Public Vaccinators in New Zealand we have received reports upon only 991 of them. So far as these go they show the following results: Cases vaccinated, 991; cases successful, 858; percentage, 96·5. These figures, though satisfactory enough, would, I believe, show even more favourable results had we received full reports. I find that many of the Public Vaccinators only send in reports when they have some complaint to make as to the strength of the lymph.

These figures also include reports on lymph issued during the time we were testing it as regards its power of keeping virile. We found that during the warm weather in midsummer there was a marked decline in strength if kept longer than six months. In order to lessen the rapidity of depreciation in warm weather during storage, the district offices have been supplied with ice-chests of a simple and inexpensive design, which are found to keep at an even temperature in the hottest weather. This should greatly lengthen the time during which the lymph remains virile.

On the application of the French Consul at Auckland, permission was given by the Minister of Public Health for the supply of lymph to the French Government at Tahiti. So far, lymph sufficient for 3,721 vaccinations has been issued, and very favourable reports have been received from the Chief Medical Officer of the colony. A charge of 3s. per dozen vaccinations is made for this issue. The Public Vaccinators in New Zealand are of course supplied free of charge.

Some difficulty has been experienced in obtaining suitable calves for the work, as it is essential they should be without any defects. Before the lymph is issued a report is received from the Chief Veterinarian as to the health of the calf as found on *post-mortem* examination.

After glycerinating the lymph it is stored at 10° C. till it is found on repeated bacteriological examination to be sterile. In this we follow the practice which obtains at the English Local Government Board Laboratory, and, indeed, practically at all the larger Continental and American institutions, and so far we have had no reports which would indicate that undue inflammation resulted from the use of the lymph.

This section of our laboratory-work involves the expenditure of a lot of time and care. The filling and packing of the vaccine tubes alone is a most laborious business, and one which cannot be hurried over. It requires not only a certain amount of manual dexterity, but also constant attention to detail to avoid exposing the lymph to danger of pollution, and to prevent it being overheated in sealing the tubes. It is a satisfaction, therefore, to begin the present year with the extra assistance which we found necessary to cope with the growing demand which this branch of our duties makes on our time.

NELSON DISTRICT.

Dr. Hudson is now in charge of this district, and will furnish a separate report on the sanitary needs. I have paid several visits during the year for special purposes, amongst others the inspection of the new sanatorium already reported on.

The question of appointing a Sanitary Inspector was discussed by the Council in the presence of Dr. Hudson and myself, but no basis of agreement was arrived at. There has been practically no inspection done since Mr. Middleton went on leave.

I made an analysis of the water-supply during December, and found it to be in excellent condition.

I visited Motueka to make inquiries as to the question whether there was any truth in the report that the library had been the means of spreading cancer among those most in contact with the books. A strong feeling exists in the neighbourhood that this was the case, and since the library was not being used it was no hardship on the borough when Cabinet directed that the library be closed officially by the Health Department. The question of the disposal of the books remains unsettled. A full report on the circumstances has been submitted to Head Office.

The Nelson District generally has been fairly free from infectious disease—a fortunate circumstance in view of the inaction of the Hospital Board in the matter of providing accommodation for such cases.

MARLBOROUGH DISTRICT.

Since Dr. Anderson's resignation as Acting District Health Officer, our representative in this district has been Mr. Johnston, Sanitary Inspector, who has done some good work.

The district has been, fortunately, fairly free from epidemics of infectious disease.

I have been able to pay but one brief visit to Blenheim. Here, there is arising much need for a drainage system for the centre of the town. The low-lying parts being subject to floods, some difficulty will be experienced at this time in keeping sewers clear. The lagoon which caused much offence from the stagnation of the water has been reclaimed.

Picton adopted a nightsoil service during the year in preference to installing sewerage, the latter scheme proving, perhaps, somewhat too costly for the size of the town, especially as it is evident that a treatment system would require to have been adopted before discharging sewage into such confined waters as the harbour affords. The nightsoil-depot has been approved by the Department, and a set of model by-laws for a nightsoil service has been supplied to the Council.

The necessity for adopting building by-laws has been demonstrated by the primitive efforts of some builders within the borough. It is to be hoped the Council will not continue to allow so much latitude in the matter.

The septic tank at the Hospital has given some trouble. Arrangements have now been made for the provision of a properly constructed filter-bed.

R. H. Makgill, M.D., D.P.H.

NELSON.

Department of Public Health, Nelson, 25th April, 1906.

Memorandum for Chief Health Officer.

The following is the public health report for the District of Nelson for the year ending the 31st March, 1906:—

During the year 73 cases of infectious diseases have been reported to the Nelson Office:

Diphtheria.—17 cases. Nelson City, 1; Riwaka, 7; Motueka, 8; Wakefield, 1.

Scarlet Fever.—33 cases. Nelson City, 3; Riwaka, 1; Motueka, 6; Ngatimoti, 5; Appleby, 1; Blenheim, 1; Lower Moutere, 4; Neudorf, 3; Richmond, 1; Murchison, 4; Westport, 1; Wakapuaka, 3.

Tuberculosis.—15 cases. Nelson City, 11; Lower Moutere, 1; Motueka, 2; Croixelles, 1 (Maori).

Enteric Fever.—6 cases. Nelson City, 5; Belgrove, 1.

Measles.—2 cases reported from Denniston.

The year may be considered to have been a fairly healthy one. Scarlet fever and diphtheria predominating in the Motueka district, and typhoid and tuberculosis in Nelson City. With regard to the latter, however, a goodly percentage were visitors from other parts of the colony. There has been no epidemic of any severity during the year.

Drainage Scheme (for the City).

This is now fairly in hand. The money for the loan has been raised. Mr. Mestayer is at work on the plans, and several thousand pounds' worth of plant has been ordered from England. No actual work has, however, as yet been commenced in the town.

Sanitary Inspector.

We have had no Sanitary Inspector since Mr. Middleton left us last June. Negotiations are being undertaken for the appointment of one, and I trust one will soon be sent to the district; for the provisions of the Public Health Act cannot be properly carried out without a qualified Inspector.

Water-supply.

The new dam gives an abundant supply, and during the year the water was analysed by Dr. Makgill and found quite satisfactory.

General Remarks.

It may be remarked that the scarlet-fever epidemic which commenced in Nelson by an imported case about October, 1900, has now almost entirely ceased in the town; it is gradually dying out in the remote country districts, which of course contracted it much later than Nelson.

There has been very little diphtheria in Nelson City for several years. One case died at an hotel during the year; this was an imported case and did not spread. It is, however, rather too prevalent in Motueka and Riwaka.

Enteric fever is below the average in the town; it is almost non-existent in the country districts.

Tuberculosis is more prevalent in the city than in the country. This is as might be expected.

Dysentry, which formerly was fairly prevalent in both town and country, has for the last ten to fifteen years been almost non-existent. This is no doubt due to improved attention to sanitary details on the part of the inhabitants. I attended one case in the town during February, undoubtedly due to defective sanitation.

Under good sanitation the Blind Bay district might be one of the healthiest localities in the world.

JAS. HUDSON, M.B. Lond.,
Acting District Health Officer.

CANTERBURY DISTRICT.

Department of Public Health, Christchurch, 30th June, 1906.

Dr. Mason, Chief Health Officer, Wellington.

I HAVE the honour to submit to you the annual report of the Canterbury Health District for the year ending the 31st March, 1906.

VITAL STATISTICS.

As the vital statistics for the whole colony are now included in your annual report, there is no necessity for special mention to be made of the statistics relating to this district.

INFECTIOUS DISEASE.

In Table No. 1 every case notified in every house has been counted; in the other tables only one case has been counted to one house when two or more have been notified on the same notification.

INFECTIOUS DISEASE.

Table No. 1.

	Population.	Enteric Fever.	Scarlet Fever.	Diphtheria.	Tuberculosis.	Erysipelas.	Septicæmia.
Amuri County	1,142	...	...	...	...	...	...
Akaroa County	3,669	...	...	...	...	...	...
Duvauchelle Bay	...	...	1	...	...	...	...
Barry's Bay	...	...	1	...	...	...	...
Ashburton County	11,342	...	..	...	...	...	...
Ashburton and suburbs	...	1	31	2	9	...	...
Rakaia	...	1	3	1	...	...	...
Mayfield	...	...	...	...	1	...	...
Chertsey	...	...	...	...	1	...	...
Hinds	...	...	...	...	1	...	...
Ashley County	11,599	...	...	...	...	...	...
Balcairn	...	...	1	...	...	...	...
Fernside	...	...	2	...	...	...	...
Rangiora	...	...	1	4	1	...	...
Kaiapoi	...	...	8	2	1	...	...
Oxford	...	...	7	...	...	...	...
Sefton	...	...	2	...	...	1	...
Eyreton	...	...	2	...	...	...	...
Southbrook	...	...	1	1	2	...	...
Ashley	...	2	1	...	...	...	...
Woodend	...	...	...	2	...	...	...
Cheviot County	1,120	...	...	...	...	...	...
Cheviot	...	...	...	..	...	1	...
Ethelton	...	...	2	...	...	...	...
Geraldine County	5,991	...	...	...	...	...	...
Geraldine	...	...	...	1	...	...	...
Temuka	...	2	1	...	...	...	...
Orari	...	...	...	1	...	...	...
Kaikoura County	1,765	1	7	...	...	...	...
Kaikouri	...	...	...	...	2	...	...
Levels County	5,496	...	..	...	1	...	...
Timaru	...	3	4	3	5	5	2
Pleasant Point	...	2	1	...	1	...	...
Mackenzie County	1,642	...	...	...	...	...	...
Fairlie	...	...	...	...	1	1	...
Selwyn County	30,787	...	...	...	...	...	...
Christchurch	...	4	34	13	39	7	1
Woolston	...	...	1	...	2	...	...
Avon	...	2	...	...	...	...	...
Riccarton	...	1	1	1	1	...	...
Heathcote	...	...	...	...	2	...	...
Papanui	...	...	1	1	...	...	...
Addington	...	...	1	...	...	...	...
Spreydon	...	1	2	...	...	...	...
New Brighton	...	...	2	...	1	...	...
Lyttelton	...	3	6	24	14	1	4
Styx	...	...	...	1	1	...	...
Carried forward	...						

INFECTIOUS DISEASE—*continued.*

Table No. 1—continued.

—	Population.	Enteric Fever.	Scarlet Fever.	Diphtheria.	Tuberculosis.	Erysipelas.	Septicæmia.
Brought forward							
Lincoln	...	...	...	...	2	...	...
Dunsandel	...	1	...	...	...	...	...
Southbridge	...	...	...	...	1	...	...
Templeton	...	...	1	1	1	...	...
Leeston	...	...	...	...	2	...	...
Burnham	...	...	...	1	...	...	...
Darfield	...	...	...	...	3	...	...
Killinchy	...	...	1	...	...	...	...
Halket	...	...	...	...	1	...	...
Waimate County	5,653	...	...	...	..	...	...
Waimate and suburbs...	...	9	5	...	...	...	1
Hakataramea	...	...	...	2	1	...	...
Waitaki County	9,086	..	...	...	...	...	...
Oamaru	...	2	48	1	9	...	...
Ngapara	...	...	2	2	...	...	...
Herbert	...	...	...	...	1	...	...
Peebles	...	...	2	...	...	...	...
Hampden	...	...	...	...	1	...	...
Windsor	...	...	1	...	...	...	...
Totals	...	35	184	64	108	16	8
Totals for Christchurch and district...	...	8	40	15	44	7	1

Cases of Tuberculosis from outside Canterbury Health District, 4.

SCARLET FEVER.

Table No. 2.

—	Apl.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Totals.
Christchurch	4	1	2	1	3	4	3	1	1	...	3	3	26
Woolston	1	...	...	...	...	...	...	...	...	...	...	...	1
Riccarton	...	...	...	...	...	1	...	...	...	...	...	...	1
Papanui	...	...	...	1	...	...	...	...	...	...	...	...	1
Addington	...	...	...	1	...	...	...	...	...	...	...	...	1
Spreydon	1	1	...	...	...	...	...	...	...	...	...	...	2
New Brighton	...	...	...	1	..	1	...	...	...	...	...	...	2
Lyttelton	...	...	...	1	1	...	...	...	...	...	2	...	4
Templeton	...	...	...	1	...	...	...	...	...	...	...	...	1
Killinchy	...	...	...	...	...	...	...	...	...	...	...	1	1
Kaikoura	...	...	...	...	...	...	...	...	...	...	1	...	1
Ethelton	...	...	...	...	...	...	...	...	...	...	1	1	2
Rangiora	1	...	...	...	...	...	...	...	...	...	...	1	2
Kaiapoi	2	...	1	2	1	...	...	...	...	...	...	...	6
Balcairn	...	...	...	...	...	...	...	...	...	1	...	...	1
Oxford	...	...	...	...	...	5	...	...	...	1	...	...	6
Southbrook	...	1	...	...	...	...	...	...	...	...	...	...	1
Fernside	2	...	...	...	...	...	...	...	...	...	...	...	2
Eyreton	...	...	1	1	...	...	...	...	...	...	...	...	2
Ashley	...	...	1	...	...	...	...	...	...	...	...	...	1
Sefton	...	...	...	...	...	2	...	...	...	...	...	...	2
Duvauchelle Bay	...	...	1	...	...	...	...	...	...	...	...	...	1
Barry's Bay	...	...	...	...	...	...	1	...	...	...	...	...	1
Rakaia	...	...	...	...	1	...	2	...	...	...	...	...	3
Ashburton and suburbs ...	5	2	4	8	2	...	1	2	1	...	1	...	26
Temuka	...	...	1	...	...	...	...	...	...	...	...	...	1
Timaru	...	...	...	1	...	1	...	...	...	...	..	2	4
Pleasant Point	...	...	...	...	...	...	...	...	...	...	...	1	1
Waimate and suburbs ..	...	...	2	...	...	...	...	1	...	1	1	...	5
Oamaru	4	3	...	7	9	4	2	1	1	2	2	2	37
Ngapara	...	...	1	...	...	...	...	...	...	...	...	...	1
Peebles	...	...	...	...	...	...	...	...	1	...	...	...	1
Windsor	...	...	1	...	...	...	...	...	...	...	...	...	1
Totals	20	8	15	25	17	18	9	5	4	5	11	11	148
Totals for Christchurch and district	6	2	2	3	3	5	3	1	1	...	3	3	32

ENTERIC FEVER.

Table No. 3.

—	Apl.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Totals.
Christchurch	...	1	...	...	...	...	...	...	1	1	...	1	4
Avon	1	...	...	1	...	...	...	...	...	...	...	...	2
Riccarton	...	...	...	...	...	...	...	...	...	...	1	...	1
Spreydon	...	...	...	...	...	...	...	...	1	...	...	...	1
Lyttelton	...	...	...	...	...	...	...	...	...	...	3	...	3
Dunsandel	...	...	...	...	...	...	...	...	1	...	...	...	1
Ashley	1	1	...	...	...	...	...	...	...	...	...	...	2
Kaikoura	...	...	...	...	...	...	1	...	...	...	...	...	1
Rakaia	...	...	...	...	...	...	...	...	...	...	1	...	1
Ashburton	...	...	...	...	...	...	...	...	...	...	..	1	1
Temuka	...	...	...	...	...	...	...	...	...	...	1	1	2
Timaru	...	1	...	1	...	...	...	...	...	1	...	...	3
Pleasant Point	...	1	...	...	...	...	...	...	...	...	...	...	1
Waimate	1	...	1	...	...	...	...	1	2	...	1	...	6
Oamaru	...	1	1	...	...	...	...	...	...	...	...	...	2
Totals	3	5	2	2	...	...	1	1	5	2	7	3	31
Totals for Christchurch and district	1	1	...	1	...	...	...	...	2	1	1	1	8

DIPHTHERIA.

Table No. 4.

—	Apl.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Totals.
Christchurch	1	3	...	...	...	2	...	...	1	1	...	1	9
Riccarton	...	1	...	...	...	...	...	...	...	...	...	...	1
Papanui	...	...	...	...	...	...	...	...	1	...	...	...	1
Lyttelton	2	2	...	5	2	4	2	...	1	...	4	2	24
Templeton	1	...	...	...	...	...	...	...	...	...	...	...	1
Burnham	1	...	...	...	...	...	...	...	...	...	...	...	1
Styx	...	...	...	...	...	...	...	...	...	1	...	...	1
Rangiora	...	1	1	...	...	...	...	1	...	...	...	1	4
Southbrook	...	...	1	...	...	...	...	...	...	...	...	...	1
Kaiapoi	...	...	...	...	1	...	...	...	...	...	...	...	1
Woodend	1	...	...	1	...	...	...	...	...	1	...	...	3
Ashburton	...	...	...	1	...	...	...	...	...	...	...	1	2
Rakaia	...	...	...	...	1	...	...	...	...	...	...	...	1
Orari	...	...	...	...	...	...	...	...	...	1	...	...	1
Geraldine	...	...	...	...	...	...	...	...	...	1	...	...	1
Timaru	...	...	...	...	2	...	...	1	...	...	...	...	3
Hakataramea	...	...	...	...	...	...	...	...	2	...	...	...	2
Oamaru	...	...	...	...	...	1	...	...	1	...	...	...	2
Ngapara	...	...	...	...	...	...	...	1	...	...	1	...	2
Totals	6	7	2	7	6	7	2	3	6	5	5	5	61
Totals for Christchurch and district	1	4	...	...	...	2	...	...	2	1	...	1	11

Scarlet Fever (*Table No.* 2).—The foregoing table shows that cases of scarlet fever have occurred throughout the district during the last year, but that there has been no outbreak which could be called epidemic except in Ashburton and Oamaru. The comparatively small number of cases in Christchurch may be, and I hope is, due to the existence of adequate accommodation in Bottle Lake Hospital for the cases that have occurred and to the careful supervision and thorough disinfection carried out by the officers of the City Council. In Christchurch and district the age and sex distribution is as follows: 5 years and under—males 0, female 1; 5 to 10 years—males 5, females 6; 10 to 15 years—males 3, females 2; 15 to 20 years—males 5, females 2; 20 to 30 years—males 0, females 3; 30 to 40 years—males 0, female 1; over 40 years—males 0, females 0: total, 28. Total in Christchurch and district, 40; total in which age known, 28. In 177 cases out of 184 of the notifications received throughout the district, 82 were males and 95 females.

Enteric Fever (*Table No.* 3).—The above table is again very satisfactory, there being only 31 cases in the district, against 27 last year, and 60 the year before. Waimate is again conspicuous, having an undue proportion of cases.

Diphtheria (*Table No.* 4).—This table is also very satisfactory with the exception of the number of cases that have been notified in Lyttelton.

Measles.—No cases of measles have been notified to the Department during the year, and as far as I know there have been no cases of true measles.

Mortality.—The mortality from the minor infectious diseases has been exceedingly slight, there being one death from scarlet fever, one from enteric fever, and one from diphtheria.

Dangerous Infectious Diseases.

There has been an entire absence of even a "scare" in connection with the class of dangerous infectious diseases, with the exception of one case of leprosy. This was the case of a man who had been resident in Christchurch for some years, having come from Queensland to New Zealand about twelve years ago. It is highly probable that he became infected in Queensland, although the disease did not appear until much later. He is at present being isolated on Quail Island.

Tuberculosis.

The number of notifications received during the year from all sources was 108, as against 131 last year. How far this number is a true record of the fresh cases that have occurred in the district is a matter of some doubt. Notices of 77 deaths from tuberculosis were received at this office, and for the year ending the 31st December, 1905, there were 44 deaths in Christchurch from phthisis, as compared with 42 in the previous year.

Canterbury Sanatorium for Consumptives.

It is over a year ago since I first proposed to the North Canterbury Hospital Board that the Hospital Boards in the district should combine for the purpose of the erection and maintenance of a sanatorium. In my last report I stated that I thought there were good grounds for stating that during the current year continuous though possibly slow progress would be made in providing accommodation for consumptives. The progress has certainly been slow, but it has nevertheless been satisfactory and on sound permanent lines. The following is a brief account of the steps taken in the district to forward this movement:—

In May, Dr. Valintine and I attended a meeting of the local branch of the Medical Association, and asked for their support in the movement. This support was promptly and cordially given. A deputation of the Medical Association subsequently waited on the Hospital Board and asked them if they would undertake to maintain a sanatorium if the Medical Association were successful in raising sufficient funds by private subscription to erect and equip a suitable institution. At that meeting the following resolution was carried: "That a letter be forwarded to the Medical Association stating that the Board are in full sympathy with their proposals as regards the establishment of the sanatorium, and will afford every assistance possible." At a subsequent meeting of the Board the following resolution was carried: "That upon the Medical Association erecting and equipping an up-to-date sanatorium for the treatment of consumption and handing the same over free of debt, the North Canterbury Hospital Board hereby agree to take over and maintain the said sanatorium as one of the institutions of the North Canterbury Hospital District." The carrying of this resolution was of great importance inasmuch as a local body representing the ratepayers agreed to maintain a new institution which would to some considerable extent increase the amount of rates which that body had levied in the past. On the 6th July a public meeting was held in Christchurch at which it was resolved "That it is desirable that a new sanatorium for the treatment of tuberculosis should be erected in the North Canterbury Hospital District," and a general committee consisting of representatives of local bodies and various other representative institutions was appointed to further the object. This committee appointed an executive committee which has practically done all the work in connection with this movement. For some time the question of the acquisition of a suitable site was a matter of considerable anxiety and trouble to the members of the executive committee. This anxiety was suddenly removed by the generous offer by the owner, Mr. J. Cracroft Wilson, and the trustees, of a most suitable site on the Cashmere Estate on the Port Hills. The site comprises about 11 acres, part of which is a knoll about 200 ft. above sea-level, with a sufficiently flat area on which to place the administrative buildings. The site is about half a mile from the terminus of the Colombo Street tram, and about two miles from the Christchurch Railway-station. Taking everything into consideration, it is doubtful if the executive committee could have chosen a more suitable site if they had had a free selection of any site within ten miles of Christchurch.

The net result of the movement up to date is the undertaking of the Hospital Board to maintain the institution, the acquiring of the free gift of a very valuable and suitable site, the collection of about £3,000 by private subscription, the agreement of the South Canterbury Hospital Board to pay their share of the cost of erection and maintenance, and the preparing of plans by the architect, Mr. Hurst Seager, which have met with the approval of the Executive committee, the Hospital Board, and the Health Department. The estimated cost of the buildings, equipment, and site was £15,000. The site has been valued at £1,650; the amount in hand therefore with Government subsidy on private subscriptions and site is about £8,600. The proportion that should be contributed by the South Canterbury Hospital Board and the Ashburton Hospital Board (if the latter agree to come in, which I have little doubt they will do), including subsidy, is £4,000. The amount of money therefore that is in view—namely, £12,600—amply justifies the executive in calling for tenders and accepting a tender for at least a portion of the buildings.

Up till recently the general impression among the public seemed to be that the position was hopeless, and that there was no prospect whatever of the sanatorium being put up; but I think that the above statement shows that the speedy erection of the buildings has passed beyond the points of probability and reached those of certainty, and that the work done by those connected with the movement, although not of such a sensational character as to appeal to some portion of the public, is a work for which they deserve every credit.

There have up to the present been legal difficulties in the three Hospital Boards in the district combining for the erection and maintenance of the sanatorium, and unfortunately no amendment of the Act was passed last session doing away with these difficulties. The Minister has now authorised

the drafting of an Act to apply to the combination of Hospital Boards generally for such purposes, and it is to be hoped that this Act will be passed early in the coming session, so that the combination of the Hospital Boards can be established on a proper basis.

Infectious-disease Hospitals.

The erection of the Infectious-disease Hospital in Timaru was completed during the year, and has recently been made use of for the first time by two cases of scarlet fever.

GENERAL SANITATION OF THE DISTRICT.

Christchurch.

Water-supply.—No further steps have been taken to bring the matter of a general water-supply before the public again. The Sydenham water-supply is now complete, and numerous connections have been made throughout the district.

Drainage.—As a result of the matter of the extension of sewers having been approved of by the City Council, the Drainage Board took steps to have powers granted them by further legislation for raising a loan without obtaining the consent of the ratepayers. This, however, did not meet with the approval of the House, and the Bill when passed made it necessary for the Board to take a poll before obtaining any further loans. In January a poll was taken of the ratepayers on the proposal to borrow £50,000 for the purpose of extending the sewers and increasing the plant at the pumping-station. The result was, that the poll was carried by an absolute majority of six; but as the provisions of the Act for some reason or other provide that only a three-fifths majority could carry the poll, the poll was lost. Of the 7,800 ratepayers on the roll only 550 voted, thus showing the small interest taken in such matters by the ordinary citizen. The defeat of the proposal at the poll was put down to the public being ignorant of the necessity of the proposed works. The newspapers took the matter up and impressed on the public the terrible state of affairs that would ensue if the present pumping machinery should be at any time insufficient to cope with the work. The Drainage Board was encouraged to take another poll, and this time they decided to ask for authority to raise £100,000. This poll was carried by an absolute majority of 750, which gave a good majority over the three-fifths majority required by the Act. Even on this second poll, however, only 1,320 votes were recorded out of a possible total of 7,800. The carrying of this poll makes it possible that within about five years every house that can be connected with the drainage system when extended will be so connected. Unfortunately, owing to the absence of a public water-supply, the connections will in most cases be only for the carrying of slops, and the present barbarous method of removal of nightsoil will continue. During the last year 588 water-closets have been installed, as compared with 578 last year. Owing to the dual control exercised by the City Council and the Drainage Board, there is no machinery for enforcing the putting-in of good plumbing-work in new houses that cannot at present connect with the sewer. It is hoped to remedy this during the current year by adopting the plumbing specifications and by-laws of the Drainage Board, and arranging for the proper inspection of these fittings.

A special inspection of the lodginghouses of the city was made by Inspectors Kershaw and McKenzie, and the report sent to the City Council. The condition of these lodginghouses was on the whole very satisfactory.

A special inspection of the sanitary accommodation provided at the public halls and places of amusement licensed by the City Council was made by Inspector Kershaw. The report, which was sent to the City Council, revealed that the accommodation provided was very unsatisfactory in a number of cases, and especially in those places most frequented by the public. It is difficult to fix on an arbitrary standard of the number of conveniences that should be provided for each sex in proportion to the number that can be accommodated in the building, as, owing to the various uses to which these places are sometimes put, each case must be considered on its merits. On the whole, however, the present arrangements are distinctly deficient. No steps appear to have been taken to remedy these deficiencies.

A special inquiry was made by Inspector Kershaw into the source, means of transit, and general conditions of the fish-supply of Christchurch, and the report was sent to the City Council. The following were the main features of the report: That the chief sources of supply are Moeraki and Port Chalmers, and that there is unnecessary delay in the conveyance of fish from these places to Christchurch, the fish generally being from two days and a half to three days old before being consumed. The means of packing are defective. To improve the conditions of the fish-supply there are required suitable provision for storage of fish at Port Chalmers and Moeraki; a suitably constructed van and quicker transit by rail; earlier fish-sales, so that the fish may be available for the consumer earlier; amendment to the Municipal Corporations Act to enable the City Council to establish a municipal fish-market; and restrictions as to the freezing of fish.

This is a matter that comes up for discussion frequently at intervals of a year or so; but so far the report has not, I believe, been considered, and no steps have been taken by the City Council to improve matters.

Christchurch Suburbs (Borough of Woolston, Road Boards of Avon, Riccarton, Heathcote, and Spreydon).

In November a poll was taken in Woolston on the proposal to borrow £20,000 for the purpose of carrying out various improvements, the most important of which is over 2,000 chains of concrete channelling. This poll was carried by one vote. The present condition of the side channels in Woolston is exceedingly bad, and the work of putting in proper side channels has been delayed far too long.

The removal of nightsoil in the suburbs, which was made compulsory by by-laws last year, has come into universal operation, and has been satisfactorily carried out.

Lyttelton.

Drainage.—Owing to the usual dispute that occurs between local authorities and Harbour Boards having occurred in Lyttelton, no progress has been made with the urgently required drainage system. At present all sorts of defects occur in the way that existing house-connections are connected with the sewers, which carry both household drainage and storm-water. The Health Department is put in the dilemma of either insisting on the necessary alterations being made to temporary connections, which if a proper drainage system was carried would probably have to be altered, and thus the householder would be put to a double expense, or of leaving things as they are in the belief that the matters of dispute as to the site of the outfall of the sewers between the Harbour Board and the Borough Council will speedily be satisfactorily settled, and the steps necessary for the satisfactory installation of a drainage scheme be put forward by the Council as speedily as possible. Owing to the sinking of new wells and an increased pumping plant there is no difficulty on the score of water-supply in Lyttelton adopting a complete water-carriage system for slops and nightsoil which could be satisfactorily treated in a septic tank before being discharged into the sea. About two years ago a short series of by-laws dealing with house connections was submitted to the Borough Council which should have applied to all new house connections; but apparently the Council considered the complete drainage scheme and complete by-laws to be possible in the near future, and these temporary by-laws were not adopted. However, the conclusion of the whole matter is that Lyttelton is very little nearer obtaining a drainage scheme than it was two years ago.

Water-supply.—Owing to the occurrence of some cases of typhoid fever in Lyttelton, the question of the possible contamination of the water-supply was carefully gone into. Numerous samples of water were taken for chemical and bacteriological analysis from the sources of supply—the reservoir, and supply-taps in the town—but although one analysis raised some suspicion of sewage contamination, subsequent analysis practically disproved this possibility.

Timaru.

In this town, as in Lyttelton, the question of allowing sewage matter to discharge into any waters under the control of the Harbour Board has been a matter of long and heated argument between the two parties concerned. Timaru has, however, advanced a step beyond Lyttelton, as it succeeded last session in getting the Timaru Borough Drainage, Sewerage, and Loans Act passed. New by-laws which have been under discussion some two years are at last approaching finality. The by-laws dealing with sewerage and sanitary matters have been submitted to and approved by this Department. In Timaru, again, the Department was in the same dilemma as in Lyttelton, except that as there is every probability of the loan being submitted to the ratepayers this year, there is more reason for delay in taking any action in improving defective house connections until after the result of the poll is known.

Waimate.

Steady progress should be made this year in making the necessary works to bring the water from the Kelsey's Bush Creek into Waimate. The necessary money has been obtained and nearly all the legal preliminaries as to acquirements of land and rights of way for the pipes have been got over. As the matter for the proper construction of cesspits has been before the Council several times and no action had been taken by them, the owners and occupiers of sections on which cesspits existed were notified by this Department to either cease using them and fill them up or to construct them properly of impervious material according to the specifications of the by-laws. With two exceptions, these pits were immediately so dealt with. As defect was made in the other two instances, informations were laid against the offending parties, and would have been taken into Court but that the parties agreed to do the work before the cases came on for hearing.

Oamaru.

The new by-laws which came into force on the 1st April, 1905, were, after a lengthy interval, duly printed so that they could practically be put in force. Drains and plumbing-work have, by arrangement with the Council, to be put in under the supervision of Inspector Kershaw. Little progress has been made with the proposed nightsoil and rubbish removal services. In order to minimise the expense of carrying nightsoil away from the town it was proposed to erect a sump into which the carts could be emptied close to the beach on a site near the old swimming-baths. A good pressure of water would be laid on, and by means of a chute the nightsoil would be discharged straight into the sea. The Borough Council were advised by this Department not to adopt such a method, as the proposed site was in fairly close proximity to dwellinghouses, and a nuisance would very probably occur. It was also pointed out that the discharge of nightsoil into the sea so close to the town might cause a nuisance. The Borough Council, however, decided to risk causing a nuisance and to put up the proposed sump on the understanding that it should be removed if any nuisance occurred. In many towns such a proposal would have aroused such indignation on the part of the inhabitants on mere sentimental reasons that such a scheme would have been speedily abandoned; but the Council and the inhabitants did not apparently consider that a sentimental objection to putting up a nightsoil depot on what might be a pleasant resort on the seaside would be of any value.

Akaroa.

The drainage scheme and septic tank is now complete, and good progress is now being made in the connection of houses with the sewer. All new work is inspected from time to time by Inspector Kershaw before it is passed.

Offensive Trades.

One permission has been granted to start an offensive trade. The offensive trades have been inspected from time to time and have been found as a rule to be carried on with as little nuisance as possible. The worst offender is the contractor for the removal of offal from the City Council abattoirs.

Buildings unfit for Occupation.

Eighteen certificates that buildings were unfit for occupation were issued. In numerous cases alterations and repairs were ordered and carried out in other buildings.

Prosecutions.

One person was convicted for exposure in a public place while suffering from scarlet fever. As the person was in poor circumstances no penalty was asked for.

For neglecting to abate nuisances, two persons were fined respectivelv £1 and costs and £2 and costs.

Private Hospitals.

At the end of December last year there were fifty private hospitals licensed in this district. Of this number thirty-one have been granted renewals and the remainder are being held over for various reasons. Three premises were refused a license. Nine new hospitals have been licensed this year. In numerous cases improvements have been required and carried out in connection with the drainage.

Medical Examinations.

Five persons have been examined for the Telegraph Department, one person for the Department of Justice, one cadet for admission to the Civil Service, and two persons for admission to Cambridge Sanatorium.

Adulteration of Food.

Forty samples of ales and forty-one samples of whisky have been taken throughout the district. Analysis of these samples has failed to reveal any adulteration in the strict sense of the word. No injurious matter has been found present, either owing to the addition of such matter or owing to its arising during the process of manufacture. The absence of arsenic in beer is very satisfactory, as there was a possibility of the malting process giving rise to the presence of arsenic unknown to the brewer. The whisky was found satisfactory as far as the present standard provided by the Act is concerned, except that in two cases it contained less than the standard amount of alcohol. After taking these numerous samples of alcoholic liquors it was decided to take a few samples of temperance drinks. The analysis of these drinks is worth quoting in full.

	No. 1. Kop's Ale. Per Cent.	No. 2. Hop-beer. Per Cent.	No. 3. Jubilee Beer. Per Cent.	No. 4. Ginger-beer. Per Cent.
Alcohol (by weight)	0·76	0·79	2·83	3·41
Extract	0·43	2·62	2·71	5·61
Ash	0·04	0·01	0·12	0·08
Acid (tartaric)	0·06	0·07	0·10	0·40
Glycerine	..	..	..	2·00
Preservatives	Nil	Nil	Nil	Nil
Poisonous metals	Nil	Nil	Nil	Nil

The extracts in Nos. 2, 3, and 4 are chiefly sugar. Samples 1 and 2 are good samples of temperance drinks. The amount of alcohol found in No. 4 nearly approaches that found in an ordinary lager-beer. As the presence of alcohol in these drinks cannot be dealt with under the Adulteration Prevention Act, it was decided, after consultation with you, to send the results of the analysis to the Inspector of Police and the Collector of Customs for them to deal with under the Acts respectively administered by them. There is little doubt that if more samples were taken many of them would be found to contain an excessive amount of alcohol.

Milk-supply.

At the request of Dr. Valintine, Acting Chief Health Officer, an inspection was made of the milk-supply in various towns in the district, and the report thereon submitted. The main conclusions of the report were: The chief difficulties in the way of obtaining a pure milk-supply are as follows: (1.) The large number of small dairies which need constant inspection. (2.) Deficient water-supply: This difficulty does not exist so much in the Christchurch District—where the artesian water-supply is almost without exception extremely good—as in some other towns where the absence of a proper water-supply causes deficient cleanliness, and gives no facilities for cooling the milk. (3.) Short leases: It is difficult to get leaseholders to make improvement when they have only short leases, and it is worthy of remark that the best dairy that I have seen was a freehold property.

It is now generally agreed among experts on this subject that the ideal milk-supply includes among other details the milking of cows under the best sanitary conditions, the immediate cooling of the milk, and the storage and delivery to the consumer in sealed bottles. The extra expense incurred could be largely if not wholly covered by a more economical system of distribution. The waste of time and money in delivering milk under the present system is obvious. The Christchurch Dairy Company can buy milk at current prices, treat it by pasteurisation and cooling, and still sell at the same price if the quantity dealt with is sufficiently large; the saving is made almost entirely in the cost of delivery.

Short of the ideal system being adopted, it would be a great improvement if all milk had to be brought to a depot or depots in the chief towns, under proper control, from whence it could be more economically distributed. The milk brought to the depot could be paid for on the butter-fat test, which would do away with all inducement to adulterate. At present adulteration has been proved to be very prevalent in Christchurch, and probably exists elsewhere. If after a lot of trouble a conviction is obtained the offender is fined about £5, and he makes up the amount of his fine by the amount of water he puts in the next morning. Unless the maximum penalty is always inflicted this adulteration will not be stopped. It is significant that when a milk-supplier has been fined for adulteration it apparently makes no difference to his custom.

In effecting such large alterations in existing methods, doubtless unforseen difficulties would crop up; but it is to be hoped that some municipality will make a practical experiment in this direction. It is satisfactory to learn that the Christchurch City Council has set up a committee to go into the matter of the improvement of the milk-supply, and it is to be hoped that there will be a practical result of the efforts of this committee.

Responsibilities of District Health Officers.

It cannot be said that the responsibilities which the general public suppose to rest on the District Health Officer at all correspond with his powers. A large amount of work, such as the milk and meat supply, the sanitation of schools, factories, and hotels, for which in other countries the District Health Officer would be responsible, is in the hands of other Government Departments and local authorities; and at what point the District Health Officer assumes responsibility has been and is veiled in mystery. A school or factory may be built with defective ventilation or sanitary accommodation: if the defects are sufficient to give rise to complaint, the matter may be referred to the District Health Officer; and often structural alterations that might have been easily made in planning the building are now practically impossible. This is only one instance, and an actual instance of what is constantly occurring. The Health Officer is more often called in to cure an evil that might have been prevented than asked how to prevent the evil from occurring; and even if he is consulted he has no power to insist on his advice being followed, he can only wait and see whether neglect to follow his advice causes an actual offence under the Public Health Act.

Inspector's Work.

The following reports from Inspectors Kershaw and McKenzie will show that a large amount of routine work has been carried out effectively and without friction. Inspector Kershaw has been chiefly confined to the larger towns in the district, and Inspector McKenzie has had most of the country inspections.

Hugh E. Finch, M.B., D.P.H.,
District Health Officer.

Dr. Finch, District Health Officer.

I have the honour to report as follows regarding my work during the year ending the 31st March, 1906.

Early in the year a number of cases of infectious diseases were reported in and about the Borough of Oamaru; each case was investigated and precautions taken to prevent the spread of infection.

I have also inspected during my weekly visits the plumbing and drainage work done in connection with the installation of sanitary fittings, and in accordance with the requirements of the by-laws notified plumbers and drain-connectors to take out licenses. Several applications have been sent in, and licenses will be issued upon applicants proving their fitness to hold them.

In Timaru inspections of a general character were made, seyeral visits being made to the Infectious-diseases Hospital in connection with the drainage and plumbing arrangements. The drains were water-tested in my presence before being covered in. The lack of plumbing and drainage by-laws in this borough has hampered the putting-in of sanitary arrangements up to modern standards, but this defect will no doubt soon be remedied.

As indicated in the summary of inspections attached, much time was given to the inquiries and inspections necessary in the compilation of the special reports on the licensed public halls, licensed and private boardinghouses, and the fish-supply and shops in the City of Christchurch.

A number of complaints in and about the city were investigated, and in certain cases requisitions were served which were duly complied with.

Inspections of the drainage systems of Lyttelton and Temuka were made, and special reports submitted thereon.

Plumbing Classes.

Classes have been conducted regularly throughout the year in Timaru and Oamaru. The average number of students attending each class is twelve. Much useful work has been done, and evidence of the benefit of the classes is to be seen in the improved plumbing-work being done in these boroughs. Several students of the Timaru class are to sit for the City Guilds of London Examination at an early date, and local examinations will be arranged in both boroughs at the completion of the course of instruction.

Summary of Inspections.

Infectious-disease outbreaks investigated, 3; infectious-disease investigations, 61; houses disinfected, 10; schools disinfected, 1; offensive trades inspected, 12; bakehouses inspected 14; pickle-factory inspected 1; part shipment fruit condemned, 1; Complaints investigated, 29; requisitions served, 9; requisitions complied with, 9; prosecutions, 1; water-samples taken, 10.

Special reports as follows: Licensed public halls, Christchurch; licensed and private boarding-houses, Christchurch; fish supply and shops, Christchurch; Barbadoes St. Cemetery, Christchurch; drainage, nightsoil and rubbish removal, Oamaru; drainage, Lyttelton; drainage, Temuka.

M. KERSHAW,
Sanitary Inspector.

Dr. Finch, District Health Officer.

I HEREWITH submit my report and summary of inspections of the past year.

General inspections have been carried out in the following country townships: Rangiora, Kaiapoi, Oxford, Springfield, Whitecliffs, Southbridge, Leeston, Little River, Geraldine, Ashburton, and Temuka.

Several of the above have also been revisited on account of small outbreaks of infectious disease, or following up requisitions previously served.

A good deal of my time has also been spent in inspecting and disinfecting in consumptive cases. All cases notified from the Nurse Maude Camps have been disinfected, and in the case of the family leaving the house disinfection has been carried out before the premises were relet.

Nightsoil-depots have been inspected at Waimate, Temuka, and New Brighton.

A number of shops and offices have been visited, and in several cases improvements in the sanitary accommodation have been effected.

Bakehouses that were found out of repair or in a dirty condition were referred to the Factory Inspectors.

Inspections of the offensive trades at Woolston were made, and the condition were found generally satisfactory.

Several overcrowding cases have also been investigated, and remedied through the local authority.

A large number of minor complaints have been investigated, and where sustained owners or occupiers have been interviewed and nuisances at once abated; in only a few cases were formal requisitions required. In only two of these cases were the requisitions quite ignored, and in those two prosecutions were successful and the offenders were fined.

SUMMARY OF INSPECTIONS.

Infectious diseases, including consumption, 120; infectious diseases, country outbreaks, 3; disinfections, 46; complaints investigated, 57, shops and offices inspected, 36; hotels inspected, 20; country townships, 24; old buildings inspected, 13; offensive trades inspected, 15; fish-shops inspected, 13; boardinghouses inspected, 7; overcrowding cases inspected, 4; consumption cases inspected, 89, consumption cases disinfected, 40; requisitions served, 21; requisitions complied with, 21; prosecutions, 2.

R. J. MCKENZIE,
Sanitary Inspector.

OTAGO AND SOUTHLAND DISTRICT.

Department of Public Health, Dunedin, 30th May, 1906.

The Chief Health Officer, Wellington.

I HAVE the honour to present you my annual report on my District of Otago-Southland for the year ended the 31st March, 1906.

During this year I have no startling events to record, as fortunately we have had no dangerous epidemics to combat, our work having been of a routine character, which, however, shows that the public health is now being gradually better and better attended to.

It may be of interest to show the number of localities visited and inspected during the twelve months by myself and my two inspectors: By Dr. Ogston—Alexandra South, Arrowtown, Bendigo, Brighton, Clinton, Clyde, Cromwell, Fairfax, Glade House (Te Anau), Gore, Invercargill, Kaitangata, Kelso, Key of Lakes, Lawrence, Lumsden, Manapouri, Mataura, Middlemarch, Milford, Milton, Mossburn, Mount Pisa, Naseby, Otautau, Pembroke, Port Chalmers, Pukerau, Queenstown, Queensbury, Ranfurly, Riverton, Rock and Pillar, Roxburgh, Sawyer's Bay, Te Anau Township, Waihola, Arthur's Point, Henley. By Inspector Gladstone—Alexandra South, Allantown, Arrowtown, Balclutha, Bendigo, Catlin's, Clyde, Cromwell, Burke's, Evansdale, Fairfax, Glenorchy, Goodwood, Heriot, Highcliff, Kaitangata, Lawrence, Manuka Creek, Milton, Mosgiel, Mount Stewart, Kelso, Naseby, Ophir, Owaka, Palmerston South, Paradise Flat, Pembroke, Port Chalmers, Portobello, Puketeraki, Purakanui, Queenstown, Ravensbourne, Roxburgh, Shag Point, Sawyer's Bay, Tapanui, Waihola, Waikouaiti, Waipahi, Waitati, Broad Bay, Arthur's Point, Ranfurly, Hawea Flat, Quarantine Island, Pukerau. By Inspector Cameron—Balfour, Bluff, Colac, Drummond, Edendale, Gore, Isla Bank, Kamahi, Kapuka, Kennington, Lumsden, Mataura, Myross Bush, Nightcaps, Orepuki, Otautau, Pukerau, Riversdale, Riverton, Seaward Bush, Scott's Gap, Spar Bush, Thornbury, Waikiwi, Waimatua, West Plains, Winton, Woodlands, Wyndham, Seaward Downs, Wallacetown, Waianiwa, Waicola, Clifton, Richmond Grove, Otapiri. These places—of which it may be observed Dr. Ogston visited 39, Inspector Gladstone 48, and Inspector Cameron 36—were inspected more than once in several instances, Dr. Ogston making 50 inspections, Inspector Gladstone 92 inspections, and Inspector Cameron 116. But, as some of the places were visited by Dr. Ogston in conjunction with one or other of his Inspectors, it may be noted that in all 97 different places received attention during the past year.

The routine work of the district involved a considerable amount of correspondence, as the following will show. From Dunedin alone the following letters were written:—By Dr. Ogston: To Town Clerks, 171; County Clerks, 26; Mayors, 14; Chairmen County Councils, 2; Road Boards, 1; Harbour Boards, 4; Hospital Boards, 8; Education Boards, 6; Drainage Board, 9; School Committees, 5; University Council, 1; Stock Departments, 5; Dairy Departments, 3; Factory Inspector, 7; Police Inspector, 1; District Railway Engineer, 4; Chief Health Officer, 65; Miscellaneous, 102. By Inspector Gladstone: To Town Clerks, 54; County Clerks, 2; Road Boards, 4; Education Boards, 1; Drainage Boards, 3; Dairy Departments, 1; Police Inspector, 1; Chief Health Officer, 3; Miscellaneous, 42.

Consultations were held as follows:—By Dr. Ogston: With Town Clerks, 8; County Clerks, 2; Town Councils, 6; County Councils, 2; Mayors, 6; City Engineer, 1; Drainage Engineer, 4; Inspectors of Factories, 6; Hospital Boards, 3; Stock Inspectors, 3. By Inspector Gladstone: Town Clerks, 23; County Clerks, 3; Town Councils, 3; County Councils, 2; Mayors, 11; Inspectors of Factories, 4; Hospital Boards, 1; Stock Inspectors, 7.

Special reports to Chief Health Officer (by Dr. Ogston), 10.

Notices sent out *re* disinfection: By Inspector Gladstone, 97; by Inspector Cameron, 146.

Microscopic examinations of sputa, &c.: Of sputa found tuberculous, 17; of sputa found non-tuberculous, 12; of sputa found to be pneumonic, 11; membrane from throat found to be diphtheritic, 1.

Alimentary matters condemned and destroyed (at Dunedin): Eggs rotten, 20 dozen (about); bananas rotten, 2,111 cases; potatoes diseased or rotten, 30 bags; prunes badly cured and full of insects, 16 boxes; figs badly cured and full of insects, 15 cases; preserved foods, &c. (various), old and decaying, 135 tins, &c.; jams badly preserved and mouldy, 36 bottles; butter rancid and mouldy, 4 cases; pigs' heads rotten, 16; pigs' carcases badly tuberculous, &c., or rotten, 23; bacon, sides and rolls, decomposing, 67; hams rotten, 9; red herrings rotten, 9 tins; frozen fish decomposing from breakdown of freezing, 81 cases; frozen hares decomposing from breakdown of freezing, 18; frozen poultry decomposing from breakdown of freezing, 4 bags; oranges rotten, 326 cases; food—sausages and mutton—supplied to a camp decomposing, a large quantity; lots of unsound fruit, &c., condemned at Invercargill, 16.

General List of Inspections, Examinations, Etc.

	By Dr. Ogston.	By Inspector Gladstone.	By Inspector Cameron.
Nightsoil-depots	7	4	6
Rubbish-tips, &c.	17	19	16
Nightsoil-collection advised	2	..	4
Nightsoil-collection neglected	11	..	..
Dirty gutters, drains, &c.	81	176	70
Defective privies, &c.	42	133	18
Dirty premises	13	176	112
Dirty stables, &c.	14	59	45
Dirty fowl-runs	8	22	32
Dirty piggeries	8	15	16
Nuisance at freezing-works	1	..	..
Nuisance at fruit-canning works	1	1	..
Smoke nuisance	2	..	3
Water-supply, tanks, &c.	11	27	242
Houses in bad order, to repair	18	48	15
,, condemned	7	..	..
Overcrowding in houses	4	6	3
,, schools	1	..	..
Schools and schoolhouses defective	1	..	8
Nuisances from animals in houses	2	..	..
Dirty papers for wrapping meat	2	..	..
Inspection of station (Mount Pisa)	1	..	..
Fish-shops examined	3	17	7
Bakehouses examined	6	1	17
Butchers' shops examined	12	42	23
Fruit-shops examined	1	19	..
Grocers' shops, stores, &c., examined	1	18	74
Milk-shops, dairy factories, &c.	4	17	7
Cordial-factories examined	2	15	4
Factories examined	..	..	36
Slaughter-yards examined	..	..	14
Hotels examined	15	26	18
Restaurants examined	..	6	9
Boardinghouses examined	..	15	18
Recreation-grounds examined	3	7	..
Auction-marts, &c., examined (often)	5	14	5
School visited	3	9	17
Diseases in schools looked to	2	..	..
Diseases in factory-workers looked to	1	..	..
Diarrhœa in camp looked into	1	..	..

GENERAL LIST OF INSPECTIONS, EXAMINATIONS, ETC.—*continued.*

	By Dr. Ogston.	By Inspector Gladstone.	By Inspector Cameron.
Consumptives in hotels seen to	3	..	..
,, exposing in public	1	..	..
,, for Cambridge examined	7	..	..
Diphtheria cases examined, &c.	16	10	14
Tuberculosis cases examined, &c.	14	36	46
Scarlet-fever cases examined, &c.	15	38	61
Enteric-fever cases examined, &c.	..	20	2
Blood-poisoning cases examined, &c.	2	2	1
Syphilis case examined, &c.	1	..	..
Shipments of fruit examined	5	5	..

In addition to these many minor matters were seen to, running into more than twice as many as those in the above list.

WATER COLLECTED FOR ANALYSIS.

Of the 34 samples of water collected or forwarded for analysis for various reasons, and examined by Professor Black, Government Analyst, and set out in his report, 20 were from cordial-factories. Of these 8 were reported as being good, 4 usable, 3 suspicious, 3 bad, 1 very bad, and 1, on being examined a second time, was reported as being good, the impurity being of a temporary nature, due to accident.

Among the others were samples of water from wells at Riverton, two of which were found to be mixed with salt water from soakage from the sea at high tides.

Two shallow wells at Otautau were polluted by ground soakage, and were disused and closed up.

The public water-supply at Queenstown at one analysis was found to be tainted with vegetable matters of a temporary nature, and subsequent analysis proved it to be essentially of good character.

The Port Chalmers public water supply, which was reported by the medical officer of one of the warships as too bad for use, was looked into by me, and the source of the pollution was proved to arise in the drainage from a dairy farm finding access to the creek running into the reservoir. This was conducted in pipes into the by-wash, and the pollution ceased, the water now being above suspicion.

The water from a public well at Gore was found good.

I was requested by the City Council to advise them regarding possible pollution of the water-supply by drainage from a dairy farm bordering on the water-reserve. On examining the farm and its surroundings, I considered the pollution unavoidable, and advised that the only way to put an end to it was to buy out the farm. This has now been done.

In connection with a number of cases of jaundice at Waitati, I had the water examined, but it threw no light on the subject.

My attention was drawn to the roof-water tank at the Stirling Railway-station, and it was cleaned out by the Railway authorities on my requesting to have it seen to.

I made a minute examination of the source and water-race supplying the Mount Pisa Station, finding that a new race having its entrance further up the creek had been made, thus removing a possible means of pollution from a rabbiter's camp The water, coming from a hillside above any habitation and running through a clean water-race with a clean gravelly bottom, is now as perfect as can be.

INFECTIOUS DISEASES.

I append a return of the infectious diseases reported in my district, which shows at a glance the phenomena of their occurrence.

I shall divide my district for comparative purposes into two sections—the one surrounding or in more direct communication with Dunedin, and the other with Invercargill—as, especially in the incidence of scarlet-fever and diphtheria, it will be found to present a graphic picture of the spread of the diseases from a centre, or the dependence of the diseases on a large centre, to some degree at least.

Thus, the Dunedin division furnishes, of scarlet-fever, 50 cases, half of which occurred at the town of Kaitangata, and 19 at Dunedin itself, leaving only six for the surrounding counties, which extended from Waihemo County in the north to Clutha County in the south. Again, the Invercargill division furnishes 86 cases of scarlet-fever, of which 31 occurred in Invercargill itself, 42 in Southland County, leaving 13 for the rest of that division in close connection with it, comprising, besides Southland, Wallace, Lake, and Tuapeka Counties. Taking population as a basis, the Dunedin division gives somewhat like 0·6 per 1,000; the southern (Invercargill) division gives about 1·6 per 1,000 of cases to the population. Thus in the latter division practically 3 cases were notified as occurring to 1 in the Dunedin division of my district; or, if we exclude Kaitangata, the numbers would be nearly 6 to 1.

To take the cases of diphtheria notified, nearly the same result will work out. The Dunedin division furnished 9 cases, to 16 from Invercargill division. This by the population basis gives 0·1 per 1,000 to the former and 0·3 per 1,000 to the latter—the same ratio as scarlet-fever.

In tuberculosis cases notified, the divisions do not show the same or even similar ratios, although the Dunedin division shows a lower ratio taking the population basis, furnishing (59 cases) 0·65 per 1,000, and the Invercargill division (43) 0·86 per 1,000 of cases notified.

Enteric fever does not furnish the same result; but as this fever is not quite in the same category, as being only infectious in a limited and easily controllable degree, its spread not being actually from person to person, but by the media of excreta, easily destroyed, the occurrence of cases with regard to localities has not the same significance. The Dunedin division gave 22 cases to 6 for the Invercargill division, or 0·24 per 1,000 to 0·12 per 1,000 respectively, taking the population basis.

The blood-poisoning cases notified were quite sporadic, and of various characters, artificially classed together, comprising erysipelas, wound-infection, and suchlike.

Return showing Number of Notified Cases of Infectious Diseases from 1st April, 1905, to 31st March, 1906.

Disease.	April.	May.	June.	July.	Aug	Sep.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Total.
DUNEDIN.													
Scarlet fever ..	..	..	..	..	..	1	4	1	..	..	1	1	8
Tuberculosis ..	3	1	3	3	1	2	2	..	5	..	..	..	20
Enteric fever ..	1	..	..	..	..	..	2	..	4	1	..	..	8
Diphtheria ..	..	1	..	..	..	1	..	..	..	..	..	1	3
Blood-poisoning	..	..	..	..	..	..	..	..	..	..	..	..	..
ROSLYN.													
Scarlet fever ..	..	..	..	..	..	..	..	..	..	..	..	..	..
Tuberculosis ..	1	..	..	..	1	1	..	1	..	..	..	..	4
Enteric fever ..	..	..	..	..	..	..	..	..	..	..	..	..	..
Diphtheria ..	..	..	..	..	..	..	..	..	..	..	..	..	..
Blood-poisoning	..	..	..	..	..	..	..	..	..	..	..	..	..
WEST HARBOUR.													
Scarlet fever ..	..	..	..	..	..	..	..	..	..	..	..	..	..
Tuberculosis ..	..	..	..	..	..	..	..	..	..	..	..	..	..
Enteric fever ..	..	..	..	..	..	..	..	..	..	..	..	..	..
Diphtheria ..	..	..	..	..	..	..	..	..	..	..	..	..	..
Blood-poisoning	..	..	..	..	..	..	..	..	..	..	..	..	..
TUAPEKA COUNTY.													
Scarlet fever ..	1	2	3	3	..	..	..	..	..	..	..	1	10
Tuberculosis ..	..	1	..	..	..	..	..	..	..	..	..	..	1
Enteric fever ..	..	..	..	..	..	..	..	..	..	..	1	..	1
Diphtheria ..	..	..	..	..	..	..	..	..	..	..	..	..	..
Blood-poisoning	..	..	..	..	..	..	..	..	..	1	..	..	1
MANIOTOTO COUNTY.													
Scarlet fever ..	..	..	..	..	..	..	..	..	..	..	..	..	..
Tuberculosis ..	..	..	..	..	..	..	..	..	1	..	..	..	1
Enteric fever ..	..	..	..	..	..	..	..	..	..	..	..	..	..
Diphtheria ..	..	..	..	..	..	1	..	..	..	..	..	..	1
Blood-poisoning	..	..	..	..	..	..	..	..	..	..	..	..	..
VINCENT COUNTY.													
Scarlet fever ..	..	..	..	..	..	..	..	..	..	..	..	..	..
Tuberculosis ..	..	..	..	..	..	..	2	..	..	..	..	..	2
Enteric fever ..	..	..	..	..	1	..	..	..	..	..	..	..	1
Diphtheria ..	..	..	..	..	..	..	..	..	..	..	..	..	..
Blood-poisoning	..	..	..	..	..	..	..	..	..	..	..	..	..

Disease.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Total.
SOUTH DUNEDIN.													
Scarlet fever ..	..	..	1	..	..	..	..	..	..	..	2	1	4
Tuberculosis ..	..	..	..	1	..	1	1	1	..	..	..	..	4
Enteric fever ..	..	..	..	..	..	..	..	..	..	..	..	..	..
Diphtheria ..	..	..	..	..	..	..	..	..	..	..	..	..	..
Blood-poisoning	..	..	..	..	..	..	..	..	..	..	..	..	..
ST. KILDA.													
Scarlet fever ..	..	..	..	..	..	..	..	..	1	..	..	..	1
Tuberculosis ..	..	..	..	..	..	..	..	..	..	..	..	..	..
Enteric fever ..	..	..	..	..	..	..	..	..	..	..	..	..	..
Diphtheria ..	..	..	..	..	..	..	..	..	..	..	..	1	1
Blood-poisoning	..	..	..	..	..	..	..	..	..	..	..	..	..
PORT CHALMERS.													
Scarlet fever ..	..	..	..	..	..	..	..	..	..	..	..	..	..
Tuberculosis ..	..	..	1	..	..	..	..	..	1	..	1	..	3
Enteric fever ..	..	..	..	..	..	..	..	..	..	..	1	..	2
Diphtheria ..	..	..	..	..	..	..	..	..	..	..	..	..	..
Blood-poisoning	..	..	..	..	..	..	..	..	..	..	..	..	..
BRUCE COUNTY.													
Scarlet fever ..	..	..	2	2	2	4	1	..	1	1	4	8	25
Tuberculosis ..	1	1	..	..	1	..	..	..	..	1	2	..	6
Enteric fever ..	..	..	..	..	..	..	..	..	..	..	..	..	..
Diphtheria ..	1	..	1	..	..	..	..	..	..	..	..	..	2
Blood-poisoning	..	..	1	..	..	1	1	..	..	..	..	..	3
WALLACE COUNTY.													
Scarlet fever ..	..	..	..	..	..	..	1	..	..	1	..	1	3
Tuberculosis ..	..	..	2	..	2	..	..	..	..	..	1	2	7
Enteric fever ..	..	..	..	..	..	..	..	..	..	..	..	..	..
Diphtheria ..	1	..	..	..	..	..	..	..	..	..	..	..	1
Blood-poisoning	..	..	..	..	..	..	..	..	..	..	..	..	..
WAIHEMO COUNTY.													
Scarlet fever ..	..	..	..	..	..	..	..	..	..	..	..	..	..
Tuberculosis ..	..	..	2	1	..	..	..	..	..	..	..	..	3
Enteric fever ..	..	..	..	1	..	..	..	..	..	..	..	..	1
Diphtheria ..	..	..	..	..	..	..	..	..	..	..	..	..	..
Blood-poisoning	..	..	..	..	..	..	..	..	..	..	..	..	..

Disease.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec	Jan.	Feb.	Mar.	Total.
CAVERSHAM.													
Scarlet fever ..	..	1	..	..	..	..	2	..	1	..	..	..	4
Tuberculosis ..	..	..	..	..	..	..	..	..	..	1	..	..	1
Enteric fever ..	..	..	..	..	..	..	..	..	..	..	..	..	..
Diphtheria ..	..	..	..	..	..	..	..	..	..	..	..	..	..
Blood-poisoning	..	..	..	..	..	..	..	..	..	..	..	..	..
NORTH-EAST VALLEY.													
Scarlet fever ..	..	..	..	..	1	..	..	..	1	..	..	..	2
Tuberculosis ..	..	..	..	..	..	..	..	..	..	..	..	..	..
Enteric fever ..	..	..	..	1	..	..	..	..	..	..	..	..	1
Diphtheria ..	..	..	..	..	..	..	..	..	..	..	..	..	..
Blood-poisoning	..	..	..	..	..	..	..	..	..	..	..	..	..
INVERCARGILL.													
Scarlet fever ..	..	4	3	..	..	3	1	4	2	4	7	3	31
Tuberculosis ..	..	..	2	..	..	2	1	5	1	2	..	3	16
Enteric fever ..	1	..	..	..	..	..	..	..	..	..	..	..	1
Diphtheria ..	..	1	2	2	1	..	1	..	1	1	..	1	10
Blood-poisoning	..	1	..	..	..	..	..	..	1	..	..	..	2
LAKE COUNTY.													
Scarlet fever ..	..	..	..	..	..	..	..	..	..	..	..	..	..
Tuberculosis ..	..	..	..	..	2	1	1	1	..	..	..	..	5
Enteric fever ..	..	..	..	1	..	..	..	..	..	..	..	..	1
Diphtheria ..	..	..	..	..	..	..	..	..	..	..	..	..	..
Blood-poisoning	2	..	..	..	..	..	..	..	..	..	..	..	2
WAIKOUAITI COUNTY.													
Scarlet fever ..	1	..	..	..	..	..	..	..	..	..	..	1	2
Tuberculosis ..	..	..	..	..	..	..	..	2	..	..	..	1	3
Enteric fever ..	..	..	..	..	..	..	..	..	..	..	..	1	1
Diphtheria ..	..	..	..	..	..	..	..	..	..	..	..	..	..
Blood-poisoning	..	..	..	..	..	..	..	..	..	..	..	..	..
CLUTHA COUNTY.													
Scarlet fever ..	..	..	..	..	..	..	..	..	..	..	..	1	1
Tuberculosis ..	..	..	..	..	1	..	..	..	1	1	1	..	4
Enteric fever ..	1	..	..	..	1	..	..	..	..	..	..	..	2
Diphtheria ..	..	..	..	..	..	..	..	..	..	..	..	..	..
Blood-poisoning	..	..	..	..	..	..	..	..	..	..	..	..	..

Disease.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Total.
MORNINGTON.													
Scarlet fever ..	..	..	..	..	..	..	..	..	..	..	..	..	..
Tuberculosis ..	..	..	..	..	..	..	..	..	..	..	..	..	..
Enteric fever ..	..	..	..	..	..	..	..	..	..	1	..	..	1
Diphtheria ..	..	..	..	..	..	..	..	..	..	..	..	..	..
Blood-poisoning	..	..	..	..	..	..	..	..	..	..	..	1	1
MAORI HILL.													
Scarlet fever ..	..	..	..	..	..	..	..	..	..	..	..	..	..
Tuberculosis ..	..	..	..	..	..	..	1	..	..	..	..	..	1
Enteric fever ..	..	..	..	..	..	..	..	..	..	..	..	..	..
Diphtheria ..	..	..	..	..	1	..	..	..	..	..	..	..	1
Blood-poisoning	..	..	..	..	..	..	..	..	..	..	..	..	..
TAIERI COUNTY.													
Scarlet fever ..	..	..	..	..	..	..	1	..	..	..	..	1	2
Tuberculosis ..	..	..	..	..	..	..	1	2	1	1	1	..	6
Enteric fever ..	2	1	..	..	1	..	..	..	..	..	..	..	4
Diphtheria ..	..	..	..	..	..	..	..	1	..	..	..	..	1
Blood-poisoning	..	..	..	..	..	..	..	..	..	..	..	..	..
PENINSULA COUNTY.													
Scarlet fever ..	..	..	..	..	..	..	..	..	1	..	..	..	1
Tuberculosis ..	..	..	..	..	..	..	..	1	..	..	1	..	2
Enteric fever ..	..	..	..	..	..	..	..	..	..	..	..	..	..
Diphtheria ..	1	..	..	..	..	..	..	..	..	..	..	..	1
Blood-poisoning	..	..	..	..	..	..	..	..	..	..	..	..	..
SOUTHLAND COUNTY.													
Scarlet fever ..	1	3	2	5	1	3	3	5	..	4	7	8	42
Tuberculosis ..	..	1	1	3	1	..	1	..	1	2	4	..	14
Enteric fever ..	..	1	1	..	..	..	1	..	..	..	..	..	3
Diphtheria ..	..	..	1	1	1	..	..	..	..	2	..	..	5
Blood-poisoning	..	..	..	..	..	..	..	..	..	..	..	..	..

I made two special investigations into the occurrence, in two places, of a number of infectious diseases.

At Invercargill, mostly in the centre of the town, a good many cases of diphtheria were reported, but beyond the fact that the locality was low-lying there was nothing to be made out as to their origin. At first sight it appeared as if the disease had been caught and spread at the district school, but closer investigation negatived that idea. In the course of this investigation some sixteen households were visited, and the local circumstances looked into.

At Kaitangata numerous cases were reported of such a doubtful nature that the doctor was puzzled to say whether he had to do with scarlet fever or German measles, or both. I went out to look at them, and while some appeared to me also to be scarlet fever, others had all the appearance of German measles. It was impossible to discriminate. Together we visited and examined more than a dozen families.

In carrying out the necessary disinfection of premises after infectious diseases, we had in two instances to meet with opposition. One of the County Clerks not only refused to undertake the disinfection of a house when notified to have it done, but actually declined to assist Inspector Gladstone, whom I sent out to do the work and to show how it should be done. I notified the Chairman of the County Council of the fact, and stated that I should be present at the next meeting of the Council to confer with them and try to put matters on a clearer footing. On taking this step, and talking over things and their duties with regard to them, we came to an understanding. In the other instance my Inspector was refused admittance to a house from which a case of diphtheria had been removed to the Hospital, but the man ultimately yielded when it was made clear to him that the consequences might be serious if he still persisted in his refusal to allow the disinfection to be carried out.

Disinfection of premises, &c., is now being carried on, frequently under the personal supervision of my Inspectors, by the local authorities, who generally employ a man who has been instructed in the details by one or other of my assistants.

In Dunedin, in which Caversham and South Dunedin are now comprised, Local Inspector Donaldson undertakes this work; at Invercargill a man has been trained by Inspector Cameron for the duty in that town and for Southland County, while many of my counties have men who have been shown our methods and who carry out this work pretty satisfactorily. In fact, this is being gradually better and better attended to and few of the cases escape our attention.

In this we shall be materially assisted by the notification of deaths by the Registrars, especially in the country districts. But it is to be desired that all deaths should be notified to the Registrars by medical men more promptly—say, within three days—so that we also should have earlier notice for disinfection purposes.

Sickness in a Military Camp.

In November my attention was called to the fact that several of the men in camp at Tahuna Park were suffering from severe diarrhœa. I went out at once, and found that much of the meat being served to them was in such a condition that it was unfit for consumption and dangerous. The sausages were so rotten that they had in many cases burst their skins, and some of the mutton was quite green, smelling badly. I ordered the bad stuff to be covered with tar and burnt at the camp, having summoned Lieut.-Colonel de Lautour, the medical officer in military charge of the district, who immediately joined me and concurred in my action. And I reported the matter to Colonel Robin, who has the military charge of the district.

Towns inspected.

The work of minute inspection of the towns in my district has been proceeded with during the year, the following places having received house-to-house visitation: Milton, Palmerston South, Queenstown, Tapanui, Arrowtown, Cromwell, Ranfurly, Clyde, Ophir, Naseby, Roxburgh, and Riverton, besides parts of the suburban boroughs of Invercargill and Dunedin.

Milton.

Some 249 premises were inspected, and of these eighty-five were faulty in some respect.

The sewers are of too flat a gradient to clean themselves, and will sooner or later require some system for flushing them periodically.

The water-supply, mostly from roof tanks or shallow wells, is not satisfactory, and an efficient water scheme is much required; but as it will be a costly undertaking, the small community is not able to undertake it for some time.

Nightsoil service is done by a borough contractor, with a monthly service, the material being buried in a paddock some miles away from the town and remote from habitations, the paddock being well fenced in and protected from cattle, &c.

House-drains have been in many instances looked to, and relaid with properly jointed flanged pipes.

Butchers', bakers', provision, and milk shops have been looked to, and are now well kept; while cow-byres, stables, and piggeries have been cleaned out and generally put in order.

The cemetery is situated on rising ground about two miles from the town.

Palmerston South.

This town contains about 193 dwellings which were inspected, a fair amount of faults being discovered.

There are two sewers in the town, but the main portion of the drainage is conveyed into a creek flowing through the town. This has been recently cleaned out, straightened, and its gradient improved. But the place will require a proper system of drainage sooner or later.

The water-supply is obtained from the Shag River by pumping up to a reservoir high above the town.

Nightsoil service has been undertaken by the municipality, a contractor taking the contents of the privies monthly or fortnightly to a well-fenced paddock about a mile from the town and remote from habitations, where it is buried.

House-drainage (slops) still in some instances goes into the street gutters, for want of sewers, but these are kept in good order.

Butchers', bakers', and provision shops have been frequently looked to and found in pretty good condition, while stables, &c., have received attention. Piggeries are not allowed within the borough.

Queenstown.

Some three hundred buildings were inspected, and found in good order, only some twenty-two defects having been noted.

The sewers, of which there are few in the town, receive only house-slops, and terminate in the lake.

The water-supply comes from a creek running down a rocky gorge, and received into a subsidence reservoir. It is generally of first-rate quality, but subject to slight pollution with decaying vegetable matters, which, however, do not materially affect it for domestic or personal use. It is carried through the town in pipes to the houses.

Nightsoil service is by contract, under control of the municipality, the house-pans being emptied once a month, the hotels and boardinghouses twice a month. The nightsoil is buried in a paddock well outside the town, remote from habitations.

House-drainage (slops) mostly runs into the street gutters, but these are frequently cleaned and flushed.

Butchers', bakers', fish, and provision shops are well kept, and the milk-supplies are very clean.

The single bakery had to be reconstructed during the year on account of age, and is now in better condition.

Stables, &c., are kept in very good order, and no piggeries are permitted within the town limits.

Tapanui.

About 140 houses were inspected, and found mostly in good condition.

The sewage and slops of the town are carried in open gutters or natural creeks, but as the water-supply is abundant this does not cause much nuisance unless these are neglected and overgrown. But the place requires a properly carried-out drainage scheme, which has been in contemplation for some time.

The water-supply is excellent, if at times peaty, and is obtained from a creek in the Blue Mountains. This is received into a reservoir and it then runs by gravitation into the town in abundance.

The nightsoil service is under the control of the municipality; but kerosene-tins prevail in many cases.

Butchers', bakers', and provision shops generally, at the time of my Inspector's visit, were not satisfactory and required cleaning up in some instances, though on the whole they were well kept.

House-drainage (slops) is carried off by street gutters and creeks, which require frequent flushing.

No pigs are allowed to be kept within the borough.

Arrowtown.

This town contains about 130 dwellings which were inspected, and were generally found to be in good order, only a few defects having been noted.

A sewer runs along the main street, receiving slops from the houses. Apart from this, the houses, which are widely scattered, run their slops generally into their gardens.

The water-supply—an excellent one—is derived from a hill behind the town, and runs into a reservoir, whence it is conveyed in abundance throughout the streets. These are frequently watered and beautifully kept, being lined with well-grown trees.

The nightsoil service is under municipal control, and is well conducted, the depot being about a mile from the town and quite away from all habitations.

House-drainage may be said to be satisfactory on the whole.

Butchers', bakers', and provision shops are now pretty satisfactory, but require looking after, as we have found on more than one occasion that manure is allowed to accumulate about the stables which most of them have in their back premises.

The stables in the town also require frequent supervision.

Hotels: As this is a place to which tourists resort, it would be highly desirable that these should be of a better class, as they are of the class which served the town when it was a goldfields town, and they are now old and out of date.

Cromwell.

This town contains about 190 buildings, which were inspected. They were found to be generally in good condition, with a few exceptions. The chief among these were those in the Chinese quarter, where the houses were mud and loose-stone hovels, very small in size, partly underground, and without light or ventilation. These were ordered to be disused.

There are no sewers, the house-slops being discharged into the street channels, in which water is continually running, flushing them.

The water-supply is obtained from a reservoir on a hill high above the town, and is abundant and good.

The nightsoil service is undertaken by the municipality, and the depot is sufficiently remote from habitations.

House-drainage is into the street gutters for slops; but as these are continually being flushed out with water there is no nuisance.

Hotels might be better than they are; but they are improving.

Butchers', bakers', &c., shops in good order.

It was noticed that the river-bank running parallel to the main street was being used as a rubbish-tip by all and sundry. This was required to be put an end to.

Ranfurly.

The beginning of a township, important only as being the connecting-place by coach to Naseby, and as the dining-place for the passengers by the Otago Central Railway.

The hotel and a boardinghouse were looked to and found to be well kept. Two places had defective privies.

Naseby.

This township contains about 124 dwellings, which were examined and found generally in good order, only some ten defects having been noticed calling for attention.

A sewer runs along the main street, along which practically the town is built, discharging into a tailings-channel, and for the rest two tail-races serve. As these are always full of water, they are well and thoroughly flushed.

The water-supply is very good, being derived from a water-race high over the town.

The nightsoil service is by contract under the municipality, the depot being in a safe place.

House-slops are either disposed of in the sewers, or in the gardens belonging to the houses, which have plenty of space for the purpose, and the soil, being very loose, absorbs everything at once.

Butchers', bakers', and provision shops: A good deal of improvement has been required to some of these and to the premises connected with them, which has been carried out.

Several badly kept piggeries on the borders of the town, but in the county, were required to be cleansed and shifted.

Clyde.

A small township devoted to mining and fruit-growing, containing about thirty households, which were inspected, and a few small defects noted.

There are no sewers, and this defect will have to be faced some day soon.

There is no water-supply beyond roof tanks and the river which flows past the town.

There is no nightsoil service, the gardens, which as a rule are fairly large—the houses being scattered—serving for its burial.

House drainage and slops are also disposed of in the gardens among the loose gravelly soil.

Butchers', bakers', and provisions shops are in good order.

Ophir.

There are about thirty households, all of which were inspected; the impression on the mind of my Inspector, and on that of myself during one or two visits, when passing through, being that the inhabitants were allowing it to revert gradually to the wilderness from which it sprang, and that the new town on the opposite side of the river at the railway-station would in time supersede it altogether.

The water-supply, for which a reservoir was provided to which water was raised by pumping, has now broken down, and the town is served by water from the creek flowing past, or by roof tanks.

There is no nightsoil service, garden burial being the rule, and as each house has plenty of space this is perhaps sufficient.

House-drainage (slops) is similarly treated.

Butchers', bakers', &c., shops are well kept.

Hotels are primitive, and at the time of inspection the back yards were in a neglected condition.

Roxburgh.

This town contains something like 130 households, in good order.

This is a mining and fruit-growing township extending widely along a main road.

It has no main or other sewer.

Its water-supply is good, from a reservoir on the hill behind the town and some height above it.

No nightsoil service, garden burial being the rule, which, as ground is abundant and of loose nature, is sufficient and safe.

House-slops are similarly disposed of.

Butchers', bakers', and provision shops are very well kept.

Hotels are good, one being new and one of the best and most comfortable in my district, and their back premises are clean and well kept.

Riverton.

This town contains about 260 households, which were inspected. It is practically divided into two towns by the river. One of these, with about eight-five dwellings, on the south side of the river, consists almost entirely of comparatively new buildings, which with only a few exceptions were found in good condition. The other, on the north side, which is partly an old whaling settlement, has a

number of houses pretty well past their existence, and which will have to be demolished in the not-far-distant future, as they are, many of them, becoming dilapidated and in need of repair; in many cases they have been built close to the ground.

A main sewer runs along the main street and part of another, which can be flushed at its highest end from a creek.

The water-supply is almost entirely from roof tanks, several of the wells formerly used having been found to be contaminated with sea-water, and having been therefore disused.

Nightsoil service: This has been under consideration for some time, and a municipal service will, I hope, be inaugurated shortly.

House-drains, where they exist, are frequently badly laid and jointed.

Butchers', bakers', and provision shops are fairly well kept, and stables, cow-sheds, &c., are also in pretty good order.

Hotels are as a rule well kept.

As this town is a health resort for people throughout Southland, I shall have to make a prolonged visitation to it this year.

MISCELLANEOUS.

Vaccine-lymph Distribution.—During the year, 1,837 tubes of lymph have been given out to medical men and Public Vaccinators in my district, as compared with 1,808 last year.

Provision for Infectious Diseases.—While the Hospital Boards of Southland and Wallace have spontaneously made or are making provision for such diseases, and for incurable cases of tuberculosis, I regret to say that the Dunedin Board has on two occasions absolutely refused to admit cases of scarlet fever to the Hospital, or to provide for them otherwise; and that, while the former Boards have or are having special hospitals built for these, the latter is still shilly-shallying over the matter on various pretexts.

Nursing-homes and Private Hospitals.—In the course of the year I inspected forty-eight nursing-homes, all of which I considered good enough to recommend for license, though in two I held back my approval till an improvement was made to my satisfaction.

Anti-spitting Placards.—The notices suggested by Inspector Gladstone against spitting in the bars of hotels, auction and store rooms, and public offices, &c., printed in English and Chinese, have met with general approval, being now hung up prominently in these places, perhaps with some good effect.

Butchers' Hawking-carts.—After several conferences the master butchers in Dunedin passed a resolution that it was advisable in the interests of cleanliness and public safety that these hawking-carts should be done away with, and that meat should be carried through the streets in parcels ordered for delivery, the carts carrying no scales, &c. The initiative of this is due to Inspector Gladstone, and in time this highly desirable regulation will, it is hoped, be carried out.

In conclusion it may be claimed that the work of our Department is progressing slowly but surely, in my district at least, of which I can only speak, and that many improvements are being carried out in many places. In Dunedin the sewering of the town is progressing, the new water-supply is approaching completion, and—though perhaps this does not bear directly on the public health—the work of supplying the town with electric light is being pushed on; in Mosgiel a new system of drainage is nearly completed, with a septic installation at its termination; in Gore the sewerage system is now in full working-order, and many of the houses are connected with it; in Otautau most of the houses in the main (practically only) street have connections with the sewer for their slops, &c.; and in many of the smaller towns a municipal collection of nightsoil is either in operation or in contemplation.

With the various Departments with whom our Acts bring us into contact we have been working harmoniously during the year, mutually helping one another and acting together.

FRANK OGSTON, M.D., &c.,
District Health Officer for the Otago-Southland District.

APPENDIX.

CAMBRIDGE SANATORIUM.

THE number of new cases admitted since the 1st April, 1905, was 142, which with the 53 cases already under treatment on that date brings the total number of cases treated during the past year to 195. Of the 53 patients who were under treatment on the 1st April, 1905, 10 were apparently "cured," 25 left improved in health, and 18 were discharged incurable. The tubercle bacillus was not found in 3 out of the 10 apparently "cured." Of the 142 patients admitted during the past year, 25 were discharged apparently "cured," 36 left benefited, 35 were discharged as incurable, and 2 died within seven days and twelve weeks respectively after admission. There remained 44 patients under treatment on the 31st March, 1906.

The total days of treatment numbered 14,143, with an average of 99½ days, the longest period being 321 days and the shortest 7 days.

The average weekly number of patients under treatment was 50.

The patients who contributed £1 and upwards per week numbered 87, and the non-payers 55.

Eleven patients had resided in New Zealand less than two years at the time of their admission. The number of those born in New Zealand was 84, including 1 Maori and 1 half-caste, from other colonies 7, from Great Britain and Ireland 47, and from the Continent of Europe 2.

The access to the Plunket Colony has been much improved. Some small buildings have been erected, including bedrooms for some of the staff, and additions to the engine-shed, enabling engine-power to be used for various operations previously done by hand.

The consumption of fuel has been very considerably reduced by the abolition of the wasteful and inefficient furnace formerly used for heating the hot-water system in the main building, and the substitution therefor of boilers in the kitchen-range, as well as in other ways.

Much-needed improvements have been made in the laundry.

It was found necessary to remove the milking-shed to a more suitable position, and to make some improvements in connection with it. Four new cows and two horses have been purchased, and three horses and many pigs have been sold. All the cows have been tested with tuberculin during the last six months by Mr. Lyons, M.R.C.V.S., but in no case was a reaction obtained.

REPORT OF DR. POMARE, HEALTH OFFICER TO THE MAORIS.

Department of Public Health, Wellington, 2nd August, 1906.

Dr. Mason, Chief Health Officer.

WE have lived long in hopes, and at last I see a glimmering of realisation in the reconstruction of the Native Department. Not that we did nothing in the past years—far from it—but we laboured under great disadvantages and difficulties. The field was too great for one man—the task too herculean for one body—the distances that had to be travelled were too great—the roads in parts were often impassable, but yet never a call came that we did not respond, a cry that we did not heed. The foundation for future work has been truly laid. When by the death-bed of many a Maori brother we have watched the flickering spark of life go out to the darkness, we have longed to see the time come when we could have proper places to take patients to, nurses of our own race to soothe the fevered brow, our own doctors to heal the sick and advise the living how to live.

The recent changes in the Native Department give promise of having this done, and, further, we can expect more systematic work being carried out in the sanitary inspecting of kaingas, medical attendance to the Maoris, and the proper care of the old men and indigent Natives.

We have looked into the question of the decline of the Maori, and have found that the causes of this were legion. Bad housing, feeding, clothing, nursing, unventilated rooms, unwholesome pas, were all opposed to the perpetuation of the race; but a deeper knowledge of the Maori reveals to us the fact that these are not the only potent factors in the causation of his decay—like an imprisoned bird of the forest, he pines for the liberty and freedom of his alpine woods. This was a warrior race used to fighting for liberty or to death. All this is gone, fighting is no more. There is no alternative but to become a pakeha. Was not this saying uttered by the mouth of a dying chief many generations ago: "Kei muri i te awe kapara he tangata ke mana te ao he ma" ("Shadowed behind the tattooed face a stranger stands, he who owns the earth, and he is white")? There is no hope for the Maori but in ultimate absorption by the pakeha. This is his only hope, if hope it be—to find his descendants merged in the future sons of the Briton of the Southern Hemisphere. Sons who will not forget that in them runs the warrior blood of unconquered chieftains of centuries, and who, on the other hand, will be imbued with loyalty and imperialism, proud of being members of the Empire to which belongs their fathers. While, however, this is taking place we must recognise the fact that these people must live under hygienic conditions not only because it would be to their own advantage, but also that the public at large demands it; and that is why the crusade must be carried on—the war waged with increased vigour and untiring effort.

I am glad to report a steady progress in the sanitary condition of the pas within the past year. Much has been done, much remains.

The scheme of having a Native Health Officer in each district, with Inspectors and nurses, aided by subsidised medical men, will facilitate matters greatly. The King-country, east coast, and Waikato are still without Sanitary Inspectors, but I have no doubt that when the new scheme becomes operative proper Inspectors will be appointed immediately and set to work.

The "good Samaritan" has not yet appeared, evidently he has not heard the stifled cry of Maori infants; perhaps he is waiting for the Government to give him a salary before giving instructions to ignorant mothers on infant-management and the prevention of disease, or the call from the foreign lands, whose inhabitants we love so much in New Zealand, drowns the feeble cry of the Maori infant whose father fought against his own kith and kin in order to establish the supremacy of the British ruler.

Speaking generally, drunkenness is on the decrease. It would be well if Chairmen of the different Councils took example from the Chairman of the Arawa Council, and had prohibition orders taken out against chronic inebriates in their districts.

A course of lectures on first aid and sanitation should be given in such schools as Te Aute, Hukarere, and St. Stephen's. I think practical good would result if such a course were pursued. A course of instruction on farming is still wanted, and a practical system of finding graduates from the schools work to do should be inaugurated. Better not to teach them anything at all than teach them to be dissatisfied with their lot and not find employment for them. If this is not done the inevitable must follow—don the blanket.

I am sorry to say there have been six small outbreaks of typhoid fever at Waiokura, Ahipara, Mangonui, Pariroa, Waotu, and Ngatiki, resulting in six deaths. Prompt action in these outbreaks no doubt prevented the disease from spreading. I am pleased, however, to state that no recurrence of typhoid took place in localities mentioned in last year's report, and, further, that there were only six places attacked this year, compared with ten last year.

The Maori having been an active race, and having always been kept in a state of excitement by wars and the rumour of wars, can now only find vent for his feelings on the racecourse, gambling, and billiard-playing, with an occasional bout in the Land Court. If we could find an employment for him that would satisfy this craving it would benefit him to a great extent. Perhaps if he was employed in the permanent army of the colony it would satisfy his craving for excitement, and it would also keep him a great deal out of doors, thus placing him somewhat nearer the same condition as he was in when we found him.

The suggestion contained in our annual report for 1904, that a Home should be established for old and indigent Natives, will come into the general scheme outlined by the Native Department. It is proposed to use the pensions of the old-age pensioners to maintain them at the Homes. It is also suggested that a nursing-home be connected with these establishments. I think it will be satisfactory in every way to have the old people looked after properly instead of having their pensions squandered by their thoughtless *mokopunas*.

Tohungaism.

The Maori, being a Polynesian, is a great fatalist. "What the gods have decreed must be." Fatalism hangs over the race like a funeral pall. In the far North a little while ago a father told his son that he (the son) was bewitched. The boy went to bed and within a week he was dead—fatalism. At this time I visited the village and was told that the father was ill. All unsuspicious of what had taken place, I examined the old man and found him perfectly healthy. I found also that he had refused all food for some days, consequently he was weak. After examining him and finding that there was nothing the matter, it suddenly dawned upon me that perhaps the old man thought he was bewitched, consequently I had a bowl of chicken-broth prepared, and then I went to him and said, "Your ailment has been revealed unto me. Take this bowl of broth. The ceremony has been performed. Eat and live, thanking the gods for their gifts." He ate, and, after polishing off the broth, said that he could feel the light of life circling through his veins. It is needless to say that man is still living. Had he been a European, an Elijah Dowie or a Christian Scientist would have cured him. It is the fatalistic idea that drives the Maori to his tohunga, for all diseases which cannot be accounted for are considered *mate maoris*, and no one can cure a *mate maori* except a tohunga. It is pleasing to report that some Councils have blankly refused to grant tohunga's licenses, and yet in one district nearly all the members of the Council are followers of a tohunga. It is hard to know what to do without interfering with the liberty of the subject too much. Of course, as long as we allow crystal-gazing, fortune-telling, spiritual mediums, and a host of other quackeries to thrive in our midst, we cannot very well see clearly to take out the mote in our brother's eye; but nevertheless we cannot help recognising the greatness of the evil of tohungaism, and that it must be grappled with at ouce. The only solution of the problem that I can see, and that has been pointed out years ago both by you and myself, is the compulsory registration of every death. The fear of gaol and a few *post-mortems* will bring them into line quicker than anything I know.

Tuberculosis.

While there would seem to be some justification for the statement that tuberculosis was known among the Maoris before the advent of Europeans, there is no doubt the introduction of European clothing, altered diet, and customs accelerated the trouble. Then, again, the ancient Maori lived on mountains, which in itself was a cure; further, his habit of living out of doors made him hardy and able to withstand the inroads of this disease. Now, however, he has left the higher altitudes and lives in overcrowded, badly ventilated, squalid whares, reeking with smoke and disease.

Smoking has a tendency to spread this malady, not only in casuing frequent expectoration, but it has also become a common thing for Maoris to borrow each other's pipes, thus conveying germs.

We have encouraged the use of spittoons in meeting-houses, and discouraged expectorating under the mats. The meeting-houses are frequently disinfected.

Isolation has not been attempted, but a thorough knowledge of the spread of this malady and its evils has been diffused throughout the islands; but isolation must be attempted before long.

From the returns of medical officers to the Maoris I have found that fully 22 per cent. of diseases the Maori suffers from are pulmonic; thus you will see that practically one out of every five of the sick Natives is suffering from pulmonary affections alone.

A crusade against this mighty foe must be instituted. Lectures illustrated with lantern-slides must be given, and all cases encouraged to go to the sanatorium.

During the past year we have examined and prescribed for 845 cases, and operated on 57.

Attached you will find reports from some of the Sanitary Inspectors, which will give you a fair idea of what is being done, also a statement from Dr. Buck, whose appointment has filled a long-desired want. He has done valuable service along the west coast, and his report echoes our reports of previous years. You will also find attached my report on the Cook Islands.

Maui Pomare,
Health Officer to the Maoris.

Department of Public Health, Wellington, 19th July, 1906.

Dr. J. M. Mason, Chief Health Officer, Wellington.

I have the honour to submit the following report on the Cook Islands for your consideration.

Upon reaching Rarotonga in February last, I found that I had to wait a week for the "Countess of Ranfurly," but I found that during the week I had more than enough to do in examining and prescribing for cases, together with Dr. Gatly, so that I postponed the sanitary inspection of the island until I returned from the northern islands of the Group.

Before going any further with this report, I want to first thank Colonel Gudgeon and his able staff throughout the Group for their untiring efforts and kindness in helping me in every conceivable way in their power during my sojourn amongst them. I am certain that without their aid my work would have been nullified to a great degree. Their courtesy and willing help rendered my work one of pleasure and pleasant memories. I have also to thank the Arikis for their lavish hospitality and the ready ear they gave to a total stranger. This may be perhaps accounted for by the fact that I, in common with them, sprang from the loins of the same ancestors. One chief said, "Yes, Turi went from here many many moons ago, but his spirit has at last returned in you"; and so it was that I had no trouble, but was constantly kept busy administering to their medical needs, more of which anon.

The Natives I found to be closely related to our Maoris, not only in language and ancestry, but also in their habits and customs. A certain writer lately made a few casual observations, and wrongly concluded that the Maori was a lazy good-for-nothing individual. If stock had been taken of some of the European scum which had drifted hitherward, probably shame would have stayed the accusation anent the Native. The real fact of the matter is that the Native is not half so bad as he is painted, and in reality his fault is the great Polynesian one of over-hospitality. He may be a little improvident, but what of that "where every prospect pleases, and only man is vile"—where Dame Nature ever smiles benignly, and is abundant in her gifts of food? "Hei aha ma wai?" ("Who cares?") is almost right in these tropical realms. And then, why should we attempt to introduce conventionalities and the everlasting worry after money amongst a people who are already contented, law-abiding and happy? Yet the Native works really hard; you only want to see Port Awarua on shipping-days and see eight or nine hundred tons of cargo being brought in and shipped at 3s. per day per man. On the whole, the Maori does a lot of work, copra-making, picking coffee, oranges, bananas, &c.

There is no doubt whatever that the Maoris of the Cook Islands have up till now been gradually dying out. A casual glance at the attached statement will show this at once, at least as far as Rarotonga is concerned. Too much reliance, however, cannot be placed in the earlier figures, as they were mere estimates taken by the London Missionary Society. Now, since the Government has taken charge of the Islands, a correct census has been taken of the Group, and henceforth we shall be able to be absolutely certain in this matter.

In the year 1827 the estimated population of Rarotonga was 6,000; there were 3,000 adults and children attending the mission schools alone. In the year 1843 the estimated population was 3,300. In 1895, true Rarotongans, 1,623; estimated population, 2,454. In 1901 the estimated population was 2,207, a decrease of 247, or of 114 in the true Rarotongan born. In 1902–4 there was a decrease of 69. In 1905 there were 90 deaths and 81 births. The birth-rate in England in 1885 was 32·5 per 1,000; in Rarotonga in the same year it was 25·92 per 1,000, or 6·58 per 1,000 less than in England. In 1906 the population was 2,334: until we have the next Government census we shall not be able to state definitely the extent of the decrease. The above figures were gathered from various sources, but principally from Mr. Blain's paper on the Natives.

The following is the population of the various islands, just taken by the Government enumerators:—

Islands.	Population.	European.	Chinese.
Rarotonga	2,334	107	6
Aitutaki	1,154	8	..
Atiu	914	4	2
Mangaia	1,523	8	..
Manihiki	519	2	..
Rakahanga	351	1	..
Mitiaro	208	2	1
Mauke	444	2	1
Pukapuka	435	..	..
Palmerston	82	..	..
Penrhyn	430	6	..
Totals	8,394	140	10

At Atiu in 1896 there was a population of 825—442 males, 383 females; 1902, 919; 1903, 889; 1904, 912; 1905, 914; 1906, 914: so we see they have actually increased 89, and have been able to maintain their numbers. The drop of 30 in 1903 was due to a kind of dysentry that was brought over from Tahiti, but since then the people of Atiu have been fairly healthy.

The causes of the deaths in the Group can be better judged by a list of the diseases I found in the Islands. I have not the slightest doubt that, given fair opportunities for sanitary reforms and medical attendance, a few years' time will find the Natives healthy, prosperous, and numerous.

Diseases.

From a medical standpoint I may say that I have had a feast of good things, for I came across a variety of ailments, and some of which I had only read of in books on tropical diseases; and, as for surgery, I regretted exceedingly that I had only a pocket-case of instruments, for I am certain many lives could have been saved if I had had a full set. However, we did our best, and the result was marvellous. During my visit I saw about seven hundred cases, 503 of which I saw alone; the rest I saw in company with Dr. Gatly. List of 525 cases attached.

(1.) Measles was quite common a little while back, it being introduced by some passing vessel, and it proved fatal to the Islanders as usual. There was one case in Rarotonga while I was there. I have no doubt that some of the other infectious diseases have been prevalent, but were unrecognised.

No records have been kept at the Hospital. (2.) Typhoid: There have been no cases of typhoid amongst the Natives, but one or two cases have occurred in an English family, probably due to the coffee-refuse which was allowed to drain into the well. (3.) Dysentery is more or less common in certain seasons of the year, due probably to the food. (4.) Erysipelas has occurred in isolated cases. (5.) Two or three have died from tetanus. (6.) Rheumatism is quite common. (7.) Worms of the *Ascaris lumbricoides* are to be met with, (8) but the *Tænia solium* I did not see. (9.) Tuberculosis, the great white plague, though not alarming, is to be feared, for I saw many cases. It is more or less the product of civilisation. When the Natives lived naturally, wearing little or no clothes, they were numerous, but when false modesty and clothes were introduced consumption became rife. The souls were perhaps redeemed by the deaths of the bodies. The changing of a nation's habits is a grave responsibility. Shelter-sheds on some mountain-peak will have to be erected some day, and segregation of the afflicted ones attempted if we are going to do any good. Perhaps the reason why tuberculosis is not any worse than it is is because the Natives live a great deal out of doors. (10.) I saw only one idiot, and heard of one case of (11) lunacy. (12.) Neuralgia is as common as amongst white races. (13.) Considering the number of syphilitics, I was astonished to find no cases of tabes dosalis, whereas fully 70 per cent. of locomotor-ataxic cases in Europeans are due to syphilis. (14.) While at Rakahanga and Manihiki I came across five cases of myelitis, due to the after-effect of what was probably a severe attack of la grippe. (15.) A case of partial paralysis, due to a gumma on the brain, was interesting, owing to the fact that it was the only nerve case I saw that was directly due to syphilis. Eye: (16) I came across only two cases of cataracts; conjunctivitis was common, probably due to the extreme heat, and light from the white sand, and diving; (17) there were several esophorics and exophorics, several cases of stoppage of the lachrymal duct, and one case of iritis and corneaitis. (18.) Heart-diseases are rare, though I saw two or three cases, and a number of varicose conditions. (19.) Ear-diseases are also common: I saw several cases of otitis media. Pulmonary Cases: (20) Bronchial asthma and (21) pleurisy are quite plentiful; (22) I saw two tubular pneumonias. (23.) Dyspepsia is rare, and what sufferers I saw were hypopeptics. (24.) Elephantiasis is to be seen at Rarotonga and Aitutaki, but principally at the latter place; it is not bad in the other islands. Wherever there are large taro-plantations we have it most plentifully. (25.) I came across the following skin-diseases: Pemphigas, pemphigas eonatorum, scleroderma, lupus vulgaris, eczema, and psoriasis. (26.) There were a terrible lot of menstrual irregularities, due probably to specific causes.

Syphillis and Gonorrhœa.

These two diseases are in reality the true cause of the majority of deaths occurring in these Islands. Ever since the whaling-days the white man has left the Natives of these fair isles a legacy of disease and death, and one would almost think that time would establish a certain amount of immunity. Perhaps it has, but a rich harvest is annually reaped from this source alone. I dread these two diseases tenfold more than consumption and a hundred times more than leprosy. We have at least some knowledge of the consumptive, and an absolute control of the unfortunate leper, but the syphilitic is allowed to sow the seeds of his loathsome disease broadcast. And what is the result? Death—death to the unfortunate woman confiding in him, death to the children, and death to the race. I am positive that gonorrhœal infection and syphilis play the leading *rôle* in producing sterility amongst the women and death amongst all.

There is a foreign island not far from Rarotonga to which many of her sons go as labourers. Well, that island is one hotbed of disease, and not a steamer returns but some of these men come back fully diseased. I would suggest, sir, though I know the æsthetic taste of some will rebel against the suggestion, yet, in the interest of humanity and of the unborn Rarotongans, I urge that all people landing in these Islands should be examined, when practicable, before being allowed to land. This is done at Tonga: why not here? If we are in earnest, and intend to save this glorious race, then this is one of the first things to be done. The percentage of diseases directly and indirectly due to syphilis and gonorrhœal infection is astounding: why, in one place alone, out of forty cases which I saw, fourteen were syphilitics.

Leprosy.

The alarming reports which were circulated some time ago *re* the spread of this malady were entirely unfounded. I took particular care to make a thorough examination, and but for a few suggestions nothing more could be done than was being done by the Federal Government. The history of leprosy in the Cook Group is a very interesting one. Perhaps I had better deal with it as I saw the cases.

I heard at Rarotonga of a case isolated at Palmerston Island, and so upon arrival there I took a guide and proceeded to the isolated camp, and I found a boy nine years of age. Case A.—Father died of heart-disease and mother of childbirth. Never been away from island. Has sister at Penrhyn with leprosy. Sister was said to have developed disease through eating lice from adopted mother, who had leprosy. Boy never came in contact with sister. Mother went to nurse her daughter in the leper island, and a doctor from a British man-of-war declared her free from leprosy years afterwards. The father isolated the son because he thought the boy was suffering from leprosy. It appears that at about this time a steamer called at Palmerston from which some old clothes were bought. The buyer of the clothes got the itch, and from him it spread to nearly every one on the island—amongst them the patient. The father, who had been at Penrhyn amongst the lepers, immediately isolated him, thinking it was leprosy. The boy was isolated at seven years of age with a real leper from Penrhyn. For a long weary year they lived together and then the real leper died and the boy buried him, at the same time accidentally, perhaps providentially, setting fire to their whare. The people then built

him another shelter. The patient has two brothers at Penrhyn perfectly healthy. Physical examination revealed absolutely no sign of leprosy. Dr. Gatly has since examined the patient at Rarotonga, and has come to the same conclusion; so I decided to let him go.

Case B, missionary (Native), aged 60 years.—Patient lived with a leper, Marerehera, at Tukou. Leprosy was contracted by Marerehera at Hawaii. After this, patient lived with his sister for three or four years. She was married to a leper, who had contracted the disease at Honolulu. Three years ago patient noticed an anæsthetic blotch on left foot, which suppurated, leaving an unhealed ulcer. Six months ago face, hands, and legs commenced to swell, and a small anæsthetic ulcer developed on left small toe. I had case completely isolated some distance from the village on the other side of the island. The house in which the patient lived is destroyed, and the church has been thoroughly fumigated and washed out with bichloride of mercury.

Case C, female, 16 years of age.—Developed complaint three years ago. Lived with relative, Marerehera the leper. Got it by direct contact. Has typical leonine face, leper's claws, bullous eruptions, ulcers, patches of anæsthesia—in fact, is in the last stages of leprosy. The patient is well isolated, having a stone wall around her whare.

Case D, male, aged 25 years, living at Rakahanga.—Three years ago the sufferer lived with Tiaka, a Penrhyn leper who has since died. Patient has anæsthesia of both ankles and feet, face and ears swollen, bullous eruptions scattered over the body, and two white patches on the body. Case is well isolated with two other lepers on a separate island.

Case E, aged 20.—Developed disease four years ago at Penrhyn. Since being at Rakahanga has become very much worse. Case is far advanced—three toes gone on right foot, two on the left, hands ulcerated, patches of scaly skin, anæsthetic patches all over. Case isolated with the other cases on the island.

Case F, aged 40.—Developed disease four months ago. Had come directly into contact with other lepers. Has swollen face and ears. Anæsthesia in both legs, scaly blotches and patches. Case is completely isolated by himself on another island.

It appears that about twenty years ago a kanaka from Honolulu, Nuka by name, went to Manihiki and there died of leprosy, which had been contracted at Hawaii. It is from him that the rest got this dreadful disease. Since 1886 the following have died of leprosy at Manihiki: (1) Nuka, male; (2) Toapa, male; (3) Marerehera, male; (4) Whakaata, male; (5) Puatea, male; (6) Teta, male; (7) Tarani, female; (8) Munakoa, male; (9) Tanire, male.

The following are the Penrhyn cases (isolated at Leper Island):—Case G, female, sister of Case A, aged 15 years: Contracted disease through eating lice from leprous adopted mother; case fully diseased; has been on island four years; usual symptoms—ulcers, anæsthesia, &c.; very scaly. Case H, female, aged 40 years: Grandfather had leprosy; got it by living with him. Case I, aged 40 years: Got it from husband; anæsthesia, blebs, and ulcers. Case J, aged 13 years: Got it from brother at Manihiki; been one year on island; usual symptoms, but not so bad. Case K, aged 14 years: Mother died of leprosy; right hand was burned but was never noticed, left a big scar; leper's claw, ulcers on left foot, anæsthesia in patches all over the body. Case L, aged 13 years: Uncle died of leprosy; associated with a leper at Penrhyn; case in last stages. Case M, aged 14 years: Father isolated the case; parents both healthy, but adopted father died of leprosy at Molokai; usual leprous signs, with anæsthesia and ulcer on left hand. Case N, aged 38 years: Had lived with a leprous Samoan for eight years; left toe gone, right-hand fingers all mere stumps, left hand leper's claw; anæsthesia, &c. Case O, aged 18 years: Father died of leprosy; case in very last stages. Case P, aged 15 years: Mother died of leprosy; case also in last stages.

Examination of supposed Lepers.—While at Manihiki I examined a woman who was isolated for supposed leprosy. Two years ago her face and hands began to swell, but gradually got well again. She said she got it from her husband. I examined the husband as well as the wife and found them both healthy. From the description given of the disease I have not the slightest doubt it was erysipelas. Case was liberated.

The following are Penrhyn cases:—

Case (*a*), male, aged 17 years.—Contracted disease two years ago from his mother, who died about two years ago. His brother is on Molokai. Has anæsthesia in both legs and hands. Ulcer on ball of right foot and on the right hand. I ordered immediate transportation of case to Molokai, which was done.

Case (*b*), female, aged 8 years.—Parents both healthy. Fourteen brothers and sisters all healthy. Origin of contact obscure, probably through staying in the same house that some leper had lived in, which house I ordered to be destroyed. Right knee has a small anæsthetic ulcer, due to its being burnt by accident, so the mother said. White anæsthetic patches on right shoulder-blade and right palm.

Case (*c*), aged 14 years.—Parents, brothers, and sisters absolutely healthy, but grandmother is on Molokai with leprosy. Patient had no direct contact with her, as far as can be ascertained. Examination negatived.

Case (*d*), male, aged 23 years.—Case has been isolated with lepers on Molokai for eight months. Examination revealed the fact that he was only suffering from *segasega* (eczema). I ordered him to be taken to one of the other islands and isolated by himself for one year, to see if he should develop the disease, he having been isolated with the lepers for so long. If at the end of a year he does not develop leprosy he is to be liberated.

Case (*e*), aged 14 years.—Father healthy. Mother died of unknown disease. Four sisters and one brother all well, except brother has sores similar to syphilis. Present trouble commenced by burning his foot and then his left hand. Six months ago an ulcer formed, piercing left big toe; ulcer unhealed. White patches on chest and right shoulder, anæsthesia on left hand. Second finger a claw, third, fourth, and little fingers' ends dropped off, piercing ulcer on third finger; ulcer on right side of foot. Leprosy.

The history of leprosy in Penrhyn is a sad and interesting one. Siku was a Penrhyn Native who lived in Samoa with an Hawaiian leper for several years. He returned in 1885 to Penrhyn and there leprosy broke out on him. Since then the following have died from it: (1) Siku, male; (2) Tawitau, male; (3) Hamoto, male; (4) Sarakura, female; (5) Kopu, male; (6) Tuatahi, male; (7) Tonga, male; (8) Urungu, male; (9) Takapuata, male; (10) Toheputa, female; (11) Turua, male, (12) Torararua, male; (13) Repo, male; (14) Hio, male; (15) Rota, male; (16) Piha, female; (17) Mama, female; (18) Ruaputa, female; (19) Kahanoau, female; (20) Saimanu, male; (21) Tepou, female; (22) Maria, female; (23) Silika, male; (24) Te Tou, male; (25) Aumata, female; (26) Horaiwa, female; (27) Urau-raratu, female; (28) Te Kapua, male; (29) Pou, female; (30) Maria, female; (31) Te Unu, male. Thus we see that thirty-one deaths have occurred since 1885 from leprosy, and twelve are now isolated with it. The statement which was printed in some of our New Zealand papers, a while back, that no isolation had been attempted is absolutely false. The fact of the matter is that the Natives were rather too keen in isolating every case which looked in the slightest way suspicious, and hence I had to liberate four people who were not suffering from leprosy at all. I have instructed all the British Resident Agents that if in future a person is suspected of suffering from leprosy, he or she is to be isolated alone and not allowed to mix with any of the lepers till a medical man comes along, which must be every three or four months. It is absolutely necessary that a medical man should visit the Group regularly, to see not only the lepers but those suffering from other ailments.

The question of looking after the lepers at Penrhyn is one to be inquired into. The poor unfortunates do not get enough to eat. There will be no need to ask for a volunteer as a keeper, as we have already an unrecognised Father Damien in Meka and his young wife, who volunteered to live on the island in order to be near their adopted son. I really do not know what would have happened to these poor unfortunate British subjects if Meka had not volunteered to go amongst them. He does all the fishing and looking-after of the sufferers, and for this he receives no recognition from the civilised world in either funds or praise. Perhaps when the great Master will call His own He will say unto him, "Good and faithful servant, enter into the rest of thy Lord." "For no greater love has man than this: that he lay down his life for his friend."

Water-supplies.

All the islands depend mostly on cocoanuts for drinking purposes, and it is just as well that they do so, as the water-supply of most of the islands is very limited. Nearly all the Islanders collect rain-water from their roofs—at least, those who have corrugated-iron roofs—or else use shallow wells, the waters of which are not always palatable or healthy. Only at Rarotonga are there good streams that could be utilised for the purpose.

While at Rarotonga I inspected the source of the proposed Awarua water-supply, and I found the water clean, pure, and cold, springing as it does from the mountains at the back, and running the whole way along a bed of gravel. The stream will be dammed about a mile and a half from the township, and from there it will be piped down in a 4 in. main. I suggested to the engineer that they had better tap the creek further up than they proposed, as by so doing they would avoid the drainings from the taro-swamps, and also obviate hardships on the Natives in regard to having the growing of their main food-supply stopped. Colonel Gudgeon is quite willing to do this.

I further suggested, though it was already thought of, that two concrete swimming-baths be erected at the end of the main, one for the women and one for the men. This can be easily arranged for by utilising the surplus water, and thus we should have a constant flow through the baths.

At Mangaia and all the other islands, with the exception perhaps of Aitutaki, concrete tanks will have to be erected by the Government to store rain-water. At Mangaia I suggested the idea to the resident missionary, and proposed that the water from the churches, which is at present wasted, should be stored, and he said that as far as he was concerned the Government could do so. As there are only a limited number of suitable roofs for catching rain-water in each island, and as all the churches have iron roofs, I think the storing of water from the church-roofs is the solution of the water-supply problem for the Islands.

Shallow wells should be done away with. I am certain that they are catch-alls for all kinds of disease-germs, especially in Native communities, where dogs and pigs are allowed to roam at their own sweet will; and while writing I must urge that the by-laws in the Islands *re* pigs be strictly enforced.

Burial-places.

Upon going around the Group one is particularly struck with the number of burial-places there are. The Natives seem to like to have their dead about them, so much so in fact that I have seen Natives living in a house at one end of which would be a grave, enclosed it is true with coral and coral cement, but nevertheless odious and, I have no doubt, pernicious on account of the close proximity to the decaying dead. This must be stopped, and corpses buried in proper places.

Houses.

I am of opinion that the Native-built whare, with the addition of a raised floor, cannot be improved upon, for it is cool, airy, and healthy. I noticed that nearly all the recent buildings are well built off the ground. I have been told that the Rev. Mr. Chalmers gave the Natives the idea of building upon stages, which is an exceedingly good one.

On the whole the Cook-Islanders can teach our Maoris how to keep their houses clean; however, I think a regular system of having the kaingas inspected every week or so should be instituted. I noticed that in Aitutaki and Manihiki where this is done the homes are more cleanly and tidy-appearing. Perhaps if the powers of Sanitary Inspectors were given to the Island-police and reports sent in to the Resident Agents throughout it would be most beneficial.

Closets.

There are very few closets in the Islands: the majority of the Natives go to the edge of the lagoons. I am certain this is not a bad practice, as the crabs and other scavengers together with the sea soon clear all refuse away. At Penrhyn the Europeans have their closets right over the water. The system of pit-closets would be dangerous and unsuitable, and of course water-closets would be out of the question.

The Hospital and Medical Officer.

The so-called Hospital is a very old store of five rooms, built nearly thirty years ago, and is altogether unsuitable for the purpose—in fact, it would be fatal to do any major abdominal operation in it, as the building is musty and old. The Hospital needs a number of surgical instruments. A new Hospital should be erected immediately behind the Whare Manuhiri, which would be most convenient not only to the public but likewise to the resident physician. The new building should consist of two small wards, a small operating-room, and a dispensary, all built of concrete. I would have one or two Native women trained as nurses so that they could be used in the different islands. The resident physician in addition to having hours at Awarua should also have hours at Ngatangia, Titikaweka, and Arorangi at least once or twice a week. The physician should be stationed at Aitutaki for three or four months to clear up all specific and other cases. With a little extra remuneration he should make a regular annual or biannual visit to each of the other islands for the sake of not only examining the supposed lepers, but also to attend the sick and afflicted. The anæsthetist should get a remuneration for services rendered; and a record of all cases attended to at the Hospital must be kept.

In conclusion I beg leave to state that with an annual visit from us to follow up the good work that has been started, with a few regulations to keep the kaiangas healthy, a rigid quarantine instituted against the introduction of venereal diseases, a strict watch kept on all suspicious cases of leprosy, good water-supplies obtained in all the islands, a few girls properly taught how to nurse and sent out amongst their people, the perpetuation of this branch of the Polynesian race will be assured.

Maui Pomare,
Health Officer to the Maoris.

Dr. Pomare.

I have the honour to submit a report on the work done since my appointment at the end of October, 1905, in the Maori Councils Districts of Raukawa, Kurahaupo, Wanganui, and Taranaki, with parts of the Maniapoto and Taupo Districts. Many parts of these districts have been visited several times in response to urgent entreaties for medical aid.

Maori Councils.

I have always endeavoured to work in conjunction with the Maori Councils, but it is very difficult in many cases to get as much assistance from them as one would desire owing to their not fully realising the amount of power conferred upon them by the Act. In my lectures I have made them realise their duties as local governing bodies, and that the Council and Marae Committees are responsible to the Sanitary Inspector and myself for the carrying-out of our instructions *re* sanitary reform. The Maoris are at last beginning to learn that they have been intrusted with no mere toy with which to play at home-rule, but with something real in helping towards improving the condition of the people. I regret that the registration of births and deaths has not received the attention it should have had, thus preventing me from making an accurate return of the vital statistics. The Councils themselves say that they have for the past few years been trying to wield a new weapon, and are only now learning the grasp of it and the way it should be used. The routine method of procedure at meetings, strict attention to business, and the value of time and quick action are too far advanced for the ceremonial verbose style of many of the middle-aged Councillors, who are still only a generation removed from the New Stone Age. I would suggest that Health Officers be made members of the Council whose districts they visit.

Sanitation.

Taking the condition of the villages of the Wanganui Council District as being more immediately under notice, I am able to report considerable improvement as a result of the work of the Maori Council. In this the credit has been largely due to Inspector Pukehika, who has combined in himself the energy of all the Marae Committees. We have been educating these Committees in their duties, and they are now beginning to share the burden of sanitary improvement. Many houses have been destroyed, others improved, and new ones erected. Water-closets are ceasing to be objects of aversion. Their use had been forgotten since peace drew the Maori down from the fighting-pas where the *paepae* was never absent; and very little argument suffices to prove that they are no startling innovation of the white man, but an old friend under a new guise. Fencing off the various houses to keep pigs and poultry at a reasonable distance seems, till pointed out, to demand as little attention as amongst many Europeans, even in this country.

The Council districts to the south show the same advance, and Maori insanitary buildings are rare. However, even with floored wooden buildings the Maoris have too much a tendency to crowd together in one room, and to neglect the use of ventilation. This tendency will vanish with the breaking-up of communism and the spread of education. In Taranaki we have the hardest district to deal with in New Zealand. As long as Te Whiti and Tohu are alive the majority of the people will maintain their isolation and reserve, which any attempt at force will fan into active opposition as it has done in the past. Here are a people cherishing a delusion which many force themselves to accept, because their fathers have died believing it and handed it on as a sacred cause. With the death of their leaders, their illu-

sions will be dispelled, from the clouds they will fall to earth again and take up the struggle for existence two generations in arrear of the other tribes. However, some have been won over, such as the Ngatihine, of Pariroa and Whenuakura, and the Ngatimaru, of the Upper Waitara. Parihaka, the headquarters of Te Whiti and Tohu, and probably the largest pa in New Zealand, is quite a small town. Fine wooden buildings continue to rise, and it is their boast that soon there will be no rush or toetoe houses at all. There is a good water-supply, conducted to the houses by pipes. The village is kept in good order. At Mokau, where the damp unhealthy site of the village was condemned, the Natives have selected a more healthy site where they intend to build.

Health.

There has been a great deal of sickness in the Taranaki district about Rahotu, and between New Plymouth and Waitara, as well as at Raetihi in the Wanganui district. Abdominal complaints, due to bad feeding, have been very prevalent amongst young children, and at Mokau led to a panic of typhoid. Chest-troubles, due to bad hygiene and improper clothing, are also common. After seeing young children and girls clothed in many cases with simply one thin print garment on, the wonder is that so many survive. There are many cases of phthisis along the coast, and great care has been taken in teaching parents the value of open-air treatment and disinfection of sputum. Phthisis is not so common as one would expect from the Maori habit of crowding into badly ventilated buildings, and the fact that they offer virgin soil to the tubercle bacillus. Tubercular bone-disease and tubercular glands form a higher percentage of the diseases, while otitis media is common among the young. After obtaining the correct census returns I hope to be able to give statistics.

The leper up the Wanganui River is isolated as well as possible until the leper island is forthcoming. His hands and feet are now healed. There were cases of typhoid at Pukerua and Bell Block.

Mortality.

The mortality in many parts is in excess of the birth-rate. This I attribute to the Maori not having been able to overtake and assimilate himself to the altered conditions of life. The gap between the Stone Age and the age of electricity and radium has been too wide to bridge in less than a century. Some of the younger generation imagine that except in the matter of pigment they are pakehas, the elders that they preserve pure and undefiled the traditions of the ancient Maori, but the main mass of the people are in a transitional state, neither the one nor the other. The energy and spirit of the hunter and warrior are disappearing. Even the sanitary laws of the old fighting-pas are lost, so that the reintroduction of some of them is regarded as a foreign innovation. The incantations which cured by suggestion the ailments caused by suggestion have no antitoxic power against civilised bacteria. The old gregarious instinct which kept the hapus and tribes together was their safeguard in the days of war, but now impedes progress, nay, even threatens the life of the race in the days of peace and intellect. The communism of the past meant industry, training in arms, good physique, the keeping of the law, the sharing of the tribal burden, and the preservation of life. It was a factor in the evolution of race. The communism of to-day means indolence, sloth, decay of racial vigour, the crushing of individual effort, the spreading of introduced infectious diseases, and the many evils that are petrifying the Maori and preventing his advance. It has outlived its use, and its continuance spells degeneration. I agree with Dr. Pomare that the time has come for the substitution of individual effort in its place.

The Maori communistic system is based on their manner of holding property. With the individualisation of Maori lands, communism and its evils will disappear. When each man has his own holding and has to depend upon his own efforts to provide home, food, and clothing for his wife and family, he will have an incentive to work, and necessity will teach him to improve and advance. Then insanitary dwellings, insufficient clothing, irregular meals, improper food, and bodies weakened by idleness, will cease to loom so largely in the causation of disease. This must be backed up by a system of education in which due proportion will be given to those branches which will be of most use to the greatest number, or, as Herbert Spencer puts it, "prepare them for complete living." The Maoris have been endowed by Nature with a megacephalic brain. They possess to a high degree the power of imitation. Circumstances have short-circuited them from the main current where the evolution of mind went on more rapidly. Famine, calamity, and war, the grim teachers of the past, can now be dispensed with. Intelligent legislation taking the place of nature can now bring the Maori rapidly through his three thousand years of arrears in time into the full blaze of the twentieth century, and enable him to take his stand on terms of equality with the white man as a fellow-citizen in what the late Mr. Seddon termed "God's own country."

That many will go to the wall we cannot deny. They have done so from the beginning of time, and no legislation can abolish the laws of Nature. It can, however, temper the wind to the shorn lamb, and protect the Maori from himself and his land-hungering white neighbour until he has approached a little nearer to the latter's knowledge. It can help him a little more before abandoning him in the struggle for existence to bear the attack of the accumulated experience of centuries of European mental progress. It is only that these matters are at the root of the question and have a direct bearing not only upon the health of individuals, but upon the existence of the race, that I have been tempted from the beaten way of health reports.

Suggestions.

The Maoris suffer as much from ignorance of nursing as they do from lack of right remedies. The need for Native district nurses is almost as great as that of medical officers. The Natives have a strong prejudice against European hospitals. Behind the barriers of the hospital-wards and behind the barrier of speech they know not what is going on. Therefore they imagine. The result is that the

majority refuse to go to the hospital. Many lives are lost which might have been saved. The only scheme to give much relief is a system of Maori cottage hospitals with Maori nurses. From these as centres practical teaching in hygiene, care of the sick, cooking of invalid-foods, and care of infants may be taught. To the Maori an ounce of practice is worth a pound of theory. In the case of children, nurses will be able to teach better than medical men. A system should be tried where every child born should be notified, and the mother visited and instructed by the local nurse. Invaluable benefit will be conferred upon the race by directing attention to the children in the way that Dr. King is doing in Dunedin. I hope that Hospital Boards are meeting the wishes of the Government, and that Maori nurses will soon be available.

PETER HENRY BUCK, M.B., Ch.B.,
Native Health Officer.

Dr. Pomare. Ruatoki, 20th February, 1906.

HEREIN are contained a few notes anent the Matatua Maori District, its people and villages.

In regard to the general attitude of the Natives towards the efforts made to induce them to improve their houses, &c., I may say that the majority of them quite agree that such improvements are desirable and beneficial, also that they are quite willing to build better dwelling-places, &c., as they can afford it.

Exceptions to the above there are. The Ngatiwhare people of Te Whaiti I have been quite unable to move from their state of apathy reported by me the year before last. Ngatimanawa of Whirinaki have ever been inimical to the Matatua Maori Council and to any advice tendered them in respect to their villages, &c. These two hapus need to be waked up a little. The Ngamaihi people of Te Teko are also very backward, as also are Ngaiteriu of Te Kautawhero, at Ruatahuna. The most deplorable and backward places (kainga) within the Matatua District are Te Kautawhero, Te Murumurunga, at Te Whaiti; and Hekerangi at Te Teko.

On the other hand, however, there are a good many kainga where the people have much improved their dwellings and surroundings. Foremost among them is Pupuaruhe, near Whakatane, where all the people dwell in small weatherboard cottages; Tanarau, at Ruatoki, where but one *whare maori* remains, and there are eleven wooden cottages. Other creditable villages are Waikirikiri, Te Houhi, Te Whareotoroa, Te Pahou, Te Poroporo, and Otamauru. The Whakatohea villages are very fair on the whole, the most backward being Te Rere, at Opotiki. Most of the Ngatiawa kainga are creditable, save Hekerangi. Generally speaking the water-supply is good; the worst is that of Otamauru, which is emphatically bad. These people should obtain some tanks to conserve rain-water, as they inform me that the water obtained by well-sinking is very bad.

During the month of January I visited all the Whakatohea, Ngatiawa, and Ngatipukeko kainga, from Opape to Te Teko, interviewing the Komiti Marae at each place, and explaining what matters they should take in hand to improve the various places. I have visited all settlements save the two at Waikaremoana. I intended to have gone here during the present month, but found that funds available would not permit of it.

In regard to the Urewera villages, those of Waimana, Ruatoki, and Te Houhi divisions are certainly creditable, while those of Ruatahuna and Maungapohatu are about as good as can be expected when one remembers their isolation and the poverty of the people.

The following is in reply to circular of the 8th January, 1906: Number of kaingas visited, 49; number of houses inspected, 468; number of houses condemned, 24; number of houses destroyed, 13; number of houses erected, 42; number of closets built, 0. Cooking-sheds are not included in the above.

Latrines.—In regard to latrines: There are two most difficult and unsatisfactory matters to deal with in this district—viz., latrines and tohungas. They should be bracketed together. Out of forty-nine kaingas visited by me only three have these necessary outhouses. The modern Maori strongly objects to them, albeit his ancestors were much more sensible. No notice has been taken of my repeated remarks on this subject. Any objection as to the cost is quite beside the mark, as very good ones may be constructed of raupo, split timber, &c. But the people object to them. That is the truth. When preparing for the meeting at Ruatoki in 1904, I had the greatest difficulty in getting the necessary *paepae* erected; and three out of the four put up do not appear to have been utilised since. As to your remarks *re* prosecuting Natives who refuse to erect the useful *paepae*, I explained this at every place I visited in three trips made in January and February so as to warn the Natives. I would propose taking the local people first—*i.e.*, those of Ruatoki—and give them a certain time wherein to erect *paepae*. Then, if they neglect to do so, bring an action against one person, as a commencement, to see how the case goes.

In regard to the general sanitation of the various kaingas, no matter how clean a village and its tenements are kept, one cannot speak well of such places so long as all surrounding lands are covered with human excreta, even such portions thereof as form the catchment-area of streams from which water is drawn for domestic purposes. Apart from this, some improvement has been observed in some parts; but the Komiti Marae, I find, are not to be depended upon to work any reform in sanitary matters. The European must take the matter in hand and insist upon a change being made.

Food.—In regard to food-supplies: In the interior the people live practically upon potatoes, very often without any addition thereto save a little puwha, or the undeveloped fronds of *Asplenium bulbiferum*. These inland people are also addicted to the use of potatoes which have been immersed in stagnant water until rotten. No more repulsive food can be imagined, but these Natives devour it with avidity. Rotten corn and "turned" meat also find an honoured place on the tribal menu. And skin-diseases are ever present.

Cooking.—I found amongst the Whakatohea people that the women are much better cooks than are the Tuhoe people, and was surprised at the quality of the home-made butter, bread, cake, &c., to be seen at Whakatohea kaingas. At Waioeka I observed several families partaking of breakfast seated at their dining-tables, and was impressed by the superiority of their mode of life.

Kauta.—In some places a better class of cooking-sheds have been erected; but in many cases women have to prepare food in the most wretched hovels. I marvel not that many prefer to cook in the open air. But I was conducted into a kauta of the descendants of Irapuaia, wherein I found a woman preparing food at a large cooking-range of the most improved design. Needless to say that I closed my notebook and left abruptly. It was no place for me.

There is one aspect of Maori domestic economy noted in this district which calls for remark. I allude to the *panem et circenses* state into which the people appear to be drifting. Each year they seem more and more inclined to appeal to Government for grants of food when any trouble comes upon them, and seem to give no thought to helping themselves. The potato-disease has much curtailed their main food-supply, undoubtedly, but they are much lacking in energy in the way of seeking other channels of food-supply. The Natives at Te Waimana are milking cows for the purpose of supplying the local factory with milk, and others might do well in the same line. Life is much too short for the Natives of Ruatoki to engage in the task of cultivating such things as cabbages, turnips, carrots, &c., albeit they show a willingness to assist me to dispose of the product of my own garden.

Liquor.—There is one point on which one may speak with a sense of pleasure—viz., in regard to drunkenness. There is not much drinking among the Natives of the Matatua District. The district constables support this statement, and appear to think that drinking is decreasing.

Health.—In reply to questions put during my late expeditions through the district, the Natives state that the past year has been, generally speaking, a healthy one.

Births and Deaths.—During the past year sixty-seven births and sixty-one deaths have been registered in the district. The excess of births over deaths is certainly small, but it is better than none. Thirty of these deaths were those of children, however, which is not to be wondered at when one knows how the hapless little ones are treated, or neglected, in illness and health.

Tohunga.—In respect to the genus tohunga I have but little to say, for the simple reason that correct information is most difficult to obtain. At thirty-one kaingas recently visited the people emphatically denied that any tohunga practised in the district. All members of the Matatua Council also deny that any sick persons are attended or treated by such in their districts. In regard to the Tuhoe District I am not prepared to believe these statements; but the Natives will not admit anything. I have heard Natives state that no assistance would be given to any action taken against the tohungas.

Waata te Rangikotua informs me that Hiromena, the female warlock of Ngatipukeko, is not now practising her gentle craft. As to Matoru and te Manihera of Ruatahuna, I can get no data to go upon. But of this much you may be assured—that most of the elder men of Tuhoe act as caretakers of the sick, or as advisers, and some of their methods of treatment are weird and wonderful.

In spite of my repeated remarks to the Council anent tohungas, the members steadily neglect to take any action in the matter.

There are many matters upon which I would fain make some remarks, but cannot see my way to making suggestions when I know that most of these Natives are "living in space," as they put it, and cannot say that any one particular yard of land is their own. *Cui bono?*

Potato-disease.—The potato-blight is again in evidence this season, and, so far, the inland districts are much more affected than the costal parts. There is no sign so far of the potato-crops at Te Teko being affected, nor yet at Pupuaruhe and Otamauru. The blight has just begun to appear in a few of the Ngatipukeko plantations. From Whakatane along the coast to Opape a few patches are affected, but not many. The Whakatohea have some fine-looking fields of kumara, which will help them should they lose the potato-crop. The Waimana and Ruatoki districts are much more affected than the coastal lands. The blight has also appeared at Ruatahuna and Te Whaiti, but it is too early to say what the loss will be. The Ruatoki people should go back to the kumara.

All my own patch of potatoes has been blighted, including some American seed and some of the famous Northern Star.

ELSDON BEST,
Sanitary Inspector.

Dr. Pomare.

SALUTATIONS to thee. Herewith I send to you my annual report on the inspection of kaingas in the Council or District of Arapawa: Number of villages visited, 6; total number of houses, 77; houses to be destroyed, 17; houses to be renewed, 23; houses to be painted, 30; water-closets to be erected, 39; number of new houses, 18.

Waikawa and Whangarae are both in need of a proper water-supply.

HAIMONA PATETE,
Sanitary Inspector.

Dr. Pomare. Waihinahina, Dargaville, 22nd February, 1906.

SALUTATIONS to thee, O friend! Herewith I forward a short report of the general condition of affairs in this district. Everything is progressing favourably in the district, from the *maraes* outside even to the beds—for they all now sleep upon raised bedsteads. The drinking in publichouses has also come to an end altogether, unlike the old days.

The matter of water-supplies is the one urgent matter that I want to draw your attention to. The following places still want proper water-supplies: Ripia, Naumai, Oruaariki, Waihinahina, Taita, Maropiu, Ahikiwi, Kapehu, and Pouto. If a subsidy was given by the Government to encourage these Natives to buy tanks and get proper water-supplies it would hasten health matters considerably.

The potato-blight has been very severe in this district; perhaps a little aid from the Government will be needed.

Number of old houses, 96; paling houses, 49; houses destroyed, 26; new houses, 32; kautas, 50; water-closets, 42; patakas, 22; churches, 5; meeting-houses, 13.

WAAKA TE HUIA,
Sanitary Inspector.

RIAPO PUHIPI, Sanitary Inspector for the Mangonui District, writes: "During the year the number of houses condemned was 32, the number of houses destroyed 26, the number of houses erected 17, and the number of closets built 9. The excess of births over deaths was 5.—Kia ora."

Dr. Pomare. Putiki, Wanganui, 13th June, 1906.

SALUTATIONS to thee, O friend! Dr. Rangihiroa and myself have just completed a second reinspection of the Councillor District of Wanganui. The multitudes have been diligent in carrying out the law. The health has been excellent throughout the district, and the welcome extended to us by the people has been sincere.

Attached you will find a list of the houses which have been destroyed, those which have been renewed, and those which have been built from February, 1905, to April, 1906.

Enough. Kia ora.

Total number of houses, 681; number to be destroyed, 72; number to be renewed, 100; number destroyed, 72; new houses erected, 22; houses renewed, 17; number of closets built, 70.

HORI PUKEHIKA,
Sanitary Inspector.

Dr. Pomare. Maketu, 23rd March, 1906.

SALUTATIONS to thee, O friend! I herewith send you a report like unto the last, excepting, first, your urgent request in regard to the doings of the tohungas in the district, and, secondly, in regard to the scarcity of potatoes.

The first part of my report will deal with the above two subjects.

Tohungas.—This is a question which has occupied our attention greatly within the past year. There are three tohungas in this district, two of whom have been stopped by the action of the Council, which warned them that if they were found trading on the credulity of the people they would be fined the sum of £50. Since then I have heard nothing more of their movements; if they have been at work they have done so secretly. The third individual is one who has combined a knowledge of herbs with a form of *karakia*, which I think is but a cloak to hide his doings. I made inquiries and found that he sometimes prevented the administration of drugs ordered by European doctors. I have made stringent inquiries as to whether medicines from duly qualified sources had been prevented from being administered, and whether cold water was used in the treatment of the patient. You know these are two of the courses which frequently prove fatal, and that is why I believe a number of tohungas are working secretly. In times gone by the name of "tohunga" was only applied to the learned of the Whare Wananga, but to-day anybody can become a tohunga—mere boys and girls even. Though the law has been laid down to suppress the tohunga evil, I am certain that there are many of them practising their craft. The law is not stringent enough. To meet this, I believe you will find that if the law was imposed upon persons who consulted tohungas it would mitigate the evil, as I know as well as you do it is not the tohunga who seeks the patient, but it is the patient who seeks the tohunga. That is why if we strike at the root the branches will wither; then the tohunga will not be the only one who will be scared, but likewise every seeker after the *tikanga maori*. There are many tohungas who will only perform after earnest solicitation. This is a matter to be considered by the General Conference of the Councils.

Potato-blight.—The potato-blight has been very severe in the whole of this district. The potatoes which were sown in August did well, but all the rest which were sown during the other months withered and died away.

Early Marriages.—These are a few words to strengthen what you have already mentioned in your report for last year. I know for a certainty that this is absolutely one of the great causes of the decay of our race. In early days youths were not allowed to marry till they had matured; in these days paternal and maternal responsibilities are assumed at twelve and fourteen years. From this cause many have become weaklings, prone to consumption, and often die in giving birth to children. Many times also the offspring die at birth, and those who live live only long enough to be snatched away by death. All know this is an evil; but the Maori is blind. This would be a good *take* for the Government to legislate a law empowering the Maori Councils to deal with this question so that the young generation springing up may be able to walk in the path that will bring them to health.

Houses.—I am pleased to report that the Maori mind is grasping the situation, and thus many comfortable weatherboard houses have been erected during the past year. Many houses are now being constructed; for some the timber is drying waiting to be put up; and many of the *whare wiwi* will be replaced by more sanitary weatherboard houses. At Tapuaeharuru a really new village has been constructed within a year. The accompanying table will, however, give you an idea of what is being done in all the villages:—

District.	New Weather-board Houses.	New Rush Houses.	W.C.s.	Renewed.	Destroyed.
Rotoiti	2	..	1	..	1
Matata	2	1	2	1	2
Te Puke	.	1	..	..	..
Taheke	..	..	..	..	..
Ohinemutu	5	..	..	..	1
Owhata	5	..	..	..	..
Tarewa	2	..	..	..	..
Whakarewarewa	4	..	3	..	..
Maketu	..	..	..	..	..
Motiti	5	..	..	..	..
Otamarakau	1	..	..	..	..
Waiteti	1	1	..	..	..
Waiotapu	12	..	..	..	..
Totals	39	3	6	1	4

Drunkenness.—Our Councillor district has been brought under section 46 of "The Licensing Act, 1904." The district was brought under this Act not for the reason that all were drunkards, but it was done for the persistent few. Much good has resulted from this action, only £14 being collected in fines since 1901; thus you see the law has been the cause of making those who drank much drink a little less, and those who drank a little not to drink at all.

Health of the People.—In regard to vaccination, I am pleased to state that the children and adults of Te Puke, Makatu, and Matata have been done—there are very few of the children unvaccinated; but I am sorry to add that very few have been vaccinated at Rotorua and Rotoiti. There are two causes for this: (1) the Natives in these parts are sceptical, and (2) the Vaccinator does not care to go out of his way to vaccinate them. He wishes that they should all go in to him at Rotorua. The best plan would be for the doctor to go to all the villages, and that a notice be sent to the Natives to gather together at one place prior to his arrival, and that he should explain to them the benefits resulting from vaccination.

I am glad to report that the general health of this district has been excellent during the past year. No outbreaks of infectious diseases have occurred; only a few children at Tapuaeharuru suffered, but none were taken. This was not a disease to be alarmed over, it was only due to cold. The following table will give you an idea of the excess of births over deaths during the past year:—

District.	Tribe.	Births.	Deaths.
Te Ngae	Ngatiuenukukopako ..	..	1
Rotorua	Ngatiwhakaue	6	11
Maketu	„	2	2
Matata	Ngatirangitihi	4	2
Maketu	Ngatipikiao	2	3
Rotoiti	„	5	4
Otamarakau	„	1	4
Matata	Te Tawera	3	5
Whakarewarewa	Tuhourangi	13	5
Te Puke	Tapuika	1	2
„	Tuhourangi	2	1
„	Ngatimoko	1	..
Waitete	Ngatitamahika	1	1
Waiotapu	Ngatiwhao Ngatitu	5	..
Horohoro	Ngatituara	2	..
Te Awahou	Ngatirangiwewehi	3	..
		—	—
Totals	.. .. ..	51	41

Increase, 10.

I know that many more births than those recorded occurred, but owing to severe sickness in the Registrar's family he was unable to go around and attend to his duties. The Government should subsidise these Registrars so that they be enabled to carry out their duties properly.

The number of deaths is sad: there were many whose days were drawing to a close through age, but the majority were young children. Some died at birth, some through colds and ignorance in nursing, and some were taken through lack of suitable food. It is deplorable. You know the ignorance prevailing. It would be well if the Government could supply all the Native-school teachers with proper food for infants and patients, as you know the extreme poverty of some prevents them from obtaining suitable food.

The drainage of Ohinemutu and Whakarewarewa, which I reported last year, has not yet been supplied. This should be done, because the houses are crowded together, and many visitors frequent these parts. Do not let the unpicturesqueness of drains and water-pipes in the Maori kainga deter the Government from spending a little money on these great adjuncts to health.

To end up this report, I want to let you know that there is one other reason why the Maoris are not multiplying, and that is due to the sterility of the women. Those who are blessed with a few are blessed indeed; but the majority of the few are quickly overtaken by death, and those that remain are a great cause of anxiety to their parents, and thus we are left in the trembling state of a query whether we are decreasing or increasing.

RAURETI P. MOKONUIARANGI.

Dr. Pomare. Tuhirangi, 25th April, 1906.

SALUTATIONS to thee, O friend! Enclosed is a short report to you of the year's work. O friend! many improvements have taken place within the past year in this district. The *maraes* and houses have been improved tenfold, and as a result very few deaths have occurred. Those who did die were mostly old men, and they died from chronic complaints.

Enough. Kia ora.

Number of houses finished and passed, 189; number condemned, 43.

TAIAWHIO TE TAU.

TAMATEA MAORI COUNCIL DISTRICT.

IHAIA HUTANA, Sanitary Inspector, writes:—

Great improvements have been made in this district, consequently there has been less infectious disease during the past year compared with previous years. The Maori style of living is becoming absorbed by that of the pakeha: the Maori whares in the district have all but disappeared, new houses properly ventilated being erected to take their place. The reform has not stopped at the houses, but has also reached the well, and beyond the well to the fowls and pigs, which are now separated from the kaingas. There has been less sickness amongst the children—sickness and death being more or less confined to the very old, who have been stricken down by such chronic diseases as rheumatism, asthma, consumption, and senility.

There are two things which are causing a great deal of trouble in this district—first, the avidity of the women to drink intoxicating liquors, which are bought in bottles and taken away from the hotels to be drunk; and, second, the squandering of much money by the men, women, and children on horses at the races. This is a malady which is equal to tuberculosis in its effects.

Tohungaism is much less in the district than formerly, there being but one tohunga; and he really looks after the sick and afflicted, though a little liquor is prescribed.

Number of houses built, 37; number of closets erected, 25; number of houses destroyed, 19.

The potato-blight has affected the whole district.

From January, 1905, to the 1st July, 1906, there were twenty-eight births in excess of deaths, there being sixty births and thirty-two deaths.

Enough. Kia ora.

RAMEKA WAIKEREPURU writes from Ohaeawai:—

Much progress has been made during the past year in the Councillor Districts of Pewhairangi and Whangarei in regard to the sanitation of houses, *maraes*, and even to the beds and to the food they eat. Many are anxious to have their lands so partitioned that they can build on them, each building on his own section. This is the only drawback at present. All are desiring to better their condition; out of twenty-five houses that I recommended to be enlarged on account of the numbers living in them, six have been so done. In regard to closets the people are still sceptical in putting them up, and therefore the law must be made to take its course in regard to this matter.

There was a crop of four tohungas growing and blooming for a season, but now they have apparently died out. My private opinion, however, is that they are not dead but merely work in secret upon the few who seek them. Why I know there were four tohungas in this district was owing to the fact that they all applied to the Council for licenses under the Act of 1900. When they were cross-examined as to the medicines they used in different cases they told us the names of the medicines. Then the Council, on account of fear that mischief might be done, told them that they had better bring samples of their medicine, and that two qualified doctors would be called in to examine them to see whether they were efficacious and right. On account of this action those tohungas have not returned to ask for licenses. There are, however, two men who have been granted licenses by the Council to give medicines; but they have been forbidden to immerse patients in cold water, and not to prevent patients from going to European doctors. Further, they have been requested by the Council to report on the cases they undertake—the result, together with their diagnosis. The following diseases they may practise upon: Amenorrhœa, asthma, colds, constipation, and stoppage of micturition. The Council has been satisfied that they are quite capable of looking after the aforementioned diseases. All other cases that come under their notice are to be recommended by them to be taken to the European doctors.

Sickness has been fairly prevalent throughout the district, but not in epidemics.

In regard to the potato-blight it has been very severe, and for that reason a petition was sent to the Council, signed by many people, asking the Council to allow the humble petitioners to make their corn rotten by immersing in water; but because of the notice from the Public Health Department which was circulated several years ago that the Maoris must not eat the bodies of animals dying from disease, and, further, that they must not eat rotten potatoes or rotten corn—that is why the Council replied that it did not see its way to grant them their petition. It would be well for the Department to see that the Government fulfils its promise to assist them by forwarding something to eat, together with potato-seed.

The Liquor Disease.—This is one of the taniwhas which causes the *rangatira* and the *tutua* to become slaves. In the days that have passed, this disease was practically overcome; but on the day that Ru Reweti was buried the Maoris gave the pakehas a feast, and the table was laden with intoxicating liquors.

For ten years this is the first time I have heard of such a thing happening amongst the Ngapuhis. They had given up liquor-drinking long before the Act was passed. Great darkness has filled me for this great temptation which causes the *rangatira*, the *marae*, the *ture*, and the *whakapono* to fall. But the law has kept on its way; the Council of Pewhairangi has fined those rangatiras £10 for the breach of the law, and, further, the Council has taken action in regard to the giving of liquor to women at the feast.

All the hapus in this district have taken hold of things most energetically, except the Hapu of Kaka Porowini. Since 1902 he has been the cause of much trouble. He and his people were fined for not paying the dog-tax; and he was the cause of one of the members of the Council resigning his seat. When I went round to get the census they refused to give their names because it was Kaka Porowini's *tikanga*.

In regard to vaccination, this is a good undertaking. There are two things, however, which have caused a little trouble: First, when the doctor arrived at the schoolhouse to vaccinate the school-children, the schoolmaster refused to allow the children to be vaccinated during school hours. Second, some of the children had to be vaccinated three times before they took: this is the fault of the vaccine. I want you to again ask the doctor to go on vaccinating them, as there are fully two hundred children not yet vaccinated.

In regard to early marriages, this is one of the great diseases which make the Maori's burden heavy. When weaklings marry weaklings the result must be weaklings. The only remedy would be to pass an Act regulating this evil.

Kia ora.

PATHOLOGICAL REPORT.

Dr. Mason, Chief Health Officer, Department of Public Health, Wellington, 10th August, 1906.

We have the honour to submit the attached tabulated report of the work done in the laboratories at Sydney Street and at Wallaceville during the past year.

The total number of specimens received for examination was 1,006—a very great increase on the number (716) sent in last year. Of these, 834 were dealt with at Sydney Street laboratory, and 172 at the Wallaceville one.

The investigation of the milk-supplies and water-supplies of the colony has materially increased this year's output of work, especially as in many cases the analysis led to a fairly elaborate research, the details of which are not shown in the tabulated list.

We would particularly draw attention to the excellent work done by our assistants, Mr. J. A. Hurley at Sydney Street, and Mr. G. H. Barker at Wallaceville. The position they hold is a responsible one, entailing much technical skill, accuracy in the smallest detail, and a whole-hearted devotion to the subject. The fact that they are able to fill the posts so satisfactorily will, we trust, be adequately recognised.

R. H. Makgill, Bacteriologist.
J. A. Gilruth, Pathologist.

Table showing Result of Examination of Pathological Specimens.

Material.	Object of Examinations.	Positive.	Negative.	Total.
Sputum	For tubercle	133	217	350
"	For hydatids	6	7	13
"	For influenza bacillus	1	..	1
"	For other organisms	4	..	4
Total sputa examined		..	..	368
Purulent and other discharges and fluids	For pyogenic organisms	2	3	5
" "	For tubercle	2	16	18
" "	For gonococci	3	14	17
" "	For plague	..	12	12
" "	For parasites	..	..	..
" "	For other conditions	7	4	11
Total discharges examined		..	..	63
Blood	For typhoid (Widal's)	11	14	25
"	For leprosy	1	..	1
"	For other conditions	3	6	9
Total blood samples		..	..	35
Throat swabs	For diphtheria bacillus	43	29	72
"	For other conditions	1	13	14
Total throat swabs examined		..	..	86
Tissues examined by section	For malignancy	72	72	144
" "	For tubercle bacillus	2	6	8
" "	For other conditions	28	12	40
Total tissues examined		..	..	192

URINES EXAMINED.

Method.	What Sought.	Positive.	Negative.	Total.
Bacteriologically	Tubercle	3	29	32
Microscopically	Deposits	25	..	25
Chemically	Albumen	17	16	33
"	Sugar	25	10	35
"	Other conditions	6	2	8
Chemical estimations	Urea	5	..	5
Total urines examined		..	..	138

ANIMALS EXAMINED.

Mice.—For plague, 5. Result negative in each case.

Rats.—For plague, 5. Result, all negative.

Insect-larva.—1. Identified.

Guinea-pigs.—Twenty-four guinea-pigs were used for inoculation, the majority being to test the presence or absence of tubercle bacilli in sputums and urines, others for ascertaining the virulence of diphtheria-cultures, and the remainder in investigating the safety of water-samples.

Total animals examined, 35.

MISCELLANEOUS SPECIMENS.

Water Samples.—Twenty-eight samples of water were examined bacteriologically, chiefly from municipal supplies. These waters are generally in a satisfactory condition, the only exception being a specimen taken from the Ponsonby Reservoir at Auckland, which was found to contain *Bacillus coli* and a putrefactive anærobe. The water-supplies at Masterton, Nelson, and Christchurch were exceptionally good at the time of examination.

Aerated Waters.—Nineteen different samples were examined—seven in bottles and twelve in siphons. The condition of these was satisfactory.

Milk Samples.—Forty-six specimens of milk from various centres in the colony were examined bacteriologically. Pathogenic organisms were found in nearly half the samples. Comparatively few could be classed as being in a satisfactory condition.

Foodstuffs.—The following foods were examined: Currants, 3 samples; bread, 3 samples; biscuit, 1 sample; pickled tongue, 1 sample.

Vaccine.—Eight specimens of glycerinised calf vaccine were investigated. Repeated bacteriological examinations were made to ascertain when the lymph was free from extraneous organisms. In all eighty-six cultivations were made for the purpose.

Cultures examined as to nature, 6.

One filter was tested as to its bacteriological efficiency.

The following table shows the results of the examinations of the various tumours received at the Health Department laboratory at Sydney Street, classified according to nature and the region of the body from which they came:—

TABLE SHOWING RESULT OF EXAMINATIONS OF TUMOURS.

	Digestive System.		Respiratory System.		Reproductive System.			
	Tongue, Lips, and Mouth.	Stomach and Intestines.	Larynx.	Lungs.	Uterus.	Ovary.	Breast.	Testicle.
Carcinoma	2	1	..	..	7	..	8	..
Sarcoma	1	..	..	..	..	1	4	2
Simple tumours	3	6	..	2	13	1	11	7

	Urinary System.		Organs of Special Sense.	Sympathetic System.	Integumentary System.	Locomotive System.	Total.
	Kidney.	Bladder.	Eye, &c., Nose and Ear.	Glands.	Skin.	Muscles, Bones, &c.	
Carcinoma	..	..	2	5	4	2	33
Sarcoma	..	..	..	..	2	3	13
Simple tumours	..	..	2	9	5	6	65

REPORTS OF PUBLIC ANALYSTS.

AUCKLAND.

SIR,— Auckland, 31st May, 1906.

I have the honour to submit herewith reports of analyses made in my laboratory under the Food Adulteration Prevention Acts during the year ending the 31st March, 1906.

The number of samples examined were sixty-three, the particulars being given on the sheets printed for this purpose and forwarded by this mail.

Twenty-five samples of milk were examined, one only coming below the standard, which under our present law would insure a conviction, and which was recorded in this instance.

Of twenty samples of hop-beer twelve convictions were sustained under the licensing laws, with various fines.

I have, &c.,

J. A. POND, P.C.S.,
Colonial Analyst.

The Chief Health Officer, Wellington.

Return of Analyses at the Analytical Laboratory, Auckland, for the Year ended the 31st March, 1906.

Department or Person from whom Sample received.	Date received.	Nature of Sample.	Adulteration suspected, or for what analysed.	Result of Analysis.
	1905.			
Police ..	May 8 ..	Cream of tartar ..	Poisons	Detected wheat-starch; nothing deleterious.
" ..	June 10 ..	Medicine	"	Detected bromide of potassium; no alkaloids.
District Health Office	" 16 ..	Butter	Powdered glass ..	Detected a few siliceous particles; glass absent.
Ditto ..	" 16 ..	"	" ..	Ditto.
" ..	" 16 ..	Bread (three pieces)	" ..	"
Police ..	" 12 ..	Vinegar	Sulphuric acid ..	Present—acetic acid, 27·63 per cent., free; SO_3, 0·16 per cent., and HCl, 0·02 per cent., both combined with bases.
District Health Office	Aug. 16 ..	Bread	Quality	Reported irregular kneading; flour from sprouted grain; nothing deleterious.
Ditto ..	" 16 ..	"	"	Ditto.
" ..	" 16 ..	"	"	"
H.M. Customs	" 23 ..	Hop-beer	Alcohol	Reported proof spirit, 2·14 per cent. by volume.
"	" 23 ..	"	"	Reported proof spirit, 2·73 per cent. by volume.
Auckland Boro' Council	" 24 ..	Milk	Water	Reported above standard; rich milk.
Ditto ..	" 24 ..	"	"	"
" ..	" 24 ..	"	"	"
" ..	" 24 ..	"	"	"
Police ..	Sept. 1 ..	Hop-beer	Alcohol	Reported proof spirit, 2·48 per cent. by volume.
" ..	" 1 ..	"	"	Reported proof spirit, 2·75 per cent. by volume.
" ..	" 1 ..	"	"	Reported proof spirit, 3·44 per cent. by volume.
" ..	" 1 ..	"	"	Reported proof spirit, 5·34 per cent. by volume.
" ..	" 7 ..	Sarsaparilla ..	Deleterious matter	All aqueous decoctions of vegetable matter flavoured with essential oil of sassafras; harmless, valueless beverages.
" ..	" 7 ..	" ..	"	
" ..	" 7 ..	" ..	"	
" ..	Oct. 25 ..	Fluid-broth ..	Copper-salts ..	Reported no trace of copper or other poisons.
District Health Officer ..	Nov. 2 ..	Bread	Diabetic food ..	Reported containing large quantity of starch.
Ditto ..	" 2 ..	Flour	" ..	Reported baked flour, dextrinised.
Costley Home	Dec. 11 ..	Milk	Water	Reported rich milk, considerably above standard.
	1906.			
Police ..	Feb. 5 ..	Medicine	Emmenogogue ..	Reported solution of sulphate of iron.
" ..	" 5 ..	"	"	Reported tincture of extract of ergot.
" ..	" 5 ..	Medicine—pills ..	"	Reported sulphate of iron and aloes.
" ..	" 8 ..	Hop-beer	Alcohol	Reported proof spirit, 9·45 per cent. by volume.
" ..	" 8 ..	"	"	Reported proof spirit, 9·04 per cent. by volume.
" ..	" 8 ..	"	"	Reported proof spirit, 6·58 per cent. by volume.
" ..	" 8 ..	"	"	Reported proof spirit, 5·86 per cent. by volume.
" ..	" 8 ..	"	"	Reported proof spirit, 3·16 per cent. by volume.
" ..	" 8 ..	"	"	Reported proof spirit, 7·87 per cent. by volume.
" ..	" 8 ..	"	"	Reported proof spirit, 3·44 per cent. by volume.
" ..	" 8 ..	"	"	Reported proof spirit, 4·64 per cent. by volume.

Return of Analyses at the Analytical Laboratory, Auckland.—continued.

Department or Person from whom Sample received.	Date received.	Nature of Sample.	Adulteration suspected, or for what analysed.	Result of Analysis.
	1906.			
Police ..	Feb. 8 ..	Hop-beer	Alcohol	Reported proof spirit, 3·16 per cent. by volume.
" ..	" 8 ..	"	"	Reported proof spirit, 1·16 per cent. by volume.
" ..	Mar. 30 ..	"	"	Reported proof spirit, 3·45 per cent. by volume.
" ..	" 30 ..	"	"	Reported proof spirit, 5·13 per cent. by volume.
" ..	" 30 ..	"	"	Reported proof spirit, 3·65 per cent. by volume.
" ..	" 30 ..	"	"	Reported proof spirit, 3·3 per cent. by volume.
Auckland Boro' Council	" 30 ..	Milk	Water	Reported above standard; rich milk.
Ditto ..	" 30 ..	"	"	"
" ..	" 30 ..	"	"	Reported above standard: total solids, 12·2 per cent.; fat, 4·12 per cent.
" ..	" 30 ..	"	"	Reported below standard: total solids, 0·71 per cent.; fat, 3·01 per cent.
" ..	" 30 ..	"	"	Reported above standard; rich milk.
" ..	" 30 ..	"	"	Reported above standard: total solids, 11·69 per cent.; fat, 3·5 per cent.
" ..	" 30 ..	"	"	Reported above standard: total solids, 12·3 per cent.; fat, 3·8 per cent.
" ..	" 30 ..	"	"	Reported above standard: total solids, 12·06 per cent.; fat, 3·6 per cent.
" ..	" 30 ..	"	"	Reported above standard: total solids, 12·02 per cent.; fat, 3·68 per cent.
" ..	" 30 ..	"	"	Reported above standard: total solids, 11·93 per cent.; fat, 3·7 per cent.
" ..	" 30 ..	"	"	Reported above standard: total solids, 11·67 per cent.; fat, 3·7 per cent.
" ..	" 30 ..	"	" .. .	Reported above standard: total solids, 12·84 per cent.; fat, 4·2 per cent.
" ..	" 30 ..	"	"	Reported above standard: total solids, 12·86 per cent.; fat, 4·07 per cent.
" ..	" 30 ..	"	"	Reported above standard: total solids, 11·52 per cent.; fat, 3·9 per cent.
" ..	" 30 ..	"	"	Reported above standard: total solids, 12·18 per cent.; fat, 4·24 per cent.
" ..	" 30 ..	"	"	Reported above standard: total solids, 12,04 per cent.; fat, 5 per cent.
" ..	" 30 ..	"	"	Reported above standard: total solids, 11·68 per cent.; fat, 3·6 per cent.
" ..	" 30 ..	" .. .	"	Reported above standard: total solids, 11·6 per cent.; fat, 2·9 per cent.
" ..	" 30 ..	"	"	Reported above standard: total solids, 11·69 per cent.; fat, 3·5 per cent.
" ..	" 30 ..	"	"	Reported above standard: total solids, 12·06 per cent.; fat, 3·6 per cent.

J. A. Pond, F.C.S., Colonial Analyst.

Wellington.

Sir,— Colonial Laboratory, Wellington, 19th April, 1906.

In compliance with section 38 of "The Adulteration Prevention Act, 1880," I have the honour to report that, for the year ending the 31st March, 1906, the following analyses have been made:—

Nature of Sample.	Number of Samples.	Nature of Sample.	Number of Samples.
Milk	12	Oatmeal	1
Bread	9	Bacon	1
Alcohol	3	Butter	1
Cream	2		—
Dried milk	1	Total	30

Of the milks, two samples were adulterated with boracic acid. One of the cream-samples contained 0·25 per cent. of boracic acid. The bacon contained $\frac{1}{40}$ grain of arsenious acid, and the butter 0·09 per cent. boracic acid. The remaining samples were unadulterated.

I have, &c.,

J. S. Maclaurin, D.Sc., F.C.S.,
Colonial Analyst.

The Chief Health Officer, Department of Public Health, Wellington.

Return of Analyses at the Analytical Laboratory, Wellington, for the Year ended the 31st March, 1906.

Department or Person from whom Sample received.	Date received.	Nature of Sample.	Adulteration suspected, or for what analysed.	Result of Analysis.
	1905.			
Dr. Hislop ..	April 3 ..	Urine	Diacetic acid and acetone	None found.
Dr. Monckton	„ 5 ..	Alcohols	Methyl alcohol ..	„
Dr. Valintine..	„ 14 ..	Bread	Alum, &c... ..	„
Cordial-factory	„ 26 ..	Water	General analysis ..	Extremely bad water; quite unfit for human consumption.
„ ..	May 8 ..	„	„ ..	Water of fair quality.
„ ..	„ 8 ..	„	„ ..	Water of good quality.
„ ..	„ 8 ..	„	„ ..	„
„ ..	„ 9 ..	„	„ ..	Water of poor quality.
„ ..	„ 9 ..	„	„ ..	Water of good quality.
Inspctr. Munro	„ 9 ..	„	„ ..	„
Cordial-factory	„ 9 ..	„	„ ..	Water of fair quality.
„ ..	„ 10 ..	„	„ ..	„
Inspect'r Dolby	„ 10 ..	„	„ ..	Heavily charged with organic matter.
Inspector of Weights and Measures	„ 17 ..	Bread	Alum	None found.
Health Department	„ 17 ..	Water	General analysis ..	Both waters of good quality.
Hokitika Borough Council	„ 25 ..	„	„ ..	No. 1 of good quality, Nos. 2 and 3 slightly inferior to No. 1.
Insp. Middleton	„ 31 ..	„	„ ..	Both waters of good quality.
Dr. Campbell..	June 12 ..	Urine	Sugar	No. 1, 4·76 per cent.; No. 2, 2·63 per cent.
Dr. McBeth ..	„ 16 ..	Dried milk ..	Poison	None found.
Inspr. Munro..	„ 24 ..	Water	General analysis ..	Both waters of good quality.
Mr. Heycock ..	„ 29 ..	„	„ ..	Water not of good quality.
Dr. Mackin ..	„ 29 ..	Urine	Sugar	1·43 per cent.
Insp. Middleton	July 4 ..	Water	General analysis ..	All of very good quality.
Charles Dougal	„ 6 ..	„	„ ..	Water of fair quality.
Dr. Mackin ..	„ 10 ..	Urine	Sugar	None found.
Insp. Middleton	„ 13 ..	Water	General analysis ..	Water of fair quality.
Health Department	„ 13 ..	„	„	
Thomas Cripps	„ 14 ..	Oatmeal	Poisons	None found.
Inspr. Brownlie	„ 21 ..	Water	General analysis ..	Water bad quality.
District Health Officer	„ 27 ..	Mixture and ointment	Atropine	(*a*) None; (*b*) considerable amount.
Fresh Food and Ice Company.	„ 31 ..	Cream	Boric acid ..	0·25 per cent. found.
Mr. Christie ..	„ 31 ..	Milk	Poisons	None found.
Dr. Mackin ..	Aug. 8 ..	Urine	Sugar	1 per cent. found.
Dr. T. King	„ 9 ..	Biscuit	General analysis.	
James Perry ..	„ 10 ..	Water	„ ..	Water of good quality.
Dr. Gibbs ..	Sept. 5 ..	Bacon	Arsenicus acid ..	$\frac{1}{10}$ grain per pound found.
„ ..	„ 7 ..	Butter	Boric acid ..	Found 0·09 per cent.
Insp. Gardiner	„ 20 ..	Water	General analysis ..	Not a good water.
Dr. Makgill ..	„ 26 ..	„	„ ..	„
Inspector of Weights and Measures	„ 25 ..	Milk	Boric acid ..	0·12 per cent. found.
Dr. Makgill ..	„ 28 ..	„	„	No. 2 contains large amount, Nos. 1 and 3 none.
„ ..	Oct. 16 ..	Cream	Preservative ..	None found.
Dr. De Lisle ..	„ 30 ..	Water	General analysis ..	Water of fair quality.
„ ..	„ 30 ..	„	„ ..	Water of good quality.
„ ..	„ 30 ..	„	„ ..	Water of fair quality.
Dr. Makgill ..	Nov. 2 ..	Milk	Preservatives ..	None found.
Dr. Mackin ..	„ 8 ..	Urine	Sugar	1·16 per cent. found.
District Health Officer	„ 16 ..	Milk	Adulterants ..	Milk well above standard.
Inspec'r Schauer	„ 30 ..	„	„ ..	„
Dr. Hislop ..	Dec. 1 ..	Urine	Colouring-matter.	
Dr. Gibbs ..	„ 2 ..	Incrustation ..	Arsenic	Heavy traces found.
Inspec'r Brownlie	„ 13 ..	Water	General analysis ..	Water of good quality.
District Health Officer	„ 15 ..	„	„ ..	Water of fair quality.
Ditto ..	„ 18 ..	„	„ ..	Water of good quality.
„ ..	„ 18 ..	„	„ ..	Water of very good quality.
„ ..	„ 22 ..	„	„ ..	Water of satisfactory quality.
	1906.			
„ ..	Jan. 16 ..	„	„ ..	Water of bad quality
„ ..	Feb. 13 ..	„	„ ..	Water of good quality (slightly turbid).
„ ..	„ 27 ..	„	„ ..	Water of fair quality.
„ ..	March 2 ..	Milk	Watering, &c. ..	Milk well above standard.
„ ..	„ 6 ..	Water	General analysis ..	Water of good quality.
Porirua Asylum	„ 27 ..	Sewage-effluents ..	„	
District Health Officer	„ 30 ..	Milk	Watering	Milk just above standard.

J. S. MACLAURIN, D.Sc., F.C.S., Colonial Analyst.

CANTERBURY.

SIR,— 6 Brittan Street, Linwood, Christchurch, 21st April, 1906.

I have the honour to send you under separate cover the returns of analyses made during the year ending the 31st March, 1906. I have, &c.,

A. A. BICKERTON, Colonial Analyst.

Dr. Mason, Chief Health Officer, Wellington.

Return of Analyses at the Analytical Laboratory, Christchurch, for the Year ended the 31st March, 1906.

Department or Person from whom Sample received.	Date received.	Nature of Sample.	Adulteration suspected, or for what analysed.	Result of Analysis.
	1906.			
Police ..	April 15 ..	Combustible ..	To identify ..	Reported it to be gelignite, discoloured with dirt.
Customs ..	" 13 ..	Acetic acid ..	Tariff	57 per cent. acetic acid.
Police ..	" 19 ..	Explosive	To identify ..	Found to be gelignite.
" ..	" 19 ..	" ..	" ..	"
" ..	" 19 ..	" ..	" ..	"
" ..	" 19 ..	Detonators ..	" ..	Found to be charged with mercuric fulminate.
" ..	" 24 ..	Explosives ..	" ..	Dynamite.
" ..	" 24 ..	" ..	" ..	Dynamite and paraffin.
" ..	" 28 ..	Exhibit, Rex *v.* Allandale and others	To identify stain ..	Found to be blood-stain.
" ..	" 29 ..	Liquid in bottle ..	For poison ..	Contained $\frac{1}{64}$ grain of extract.
" ..	" 29 ..	" ..	" ..	" $\frac{1}{256}$ "
" ..	" 29 ..	" ..	" ..	Very dilute tincture of aconitum N.
" ..	" 29 ..	" ..	" ..	" belladonna.
" ..	" 29 ..	" ..	" ..	" China.
" ..	" 29 ..	" ..	" ..	" mercurious cor.
" ..	" 29 ..	" ..	" ..	" cina.
Health ..	" 29 ..	Water, 72 Manchester Street	Purity ..	Volatile matter, 3·92 gr. per gallon; insoluable matter, 2·99 gr. per gallon; sodium-chloride, 0·93 gr. per gallon; traces of lime, sulphates, and nitrates; magnesia, nitrates, phosphates, nil; free ammonia, 0·04 parts per million; albuminoid ammonia, 0·036 parts per million. The water is not bad, although not so good as most of the artesian-well water of Christchurch.
" ..	May 18 ..	Water from Waitaki River, Oamaru	"	Volatile matter, 1·96 gr. per gallon; sodium-chloride, 0·7 gr. per gallon; sodium-carbonate, 26·32 gr. per gallon; silicate, &c., 0·42 gr. per gallon; traces of lime, iron, sulphates. It appears as if the presence of sodium-carbonate was due to an accident.
..	" 18 ..	Water from Pareora River, Timaru	"	Volatile matter, 1·12 gr. per gallon; sodium-chloride, 0·91 gr. per gallon; silica, &c., 0·4 gr. per gallon; lime, 0·83 gr. per gallon; traces of iron, magnesia, sulphates; free ammonia, trace; albuminoid ammonia, 0·016 parts per million. A good water.
" ..	" 18 ..	Water, Thompson's factory — filtered town water	"	Volatile matter, 1·4 gr. per gallon; sodium-chloride, 1·04 gr. per gallon; silica, &c., 0·64 gr. per gallon; traces of lime, iron, and sulphate; free ammonia, trace; albuminoid ammonia, 0·004 parts per million. Good water.
" ..	" 18 ..	Water from well at Sheffield	"	Volatile matter, 1·64 gr. per gallon; sodium-chloride, 1·65 gr. per gallon; sodium-carbonate, 0·4 gr. per gallon; silicates, &c., 0·65 gr. per gallon; traces of lime, nitrates, and sulphates; free ammonia, trace; albuminoid ammonia, 0·004 parts per million. A good water.
Customs ..	" 21 ..	Acetic acid ..	Tariff	57·8 per cent. acetic acid.
Police ..	" 15 ..	Jam from Sergeant Johnson	Adulteration ..	Free from any injurious ingredients or preservatives, and made from genuine black currants. The abnormal appearance of the jam was due to the sugars crystallizing out.

Return of Analyses at the Analytical Laboratory, Christchurch—continued.

Department or Person from whom Sample received.	Date received.	Nature of Sample.	Adulteration suspected, or for what analysed.	Result of Analysis.
	1906.			
Health ..	June 7 ..	Water from Kurow Station	..	Volatile matter, 7·28 gr. per gallon; carbonates and sulphates of lime and magnesia, 3·64 gr. per gallon; chloride of sodium, 3·69 gr.; nitrates and sulphates of alkalies, 4·43 gr.; nitric anhd., 2·21 gr.; chlorine, 2·24 gr.; phosphates and iron, traces. The high amounts of nitric anhd. and chlorides, and the traces of phosphates indicates that the water supplying the well is contaminated by infiltration of matters from the cesspit.
Sister Dora ..	„ 16 ..	Medicine ..	..	Found to be free from poison.
Customs ..	„ 26 ..	Acetic acid ..	..	59·21 per cent. acetic acid.
Health ..	„ 26 ..	Water, 21 Peacock Street, Christchurch (Inspector McKenzie)	Purity	Volatile matter, 1·4 gr. per gallon; sodium-chloride, 1·04 gr. per gallon; nitrates and sulphates, 0·64 gr. per gallon; insoluble matter, 1·68 gr. per gallon; free ammonia, 0·08 parts per million; albuminoid ammonia, 0·008 parts per million. The colour of the water is bad—this is due to the presence of iron and a little carbon; otherwise the water is good. It would be best to filter it before drinking.
Customs ..	July 1 ..	Acetic acid ..	Tariff	58·5 per cent. acetic acid.
H. W. Bishop, Esq., Stipendiary Magistrate	„ 4 ..	Opium	To see if genuine ..	A mixture of starch, invert sugar, water, other organic matters, and a a little colouring; probably made from sago, treacle, and a little gum. The sample was free from opium.
Ditto ..	„ 4 ..	„	For comparison ..	Genuine opium for smoking.
„ ..	„ 4 ..	Opium-ash ..	To see if suitable for smoking	Opium-ash containing 49 per cent. of opium, which could be recovered and used for smoking.
Health ..	„ 1 ..	Water, Kurow River	Purity	Volatile matter, 1·4 gr. per gallon; carbonates and sulphates of zinc, 1·41 gr. per gallon; sodium-chlorides, 0·23 gr. per gallon; clay-silicates, 0·53 gr. per gallon; free ammonia, bare trace; albuminoid ammonia, bare trace; iron and sulphate, traces. The water is a very pure one.
Customs ..	July 20 ..	Acetic acid ..	Tariff	26·5 per cent. acetic acid.
„ ..	„ 20 ..	„ ..	„	4·6 „
„ ..	„ 31 ..	„ ..	„	30 „
„ ..	„ 31 ..	„ ..	„	57·4 „
„ ..	Aug. 10 ..	„ ..	„	56 „
Police (Mr. Cook)	„ 16 ..	Chops ..	Phosphorus poison..	Found free from phosphates, but containing contagious photogenic bacteria—a luminous species of putrefactive bacteria.
Customs ..	„ 27 ..	Concentrated vinegar	Tariff	Acetic acid.
„ ..	„ 27 ..	Acetic acid ..	..	„
„ ..	„ 27 ..	Vinegar	..	„
„ ..	„ 27 ..	Acetic acid ..	..	56·5 per cent. acetic acid.
„ ..	„ 30 ..	„ ..	..	58·7 „
„ ..	Sept. 14 ..	Glacial acetic acid..	..	98 per cent. acetic acid; 56° Fahr. melting-point.
„ ..	„ 14 ..	Acetic acid ..	..	56·3 per cent. acetic acid.
Health ..	Oct. 14 ..	Water, well at Lincoln	Purity	Volatile matter, 1·96 gr. per gallon; sodium-chloride, 1·27 gr. per gallon; lime, 1·54 gr. per gallon; sulphate of soda, 0·63 gr. per gallon; iron and silicate, 0·42 gr. per gallon; free ammonia, 0·03 parts per million; albuminoid ammonia, 0·008 parts per million. A very good water.
„ ..	„ 24 ..	Water, Geraldine water-supply	„	Volatile matter, 1·01 gr. per gallon; sodium chloride, 0·69 gr. per gallon; lime, iron, and silicates, 1·41 gr. per gallon; free ammonia, 0·003 parts per million; albuminoid ammonia, 0·014 parts per million. Very good water.
..	„ 24 ..	Ditto	„	Volatile matter, 1·12 gr. per gallon; sodium-chloride, 0·69 gr. per gallon; lime, iron, and silica, 0·99 gr. per gallon; free ammonia, 0·005 parts per million; albuminoid ammonia, 0·01 parts per million. A very good water.

Return of Analyses at the Analytical Laboratory, Christchurch—continued.

Department or Person from whom Sample received.	Date received.	Nature of Sample.	Adulteration suspected, or for what analysed.	Result of Analysis.
	1906.			
Police ..	Oct. 10 ..	Viscera of a dog ..	Poison	Found strychnine present in sufficient quantity to have been the cause of death; also from commencement of intestines separated pieces of cooked meat containing strychnine. There was no indication that the dog had eaten any birds.
Customs ..	Nov. 4 ..	Acetic acid ..	Tariff	Acetic acid, 49·2 per cent.
„ ..	„ 4 ..	„ ..	„	„ 57·4 „
Health ..	Oct. 27 ..	Water, Timaru water-supply	Purity	Volatile matter, 1·12 gr. per gallon; carbonate of lime, 1·52 gr. per gallon; chloride of sodium, 0·8 gr. per gallon; silicates, 0·93 gr. per gallon; sulphates, trace; free ammonia, 0·006 parts per million; albuminoid ammonia, trace.
„ ..	„ 27 ..	Ditto	„	Volatile matter, 1·12 gr. per gallon; carbonate of lime, 1·68 gr. per gallon; sodium-chloride, 0 8 gr. per gallon; silicates, 0·9 gr. per gallon; sulphates, trace; free ammonia, 0·004 parts per million; albuminoid ammonia, trace.
„ ..	„ 27 ..	„	„	Volatile matter, 2·24 gr. per gallon; carbonate of lime, 1·96 gr. per gallon; sodium-chloride, iron, and silicates, 2 gr. per gallon; sulphates, trace; free ammonia, 0·01 parts per million; albuminoid ammonia, trace. Contains a little organic growth with iron.
„ ..	Nov. 4 ..	Water, Oamaru water-supply	„	Volatile matter, 0·36 gr. per gallon; carbonate of lime, 0·56 gr. per gallon; sodium-chloride, 0·8 gr. per gallon; silicates, 0·28 gr. per gallon; sulphates, trace; free ammonia, 0·001 parts per million; albuminoid ammonia, trace. A remarkably clear and pure water.
„ ..	„ 4 ..	Ditto	„	Volatile matter, 1·4 gr. per gallon; carbonate of lime, 0 56 gr. per gallon; sodium-chloride, 0·8 gr. per gallon; silicates, 1·41 gr. per gallon; sulphates, trace; free ammonia, 0·002 parts per million; albuminoid ammonia, trace. Contained a little suspended organic matter and clay.
„ ..	„ 18 ..	Sydenham water-supply	„	Volatile matter, 1·68 gr. per gallon; carbonate of lime, 2 gr. per gallon; carbonate of soda, 0·99 gr. per gallon; sodium-chloride, 0·74 gr. per gallon; silicates, 1·36 gr. per gallon; sulphates, bare trace; free ammonia, 0 015 parts per million; albuminoid ammonia, 0·008 parts per million. Contains bicarbonate of soda, and becomes alkaline on boiling.
„ ..	„ 28 ..	St. Albans water ..	„	Volatile matter, 0·84 gr. per gallon; lime, &c., 1·68 gr. per gallon; sodium-chloride, 0·56 gr. per gallon; sulphates, bare trace; iron, bare trace; free ammonia, 0·02 parts per million; albuminoid ammonia, 0·01 parts per million. Good, and pure from contamination.
Customs ..	Dec. 1 ..	Acetic acid ..	Tariff	57·9 per cent. acetic acid.
Health ..	Oct. 16 ..	Sumner Borough water-supply	Purity	Volatile matter, 2·24 gr. per gallon; sodium-chloride, 1·04 gr. per gallon; lime, 2·48 gr. per gallon; silicates, 1·4 gr. per gallon; iron, trace; free ammonia, 0·008 parts per million; albuminoid ammonia, 0·001 parts per million.
„ ..	„ 16 ..	Lyttelton town water	„	Volatile matter, 6·72 gr. per gallon; sodium chloride, 9·11 gr. per gallon; sulphate of soda, trace; lime, 2·65 gr. per gallon; silicates, 1·68 gr. per gallon; nitrates, trace; iron, trace; free ammonia, 0 012 parts per million; albuminoid ammonia, 0·002 parts per million. On the 5th December another sample of this water was received, and it also contained a little over 9 gr. per gallon of sodium-chloride, which is a larger quantity than is usually found in Canterbury potable waters.

Return of Analyses at the Analytical Laboratory, Christchurch—continued.

Department or Person from whom Sample received.	Date received.	Nature of Sample.	Adulteration suspected, or for what analysed.	Result of Analysis.
	1905.			
Health ..	Dec. 4 ..	Akaroa Borough Council water-supply	Purity	Volatile matter, 1·45 gr. per gallon; sodium-chloride, 2·5 gr. per gallon; lime, 0·71 gr. per gallon; silicates, 1·68 gr. per gallon; sulphate, trace; nitrates, bare trace; free ammonia, 0·006 parts per million; albuminoid ammonia, trace.
" ..	" 4 ..	Ditto	"	Volatile matter, 2·24 gr. per gallon; sodium-chloride, 2·64 gr. per gallon; lime, 0·7 gr. per gallon; silicates, 1·95 gr. per gallon; sulphates, trace; nitrates, bare trace; iron, little present, and doubtless from the pipes; free ammonia, 0·01 parts per million; albuminoid ammonia, trace.
" ..	" 15 ..	Water at Linwood ..	"	Volatile matter, 1·68 gr. per gallon; iron and lime, 1·25 gr. per gallon; sodium-chloride, 1·27 gr. per gallon; silicates, 1·12 gr. per gallon; sulphates, trace; free ammonia, 0·086 parts per million; albuminoid ammonia, 0·01 parts per million. Slightly contaminated with fresh sewage-water.
Customs ..	" 20 ..	Acetic acid ..	Tariff	57·2 per cent. acetic acid.
" ..	" 20 ..	Glacial acetic acid ..	"	98 per cent. acetic acid; 56° Fahr. melting-point.
..	" 29 ..	Acetic acid ..	"	56·4 per cent. acetic acid.
	1906.			
..	Jan. 6 ..	" ..	"	98·5 per cent. acetic acid; 57° Fahr. melting-point.
..	" 25 ..	" ..	"	57·6 per cent. acetic acid.
..	Feb. 4 ..	" ..	"	51 "
" ..	" 4 ..	" ..	"	59 "
Inspector of Weights and Measures	" 4 ..	Ashburton bread ..	Adulteration ..	Free from adulteration.
Ditto ..	" 4 ..	" ..	" ..	"
" ..	" 4 ..	" ..	" ..	"
" ..	" 4 ..	" ..	" ..	"
" ..	" 4 ..	" ..	" ..	"
" ..	" 4 ..	" ..	" ..	"
" ..	" 4 ..	" ..	" ..	"
Health ..	" 6 ..	Water	Purity	Organic volatile matter, 3·14 gr. per gallon; sodium-chloride, 1·29 gr. per gallon; nitrates and sulphates, 0·35 gr. per gallon; silicates, 0 58 gr. per gallon; free ammonia, 0·04 parts per million; albuminoid ammonia, 0·03 parts per million. The analysis shows the water is not good.
Inspector of Weights and Measures	" 3 ..	Ale, draught ..	" ..	Specific gravity of ale, 1·0069; original gravity of wort, 1·0482. Alcohol, 5·13 per cent.; extract, 3·83 per cent.; acid, as lactic, 0·156 per cent.; ash, 0·28 per cent.; sulphates, as lime-salt, 0·14 per cent.; sulphites, trace; other preservatives, nil; bitters, (from) hops; poisonous metals, nil.
Ditto ..	" 3 ..	" ..	" ..	Specific gravity of ale, 1·0043; original gravity of wort, 1·0457. Alcohol, 4·33 per cent.; extract, 3·15 per cent.; acid, as lactic, 0·16 per cent.; ash, 0·21 per cent.; sulphates, as lime-salt, 0·06 per cent.; sulphites, trace; other preservatives, nil; bitters, (from) hops; poisonous metals, nil.
..	" 3 ..	" ..	" ..	Specific gravity of ale, 1·0059; original gravity of wort, 1·0505. Alcohol, 4·02 per cent.; extract, 3·68 per cent.; acid, as lactic, 0·1269; ash, 0·24 per cent.; sulphates, as lime-salt, 0·16 per cent. Sulphites, trace; other preservatives, nil; bitters, (from) hops; poisonous metals, nil.
..	" 3 ..	" ..	" ..	Specific gravity of ale, 1·00071; original gravity of wort, 1·0525. Alcohol, 4·7 per cent.; extract, 4 per cent.; acid, as lactic, 0·139 per cent.; ash, 0·29 per cent.; sulphates, 0·17 per cent.; sulphites, trace; other preservatives, nil; bitters, (from) hops; poisonous metals, nil.

Return of Analyses at the Analytical Laboratory, Christchurch—continued.

Department or Person from whom Sample received.	Date received.	Nature of Sample.	Adulteration suspected, or for what analysed.	Result of Analysis.
Inspector of Weights and Measures.	1906. Feb. 3 ..	Ale, draught ..	Purity ..	Specific gravity of ale, 1·0105; original gravity of wort, 1·0656. Alcohol, 5·64 per cent; extract, 5·31 per cent.; acid, as lactic, 0·158 per cent.; ash, 0·27 per cent; sulphates, as lime, 0·01 per cent.; sulphites, trace; bitters, (from) hops; poisonous metals, nil.
Ditto ..	" 3 ..	" ..	Adulteration ..	Specific gravity of ale, 1·0011; original gravity of wort, 1·0681. Alcohol, 5·38 per cent.; extract, 2·95 per cent.; ash, 0·17 per cent.; acid, as lactic, 0·146 per cent.; sulphates, as lime, 0·09 per cent.; sulphites, trace; bitters, (from) hops; poisonous metals, nil.
" ..	" 3 ..	Ale, bottled ..	" ..	Specific gravity of ale, 1·0051; original gravity of wort, 1·0432. Alcohol, 4·08 per cent.; extract, 3·21 per cent.; ash, 0·26 per cent; acid, as lactic, 0·129 per cent.; sulphates, as lime, 0·13 per cent.; sulphites, trace; bitters, (from) hops; poisonous metals, nil.
" ..	" 3 ..	" ..	" ..	Specific gravity of ale, 1·0033; original gravity of wort, 1·0502. Alcohol, 5·39 per cent.; extract, 3·05 per cent.; ash, 0·24 per cent.; acid, as lactic, 0·139 per cent.; sulphates, as lime, 0·2 per cent.; sulphites, trace; bitters, (from) hops; poisonous metals, nil.
" ..	" 3 ..	" ..	" ..	Specific gravity of ale, 1·0047; original gravity of wort, 1·0512. Alcohol, 4·82 per cent.; extract, 3·44 per cent.; ash, 0·26 per cent.; acid, as lactic, 0·135 per cent.; sulphates, as lime, 0·13 per cent.; sulphites, trace; bitters, (from) hops; poisonous metals, nil.
" ..	" 3 ..	" ..	" ..	Specific gravity of ale, 1·0052; original gravity of wort, 1·0517. Alcohol, 4·83 per cent.; extract, 3·57 per cent.; ash, 0·23 per cent.; acid, as lactic, 0·145 per cent.; sulphates, as lime, 0·07 per cent.; sulphites, trace; bitters, (from) hops; poisonous metals, nil.
" ..	" 3 ..	" ..	" ..	Original gravity of wort, 1·0691; specific gravity of ale, 1·0079. Alcohol, 6·22 per cent.; extract, 4·8 per cent.; acid, as lactic, 0·169 per cent.; ash, 0·28 per cent.; sulphates, 0·11 per cent.; sulphites, trace; other preservatives, nil; bitters, (from) hops; poisonous metals, nil.
" ..	" 3 ..	" ..	" ..	Original gravity of wort, 1·0651; specific gravity of ale, 1·0045. Alcohol, 6·29 per cent.; extract, 3·99 per cent.; acid, as lactic, 0·131 per cent.; ash, 0·2 per cent.; sulphates, 0·09; sulphites, trace; other preservatives, nil; bitters, (from) hops; poisonous metals, nil.
" ..	" 3 ..	Whisky	" ..	Alcohol, 40·3 per cent., equals, 16·46 per cent. under proof; extract, 0·1 per cent.; acid, 0·025 per cent.; methyl alcohol, nil; fusel-oil, trace; colouring matter, chiefly tannin.
" ..	" 3 ..	"	" ..	Alcohol, 37·67 per cent, equals, 21·5 per cent. under proof; extract, 0·19 per cent.; acid, 0·035 per cent.; methyl alcohol, nil; amylic alcohol, trace.
" ..	" 3 ..	"	" ..	Alcohol, 41·55 per cent., equals 14·1 per cent. under proof; extract, 0·13 per cent.; acid, 0·035 per cent.; methyl alcohol, nil; fusel-oil, trace.
" ..	" 3 ..	"	" ..	Alcohol, 38·22 per cent., equals 20·45 per cent. under proof; extract, 0·16 per cent.; acid, 0·036 per cent.; methyl alcohol, nil; fusel-oil, race.

Return of Analyses at the Analytical Laboratory, Christchurch—continued.

Department or Person from whom Sample received.	Date received.	Nature of Sample.	Adulteration suspected, or for what analysed.	Result of Analysis.
	1906.			
Inspector of Weights and Measures.	Feb. 3 ..	Whisky	Adulteration ..	Alcohol, 36·83 per cent., equals 23·12 per cent. under proof; extract, 0·21 per cent.; acid, 0·035 per cent.; methyl alcohol, nil; fusel-oil, trace.
Ditto ..	" 3 ..	"	" ..	Alcohol, 39·55 per cent. equals 17·88 per cent. under proof; extract, 0·25 per cent.; acid, 0·035 per cent.; methyl alcohol, nil; fusel-oil, trace.
Customs ..	" 20 ..	Glacial acetic acid	Tariff	95 per cent. acetic acid; 49° Fahr. melting-point. The sample was not glacial.
" ..	" 24 ..	Acetic acid ..	"	49·6 per cent. acetic acid.
" ..	" 24 ..	" ..	"	57·5 per cent. "
Inspector of Weights and Measures, Rangiora.	" 9 ..	Whisky ..	Purity	Alcohol, 40·3 per cent., equals 16·46 per cent. under proof; extract, 0·16 per cent.; acetic acid, 0·05 per cent.; fusel-oil, trace; methyl alcohol, nil.
Ditto ..	" 9 ..	"	"	Alcohol, 38·22 per cent., equals 20·43 per cent. under proof; extract, 0·18 per cent.; acid, 0·025 per cent.; fusel-oil, trace; methyl oil, nil.
" ..	" 9 ..	"	"	Alcohol, 40·05 per cent., equals 16·93 per cent. under proof; extract, 0·19 per cent.; acid, 0·05 per cent.; fusel-oil, trace; methyl alcohol, nil.
" ..	" 9 ..	Ale, draught ..	"	Original gravity, 1·0457; specific gravity, 1·0121. Alcohol, 4·33 per cent.; extract, 3·15 per cent.
" ..	" 9 ..	" " ..	"	Acid (lactic), 0·14 per cent.; ash, 0·32 per cent.; sulphates, 0·13 per cent.; sulphites, trace; other preservatives, nil; bitters, (from) hops. A weak ale.
" ..	" 9 ..	" bottled ..	"	Original gravity, 1·0616; specific gravity, 1·0102. Alcohol, 4·7 per cent.; extract, 5·07 per cent.; acid (lactic), 0·175 per cent.; ash, 0·53 per cent.; sulphates, 0·14 per cent.; sulphites, trace; other preservatives, nil; bitters, (from) hops.
" ..	" 9 ..	" Rangiora ..	"	Original gravity, 1·0453; specific gravity, 1·015. Alcohol, 3·67 per cent.; extract, 4·43 per cent.; ash, 0·26 per cent.; acid (lactic), 0·18 per cent.; sulphates, 0·12 per cent.; sulphites, trace; other preservatives, nil; bitters, (from) hops. Too great a proportion of water.
" ..	" 9 ..	" Crown Brewery	"	Original gravity, 1·0535; specific gravity, 1·0071. Alcohol, 4·75 per cent.; extract, 4·05 per cent.; ash, 0·25 per cent.; acid (lactic), 0·13 per cent.; sulphates, 0·17 per cent.; sulphites, trace; bitters, (from) hops; poisonous metals, nil.
" ..	" 9 ..	Wine	"	Specific gravity, 6·9945. Extract, 1·65 per cent.; alcohol, 7·5 per cent.; equals proof spirit, 16·36 per cent.; ash, 0·13 per cent.; acid (acetic), 0·61 per cent.; preservatives and poisonous metals, nil. This sample had a flat and unpleasant acid taste, and was in my opinion unsound and unfit for use.
" ..	" 12 ..	Ale, bottled, Crown	"	Original gravity, 1·0496; specific gravity, 1·0048. Alcohol, 4·7 per cent.; extract, 3·44 per cent.; ash, 0·28 per cent.; acid (lactic), 0·126 per cent.; sulphates, 0·14 per cent.; sulphites, trace; bitters, (from) hops; poisonous metals, nil.
Inspector of Weights and Measures	" 12 ..	Ale, draught, Manning's	"	Original gravity, 1·0448; specific gravity, 1·0077. Alcohol, 4·02 per cent.; extract, 3·86 per cent.; ash, 0·28 per cent.; acid (lactic), 0·167 per cent.; sulphates, 0·12 per cent.; sulphites, trace; bitters, (from) hops; poisonous metals, nil.
Ditto ..	" 12 ..	Whisky	"	Alcohol, 38·78 per cent., equals 19·36 per cent. under proof; extract, 0·17 per cent.; acid, 0·03 per cent.; fusel-oil, trace; methyl alcohol, nil.

Return of Analyses at the Analytical Laboratory, Christchurch—continued.

Department or Person from whom Sample received.	Date received.	Nature of Sample.	Adulteration suspected, or for what analysed.	Result of Analysis.
	1906.			
Inspector of Weights and Measures, Oamaru	Feb. 18 ..	Whisky	Purity	Alcohol, 40·05 per cent., equals 16·93 per cent. under proof; extract, 0·21 per cent.; acid, 0·03 per cent.; fusel-oil, trace; methyl alcohol, nil.
Ditto ..	„ 18 ..	„	„	Alcohol, 36 per cent., equals 24·74 per cent. under proof; extract, 0·16 per cent.; acid, 0·06 per cent.; fusel-oil, trace; methyl alcohol, nil.
„ ..	„ 18 ..	„	„	Alcohol, 40·3 per cent., equals 16·46 per cent. under proof; extract, 0·22 per cent.; acid, 0·03 per cent.; fusel-oil, trace; methyl alcohol, nil.
„ ..	„ 18 ..	Ale, draught, Simpson and Co.	„	Original gravity, 1·0450; specific gravity, 1·0043. Alcohol, 4·27 per cent.; extract, 3·1 per cent.; ash, 0·19 per cent.; acid (lactic), 0·167 per cent.; sulphates, 0·13 per cent.; sulphites, trace; other preservatives, nil; bitters, (from) hops; poisonous metals, nil. A very weak sample.
„ ..	„ 18 ..	Ale, draught, McGavin and Co.	„	Original gravity, 1·0530; specific gravity, 1·0027. Alcohol, 5·26 per cent.; extract, 3·1 per cent.; ash, 0·16 per cent.; sulphates, 0·05 per cent.; acid (lactic), 0·123 per cent.; sulphites, trace; other preservatives, nil; bitters, (from) hops; poisonous metals, nil.
„ ..	„ 18 ..	Ale, draught, Speight and Co.	„	Original gravity, 1·0574; specific gravity, 1·0046. Alcohol, 5·45 per cent.; extract, 3·71 per cent.; ash, 0·18 per cent.; sulphates, 0·04 per cent.; acid (lactic), 0·106 per cent.; sulphites, trace; other preservatives, nil; bitters, (from) hops; poisonous metals, nil.
„ ..	„ 18 ..	Ale, bottled, R. Shand	„	Original gravity, 1·0555; specific gravity, 1·0031. Alcohol, 5·51 per cent; extract, 3·31 per cent.; ash, 0·3 per cent.; sulphates, 0·11 per cent.; acid (lactic), 3·36 per cent.; sulphites, trace; other preservatives, nil; bitters, (from) hops; poisonous metals, nil.
Health ..	Mar. 1 ..	Water from the Lyttelton water-supply	Chlorides	Chlorine, 0·56 gr. per gallon, equal to 0·92 gr. sodium-chloride.
„ ..	„ 1 ..	Ditto	„	Chlorine, 0·56 gr. per gallon, equal to 0·92 gr. sodium-chloride.
„ ..	„ 1 ..	„	„	Chloride, 0·05 gr. per gallon, equal to 1·74 gr. sodium-chloride.
„ ..	„ 1 ..	„	„	Chloride, 6·65 gr. per gallon, equal to 10·95 gr. sodium-chloride.
„ ..	„ 1 ..	„	„	Chloride, 1·05 gr. per gallon, equal to 1·74 gr. sodium-chloride.
„ ..	„ 1 ..	„	Purity	Organic and volatile matter, 1·96 gr.; sodium-chloride, 1·04 gr.; sodium-bicarbonate, 0·92 gr.; iron, 0·02 gr.; carbonate of lime, 2·62 gr.; nitric anhd., 0·04 gr.; sulphates, trace; free ammonia, 0·074 parts per million; albuminoid ammonia, 0·018 parts per million. Not first-class, as, in addition to rather much ammonia, it contains about 8 gr. per gallon of mineral matter, and becomes alkaline on boiling. A sediment coming up from the well is composed of oxide and salts of iron and vegetable organic matter. The vegetable matter is a species of fungus known as the iron-bacteria.

Return of Analyses at the Analytical Laboratory, Christchurch—continued.

Department or Person from whom Sample received.	Date received	Nature of Sample.	Adulteration suspected, or for what analysed.	Result of Analysis.
..	1906. Mar. 1 ..	Water from the Lyttelton water-supply	Purity	Volatile and organic matter, 3·6 gr.; sodium-chloride, 10·95 gr.; carbonate of lime, 2·34 gr.; iron, 0·005 gr.; silicates, 1·58 gr.; nitrates, trace; sulphates, trace.
..	" 1 ..	Ditto	"	Volatile and organic matter, 3·92 gr.; sodium-chloride, 10·95 gr.; carbonate of lime, 2·34 gr.; iron, 0·02 gr.; silicates, 1·68 gr.; nitrates, trace; sulphates, trace.
Customs ..	" 7 ..	Glacial acetic acid..	Tariff	Acetic acid, 94 per cent.; melting-point, 48° Fahr. This sample is not "glacial."
Health ..	" 10 ..	Water, Lyttelton waterworks	Purity	Volatile and organic matter, 4·74 gr.; sodium-chloride, 11·66 gr.; soda-salts, 0·56 gr.; lime, 3·36 gr.; silicates, 1·62 gr.; iron and sulphates, trace; free and albuminoid ammonia, trace.
" ..	" 10 ..	Ditto	"	Volatile and organic matter, 1·68 gr.; sodium-chloride, 1·51 gr.; soda-salts, trace; lime, 0·38 gr.; silicates, 1·12 gr.; iron, trace; sulphates, trace; free ammonia, 0·07 gr.; albuminoid ammonia, 0·014 gr.
" ..	" 10 ..	"	"	Volatile and organic matter, 0·98 gr.; sodium-chloride, 4·62 gr.; soda-salts, trace; lime, 1·68 gr.; silicates, 0·28 gr.; iron and sulphate, trace, free ammonia, trace; albuminoid ammonia, trace.
" ..	" 10 ..	"	"	Volatile and organic matter, 4·82 gr.; sodium-chloride, 13·28 gr.; soda-salts, 0·96 gr.; lime, 4·48 gr.; silicates, 1·40 gr.; iron, nitrates, free ammonia, albuminoid ammonia, trace.
" ..	" 10 ..	"	"	Volatile and organic matter, 5·04 gr.; sodium-chloride, 13·28 gr.; soda-salts, 0·94 gr.; lime, 3·68 gr.; silicates, 1·4 gr.; iron, free ammonia, and albuminoid ammonia, trace.
" ..	" 10 ..	"	"	Volatile and organic matter, 4·2 gr.; sodium-chloride, 2·8 gr.; sodium-salts, 0·59 gr.; lime, 4·4 gr.; silicates, 1·96 gr.; iron, nitrates, free ammonia, and albuminoid ammonia, trace.
Customs ..	" 18 ..	Acetic acid ..	Tariff	Acetic acid, 58·7 per cent.
Inspector of Weights and Measures, Kaikoura	" 12 ..	Whisky	Purity	Alcohol, 43 per cent., equals 11·38 per cent. under proof; extract, 0·19 per cent.; acid, 0·05 per cent.; fusel-oil, trace; methyl alcohol, nil.
Ditto ..	" 12 ..	"	"	Alcohol, 32·94 per cent., equals 20·96 per cent. under proof; extract, 0·43 per cent.; acid, 0·06 per cent.; fusel-oil, trace; methyl alcohol, nil. A little sherry wine has been added.
" ..	" 12 ..	"	"	Alcohol, 40·3 per cent., equals 16·46 per cent. under proof; extract, 0·19 per cent.; acid, 0·03 per cent.; fusel-oil, trace; methyl alcohol, nil.
" ..	" 12 ..	Ale, Bass and Co. ..	"	Original gravity, 1·0576; specific gravity, 1·0049. Alcohol, 5·83 per cent.; extract, 3·46 per cent.; acid (lactic), 0·17 per cent.; ash, 0·31 per cent.; sulphates (lime), 0·13 per cent.; sulphites, trace; poisonous metals, nil.

Return of Analyses at the Analytical Laboratory, Christchurch—continued.

Department or Person from whom Sample received.	Date received.	Nature of Sample.	Adulteration suspected, or for what analysed.	Result of Analysis.
Inspector of Weights and Measures, Kaikoura	1906. Mar. 12 ..	Ale, Marlborough Brewery	Purity	Original gravity, 1·062; specific gravity, 1·0056. Alcohol, 5·51 per cent.; extract, 3·62 per cent.; ash, 0·28 per cent.; acid, 0·16 per cent.; sulphates, 0·04 per cent.; sulphites, trace; poisonous metals, nil.
Ditto ..	" 12 ..	Ale, Ward and Co.	"	Original gravity, 1·0528; specific gravity, 1·0058. Alcohol, 5·07 per cent.; extract, 3·6 per cent.; ash, 0·42 per cent.; acid (lactic), 0·12 per cent.; sulphates (lime), 0·08 per cent.; sulphites, trace; poisonous metals, nil.
Customs ..	" 21 ..	Acetic acid ..	Tariff	Acetic acid, 29·25 per cent.
Health ..	" 20 ..	Water, service-pipes	Purity	Organic and volatile matter, 2·52 gr.; sodium-chloride, 4·94 gr.; sodium-sulphites, 0·64 gr.; carbonate of lime, 2·52 gr.; silicates, 1·12 gr.; nitrates, bare trace; free ammonia, 0·004 gr.; albuminoid ammonia, trace.
" ..	" 20 ..	Water, service-pipes, Lyttelton	"	Organic and volatile matter, 2·66 gr.; sodium-chloride, 4·94 gr.; sodium-sulphates, 0·69 gr.; carbonate of lime, 2·52 gr.; silicates, 1·10 gr.; nitrates, bare trace; free ammonia, 0·004 gr.; albuminoid ammonia, trace.
" ..	" 20 ..	Ditto	"	Organic and volatile matter, 2·52 gr.; sodium-chloride, 4·94 gr.; sodium-sulphates, 0·7 gr.; carbonate of lime, 2·52 gr.; silicates, 1·12 gr.; nitrates, faint trace; free ammonia, 0·004 gr.; albuminoid ammonia, trace.
" ..	" 20 ..	"	"	Organic and volatile matter, 3·08 gr.; sodium-chloride, 4·94 gr.; sodium-sulphates, 0·69 gr.; carbonate of lime, 2·52 gr.; silicates, 1·14 gr.; nitrates, bare trace; free ammonia, 0·004 gr.; albuminoid ammonia, trace.
Engineer of Pumping-station, Lyttelton waterworks	" 22 ..	"	"	Organic and volatile matter, 0·84 gr.; sodium-chloride, 1·48 gr; carbonate of lime, 2·44 gr.; silicates, 1·12 gr.; iron, trace; sulphates, trace; free ammonia, 0·024 gr.; albuminoid ammonia, 0·01 gr. This is a very good water, and as it contains very little mineral matter, as much water as possible should be obtained from this source, so as to reduce the amount of salt in the total water-supply.

A. A. Bickerton, Colonial Analyst.

Otago.

University Laboratory, Dunedin, 22nd May, 1906.

Sir,—

I have the honour to forward herewith my return of analyses for the Department of Public Health for the year ending the 31st March last.

I have no remarks to offer on the year's work in this laboratory except to say that the quality of the milk has improved all round since the standard of butter-fat was raised to 3 per cent.

I have, &c.,

James G. Black,

Analyst to Public Health Department.

The Chief Officer, Department of Public Health.

Return of Analyses at the Analytical Laboratory, Dunedin, for the Year ended the 31st March, 1906.

Department or Person from whom Sample is Received.	Date Received.	Nature of Sample.	Adulteration suspected, or for what analysed.	Total Solids.	Chloride of Sodium.	Organic Matter.	De Chaumont's Process for Consumption of Oxygen.			
				Per Cent.	Per Cent.	Per Cent.	Per Cent.	Per Cent.	Per Cent.	
	1905.									
Public Health	May 19 ..	Water	Impurities ..	9·2	2·7	1·4	1·47	1·47	..	Usable.
"	" 19 ..	"	" ..	23·0	5·1	3·1	1·39	1·28	0·11	"
"	" 19 ..	"	" ..	6·9	5·3	3·6	1·41	1·21	0·2	"
"	" 19 ..	"	" ..	27·0	17·0	2·9	1·18	1·17	0·01	"
"	" 30 ..	"	" ..	7·5	2·9	3·1	1·76	1·76	..	Suspicious.
"	June 17 ..	"	" ..	13·0	3·6	3·2	1·95	1·71	0·24	"
"	" 17 ..	"	" ..	12·6	2·3	2·8	1·2	1·11	0·09	Usable.
"	" 17 ..	"	" ..	5·9	2·3	1·4	0·87	0·8	0·07	Good.
"	" 17 ..	"	" ..	7·1	3·0	1·4	0·96	0·95	0·01	"
"	" 17 ..	"	" ..	7·0	3·0	1·9	0·72	0·69	0·03	"
"	" 17 ..	"	" ..	9·24	2·8	2·0	2·13	1·83	0·3	Bad.
"	" 28 ..	"	" ..	12·6	2·1	3·6	0·84	0·84	..	Good.
"	" 28 ..	"	" ..	9·8	3·8	1·5	2·76	2·68	0·08	Bad.
"	" 28 ..	"	" ..	8·0	2·4	3·0	0·6	0·56	0·04	Good.
"	" 28 ..	"	" ..	22·1	1·9	6·0	0·96	0·96	..	"
"	July 27 ..	"	" ..	49·3	..	9·2	2·2	2·16	0·04	Bad.
"	" 27 ..	"	" ..	11·7	1·6	5·4	0·76	0·75	0·01	Good.
"	" 27 ..	"	" ..	9 8	1·5	2·46	0·8	0 8	..	"
"	" 27 ..	"	" ..	3 0	1·4	1·15	1·7	1·7	..	Suspicious.
"	" 27 ..	"	" ..	3·0	1·5	0·92	1·6	1·6	..	"
"	Aug. 14 ..	"	" ..	92·7	..	..	2·4	2·4	..	Bad.
"	" 14 ..	"	" ..	40·25	..	..	2·6	2·6	..	"
"	" 14 ..	"	" ..	22·4	..	..	2 8	2·8	..	"
"	" 14 ..	"	" ..	22·75	..	..	2·56	2·5	0·01	"
"	Sept. 7 ..	"	" ..	44·0	1·7	9·2	..	..	..	Good.
"	" 26 ..	"	" ..	15·1	2·0	2·2	1·0	1·0	..	"
"	" 26 ..	"	" ..	7·3	1·4	1·34	2·7	2·7	..	Bad.
"	" 26 ..	"	" ..	7·1	1·2	1·6	0·76	0·7	0·06	Good.
"	" 26 ..	"	" ..	14·5	4·0	1·34	5·3	5·0	0·3	Very bad.
"	Oct. 25 ..	"	" ..	14·3	1·7	1·8	0·55	0·54	0·01	Very good.
"	" 25 ..	"	" ..	7·4	1·5	0·95	1·96	1·92	0·04	Suspicious.
"	Sept. 26 ..	"	" ..	16·8	2·3	5·0	0·68	0·67	0·01	Good.
"	Dec. 20 ..	"	" ..	7·2	1·3	1·3	2·0	2·0	.	Suspicious.
"	" 20 ..	"	" ..	7·1	1·0	1·3	1·8	1·8	..	"
"	" 20 ..	"	" ..	7·15	1·15	1·3	1·9	1·9	..	"

Department or Person from whom Sample is Received.	Date Received.	Nature of Sample.	Adulteration suspected, or for what analysed.	Total Solids.	Butter-fat.
				Per Cent.	Per Cent.
	1905.				
Dairy Inspector	Dec. 18 ..	Milk	Water, removal of cream	14·1	3·38
"	" 18 ..	"	Ditto	..	2·7
"	" 18 ..	"	"	13·4	3·4
"	" 18 ..	"	"	14·2	3·55
"	" 18 ..	"	"	12·96	3·01
"	" 18 ..	"	"	14·87	4·2
"	" 18 ..	"	"	13·6	3·3
"	" 23 ..	"	"	13·61	3·0
"	" 23 ..	"	"	14·47	3·8
"	" 23 ..	"	"	13·58	3·96
"	" 23 ..	"	"	17·0	7·7
"	" 23 ..	"	"	13·6	3·68
"	" 23 ..	"	"	13·8	3·7
"	" 23 ..	"	"	12·9	3·4
"	" 23 ..	"	"	Not determined	Too long kept—decomposed.

NOTE.—The results of the analyses of waters are stated in grains per gallon.

JAMES G. BLACK, Analyst.

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