1933.

NEW ZEALAND.

DEPARTMENT OF HEALTH.

ANNUAL REPORT OF THE DIRECTOR-GENERAL OF HEALTH.

Presented in pursuance of Section 100 of the Hospitals and Charitable Institutions Act, 1926.

HON. J. A. YOUNG, MINISTER OF HEALTH.

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REPORTS.

The DIRECTOR-GENERAL OF HEALTH to the Hon. the MINISTER OF HEALTH, Wellington.

I HAVE the honour to lay before you the annual report of the Department for the year 1932–33.

PART I.—GENERAL SURVEY.

VITAL STATISTICS.

Death-rate.—1932 was remarkable for its death-rate—viz., 8·02 per 1,000 mean population, the lowest rate so far recorded in New Zealand. A falling death-rate is a feature of our vital statistics, but the present level of the rate is lower than would have been considered possible a few years ago, more particularly in view of the altered age constitution of our population and the ever-increasing number of people of advanced years in our midst.

Birth-rate.—The birth-rate, which was 17·09 per 1,000 mean population, shows a further fall as compared even with the low rate for the preceding year. The falling proportion of married women of child-bearing ages has been a distinct factor affecting this rate.

Infant Mortality.—Infant mortality has shown a steady improvement during the last twenty years, the rate for 1932 being the record low figure of 31·22 per 1,000 live births.

Still-births.—The still-birth rate was 30 per 1,000 live births, a slight reduction on the previous year's rate of 30·4.

INFECTIOUS DISEASES, ETC.

The number of notifications of infectious and notifiable diseases in 1932 was 3,715, being 1,298 less than in 1931 and 3,523 less than in 1930. With the exception of a minor epidemic of acute poliomyelitis, infectious diseases were in the main marked by a distinct fall in incidence.

Scarlet Fever.—Of this disease 829 cases were notified and 6 deaths, as against 1,304 cases and 11 deaths for the previous year.

Diphtheria.—Eight hundred and two cases of diphtheria and 40 deaths were reported, representing a decrease on the low figures for the preceding year.

In the East Cape Health District an interesting demonstration was given of how the family doctor can participate in the campaign of active immunization against this disease. The account of what was done is best given in the words of Dr. Turbott, the Medical Officer of Health, Gisborne, who writes as follows:—

> "Public interest was created in the press, which gave excellent willing assistance, by addresses at mothers' meetings, and through Rotary, whose valuable support in meeting prejudice was elicited. Adverse propaganda by antivivisectionists and others immediately arose, but the campaign prospered in spite of this. Medical interest was immediately active, and the local Division of the British Medical Association not only supported immunization, but agreed to take their rightful place as participants in such preventive work. The local Division in this respect have given a lead to the rest of the Dominion.
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> "All local medical practitioners immunized against diphtheria those children who were brought to them for the purpose. By common consent it was agreed to charge reduced fees—namely, 10s. 6d.—for a course of three weekly injections. The practitioners preferred to use toxin-antitoxin for their campaign instead of anatoxin, and for uniformity the former was also used by the Medical Officer of Health. It was decided to give the practitioners six months in which to treat those who could afford to pay for the protection. The publicity by the Medical Officer of Health was during this time directed towards persuading parents to take their children to the family doctor for immunization against diphtheria. One hundred and thirty-four children were taken to doctors and given three injections of toxin-antitoxin at weekly intervals. 1931 was a depression year. The response was small, but definitely worth while. The public had it drawn to their attention that medical practitioners were sympathetic to health work, and sufficiently preventive in outlook to take part in a campaign designed to prevent people from contracting disease.
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> "At the end of six months it was evident that the practitioners' effort must be supplemented by offering protection free of charge through the Medical Officer of Health. Parents were invited to bring the pre-school children to the district office, or to allow their children to be immunized at school. Pre-school children were also welcomed at school clinics. No Schick testing was done either beforehand to determine susceptibility or afterwards to demonstrate presence of immunity. It is the Department's practice to dispense with this aid in mass-immunity campaigns until such time as public opinion is more enlightened and the two extra needlings not objected to as at present.
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> "The response was satisfactory: 2,510 school children and 117 pre-school children were given the triple injection at weekly intervals. These children were scattered all over the health district, and when those protected by the family doctor are added, a total of 2,761 children of varying ages below fourteen years were treated. This means that 33·6 per cent. of the white school population of this district has been protected against diphtheria. It is regretted that more pre-school children were not done, but mothers are still reluctant to submit the babies to needling processes. However, the immunes created by immunization should reduce the general child populations susceptibility to diphtheria, and thus keep big epidemics at bay. No attempt was made to include the Maori child population in this immunization campaign, in spite of requests from certain Maori areas, as from a previous study of Maori susceptibility to diphtheria their low infectivity then demonstrated seemed to render an immunization campaign among Maoris unnecessary."

The encouraging results achieved in this instance should strengthen the Department's efforts to extend diphtheria immunization throughout the Dominion. One has only to study the statistics of countries where diphtheria immunization has been extensively carried out to be impressed with the value of such preventive work.

Enteric Fevers.—There was a rise in the number of notifications received for this group of diseases, epidemics of a minor nature being experienced mainly among the Maori race. Control of these outbreaks was quickly gained by sanitary measures and by inoculation of contacts. The Medical Officer of Health, Gisborne, reports that the continuance of the low Maori incidence in his district is gratifying, leading one to the conclusion that the policy of routine inoculation every two years of all Maori school-children and all willing adults or pre-school children is well worth while. None of the Maoris in that district who contracted the disease had been inoculated.

Included in the Appendix to this report is an account of an investigation carried out by Dr. F. S. Maclean into cases of typhoid fever in the Hawke's Bay District traced to the eating of polluted shell-fish.

Poliomyelitis.—In the latter part of 1931 poliomyelitis became prevalent in Southland, and thence spread to other parts of the Dominion. The brunt of this minor epidemic was borne by the South

Island, particularly Southland and Otago, but the North Island did not wholly escape. Altogether, in 1932, 148 cases and 19 deaths were reported from the whole of New Zealand, 103 cases and 17 deaths occurring in the South Island as against 45 cases and 2 deaths in the North Island.

The history of poliomyelitis in New Zealand is of a disease which is never entirely absent, but which lies comparatively dormant for years, flaring up in occasional widespread epidemics, such as were experienced in 1916 and again in 1925. This latest manifestation of poliomyelitis was unusual, in that, although the virus was distributed throughout practically the whole of the Dominion, the outbreak ran a comparatively quiet course without the explosive onset and the rapid spread which have been features of previous epidemics.

The modern conception of poliomyelitis is that for every case with paralysis there are many abortive cases and numerous other persons who become infected without the development of clinical symptoms. As one attack of poliomyelitis confers protection against the disease during the rest of life, there is every reason to hope that a fair measure of national immunity has been acquired as the result of our recent experience.

It is interesting to record that in the latter part of 1931 there was also a disquieting prevalence of poliomyelitis in Victoria, and that the disease spread in New South Wales and Queensland during 1932. The New Zealand outbreak followed the Australian outbreak in point of time, but appeared to be independent of it. In this connection it is significant that poliomyelitis first appeared in epidemic form in 1931 in Southland, a part of New Zealand which has no direct passenger communication with Australia.

Favourable reports have again been received as to the efficacy of convalescent serum in relieving the symptoms and reducing the number of deformities usually associated with this disease. Arrangements made by the Department for payment of donors of blood have proved of value in obtaining an adequate supply of blood for the preparation of this serum.

Dr. T. R. Ritchie carried out a painstaking investigation into the past incidence of poliomyelitis in the Otago and Southland Health Districts during the period 1914 to 1932. This does not lend itself to publication, but the salient fact brought out in this report confirms the opinion expressed by Percy Stocks, M.D., D.P.H. (*Journal of Hygiene*, Vol. 32, No. 2, April, 1932), as to one experience of poliomyelitis conferring a long lasting immunity upon small rural communities and townships.

Dr. Ritchie states "that during the above period there have been five epidemics in the district, with occasional inter-epidemic cases, and it is remarkable how seldom localities once visited have suffered from a second visitation. Of the thirty-eight localities where cases occurred in 1914, only fourteen have been revisited and of these only four are rural communities, the other ten being the cities of Dunedin and Invercargill and eight boroughs."

The pamphlet on poliomyelitis prepared by the British Medical Association and the Department was revised and widely distributed to the members of the medical profession.

Puerperal Fever.—The number of deaths from puerperal causes for 1932 shows a decrease in comparison with the figures for previous years. The puerperal mortality rate of 4·06 per 1,000 live births is the lowest recorded since 1913, and when it is remembered that the proportion of first births is now much higher than was the case twenty years ago the result can be regarded as indicating a definite, even though slight, improvement over this period.

It is pleasing to note that the number of deaths from puerperal septicæmia (excluding those from abortions) was only 13 in 1932, as compared with 18 in 1931 and 56 as recently as 1927. Deaths from septic conditions following abortion show a welcome, if small, fall, being 26 in 1932, as compared with 29 in 1931.

Full details as to the result of measures taken in the interest of maternal welfare will be found in Dr. Paget's report.

Tuberculosis.—The death-rate from tuberculosis, which was 4·22 per 10,000 of mean population, represents a continuation of the improvement which has been achieved for many years past.

Investigations and reports in New Zealand and other countries reveal the fact that the incidence of tuberculosis amongst the nursing staffs of general hospitals is unduly high. It is evident from these investigations that tuberculosis is an occupational risk of nurses, and that, to minimize the risk, nurses should be properly trained in the technique of aseptic nursing. In view of this, steps were taken to bring about a closer supervision of the health of nurses in public hospitals and sanatoria and to ensure as far as possible the removal of deleterious influences. The Director, Division of Nursing, in her report outlines measures which are calculated to guard nurses from infection and to protect their general health.

In co-operation with the Post and Telegraph Department an extensive campaign was again carried out for the sale of Christmas Seal stamps for financing the Children's health camps, which are doing such fine preventive work throughout the Dominion. Thanks are due to all those who assisted in this work.

Post-operative Tetanus.—Consequent upon the development of two cases of post-operative tetanus, Dr. P. P. Lynch, pathologist, Wellington Hospital, made bacteriological examinations of catgut suspected of conveying infection. He found that the charge against catgut in these two instances can remain only a suspicion, as no tetanus bacilli were found in the specimens examined, while in both cases there were other sources of infection which had been left unconsidered.

Cancer.—There was a slight fall in the mortality from cancer, the number of deaths showing a decrease of twenty-one, while the death rate fell from 10·33 to 10·11 per 10,000.

The Census and Statistics Office, with a view to contributing some light on certain aspects of the cancer problem, has for some years past maintained an individual record and history of all persons treated for cancer in the public hospitals in the Dominion. As nearly two thousand cases of cancer pass through these institutions annually, a considerable amount of data has been accumulated during the past seven years. This information was published and reviewed by the Government Statistician in the *Monthly Abstract of Statistics* during 1932, and should prove of considerable interest to investigators and research workers engaged in the cancer problem.

The New Zealand Branch of the British Cancer Campaign Society has continued its valuable work. The report of the Wellington Medical Consultant Committee of the society shows that the method of keeping records was standardized and brought into conformity in the four centres. Among the improvements introduced in the recording of cases was the provision of a follow-up system which enables cases which have left hospital to be kept under supervision. The result of the experience for the last three years has been to define more clearly the type of malignant disease in which radium is of value in treatment. The experience of the committee in this respect is in accord with reported results of the cancer clinics in other parts of the world. It has been found—and this is in accord with experience abroad—that deep X-ray radiation is finding a larger place than hitherto in the treatment of growths. The committee is watching closely the trend of expert opinion in the matter of radium and deep X-ray treatment in other parts of the world, and is keeping abreast of current medical opinion in all aspects of cancer.

Further statistical information and comments on vital statistics will be found in the report of the Director, Division of Public Hygiene.

The Economic Depression and the Public Health.

Health administrations throughout the world have viewed with considerable anxiety the possible effects of the present economic depression on the state of the public health.

In New Zealand information which may be expected to throw light on the problem is available from three sources:—

(1) The returns of deaths compiled by the Census and Statistics Office.
(2) The morbidity returns supplied by the public hospitals throughout the Dominion.
(3) The records of examinations of school-children carried out by the School Medical Service.

As has already been shown, there is no evidence from the vital statistics that the health of the masses has been in any way impaired during more recent years. The death-rate, the infant-mortality rate, the mortality from tuberculosis, were all lower in 1932 than at any other time in the history of the Dominion. This is all to the good, but it may be argued that the death returns do not represent the true position as the effects of malnutrition are delayed and while causing sickness may not have had time as yet to affect the death-rate. The records of our public hospitals, however, do not support any suggestion that there is increased morbidity in New Zealand as the result of the depression. The statistics for patients treated in the public hospitals in the Dominion are as set out below:—

Patients treated in Public Hospitals.

Year.	Persons under Treatment.	Proportion per 1,000 of Population.
1927–28	79·500	55·08
1928–29	87·888	60·20
1929–30	89·761	60·75
1930–31	89·147	59·52
1931–32	85·562	56·06

This table shows that the position in 1931–32 is little worse than in 1927–28, and is definitely better than in the intervening years.

The returns of examinations carried out by School Medical Officers again go to show that the nutrition of school-children has been well maintained. The facts are brought out by the following table giving the percentage rates of school-children classified as suffering from sub-normal nutrition over a period of five years:—

Sub-normal Nutrition amongst School-children.

Year.	Percentage of Total Number of Children examined.
1928	.. 6·84
1929	.. 7·06
1930	.. 6·30
1931	.. 6·68
1932	.. 5·81

It will be seen that since 1928 there has been an actual fall in the percentage rate of children suffering from malnutrition. In considering successive years the figures may be regarded as reliable since they refer to some 60,000 to 70,000 annual examinations over a period in which the personnel of the School Medical Service and the standard of the examination have remained fairly constant.

Since the beginning of the current year School Medical Officers have been asked to keep a close watch on the position. Reports to hand are to the effect that while there is little or no increased malnutrition among country children there is a group of city children which is showing some evidence of malnutrition.

To sum up, then, it can be definitely stated—

(1) Measured by mortality and morbidity rates, the economic crisis has not yet shown any detrimental effect on the public health.

(2) There has been no increase in the proportion of in-patients treated in public hospitals.

(3) On the whole, the nutrition of New Zealand school-children has been well maintained, although there is some evidence that a group of city children is showing clinical signs of malnutrition due to the economic position.

Administration.

Close supervision was maintained over departmental expenditure during the year under review. Largely as a result of the low incidence of infectious disease, the net expenditure on recognized public-health services, apart from subsidies to Hospital Boards, again shows a substantial reduction on the expenditure for the preceding financial year.

Reorganization of the Department's activities in the North Auckland District was carried out during the year. Hitherto public-health matters in that area had been controlled from Auckland by a Medical Officer of Health and a School Medical Officer, but these two posts were combined and the duties in connection with them are now carried out by the one Medical Officer stationed at Whangarei. From an economic and administrative point of view this arrangement has proved sound policy. A Medical Officer in charge of a district in which this system of organization is in force comments as follows on the advantages of single control :—

> "Financial saving occurs when one person is executing work formerly occupied by two officers. It might be said, under the circumstances, that the general efficiency of health services would suffer, but in practice this does not appear to be the case, as to a great extent any disability is compensated for by the more central situation of the health officers, necessitating less waste of time in travelling, with decreased travelling-expenses. The personal advantages to a medical officer from single control are many and varied, the greatest, of course, is the larger degree of personal contact with all classes of the community, and with this is associated a better grasp of the many health problems involved.
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> "School contact is invaluable in this connection, as there one sees the very beginnings of disease and gets glimpses of the possible causative factors at work, and by health education through the school, and otherwise, or by better sanitary control of the environment, it should be possible to remove many of the dysgenic forces at work, with the resultant benefit to the child and adult population.
>
> "A possible disadvantage with combined areas is the difficulty experienced in steering a true course through the multitude of problems encountered; individual preferences for certain types of work have to be carefully guarded against, and in this connection school examination could easily assume too dominant a position in the health officer's mind with possible neglect of the older and well proved methods of sanitary control, which has proved so efficacious in the past and will continue to do in the future."

Public Hygiene.—An important feature of the work of the Division of Public Hygiene was the effort made to bring about co-ordination of public-health work among the various local authorities so as to eliminate possible overlapping and duplication where controlling authorities' responsibilities approach close to each other. General sanitation problems received due attention. Inspection was instituted of chemists' records to see that they comply with the regulations gazetted under the Dangerous Drugs Act.

Special investigations were carried out by Dr. H. B. Turbott—one on the "Bacteriological Control of Milk-supplies, East Cape Health District," and, in collaboration with Mr. H. F. Wise, "The Ice-cream of Gisborne—Bacteriological Control and Sterilization of Factory Equipment." Reports on these are included in the Appendix.

School Hygiene.—A feature of Dr. Ada Paterson's report is the special endeavour that has been made by the School Medical and Nursing Service to ensure a satisfactory standard of nutrition among school-children. Other activities in the interest of the welfare of children to which attention is drawn in this report are the steps taken for the prevention of tuberculosis and diphtheria. The goitre problem has continued to receive constant attention.

Nursing.—Miss Lambie in her report outlines steps taken to improve the standard of nursing in New Zealand, and in doing so emphasizes the value of the establishment of the post-graduate course for nurses.

Dental Hygiene.—One hundred and seventy-nine additional schools were placed under dental supervision, and there was an increase of 4,411 in the number of children who received systematic treatment during the year. The rapidly falling ratio of teeth extracted for every one hundred fillings performed is a gratifying feature of the Director's report.

The system of control through district dental superintendents continues to be satisfactory as regards supervision over the work of the clinics and for economical administration.

The co-operation received from the Dental Clinic Committees has contributed much to the successful operation of this branch of the Department's work.

Hospitals.—Hospital Boards have continued to co-operate with the Department with a view to effecting economies, and hospital maintenance expenditure for the past year shows a further reduction of approximately £75,000 compared with the previous year.

The collection of patients' fees has grown more difficult owing to the prevailing financial position, and the drop in receipts under this heading largely accounted for Boards as a whole incurring a net deficit of approximately £42,000.

The Department is, however, keeping a close watch on the expenditure of Boards by reviewing quarterly budget statements, which all Boards are now required to submit.

It will be observed from the report of the Director, Division of Hospitals, that as an economy measure a number of Boards have leased their smaller hospitals. Many of these institutions are, by reason of the low number of patients treated, very costly to maintain, and in view of the present means of transport it is often doubtful whether their continuance is merited.

Full statistical and financial information with regard to hospitals and institutions under the control of Boards will be published as a special appendix to this report at a later date when the returns from Boards' secretaries are all to hand.

Maori Hygiene.—The death-rate amongst Maoris was 17·06, as compared with 14·81 in 1931. There was a slight fall in infant-mortality, the rate being 95·45 per 1,000 live births. In this connection special educational endeavours are being made to reduce deaths of infants to a figure more in line with the European rate. Suitable pamphlets have been issued on the proper methods of feeding and clothing of infants.

The birth-rate of 39·28 represents a substantial rise in this rate. The excess of births over deaths continues to give the Maori a highly satisfactory natural increase. The death-rate for puerperal causes was 7·29 per 1,000 live births, five of the twenty deaths recorded being due to puerperal septicæmia. Respiratory diseases were responsible for 16·29 per cent. of the total deaths. A large number of deaths still occur from tuberculosis, the rate for all forms of this disease being 41·65 per 10,000. As a result of the co-ordination of school medical inspection work and district nursing referred to in the report of the Director, Division of Nursing, closer supervision is being given to the health of the Maori people. The statistical summary relating to the work of district nurses included in the same report shows that 2,759 visits were paid to pas. Towards the end of 1932 the term of office of the majority of Maori Councils expired, and the new Councils appointed are working well on behalf of the Maori race.

Health Education.—During the year the work of health education has been continued on the lines described in previous reports. This work has included articles supplied to the press, educational talks broadcast through courtesy of the Radio Broadcasting Board, and addresses delivered to various organizations. In addition, information has been supplied from time to time to the health organization of the League of Nations, the International Union against Tuberculosis, the Social Hygiene Council, &c. On request from the New Zealand Institute papers on public-health problems relating to New Zealand were prepared by Dr. Duncan Cook, Dr. F. S. Maclean, and Dr. H. B. Turbott for presentation to the Fifth Pacific Science Congress, Canada, 1933.

Boards Associated with Department.—The various Boards associated with the Department have continued their work during the year—namely, the Board of Health, Medical Council, Plumbers Board, Masseurs Registration Board, Opticians Board, and Nurses and Midwives Registration Board. Reference to the work of the last-mentioned body will be found in the report of the Director, Division of Nursing.

During the year legislation was passed requiring medical practitioners, plumbers, masseurs, and opticians to obtain annual practising certificates, it being necessary to increase the revenue in each case to cover the costs of administering the governing law.

The Department acknowledges its indebtedness to the members of these Boards for their able services.

Staff.—During the year several officers retired from the Department on superannuation. In particular, I would refer to Mr. K. Cameron and Mr. M. Kershaw, Senior Inspectors of Health at Dunedin and Christchurch respectively, who had been associated with the Department for many years. Both had proved themselves able officers.

I have also to record with regret the death during the year of Miss Hester Maclean, R.R.C., Florence Nightingale Medallist, who had lived in retirement in Wellington for some years past, and who was formerly Director, Division of Nursing. Miss Lambie in her report refers more fully to Miss Maclean's distinguished career.

The Department also lost the services of a number of officers who had been associated with it for a number of years through the transfer of the Otaki Sanatorium and the Bacteriological Laboratories at Whangarei, Gisborne, and Invercargill to local Hospital Board control.

In conclusion, I wish to express thanks for the support given me by officers of the Department throughout the year.

M. H. WATT, Director-General of Health.

PART II.—PUBLIC HYGIENE.

I have the honour to submit my annual report for the year ended 31st March, 1933. It is necessarily brief and devoid of graphs owing to need of economy.

SECTION I.—VITAL STATISTICS.

POPULATION.

The mean population of the Dominion for 1932 (exclusive of Maoris) was estimated to be 1,456,237. This total represents an increase over the corresponding figure for the previous year of 11,336, or a percentage increase of population of 0·78.

BIRTHS.

The births of 24,884 living children were registered in the Dominion during 1932, as against 26,622 in 1931. The birth-rate for 1932 was thus 17·09 per 1,000 of mean population. The general course of the birth-rate during the last five years is shown in the following table :—

Births (Number and Rate) in New Zealand, 1928–1932.

Year.	Total Number of Births registered.	Birth-rate per 1,000 of Mean Population.
1928	27,200	19·56
1929	26,747	19·01
1930	26,797	18·80
1931	26,622	18·42
1932	24,884	17·09

The birth-rate steadily declines. There were 24,884 births for a population of 1,456,237 and there were 11,683 deaths, the difference or natural increase being 13,201 persons or 0·91 per cent. only of the total population. Back in 1870 the natural increase was 3·1 per cent.

DEATHS.

The total number of deaths (11,683) registered during the year 1932, as compared with 12,047 in 1931, shows a decrease of 364.

Crude Death-rates.

Year.	Crude Death-rate per 1,000 Mean Population.	Year.	Crude Death-rate per 1,000 Mean Population.
1928	8·49	1931	8·34
1929	8·75	1932	8·02
1930	8·56		

New Zealand has a very low general death-rate, but, owing to the steadily reducing birth-rate, her annual natural increase of population is only 0·91 per cent.

STILL-BIRTHS.

Still-births, which are defined by the Births and Deaths Registration Act of 1924 as "children which have issued from their mother after the expiration of the twenty-eighth week of pregnancy, and which were not alive at the time of such issue," are compulsorily registrable in the Dominion. The next table shows the number of such births and their rate per 1,000 live births in individual years for the quinquennium 1928–1932.

Still-births (Number and Rate) in New Zealand, 1928–1932.

Year.	Total Number of Still-births registered.	Rate of Still-births per 1,000 Live Births.
1928	839	30·8
1929	870	32·5
1930	865	32·3
1931	809	30·4
1932	746	30·0

There was a reduction in the still-birth rate this year, and further on will be seen a reduction also in the death-rate of infants under one week of age.

(NOTE.—Still-births are not included, either as births or deaths, in the various numbers and rates given elsewhere in this report.)

THE PRINCIPAL CAUSES OF DEATH.

The following table gives the main causes of deaths last year in their order of magnitude, and the actual number of deaths therefrom.

TOTAL DEATHS IN NEW ZEALAND IN 1932, 11,683.

Causes.		Actual Deaths.
Heart-disease (all forms)		2,935
Cancer		1,472
Violence		928
Chest disease—		
Pneumonia	278	
Pneumonia secondary to influenza, whooping-cough, and measles	51	
Bronchitis	207	
Broncho-pneumonia	226	
	—	762
Tuberculosis (all forms)		615
Apoplexy or cerebral hæmorrhage		611
Kidney or Bright's disease		580
Senility		439
Disease of the arteries		444
Diabetes		229
Diseases and accidents of child-birth (*i.e.*, maternal mortality)		101
Appendicitis		101
Hernia and intestinal obstruction		94
Diarrhœa and enteritis		68
Epilepsy		41

Common Infectious Diseases.

Influenza (all forms, including pneumonic)	67
Diphtheria	40
Whooping-cough	44
Scarlet fever	6
Typhoid fever	8
Measles	..

Infant Mortality.

Infant deaths (under one year), all causes	777

For several years now the principal causes of death have been thus tabulated. The year 1932 compared with 1931 gave, in round numbers, 360 fewer deaths in a population increased by 11,336. Reduction in deaths occurred principally as follows: Accidental violence, 265; infectious diseases, 166; chest diseases, 87; infant-mortality, 79; whereas there was an increase in deaths from heart-disease (an increase of 118) and diseases of the arteries (24).

An outstanding feature noteworthy over many years is that the death-rates from the common infectious diseases appear to show a steady and definite reduction. The greatest example is typhoid fever. A five-year average taken fifty years ago gave a mortality more than forty times that for the five years ending in 1932. We still experience epidemics of scarlet fever, diphtheria, measles, and whooping-cough, but these epidemics give an annual death-rate very much lower than that experienced in former epidemics, while in the intervening non-epidemic years the sporadic cases have assumed a milder type and give a reduced death-rate. Tuberculosis also displays this very markedly over a fifty-year period, the death-rate per 10,000 of mean population in 1881 having been 13·8 compared with 4·22 in 1932, a threefold reduction. In the last five years the death-rate from this disease per 10,000 of mean population has been reduced from 5·02 to 4·22.

As is well-known, the infantile-death rate of New Zealand (made up of infant deaths from all causes) has been very greatly reduced, and during recent years infants under one month of age are sharing in this lessened mortality.

These reductions are so great and so sustained that one is forced to the conclusion that good environment (to use a comprehensive term which includes measures taken to improve diet and hygiene) is steadily removing these diseases. This same tendency in lesser degree is noticeable in the vital statistics of closely populated England and is coincident in both countries with improving nutritional and hygienic conditions, including welfare measures directed mainly to those in special need of guidance or protection. The thought then arises, despite the prophesies of certain epidemiologists who, on historical grounds, predict a recurrence of high infectious-disease virulence and mortality and perhaps undervalue the influence of improved environment, and those of immunologists who regard the subject as essentially one of acquired immunity, whether or not New Zealand and even closely populated England can by the maintenance or even improvement of a good environment retain the *natural resistance of their peoples to these diseases.*

The Dominion is now unfortunately experiencing a period of want and poverty, and, pending necessary adjustments, there will be some overcrowding of persons in dwellings. Doubtless this will in some measure mar our vital statistics, but such effect is not yet noticeable. It is to be hoped that restoration of the economic balance can be achieved in order that the beneficient influence over many years of steady improvement in the nutrition and the hygienic environment of the poorer people will not be greatly lessened.

THE PRINCIPAL CAUSES OF DEATH ITEMIZED.

Cause.	Year.				
	1928.	1929.	1930.	1931.	1932.
Heart-disease (all forms)	2,315	2,533	2,897	2,817	2,935
Apoplexy or cerebral hæmorrhage ..	643	634	659	634	611
Diseases of the arteries	394	428	432	420	444
Totals	3,352	3,595	3,988	3,871	3,990

It is again noteworthy that these diseases of the heart and arteries accounted for 3,990 deaths—*i.e.*, 34 per cent. of the total deaths during the year. In 1928 they accounted for 28 per cent., in 1929 29 per cent., and in 1930 and 1931 32 per cent. of the total.

This, by reason of its magnitude and increasing tendency, appears to present a field worthy of special investigation by the Department and the medical profession. Certain infectious and other diseases such as scarlet fever, diphtheria, and acute rheumatism, and syphilis are known to sometimes affect the heart and blood-vessels, but their potency and influence has definitely waned.

Again, some may regard deaths from these diseases as the inevitable results of fair wear-and-tear, but analysis shows that, during the three years ending 1930, of an approximate total of 11,000 deaths in New Zealand from those causes 2,500 occurred before the age of sixty had been reached, 1,100 before age fifty, and 500 before age forty.

These diseases, then, not only shorten life, but stand out as the main blot on a clearing horizon. Medical attention to individual patients (usually middle-aged or older persons) does by means of detection of arterio-sclerosis, high blood-pressure, or heart incompetency, and the alteration of habits, including dietary, lengthen their lives, but by co-operative effort in a wider field, commencing at an earlier age, and an endeavour to ascertain the fundamental causes of these very common diseases of the heart and blood-vessels it seems possible that longevity could be increased.

Cancer, another important cause of death, is regarded by many as a disease of civilization. If this be true, then the necessary correction of the human errors which predispose to cancer will probably prove to be neither a short nor a simple task. There are, in fact, very few examples in medical history of any disease having been eradicated by rapid cure, and in respect of these diseases of the heart and blood-vessels it may be said with greater force than is true of cancer that the results of early diagnosis and medical attention to individual cases appear to justify a wider and earlier application of the process. Moreover, the very fact that our knowledge of the causes of arterio-sclerosis and of many forms of heart-disease is scanty itself points to the need of special investigation. The number of annual deaths involved is such as to offer a margin of gain worth the effort.

CANCER, 1,472.

The following table, taken from the "New Zealand Official Year-Book," shows the cancer death-rate in the Dominion for the last five years :—

Number of Persons who died from Cancer, the Proportion per 10,000 Persons living, and the Percentage of all Deaths, 1928–32.

Year.	Deaths from Cancer.	Total Deaths, all Causes.	Deaths from Cancer per 10,000 of Living Persons.	Deaths from Cancer per 100 of all Deaths.
1928	1,374	11,811	9·87	11·63
1929	1,467	12,314	10·43	11·91
1930	1,452	12,199	10·19	11·90
1931	1,493	12,047	10·33	12·39
1932	1,472	11,683	10·11	12·60

We know not the cause of cancer. It is increasing in prevalence at a slow, not rapid, rate. Being a disease of late life and having in the past often missed detection or registration, its apparent increase is in considerable measure accounted for by our longer span of life and greater skill in diagnosis. The real increase is slight.

It has always been an important cause of death, but results show that nowadays submission to skilled treatment at an early stage is worth while. Particularly after the age of thirty-five we should seek medical examination for any unusual condition which might be cancer.

Violence, 928.

Violence has now assumed third place as a cause of deaths in New Zealand; 663 of these deaths were due to accident, 240 to suicide, and 25 to homicide. The number of deaths from suicide increased from 226 in 1931 to 240 last year.

In the last five years the number of deaths annually from motor-vehicle accidents has averaged 178.

Chest-diseases, 762.

Pneumonia	278
Pneumonia secondary to influenza, whooping-cough, and measles	51
Broncho-pneumonia	226
Bronchitis	207
	762

There is reason to believe that many of these deaths could be prevented. In some countries the experiment has been tried of making every pneumonia case compulsorily notifiable, and attempting isolation. Apparently the results achieved have not justified the expense and trouble thereby involved, but the fact remains that probably a large proportion of these illnesses are infectious. All associated with epidemics of influenza, measles, whooping-cough, or diphtheria certainly are. Again, when in the absence of a recognized outbreak of such common infectious diseases, groups of pneumonia or broncho-pneumonia cases occur in a community, affecting in considerable measures virile young adults, adolescents, and children, of which it can be said the infecting agent is virulent, then measures can be taken which give promise of considerably reducing the death-rate from these lung-ailments. Such measures are complete case-isolation to be practised by doctor and nurse, and convalescents to be restrained from close contact with other persons, attendance at indoor public gatherings, &c., until they have completely recovered.

Tuberculosis (all Forms), 615.

The following table indicates the course of this disease since 1928:—

Year.	Number of Deaths from Tuberculosis.	Death-rate from Tuberculosis per 10,000 of Mean Population.	Year.	Number of Deaths from Tuberculosis.	Death-rate from Tuberculosis per 10,000 of Mean Population.
1928 ..	699	5·02	1931 ..	617	4·27
1929 ..	642	4·56	1932 ..	615	4·22
1930 ..	649	4·55			

New Zealand has the lowest death-rate from tuberculosis in the world. In common with many other countries, including Great Britain, it has steadily reduced in the last half-century. This year's rate is remarkably low. Tuberculosis, however, still takes fifth place as a cause of death in New Zealand and disables temporarily or permanently many more than it kills.

Of 615 deaths from tuberculosis last year, 488 (= 3·35) were assigned to pulmonary tuberculosis, and 127 to other forms of this disease, comprising tuberculosis, meningitis, and peritonitis, and tuberculosis of the bones, joints, glands, &c.

Pulmonary Tuberculosis.

The pulmonary cases are regarded by most authorities as conveyed from human sources. There were 904 notifications of fresh cases during the year.

Other Forms of Tuberculosis.

The 127 deaths last year from other forms of tuberculosis were made up as follows:—

Tuberculosis of meninges and central nervous system	47
Tuberculosis of intestines and peritoneum	22
Tuberculosis of vertebral column	12
Tuberculosis of bones and joints	1
Tuberculosis of skin and subcutaneous cellular tissue	..
Tuberculosis of lymphatic system	2
Tuberculosis of genito-urinary system	12
Tuberculosis of other organs	4
Disseminated tuberculosis	27
	127

A small proportion only of these latter deaths, particularly those of children, are deemed by recognized authorities to be possibly due to infection from the cow, and bacteriological tests of milk-supplies in New Zealand have shown the milk-supply to be remarkably free from bovine tubercle.

Kidney or Bright's Disease, 580.

Since 1900, unlike heart-disease, apoplexy, and diseases of the arteries, the death-rate from which have greatly increased, that from kidney or Bright's disease has shown little variation.

Diabetes, 229.

There has been little variation in the death-rate from diabetes in recent years.

Maternal Mortality.

The questions of maternal mortality and diseases and accidents of childbirth are dealt with fully in the report on maternal welfare by my colleague, Dr. Paget.

SECTION 2.—THE COMMON INFECTIOUS DISEASES.

Influenza (all Forms), 67.

Number of Deaths from Influenza in New Zealand, 1928–32.

Year.	Number.	Year.	Number.
1928	242	1931	221
1929	297	1932	67
1930	131		

Pneumonic Influenza.

Pneumonic influenza, the deaths from which are included in "Influenza (all forms)," is a form of influenza which is compulsorily notifiable.

Pneumonic Influenza in New Zealand, 1928–32.

Year.	Deaths.	
	Number.	Rate per 10,000 of Mean Population.
1928	100	0·72
1929	120	0·85
1930	66	0·46
1931	121	0·84
1932	21	0·14

Diphtheria, 40.

Diphtheria in New Zealand, 1928–32.

Year.	Notifications.		Deaths.*	
	Number.	Rate per 10,000 of Mean Population.	Number.	Rate per 10,000 of Mean Population.
1928	1,600	11·51	72	0·52
1929	1,687	11·99	92	0·65
1930	1,440	10·10	58	0·41
1931	1,327	9·18	55	0·38
1932	802	5·51	40	0·27

* Figures include deaths from croup.

Scarlet Fever, 6.

The course of scarlet fever in New Zealand is briefly shown in the table below:—

Scarlet Fever in New Zealand, 1928–32.

Year.	Notifications.		Deaths.	
	Number.	Rate per 10,000 of Mean Population.	Number.	Rate per 10,000 of Mean Population.
1928	6,127	44·06	55	0·40
1929	4,848	34·46	27	0·19
1930	2,244	15·75	16	0·11
1931	1,304	9·02	11	0·08
1932	829	5·69	6	0·04

Whooping-cough, 44; Measles, Nil.

Neither of these two diseases is compulsorily notifiable. Whooping-cough was prevalent, but the number of deaths caused thereby was low in comparison with former epidemics.

Typhoid or Enteric Fever, 8.

The position as regards this disease for the period 1928–31 is shown in the table below:—

Enteric Fever in New Zealand, 1928–32.

Year.	Notifications.		Deaths.	
	Number.	Rate per 10,000 of Mean Population.	Number.	Rate per 10,000 of Mean Population
1928	290	2·09	16	0·12
1929	278	1·98	22	0·16
1930	149	1·04	7	0·05
1931	161	1·11	8	0·06
1932	195	1·34	8	0·06

It is also of interest to state that the death-rate from typhoid fever (average) for the last five years was approximately forty times less than a similar average taken fifty years ago.

SECTION 3.

Infant Mortality, 777.

The infant-mortality rate for 1932 was 31·22 per 1,000 births.

Infant Mortality in New Zealand, 1928–32 (per 1,000 Live Births).

Year.	Under One Month.	One Month and under Twelve Months.	Total under Twelve Months.	Year.	Under One Month.	One Month and under Twelve Months.	Total under Twelve Months.
1928 ..	25·44	10·74	36·18	1931 ..	22·69	9·46	32·15
1929 ..	23·26	10·84	34·10	1932 ..	21·30	9·92	31·22
1930 ..	24·03	10·45	34·48				

It will be seen from the above table that there was a substantial reduction last year in the death-rate of infants, and those under one month of age shared in this reduction.

Analysis of Deaths of Infants under One Month of Age, 1932.

The following table gives the causes of these deaths during the year:—

Cause of Death.	Under One Day.	One Day and under One Week.	One Week and under Two Weeks.	Two Weeks and under Three Weeks.	Three Weeks and under One Month.	Total.
Influenza	..	..	..	..	..	..
Syphilis	..	..	..	..	..	..
Meningitis	..	..	..	..	..	..
Convulsions	..	1	1	..	..	2
Broncho-pneumonia	..	3	2	..	3	8
Pneumonia	..	2	..	..	1	3
Diarrhœa and enteritis	..	..	2	1	..	3
Congenital malformations	21	56	13	8	6	104
Congenital debility	8	4	3	..	1	16
Injury at birth	11	44	7	..	..	62
Premature birth	99	74	19	13	7	212
Other diseases	22	51	12	5	1	91
Accidental mechanical suffocation ..	..	..	..	..	..	..
Other causes	3	10	6	4	6	29
Totals, 1932	164	245	65	31	25	530
Totals, 1931	190	281	73	39	21	604

Thus 409 of a total of 530 infant deaths in the first month of life occurred during the first week and may be regarded as mainly due to pre-natal influences. It is also of interest to record that well over half of the infant deaths (in the first twelve months of life) occurred in this first week—*i.e.*, 409 in a total of 777.

Table A.—Notifiable Diseases in New Zealand, 1932, showing Distribution by Months.

Month.	Scarlet Fever.	Diphtheria.	Enteric Fever.	Tuberculosis.	Cerebro-spinal Meningitis.	Poliomyelitis.	Puerperal Fever.				Ophthalmia Neonatorum.	Lethargic Encephalitis.	Food Poisoning.	Bacillary Dysentery.	Actinomycosis.	Undulant Fever.	Lead Poisoning.	Leprosy.	Anthrax.	Beriberi.	Phosphorus Poisoning.	Pneumonia.	Totals.
							Influenza.	Erysipelas.	Ordinary.	Following Abortion or Miscarriage.													
January	79	62	32	66	..	12	1	7	3	11	8	5	4	..	3	1	6	7	1	1	..	..	..	..	..	..	309
February	68	52	16	95	..	30	3	21	6	10	3	2	3	..	3	4	..	4	..	2	..	..	..	..	..	..	322
March	81	88	18	77	3	39	2	20	3	15	4	1	4	1	2	1	11	4	..	1	..	..	..	..	..	..	375
April	81	74	21	58	1	23	..	23	11	10	8	2	2	..	1	3	1	12	..	2	..	..	..	..	..	..	333
May	75	78	14	76	2	8	4	22	19	6	7	2	2	..	3	2	..	1	..	1	1	..	..	..	..	..	323
June	72	89	15	79	..	6	5	22	9	8	6	..	3	1	1	1	..	12	1	2	..	..	..	..	..	..	332
July	81	73	19	89	2	1	1	21	9	11	2	..	2	..	1	..	..	..	1	..	..	..	..	..	..	..	313
August	68	68	10	52	..	8	3	19	13	17	6	1	2	1	..	3	1	2	1	2	..	..	..	..	..	..	277
September ..	55	58	5	81	2	5	2	24	15	19	2	2	5	1	3	..	..	..	..	..	..	..	..	..	..	..	279
October	52	51	9	101	2	2	1	17	9	12	4	..	5	..	1	3	..	..	..	7	..	..	..	..	..	..	276
November	56	47	23	86	1	7	1	17	5	15	6	1	3	..	1	..	..	1	2	5	..	..	..	..	..	..	277
December	61	62	13	44	3	7	1	20	8	8	6	1	2	..	4	3	53	1	1	1	..	..	..	..	..	..	299
Totals ..	829	802	195	904	16	148	24	233	110	142	62	17	37	4	23	21	72	44	7	24	1	..	..	..	..	*	3,715
Totals, 1931 ..	1,304	1,327	161	1,109	22	25	247	233	160	133	84	21	59	9	33	12	24	31	1	13	2	1	1	1	..	*	5,013
Totals, 1930 ..	2,244	1,440	149	1,244	30	12	104	322	157	162	93	30	52	7	36	15	18	68	5	6	3	..	..	..	1	1,040	7,238

* Ceased to be a notifiable disease in January, 1931.

Table B.—Notifications of Cases of Notifiable Diseases for Year ended 31st December, 1932.

Name of Disease.	North Auckland.	Central Auckland.	South Auckland.	Thames-Tauranga.	Taranaki.	East Cape.	Wanganui-Horowhenua.	Wairarapa-Hawke's Bay.	Central Wellington.	Nelson-Marlborough.	Canterbury.	West Coast.	Otago.	Southland.	Totals.
Scarlet fever	12	69	35	8	30	6	42	22	59	14	169	22	211	130	829
Diphtheria	32	204	139	26	62	24	86	47	64	12	81	15	6	4	802
Enteric fever	1	31	53	10	4	31	12	17	3	2	13	1	4	13	195
Tuberculosis	18	179	55	26	40	36	35	40	113	27	153	23	111	48	904
Cerebro-spinal meningitis	1	2	2	..	..	1	1	4	..	2	..	..	2	1	16
Poliomyelitis	4	2	9	2	1	2	5	8	12	6	57	3	26	11	148
Influenza	..	2	..	..	1	..	..	1	2	2	12	2	1	1	24
Erysipelas	2	59	15	3	5	9	19	13	31	3	49	10	12	3	233
Puerperal fever—															
Ordinary	5	11	15	3	7	3	6	6	10	3	21	3	12	5	110
Following abortion or miscarriage	8	78	12	4	..	1	4	3	3	..	21	2	6	..	142
Eclampsia	2	11	7	2	4	..	5	11	7	1	9	1	1	1	62
Tetanus	1	4	2	..	..	..	3	2	3	..	..	..	1	1	17
Hydatids	..	1	1	1	2	2	2	4	1	1	15	..	6	1	37
Trachoma	..	1	1	..	..	..	1	..	1	..	..	..	..	..	4
Ophthalmia neonatorum	1	3	2	..	1	2	3	1	..	..	1	..	8	1	23
Lethargic encephalitis	..	3	3	1	5	..	1	2	..	1	2	..	2	1	21
Food poisoning	..	7	2	..	8	..	35	4	..	..	15	1	..	..	72
Bacillary dysentery	8	25	..	5	..	4	..	2	..	..	..	..	..	..	44
Actinomycosis	1	2	..	..	..	1	..	1	..	..	2	..	..	..	7
Undulant fever	..	3	4	2	1	1	4	6	1	..	1	..	1	..	24
Lead poisoning	..	..	..	..	..	..	..	..	..	..	1	..	..	..	1
Totals	96	697	357	93	171	123	264	194	310	74	622	83	410	221	3,715

Table C.—Notifiable Diseases in New Zealand, 1932, showing Distribution by Age and Sex.

Disease.	Under 1 Year.		1 to 5 Years.		5 to 10 Years.		10 to 15 Years.		15 to 20 Years.		20 to 25 Years.		25 to 30 Years.		30 to 35 Years.		35 to 40 Years.		40 to 45 Years.		45 to 50 Years.		50 to 55 Years.		55 to 60 Years.		60 to 65 Years.		65 to 70 Years.		70 to 75 Years.		75 to 80 Years.		80 Years and over.		Total Cases at all Ages.	
	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.
Scarlet fever	..	3	116	119	137	168	43	56	12	49	5	32	8	26	7	18	4	11	2	6	..	3	..	4	..	..	..	..	..	..	..	..	..	..	..	..	334	495
Diphtheria	5	3	122	114	155	162	48	54	9	25	13	22	8	12	7	17	2	10	1	4	1	1	..	5	..	1	..	1	..	..	..	..	..	..	..	..	371	431
Enteric fever	..	..	8	7	20	17	9	13	18	10	13	10	10	11	7	8	5	8	5	1	5	1	2	1	1	2	..	2	..	1	..	..	..	..	..	..	103	92
Tuberculosis	1	2	5	1	14	16	10	26	49	66	69	116	62	82	31	50	55	29	38	23	50	10	23	12	18	6	11	5	7	3	8	2	1	1	..	2	452	452
Cerebro-spinal meningitis	..	2	2	2	1	1	2	..	..	..	2	..	..	..	1	1	..	..	..	..	..	1	..	..	..	..	..	..	..	1	..	..	..	..	..	..	8	8
Poliomyelitis	4	4	30	20	32	17	10	8	3	5	3	5	1	2	2	..	..	1	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	86	62
Influenza	..	..	3	1	..	1	..	2	4	1	1	1	3	..	..	1	1	..	2	..	1	..	..	..	2	..	..	..	..	..	..	..	..	..	..	..	17	7
Erysipelas	3	3	4	9	7	1	1	1	4	5	3	6	7	9	5	13	7	17	9	12	6	16	13	24	7	7	12	7	2	3	4	2	1	..	2	1	97	136
Puerperal fever—																																						
Ordinary	..	..	..	..	..	..	..	1	..	16	..	26	..	28	..	20	..	13	..	4	..	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	110
Following abortion or miscarriage	..	..	..	..	..	..	..	..	..	12	..	34	..	41	..	30	..	19	..	6	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	142
Eclampsia	..	..	..	..	..	..	..	1	..	12	..	20	..	15	..	5	..	5	..	3	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	62
Tetanus	..	..	2	..	3	..	4	..	..	..	1	..	..	1	..	1	..	..	..	..	..	..	1	..	..	1	1	1	1	..	..	..	..	..	..	..	..	13	4
Hydatids	..	..	..	..	2	1	2	..	..	..	4	..	2	2	3	..	2	3	2	3	2	1	..	3	2	..	1	..	..	1	..	..	1	..	..	..	23	14
Trachoma	..	..	..	..	..	..	1	..	..	..	..	..	..	..	1	..	..	..	1	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	3	1
Ophthalmia neonatorum ..	12	11	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	12	11
Lethargic encephalitis ..	..	..	..	1	3	2	1	..	1	2	1	..	2	..	1	1	..	..	1	..	..	1	1	1	..	1	1	..	..	..	..	..	..	..	..	..	12	9
Food poisoning	..	..	..	1	..	..	12	1	21	3	1	6	1	6	1	2	..	3	4	4	1	..	..	2	..	..	1	..	..	1	..	..	1	..	..	..	42	30
Bacillary dysentery ..	..	..	6	10	4	4	..	..	1	1	2	..	1	..	3	2	1	..	2	..	..	1	1	..	1	..	..	..	..	..	..	1	2	..	1	..	25	19
Actinomycosis	..	..	..	..	..	..	1	1	2	1	..	..	..	..	..	..	1	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	5	2
Undulant fever	..	..	..	..	1	..	1	2	3	..	2	1	2	..	3	..	1	2	1	1	3	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	18	6
Lead poisoning	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..
Totals	25	28	298	285	379	390	145	166	127	208	120	279	107	235	72	169	79	121	71	67	69	38	41	52	32	19	27	16	10	10	12	5	5	2	3	3	1,622	2,093

TABLE D.—MAORIS: NOTIFICATIONS OF INFECTIOUS DISEASES, 1932.

District.	Diphtheria.	Enteric.	Tuberculosis.	Cerebro-spinal Meningitis.	Poliomyelitis.	Erysipelas.	Puerperal Fever.	Abortion.	Eclampsia.	Tetanus.	Hydatids.	Trachoma.	Ophthalmia.	Lethargic Encephalitis.	Dysentery.	Undulant Fever.	Totals.
North Auckland	..	20	16	..	1	..	1	..	..	1	..	1	2	..	5	..	47
Central Auckland	1	13	8	..	..	1	..	..	..	..	..	1	..	..	..	..	24
South Auckland	..	40	32	..	..	1	2	..	1	..	..	..	..	..	..	..	76
Thames-Tauranga	..	4	5	..	..	..	1	..	..	..	..	..	..	..	..	..	10
Taranaki	..	..	11	..	..	..	..	..	..	..	..	..	..	1	..	..	12
East Cape	1	16	23	1	1	1	2	1	..	..	2	..	..	..	..	..	48
Wanganui-Horowhenua	..	2	7	..	..	..	..	..	..	..	1	1	..	..	..	..	11
Wairarapa-Hawke's Bay	1	9	7	..	..	..	..	1	..	..	..	..	1	..	..	1	20
Central Wellington	..	..	2	..	..	..	..	..	..	..	..	..	..	..	..	..	2
Nelson-Marlborough	..	..	2	..	..	..	..	..	..	..	..	..	..	..	..	..	2
Rest of South Island	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	3	104	113	1	2	3	6	2	1	1	3	3	3	1	5	1	252

TABLE E.—VENEREAL-DISEASES CLINICS.—CASES TREATED DURING THE YEAR ENDED 31ST DECEMBER, 1932.

	Auckland.		Wellington.		Christchurch.		Dunedin.		Totals.	
Number of persons dealt with at or in connection with the out-patient clinic for the first time and found to be suffering from—	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.
Syphilis	157	87	47	63	28	14	21	13	253	177
Soft sore	2	..	..	..	16	..	1	..	19	..
Gonorrhœa	484	153	279	108	317	111	67	52	1,147	424
No venereal disease	123	54	66	70	20	5	13	6	222	135
Total attendance of all persons at the out-patient clinics who were suffering from—										
Syphilis	2,855	2,080	2,001	1,517	1,439	829	1,135	908	7,430	5,334
Soft sore	23	..	..	..	118	..	12	..	153	..
Gonorrhœa	16,629	2,246	15,804	3,251	10,900	5,440	3,431	3,299	46,764	14,236
No venereal disease	..	..	120	111	128	22	19	8	267	141

Year.	Persons attending Public Clinics in New Zealand for the First Time, and found to be suffering from			
	Gonorrhœa.		Syphilis.	
	Number.	Rate per 1,000 of Mean Population.	Number.	Rate per 1,000 of Mean Population.
1922	1,039	0·83	399	0·32
1923	986	0·77	323	0·25
1924	1,129	0·87	240	0·18
1925	1,176	0·88	255	0·19
1926	1,454	1·07	268	0·20
1927	1,584	1·15	245	0·18
1928	1,617	1·16	220	0·16
1929	1,855	1·32	308	0·22
1930	1,789	1·26	269	0·19
1931	1,617	1·12	418	0·29
1932	1,571	1·08	430	0·29

SECTION 4.—NUMBER OF VESSELS INSPECTED DURING THE YEAR ENDED 31ST DECEMBER, 1932.

Port.	Number of Vessels inspected.	Infectious-disease Cases.	V.D. Cases.	Infirm Cases.
North Auckland Health District—				
Russell	1	..	..	..
Mangonui	1	..	..	..
Combined Auckland Health District—				
Auckland	301	11	18	113
Taranaki Health District—				
New Plymouth	19	..	..	..
East Cape Health District—				
Gisborne	3	..	..	..
Combined Wellington Health District—				
Wellington	136	7	10	19
Wanganui	5	..	..	..
Napier	12	..	..	..
Picton	2	..	..	..
Nelson	2	..	..	..
Combined Canterbury Health District—				
Lyttelton	26	..	2	..
Timaru	..	..	..	..
Greymouth	1	..	..	..
Westport	1	..	..	..
Combined Otago Health District—				
Oamaru	6	..	..	..
Port Chalmers	13	..	..	..
Bluff	42	..	..	..
Totals	571	18	30	132

SECTION 5.—WORKING OF THE SALE OF FOOD AND DRUGS ACT.

TABLE 1.—SHOWING SAMPLES RESPECTIVELY OF MILK AND OTHER FOODSTUFFS TAKEN AND DEALT WITH DURING THE YEAR ENDED 31ST DECEMBER, 1932.

Health District.	Number of Samples taken.		Number of Vendors.		Samples not complying.					
					Number of Samples.		Number of Warnings issued.		Number of Prosecutions recommended.	
	Milk.	Other.	Milk.	Other.	Milk.	Other.	Milk.	Other.	Milk.	Other.
North Auckland	63	8	52	8	2	..	1	..	1	..
Central Auckland	1,335	192	1,333	169	124	19	110	10	14	9
South Auckland	202	3	202	3	5	1	4	1	1	..
Thames-Tauranga	34	..	34	..	3	..	2	..	1	..
Taranaki	64	13	52	11	..	2	..	..	..	2
East Cape	199	118	199	66	4	..	4	..	..	..
Wanganui-Horowhenua	216	26	216	18	5	3	4	..	1	3
Wairarapa-Hawke's Bay	184	27	184	21	7	3	4	2	3	1
Central Wellington	1,857	66	1,803	49	42	4	9	..	33	3
Nelson-Marlborough	169	40	166	35	3	2	1	1	2	1
Canterbury	1,892	196	1,783	195	117	46	100	8	17	11
West Coast	190	56	176	56	20	9	18	6	2	3
Otago	983	950	577	361	73	119	49	66	14	10
Southland	228	118	111	68	18	19	15	16	1	3
Totals	7,616	1,813	6,888	1,060	423	227	321	110	90	46

TABLE 2.—SHOWING INSPECTION OF PREMISES ENGAGED IN SELLING OR MANUFACTURING FOODSTUFFS DURING THE YEAR ENDED 31ST DECEMBER, 1932.

Health District.	Number of Premises inspected engaged in the Selling or Manufacture of Foodstuffs.	Number of Instances Articles were "seized" or "destroyed."	Number of such Food Premises requiring Sanitary Alteration.
North Auckland	1,337	2	233
Central Auckland	1,741	30	348
South Auckland	2,604	3	221
Thames-Tauranga	472	..	86
Taranaki	300	13	40
East Cape	741	3	165
Wanganui-Horowhenua	575	46	32
Wairarapa-Hawke's Bay	342	1	14
Central Wellington	379	29	20
Nelson-Marlborough	508	3	36
Canterbury	896	5	5
West Coast	553	11	27
Otago	2,536	7	293
Southland	1,008	4	41
Totals	13,992	157	1,561

TABLE 3.—LEGAL PROCEEDINGS FOR YEAR 1932.

	Number of Prosecutions.	Amount. £ s. d.
Milk below standard	43	153 17 4
Milk, added water	29	195 13 2
Preservative in milk	4	36 1 11
Colouring in milk	1	6 3 9
Selling milk in dirty bottles	1	4 13 0
Filling milk bottles on road	1	6 19 0
Preservative in cream	2	8 11 3
Butter, excess moisture	1	3 0 6
Camphorated oil below standard	11	42 3 0
Beer, excess chloride	1	1 15 6
Canned peas below standard	1	4 10 0
Preservative in meat	9	35 12 1
Spirits not true to label	7	270 4 7
Food premises (Regulation H. 125)	2	34 6 0
Plumbing and Drainage Regulations	2	2 12 0
Insufficient water-supply	1	2 12 6
Totals	116	£808 15 7

SECTION 6.—ADMINISTRATION.

Staff Changes.—During the year Dr. R. J. R. Mecredy, Medical Officer of Health, New Plymouth, resigned, and Dr. M. A. Champtaloup was appointed to the joint duties of Medical Officer of Health and School Medical Officer for the New Plymouth Health District. I regret having to chronicle the death at Masterton of Inspector W. A. McGregor. He was one of the sturdy and popular old-timers in the Inspector service, but for two years past had shown signs of failing health.

Economy Measures.—My thanks are again due to officers for necessary economy in travelling and other administrative expenses.

Sanitary Administration.—Reports received from the various Medical Officers of Health appear to show that, despite the times we live in, the sanitary services of local authorities are being satisfactorily maintained and in a very few instances such as at Blenheim and Eastbourne necessary drainage schemes are in process of installation. A few very necessary additions to water-supplies also are under construction. In general both public and private building has greatly lessened.

Infectious Diseases.—The year has been a very light one in respect of infectious-diseases outbreaks.

Food and Drugs.—During the year several amendments of the regulations were passed. It was found advisible to require on the labels of any proprietary preparation containing thyroid gland a warning that the preparation should not be used except under medical direction. This arose out of the widespead sale of such a preparation for treatment of obesity. A similar provision already exists for the labelling of goitre remedies containing iodine. Provision has been made for the use of sodium

benzoate in place of salicylic acid where this preservative is permitted. Owing to the instability of iodine in iodized salt, provision has been made for a variation of from one part to two parts of potassium iodide in every two hundred and fifty thousand parts of salt.

The amendments also included regulations for labelling canned dried peas.

The regulations for the marking and control of cool-store eggs were revoked as being impracticable. The minimum requirements for milk-fat in cream has been reduced from 40 per cent. to 35 per cent.

During the year, in addition to maintaining the routine sampling of milk, butter, and other foodstuffs, attention has been given to the systematic sampling of the B.P. preparations commonly used as household remedies. While in the main the position is found to be satisfactory, there is evidence that there are a number of packers of these lines without pharmaceutical training and incapable of adequately testing their own results. It is possible that a serious result may some day arise, but the position cannot be adequately met without suitable legislation. In the meantime sampling will continue and prosecutions will be taken where such action is indicated.

Thanks are again due to the Comptroller of Customs and the Dominion Analyst and their officers for valuable assistance and advice.

I desire to again express my appreciation of the loyal and able co-operation of the Medical Officers of Health and their staffs.

T. McKibbin,
Director, Division of Public Hygiene.

PART III.—SCHOOL HYGIENE.

I have the honour to report on the work of the Division of School Hygiene for the year ended 31st March, 1933.

Staff.

There has been a reduction in the permanent staff of School Medical Officers, which now consists of a Director, ten School Medical Officers, and twenty-five school nurses. In three districts—East Cape, North Auckland, and Taranaki—the Medical Officer of Health acts also as School Medical Officer. At the end of the year Dr. Mecredy resigned from the position of Medical Officer of Health and School Medical Officer, Taranaki, his place being filled by the transfer of Dr. Champtaloup from Auckland to Taranaki. There has been no alteration in the personnel of the School Nursing Service during the year; Miss Cox, Gisborne, exchanged positions with Miss O'Meara, West Coast; Miss Hodges, District Nurse, Hamilton, transferred to the position of School Nurse, Wellington, Miss Milroy, Wanganui, taking her position at Hamilton; Miss Grey, Auckland, was transferred to Wanganui to replace Miss Milroy.

Figures relating to Work accomplished in 1932.

The following summary serves to indicate the extent of work accomplished during the school period, February to December, 1932:—

Schools inspected—		
Of roll under 100	1,057	
Of roll 100 to 500	359	
Of roll over 500	139	
		1,555
Children examined—		
Complete examinations	66,479	
Partial examinations	49,657	
		116,136
Number of notifications sent to parents		39,261
Number of addresses to school-children		652
Number of parents interviewed		12,550
Number of lectures or addresses to parents		40

The figures for the work of the school nurses are as follows:—

Number of days assisted Medical Officer in schools		1,670
Number of children examined for medical schedule (H. Sch. 14)		87,900
Number of children examined by special request		8,675
Number of children re-examined after medical officer's inspection		35,016
Number of visits paid to homes in—		
Large towns	8,418	
Small country towns	2,542	
Scattered districts	1,417	
		12,377
Number of children taken personally to hospital, &c.		976
Number of children taken personally to dental clinic		575
Number of health talks given		661

ANALYSIS OF 62,222 COMPLETE EXAMINATIONS,

Total number of children examined	62,222
Percentage found to have defects	74·29
Percentage with defects other than dental	53·69
Percentage of children showing evidence of—	
Subnormal nutrition	5·81
Pediculosis	1·00
Uncleanliness	1·43
Skin—	
Impetigo	1·20
Scabies	1·67
Ringworm	0·18
Other skin diseases	1·27
Non-vaccination	93·60
Heart—	
Organic disease	0·71
Functional disturbance	1·47
Respiratory disease	1·24
Total deformities of trunk and chest	19·21
Mouth—	
Deformity of jaw or palate, including irregularity	4·14
Dental caries	41·43
Extractions of permanent teeth	7·13
Fillings	43·36
Perfect sets of teeth	3·30

Percentage of children, &c.—*continued.*	
Nose and throat—	
Nasal obstruction	3·22
Enlarged tonsils	15·61
Enlarged glands	10·85
Goitre—	
All degrees	15·24
Incipient	11·41
Small	3·26
Medium	0·49
Large	0·08
Eye—	
External eye-disease	1·37
Defective vision (total)	3·57
Corrected	1·92
Uncorrected	1·65
Ear—	
Otorrhœa	0·26
Defective hearing	0·33
Defective speech	0·68
Mental—	
Feeblemindedness	0·31
Epilepsy	0·04
Other nervous defects	0·25
Tuberculosis—	
Total	0·15
Pulmonary	0·10
Other tissues	0·05
Notifications to parents	36·63

It is thus evident that in spite of the diminution of staff the amount of routine work done has been well maintained. The reduction and reorganization of staff has resulted in lessened expenditure but has necessitated the concentration of our efforts on routine work and has made impossible the carrying-out of any special investigations as in previous years.

SCHOOL NURSING STAFF.

In pursuance of the system of reorganization mentioned in the report last year, district nurses in outlying areas are now acting as school nurses in increasing number. This arrangement holds throughout the Auckland and East Cape districts, the work of the school nurses proper being therefore restricted to Auckland City and a small part of the country beyond. It is anticipated that this arrangement will not only make for economy, but will ensure better understanding and closer co-operation between the officers of the Department and the local residents. Hitherto School Medical Officers have had limited opportunity for getting into touch with parents in country districts. Visits to remote schools have perforce to be infrequent. For reasons of economy and because of our reduced numbers, it is necessary to concentrate our efforts where the school population is greatest; for the same reasons the follow-up visits of the school nurses have had to be curtailed. The district nurse, however, is always available. She is the friend of every one, and is appealed to for assistance in all local health problems. She has ample opportunity, therefore, of following up the advice of the visiting Medical Officer and ensuring that treatment recommended is obtained. Moreover, though children in remote areas as elsewhere suffer from defects requiring medical or surgical attention, there is also a vast amount of health education necessary which can be carried out only by a nurse living within the area.

There has been a reduction (to 12,377 from 14,885) in the number of visits to homes paid by school nurses. This, while a matter for regret, is an inevitable result of staff reduction. There is an annually increasing demand from health camp organizations for the services of school nurses. During the year sixteen school nurses were on duty at health camps for a period of two weeks or (in a few instances) longer.

In Taranaki the arrangement with the Red Cross Society still holds, by which Misses Corkill and Small carry out combined duty as Red Cross and school nurses. The quality and amount of work done by these officers in their dual capacity is excellent, but, in view of the increasing demand for their services, especially in the form of evening classes, some modification of the present programme is essential.

In Marlborough the arrangement by which Miss Atkinson acts as school nurse and local Child Welfare Officer is working satisfactorily.

The work of the school nurses cannot be assessed in figures. It is pleasing to record that they have not a literal interpretation as to the scope of their duties, but give advice and assistance in many minor problems beyond, thus succeeding in establishing a friendly relationship between the parents and themselves.

MALNUTRITION.

In view of the difficulty of the present times, special attention has been given to the question of malnutrition. The returns giving the result of the examination of primary-school children for the last nine years show little variation in the percentage of subnormal nutrition noted. These are: 1932, 5·81; 1931, 6·68; 1930, 6·30; 1929, 7·06; 1928, 6·84; 1927, 7·14; 1926, 7·45; 1925, 9·21; 1924, 5·88.

In view of the large number of examinations to which this return refers (between 60,000 and 70,000 annually) these figures may be regarded as giving a reliable basis for comparison. Any alteration in the personnel of examining Medical Officers has not been sufficient to cause marked variation in the general standard used in estimating nutrition. The same conclusion is arrived at, moreover, by comparing the annual returns of individual School Medical Officers working year after year in the same district.

As might be expected, the percentage of primer children suffering from malnutrition is somewhat greater than that of older children: 1932, 8·26; 1931, 7·45; 1930, 8·01; 1929, 8·24; 1928, 8·67; 1926, 8·39 (1927 not available).

To sum up:—

(1) Generally speaking, over the Dominion as a whole, there is no evident increase in the percentage of school-children suffering from malnutrition.

(2) There is no increase of malnutrition in country districts, where food is readily available and any necessitous case can be readily dealt with locally.

(3) Most School Medical Officers state that in the cities a small proportion of children, belonging especially to primer-class age groups, show clinical signs of malnutrition. Food is poor in quality rather than quantity; deficient in vitamins, first-class protein, and in fat—milk, fresh eggs, butter, fresh vegetables, and meat are lacking.

The fundamental necessities for right nurture (food of the right type and amount, adequate sleep and rest, fresh air, sunlight, and wholesome exercise) are as readily available in New Zealand as in any other country. It is the question rather of their right distribution and usage that is of importance. It is impossible to over-emphasize the value of good domestic economy, and the capability of the mother, therefore, is of the greatest importance. Many women use small means intelligently with remarkable success; others muddle along incompetently whatever their resources.

It must not be forgotten that even during times of prosperity a definite percentage of children show evidence of malnutrition. Other factors than the food-supply powerfully influence nutrition. In particular, too little responsibility is assigned to the bad effect of inadequate sleep, and this applies to the well-to-do and poor alike. A sound rule is: Under twelve years, 12 hours' sleep. In comfortable homes talented children are often exploited and overstimulated, and spoiled children are allowed to stay up too late.

In the cities poor people crowd together for economy and to secure the maximum amount of warmth in winter. One School Medical Officer states:—

> "The information collected regarding the home conditions shows that the crowded state of the homes, and the unhygienic conditions under which the children live, and especially sleep, must be largely responsible for their poor physical condition. Another regrettable matter is the late retiring-hours and irregular hours of sleep of so many children. If parents have difficulty in obtaining sufficient and nourishing food for their families, the necessity for conserving physical and nervous energy as much as possible should be obvious. In many cases the difficulty is due to complete lack of parental control."

Country children generally, especially from good farming districts, attain a satisfactory standard of growth and health. It has always been noted by School Medical Officers, however, that though their nutrition as a whole compares favourably with that of city children, marked malnutrition may occur in remote country districts. It is a popular fiction that the country child is necessarily possessed of superior advantages. Among the struggling population of the backblocks, houses are often poor and cramped, with sanitation non-existent. In dairying districts children may be employed early and late out-of-doors. Food may be monotonous, hastily prepared, and badly cooked; it is often deficient in vitamins and in body-building constituents. In New Zealand fresh fruit and vegetables, milk, eggs, and cheese should be readily obtained and widely utilized. The compulsory attention exacted by the share milkers' cows often result in a distaste for milk. Dr. Henderson in his inquiry into the condition of rural school-children found that 10 per cent. of share milkers' children never touched milk. The amount of outside work done by the mother (*e.g.*, share milking) often detracts from her efficiency in the house. Fatigue and isolation, the struggle against poverty and her own limited knowledge depress her further. For such women the telephone and radio, if they can be afforded, are a definite aid to mental and physical health.

There are, of course, fortunately in this country, thousands of competent cheerful housewives, whose intelligent management and self-denial are one of its most valuable assets. While all authorities stress the supreme importance of maternal efficiency, the scope of this is necessarily modified by the ability of the father to provide material requirements for his children and in his hands often to an even greater degree than the mother's is the responsibility of directing their abilities and energies.

The figures given above refer to subnormal as well as marked malnutrition, and it should be emphasized that the standard used in estimating malnutrition is a high one. Taking the Dominion as a whole, we have every confidence that in growth and development and in freedom from defect and disease, New Zealand children compare favourably with those of other countries.

Special measures for maintaining or improving the nutrition of pupils have been inaugurated in many schools throughout the Dominion. The importance of an organized and nutritious school lunch

is becoming more widely recognized. In most schools at present an effort is made to provide all children who remain at school during the lunch period with hot cocoa (made with a liberal supply of milk) or with milk. In some schools the children contribute towards the cost of this; in others the School Committee, Parent-teacher Association, or some local philanthropic body raises the necessary funds. It is hoped to increase the average daily consumption of milk, now calculated to be $\frac{3}{8}$ pint per person, whereas School Medical Officers advocate from 1 to $1\frac{1}{2}$ pints for every child daily. The population of New Zealand would undoubtedly benefit from an increased consumption of our own dairy-products.

Health Camps.

Very practical assistance has been given to undernourished and delicate children during last year by various health-camp organizations. The health-camp movement is extending throughout the Dominion drawing annually new districts within its scope.

The Community Sunshine Association in Auckland has held monthly health camps for children at Motuihi Island, in Auckland Harbour, for twenty-eight months continuously, many hundreds of children benefiting thereby. In the summer vacation a sunshine camp for delicate children was held once more at Waiheke Island, school nurses being in charge.

The Waikato Children's Health Camp Association again held its annual camp for approximately two hundred children at Waikato Heads. The Bryant Home at Raglan unostentatiously continues its splendid work.

The Raukawa Children's Health Camp at Otaki under the management of the Wellington Children's Health Camp Association has now been open continuously for over a year. Dr. Helen Bakewell, School Medical Officer, reports as follows: "During the period February, 1932, to February, 1933, 529 children had been admitted; these figures include a camp of fifty-five children from the special classes at Wellington. The minimum length of stay has been fixed at six weeks, but this period has been prolonged indefinitely according to the physical condition and home circumstances of the child. The children admitted have been recommended by private practitioners, headmasters, or social-welfare organizations, or are cases selected by the school medical and nursing staff. Though intended primarily for children showing some physical disability as malnutrition, debility after sickness or operation, minor degree of chorea, tendency to chronic asthma or bronchitis, and for tuberculosis contacts, it was found desirable to extend the scheme somewhat to include children whose poor home surroundings and inadequate diet rather than their actual physical condition required adjustment. This was especially necessary during the winter months. With regard to the types of case, malnourished and debilitated children have done well; those admitted for convalescence after tonsillectomy have made excellent progress, and more, I think, of these might be admitted for a longer period, especially when they have had to be discharged from hospital twenty-four hours after operation to homes in insanitary areas and to inadequate diet. Asthma cases, contrary to expectation, have done extremely well; six children with definite asthmatical symptoms have been admitted at different times and from different areas and after the first twenty-four hours they have shown no further symptoms during the period of their stay. Of eight cases of mild chorea two did well, but though others put on weight very creditably the nervous symptoms did not improve at the same rate. For this group a more gradual adaptation to life in the children's community with the added stimuli of the sunshine and sea air at Otaki is apparently indicated."

In Canterbury the Sunlight League of New Zealand, represented by Miss Wilding, conducted a most successful camp for twenty-five girls at Okain's Bay.

In Otago a very successful health camp was held at Waikouaiti in charge of Mrs. Marshall Macdonald, assisted by school nurses, and for Southland children a health camp was held at Pounawea for some forty-five children under the supervision of Dr. Abbott, School Medical Officer, and the school nurses.

Space does not permit acknowledgment of the generosity of individual citizens and the personal effort of many voluntary workers, who were responsible for the success of these and other camps. They must feel their reward, however, in the increased vigour and happy memory afforded to the children.

Tuberculosis Contacts.

In spite of our restricted resources, an effort has been made to continue the supervision and care of tuberculosis contacts. Each year brings additional evidence of the value of this work, which, by safeguarding nutrition and ensuring improved environment, prevents many children from becoming victims to the disease. In Wellington Dr. Bakewell reports on 548 tuberculosis contacts kept under observation:—

> "Thirteen cases of those under observation showed some pathological signs. Of these, 1 was sent to Pukeora Sanatorium (discharged, April, 1933), 1 was sent to Ewart Hospital (a Maori child from Waiwhetu), 1 was in an advanced state of tuberculosis when discovered, having come from another district and being over school age, was admitted to Ewart, and died March, 1933. One was in hospital for three months having inunction and general treatment, attended school during the rest of the year in good health, and is at present having a period at the health camp. Nine were treated at home with inunction and general measures. Seven of these have been in the health camp for a longer or shorter period. The total of 89 admissions to the health camp is satisfactory. The 33 cases treated by the eye, ear, nose, and throat specialists include 3 antrum explorations, 2 mastoid operations, 20 for removal of tonsils and adenoids, 2 for correction of visual errors; the remainder for minor ear and nose conditions, or for specialist's examination and opinion. The cases to general outpatients include pyelitis, slight hypo-thyroidism, debility, &c. A large percentage of contacts attend the dental clinics, who give very satisfactory and generous treatment."

Tuberculosis Contacts, Wellington District: Summary from 21st February, 1932, to 20th February, 1933.

Number of schools visited—	
Three monthly	72
Six to twelve monthly	15
Number of children on register	548
Number of children examined by Dr. Short	354
(But number of examinations carried out by him)	369
Number of children—	
X-rayed	28
Receiving inunction	10
To eye, ear, nose, and throat specialists (Drs. Macdonald and Hope-Robertson)	33
To orthopædic specialist (Dr. Gillies)	7
To Dr. Montgomery Spencer or to General Out-patient Department	9
To Health Department for weighing or examination by School Medical Officer	55
To health camp	89
To dental clinics or hospital dental (and others to private dentists)	125
Number of home visits paid by school nurse (approximately)	712

In Otago Dr. Stevenson gives a short summary of the progress noted throughout the year in 399 tuberculosis contacts. Of these, one girl, aged thirteen, developed a tubercular peritonitis and is now in sanatorium. It is considered that the early diagnosis of the disease was made owing to the fact of her being already under supervision, and the possibility of her recovery is accordingly strengthened.

Reports have been forwarded by Miss Wright, school nurse, upon 202 tuberculosis contacts kept under observation of the School Medical Officers in Auckland. In the Waikato 84 T.B. contacts are under observation. Dr. Anderson, Napier, reporting on 250 contacts refers to the difficulty of making satisfactory provision for Maori contacts. Dr. Turbott, Gisborne, reports on 80 T.B. contacts in the East Cape district; Dr. Abbott, Southland, reports on 234 contacts; and Dr. Irwin, Nelson, on some 75 in the Nelson-Marlborough district.

All School Medical Officers give illustrations of the benefit of this constant supervision of tuberculosis contacts by providing opportunity for early diagnosis and care of incipient cases. From the lower standpoint of financial value even it is evident that work of this preventive nature has more than justified itself.

Open-air Schools for Delicate Children.

Two schools deserve special mention for their work on behalf of delicate children.

One is the Sara Cohen Memorial School, Dunedin, an open-air school situate at Kew, with an attendance last year of 21 pupils. Dr. Stevenson furnishes interesting figures with regard to the physical condition and progress of the scholars. A decided advance has been made this year, arrangements being made for a hot midday meal for the pupils. The Education Department made a grant which made the building of a kitchen possible; various friends equipped it, and, with the assistance of Professor Strong, of the Home Science School, arrangements have been made for a committee of ladies voluntarily to give their support to the school and maintain the cooking of the meal.

In Auckland the Sunshine School continues its good work; 33 new pupils were admitted last year, the reason for admission being given as follows: Rheumatism, 4; heart abnormality, 2; rheumatism and cardiac, 2; malnutrition 4; subnormal nutrition, 3; abdominal symptoms, 2; respiratory, 2; history of fits, 1; anæmia, 4; nervous debility, 5; asthmatic tendency, 2; T.B. contact, 1; retarded, 1. Here also arrangements are made for a hot midday dinner for the pupils, including meat, fish, soup, vegetables, puddings, and fruit. Miss Wright, school nurse in charge, comments upon the number of children who for a short time after admission evidenced dislike for the ordinary wholesome articles of diet, but states that this difficulty is usually overcome in time. Children attending this school receive regular sunbathing under Miss Wright's supervision.

Personal Cleanliness and Clothing.

The general standard with regard to personal cleanliness and clothing was satisfactory, though a slight decline, mainly in certain city area, has been evident. Clothing has been largely supplemented by gifts from social-welfare organizations or from private citizens, so that on the whole few children have been inadequately clad. Food and rent make the first demand on a small allowance. Overcrowding, which results from an effort to economize in rent, means lessened facilities for cleanliness, and fosters indifference. The increase of dirt and skin diseases noted in certain districts has not been great enough to influence materially the percentage for the whole Dominion. Considerable difficulty has occurred owing to an outbreak of ringworm, especially ringworm of the head, which is hard to control. Cases are reported where children showing scurfy patches of the scalp have infected their associates with obstinate and severe ringworm. This indicates the necessity for bacterial examination of all suspected cases. Dr. Turbott, in Gisborne, reports as follows:—

> "The ringworm clinic conducted throughout the week and on Saturday mornings by the district office staff has dealt with thirty-nine cases. Treatment is continued until the scalp seems healthy and at least three negative bacteriological findings are obtained. X-ray treatment is unfortunately unobtainable here, and with lotions or ointment a cure under three months is a happy result in local experience."

Kindergartens.

During the year 739 kindergarten children were examined; the result of the examination is shown as follows: Number of children examined, 739. Percentage found to have defects, 81·87. Percentage with defects other than dental, 63·33. Percentage of children showing evidence of—Subnormal nutrition, 3·65; pediculosis, 0·95; uncleanliness, 1·35. Skin—Impetigo, 0·81; scabies, 0·81; ringworm, 0·00; other skin diseases, 2·44. Non-vaccination, 99·59. Heart—Organic disease, 0·41. Respiratory disease, 4·60. Total deformities of trunk and chest, 15·42. Mouth—Deformity of jaw or palate, including irregularity, 1·22; dental caries, 45·06; fillings, 13·80; perfect sets of teeth, 22·60. Nasal obstruction, 5·68. Enlarged tonsils, 23·27. Enlarged glands, 14·75. Goitre—All degrees, 3·39. Eye—Total defective vision, 1·09; corrected, 0·95; uncorrected, 0·14. Ear—Otorrhœa, 0·54; defective hearing, 0·41. Defective speech, 1·22. Notifications to parents, 35·05 per cent.

School Medical Officers noted with appreciation, first, the great interest displayed by parents as evidenced by the number who attend the medical examination, and, secondly, the devotion shown by the teachers to the welfare of their pupils. These factors have been responsible for the maintenance of a much higher level of well-being of kindergarten children than might have been anticipated. Dr. Wilson reports as follows:—

> "Practically every mother attends when the kindergarten children are being medically examined. I think this may be due in part to the interest shown by the teachers in the work."

Dr. Irwin makes similar comment:—

> "The kindergarten teachers show a keen interest in the health and welfare of the children. Each year in many cases with their co-operation we are enabled to ward off more serious illness by obtaining early treatment of remediable defects."

A kindergarten school forms a social centre for the district, and its educational merit is by no means confined to its pupils. Parents, teachers, and children cheerfully co-operate for the common good.

Native Schools.

Returns showing the result of examination of 2,724 Maori children are as follows: Number of children examined, 2,724. Percentage found to have defects, 87·22. Percentage with defects other than dental, 64·65. Percentage of children showing evidence of—Subnormal nutrition, 4·11; pediculosis, 4·81; uncleanliness, 2·39. Skin—Impetigo, 3·52; scabies, 17·44; ringworm, 0·07; other skin diseases, 3·38. Non-vaccination, 99·96. Heart—Organic disease, 0·77. Respiratory disease, 3·08. Total deformities of trunk and chest, 19·69. Mouth—Deformity of jaw or palate, including irregularity, 9·80; dental caries, 74·19; extractions of permanent teeth, 1·40; fillings, 7·71; perfect sets of teeth, 12·67. Nasal obstruction, 3·38. Enlarged tonsils, 9·88. Enlarged glands, 5·32. Goitre—All degrees, 11·53. Eye—Total defective vision, 1·32; corrected, 0·07; uncorrected, 1·25. Ear—Otorrhœa, 0·70; defective hearing, 0·22. Defective speech, 0·29. Tuberculosis—Total, 6·06.

Dr. Turbott continues his comparative survey of the health of 1,485 Maori and 2,487 pakeha children:—

	Maori.	Pakeha.
Heart—		
Organic disease	0·67	0·82
Functional disease	0·33	0·54
Respiratory disease—Unhealthy chests	1·41	0·77
Physique—		
First-class nutrition	38·31	27·94
Subnormal nutrition	0·62	1·67
Total deformities, trunk and chest	2·26	4·54
Club feet	0·13	0·00
Cleanliness—		
Uncleanliness	0·20	0·27
Pediculosis	4·37	0·18
Skin conditions—		
Scabies	16·96	0·36
Impetigo—septic sores	4·64	1·64
Other skin diseases	0·53	1·60
Vaccination performed	0·07	5·98
Dental hygiene—		
Defects in jaw and palate	0·14	0·36
Perfect sets of teeth	17·04	2·34
Dental caries—		
Primary	32·21	28·48
Secondary	15·71	21·21
Pyorrhœa	2·18	0·62
Defects, nose and throat—		
Nasal obstruction	5·94	8·68
Enlarged tonsils	14·22	21·94
Enlarged cervical glands	3·83	9·37

	Maori.	Pakeha.
Goitre		
Incipient	4·92	28·27
Small	0·15	0·47
Medium	0·00	0·14
Large	0·00	0·00
Total	5·08	28·89
Special senses—		
Ears—		
Otorrhœa	0·59	0·13
Eyes—		
Conjunctivitis	0·39	0·47
Squints—		
External and internal	0·07	0·28
Defective vision—		
Uncorrected	5·09	7·40
Corrected	0·00	2·06
Hernia	0·26	0·13
Phimosis	0·00	0·04
Circumcision	0·07	2·67
Eneuresis } From pakeha parents' statements only	..	0·47
Worms } From pakeha parents' statements only	..	0·23

The greater incidence of respiratory disease, of skin disease, and of pyorrhœa in Maori children is again evident. Dr. Anderson states with reference to Maoris in Hawke's Bay :—

> "It is my experience that almost every Maori child has enlarged tonsils of varying degree, and this, together with their atrocious diet and unhygienic manner of living, is responsible for their persistent colds in the winter time, which condition almost invariably leaves them open to further infection."

The following extracts from Dr. Cook's report on Maori children in North Auckland are of interest :—

> "Subnormal nutrition does not appear to any great extent among white children in North Auckland. Native children are particularly interesting when considering their nutrition. During the summer months their appearance is quite different from that of the winter. In the summer, to use a veterinary term, they have, so to speak, a bloom in their appearance consisting of healthy skins, alert eyes, firm flesh, and a general appearance of well-being. In the winter, however, many look anæmic, with dull eyes, unhealthy skins, relaxed muscular tissues, with little, if any, superfluous adipose tissue. The Native diet appears to be deficient in quantity and quality during the winter. . . . The deterioration of Maori health in winter-time due to defects in diet is influenced by home conditions, particularly where there is definite overcrowding, with perhaps insufficient clothes and bedding. In summer the Native is fairly comfortable, well fed as a rule, and the question of clothes is relatively unimportant; most of the time is spent in the open air and bathing in near-by streams. In the winter conditions are very changed; the food-supply is defective in quantity, and the defect in quality is even more pronounced. Cold leads to overcrowding in small rooms with poor ventilation, resulting in almost constant nasal catarrh proceeding to bronchitis. Better hygiene and sanitation in the Maori home appears to be the only hope of arresting the deterioration of this formerly wonderful specimen of the human race. Native-school teachers, despite desperate odds, are doing their bit to assist their pupils in better methods of living. . . . Any system of education for a Native race which does not aim at health and utility as primary considerations will after many years of toil achieve little of value. Primitive peoples, like artisans in our own civilization, set great value on the practical requirements of life, and have little regard for book knowledge. This to a great extent explains the apathy of the older Maori toward pakeha customs."

The prevalence of skin-disease (hakehake) among Native school-children has been referred to in previous reports, the report for 1932 containing an account of Dr. Turbott's investigation "Treatment of Scabies, Impetigo, and Pediculosis—A District Nursing Study of Comparative Values."

Goitre.

Statistics for the year from routine examinations are as follows. (It must be remembered that the general incidence of goitre would appear to be higher if a larger number of older children, as in Standards IV and V, were included in the routine examination.)

——	Primers.	Standard II.	Standard VI.	Whole Schools.	Summary.
All degrees	10·04	15·00	21·33	18·31	15·24
Incipient	8·20	11·84	14·46	13·17	11·41
Small	1·61	2·81	5·60	4·35	3·26
Medium	0·20	0·31	1·02	0·71	0·49
Large	0·03	0·04	0·25	0·08	0·08

Incidence among Maoris, and therefore in Native schools, is much less, as above noted.

With reference to the effect of iodized salt, Dr. Baker McLaglan, as a result of some years observations in the Canterbury District, writes as follows:—

"There is no doubt in my mind that the regular consistent use of iodized salt does considerably reduce the incidence of goitre. I have seen far more children whose early goitres have diminished or disappeared, their only treatment being iodized salt, than can be accounted for by coincidence alone; but iodized salt is not infallible. In a previous report I referred to two country schools where two little communities were circumscribed and population stationary. In both communities the local store stocked nothing but iodized salt, and in neither of those schools had a single case of goitre increased, nor had a non-goitreless child developed goitre since the previous examination two years before. Most of the existing goitres had improved or disappeared. The children totalled about forty in all.

"—— School, in Canterbury, has a surprisingly low incidence of goitre, much lower than it had twelve years ago. When questioned the children or parents all say they do always, and have 'always'—namely, for years—used nothing else but iodized salt. The social standing in that school is good, and their replies reliable.

"—— School, two or three miles away, has a much higher incidence of goitre. There, the use of iodized salt is less general and less consistent, but the social standing is poor. Whilst I really think the more general and consistent use of iodized salt is one great factor in this difference, still there is no doubt that poverty, mental strain, and anxiety throw an extra strain on the thyroid. Consequently, schools of widely different social standing are not absolutely comparable.

"As you know, personal and family susceptibility to goitre varies greatly. Often a somewhat larger dose of iodine will reduce or check goitres where iodized salt alone is insufficient—such an extra dose as is obtained by painting over the goitre with weak tincture of iodine, rubbing in iodex or lin. pot. iod., or drinking one minim of the weak tincture once a week; but this too fails in a number of cases where the child seems determined to have goitre whatever you do. In these cases probably still larger doses would be better, but I have never felt free to use them, as I was unable to supervise the results closely enough."

Dr. Mecredy, working in Taranaki, last year reported an increase in the incidence of goitre, apparently unrelated to iodine content of soil which is generally high in that area. The position is being closely observed.

Physical Education.

Owing to reduction in the staff of physical instructors and also of teachers, it has not been practicable, except in a few instances, to conduct remedial classes for children suffering from defective posture. Dr. Champtoloup was responsible for the establishment of one in the Normal School, Auckland.

Dr. Stevenson (Otago) reports that postural classes were established in five town schools. As in previous years, many children were referred for treatment to the Orthopædic Department of the Dunedin Hospital, where also classes for the treatment of mouth-breathing and also of flat feet have been attended with benefit by groups of school-children in need of such special training.

Dr. Irwin, in Nelson, has given special attention to the question of flat foot, and discusses the various factors responsible. Exercises to correct the condition were recommended when necessary.

At school unfortunately few playgrounds have a smooth enough surface to permit of shoes being removed for drill, and only in a few schools do conditions permit of lying-down exercises being taken out of doors for anything but a brief period on warm days.

Medical Examination of Teachers.

As no pupil teachers or probationers were appointed by the Education Department during the year, the services of the School Medical staff were required for the examination of only a small number of teachers entering the training college directly. In previous years the number of applicants for entrance into the teaching profession equalled some seven hundred or eight hundred, and their medical examination necessarily took up a good deal of time, which School Medical Officers this year have been able to utilize in the routine examination of children. The examination of prospective applicants a year before the termination of their school career has also been discontinued. This is unfortunate, as it means the elimination of any routine examination of secondary-school pupils, only a few secondary schools, therefore, being visited.

Sanitation.

School buildings erected within recent years undoubtedly show advance, and it is satisfactory to note the wider application of open-air school principles. Newly built schools—*e.g.*, Parnell, Auckland—though they have not detached class-rooms, give access to sun and air to an extent that classifies them with open-air schools in other parts of the world. Dr. Henderson, in Auckland, has furnished an interesting report giving the percentage of absenteeism and causes of absence among pupils attending schools of the following types: (*a*) Schools with cross ventilation of class-rooms with corridor intervening; (*b*) as (*a*) with fanlights above the corridor; (*c*) open-air—Taranaki type, with modifications; (*d*) open-air—Fendalton type, with modifications. Modern fresh-air class-rooms with satisfactory cross ventilation, he finds, show as good a record in respect of attendance as do those of the detached open-air type.

The Fendalton School, Christchurch, the pioneer open-air school in Canterbury, has been widely copied with or without some modification of the original design of Dr. Phillipps. At Fendalton the open-air class-rooms built round the central garden look very attractive. The headmaster, Mr. Blank,

as the result of experience, is an ardent advocate of open-air schools of the Fendalton type, and his enthusiasm and co-operation with Dr. Phillipps have been most valuable in demonstrating their advantages. A visitor to the school is impressed by its happy atmosphere and the evident pride of the pupils in their surroundings. The Taranaki open-air class-room with drop sash windows and ultra-violet glass panels meets also with the keen approval of its inhabitants.

> "There is no doubt but that the standard of cleanliness in the primary schools has improved in recent years. There is also no doubt but that it still falls, except in the minority of schools, far below a standard which would be considered satisfactory in the average home." (Extract from Annual Report for 1930.)

The best use is often not made of existing facilities for fresh air, cleanliness, order, &c. The personality and influence of the teacher can be largely estimated by the attention given to the various amenities of school life. In country schools where there is no water carriage system, the condition of the outbuildings leave much to be desired, and too often their sordid state is assumed to be inevitable. School Medical Officers in one or two districts report upon the result of using oil preparations on the school floor which is beneficial in keeping down the dust. Dr. Cook, speaking of the sanitation of Native schools, states :—

> "A better sanitary conscience is an urgent necessity for both the child and adult population of the north. Children who are accustomed during their school days to make-shift and badly kept buildings and outhouses will not in later life see the necessity for anything better in their own homes. . . . One cannot close without paying a tribute to the work of many teachers who under extreme difficulties keep their buildings and grounds in very good order with excellent effects on their pupils. What one teacher can accomplish should be the aim and object of every teacher."

Infectious Diseases.

The following appeared in epidemic form during the year: Influenza, whooping-cough, measles, chicken-pox, and diphtheria. Preventive treatment for diphtheria has been continued, anatoxin being used as the immunizing agent in place of toxin antitoxin. Drs. Wilson and Champtaloup treated certain schools and orphanages in the Auckland District, approximately seven hundred children being immunized. Dr. Wilson has forwarded interesting observations with regard to the use of anatoxin. In the East Cape district Dr. Turbott, as Medical Officer of Health, carried out an active campaign with excellent results.

The Division of School Hygiene wishes to express appreciation to the Mental Hospitals Department, Education Department, various Education Boards, School Committees, and teachers for valuable co-operation.

A. G. Paterson,
Director, Division of School Hygiene.

PART IV.—HOSPITALS.

I have the honour to submit my report for the year 1932–33.

During the year the necessity for exercising the strictest economy was fully appreciated by the various Hospital Boards, with the result that the costs generally show a substantial decrease; indeed, a few of the hospitals have now brought their costs down to a commendably low figure which will require constant watchfulness to maintain.

The problem of the small hospital has also been receiving some attention during the last year, and, in order to effect savings, arrangements have been made to close some of these as public hospitals and lease them to private individuals who conduct them as licensed private hospitals. In most cases the Hospital Board charges a purely nominal rental and pays the licensee a subsidy in order to ensure that no necessitous case is refused hospital accommodation. The hospitals concerned are principally maternity hospitals.

While it is yet too soon to make a definite pronouncement, the indications are that the arrangements will be successful, assuring the same service to the locality whilst effecting considerable savings to public funds.

The following are the names of the hospitals so far leased: Motueka, Port Chalmers, Huntly, Methven, Rakaia, McHardy Home (Napier), Denniston, Riverton (maternity), Nightcaps.

In addition, there are two maternity hospitals (Tuatapere and Hokitika) established by Hospital Boards, which have been leased to private licensees for some years.

Other Boards have similar proposals under consideration.

Buildings.—Considerable progress was made during the year with the rebuilding of Napier Hospital. There is now available a general hospital of 132 beds, with an additional twenty beds for isolation and tuberculosis.

No permanent office accommodation has yet been provided, and in all probability additional infectious-disease accommodation will be required.

The total loan expenditure to date is approximately £49,000. A large amount of salvaged material and equipment was used in the reconstruction, the cost of which is not included in the above figure.

Other building activities during the year included—

(1) Remodelling kitchen at Auckland Hospital, resulting in a well-equipped modern hospital.
(2) Strengthening of buildings at Wanganui Hospital. The earthquake in 1931 disclosed several weak features in the construction and during the year the necessary strengthening was completed.
(3) An up-to-date hot-water service was installed in Dunedin Hospital.
(4) The strengthening of the Nurses' Home at Nelson was completed.
(5) New laundry and boiler-house at New Plymouth Hospital was completed, and is now in operation.
(6) Completion of Nurses' Home at Christchurch Hospital.

Earthquake Damage.—In the earthquake which occurred in the Wairoa-Gisborne area in September, 1932, considerable damage was done to hospital buildings and equipment, both at Wairoa and Gisborne; but fortunately there was no loss of life. The earthquake revealed certain weaknesses in the construction of the wards at Gisborne Hospital, and plans and specifications have been prepared for the necessary strengthening-work.

The ward most seriously damaged has already been repaired and strengthened.

Wairoa Hospital, being a wooden building, escaped more lightly, and the hospital activities were never interrupted.

The new Nurses' Home at Wairoa, which was being built to replace the one destroyed in the previous earthquake, also suffered some damage.

Transfer of Departmental Institutions.—Instructions were issued during the year that all departmental institutions, with the exception of Queen Mary Hospital at Hanmer, were to be transferred to the various Hospital Boards. Negotiations were therefore opened, with the result that Otaki Sanatorium has been transferred to the Palmerston North Hospital Board, and negotiations are practically complete concerning the transfer of Pukeora Sanatorium, Wanganui St. Helens Hospital, and Gisborne Townley Hospital to the Waipawa, Wanganui, and Cook Hospital Boards respectively.

Hospital Inspection.

During the year the technical officers of the Department have continued to pay special attention to the engineering problems of the various hospitals, indicating where economy could be effected without loss of efficiency. The question of economy in the use of fuel, steam, and hot water is fully discussed, the various engineers showing a very keen interest in these several matters.

Dangerous Drugs.

The necessity for the proper storage of these and the necessity for keeping accurate records of their consumption has been stressed with the various Medical Superintendents. In all instances complete co-operation was secured.

Departmental Institutions.

The following are extracts from the annual reports of the various institutions (with the exception of the St. Helens Hospitals).

Queen Mary Hospital, Hanmer (Medical Superintendent, Dr. C. Chisholm).

"Every effort has been made to maintain the essential efficiency of the institution, and at the same time to economize in all possible directions. Economies have been carried out during the year by reduction of staff, greatest care of stores and material, and no new work has been undertaken. One noteworthy saving was achieved by burning wood from the Forestry Department's plantations in place of coal in the boilerhouse.

"The effect of the economic state of the country is reflected very clearly in the Hospital, by the inability of patients to accept treatment when recommended, or by their being unable to remain long enough under treatment, to gain the optimum amount of benefit, owing to their financial difficulties. The effect is also seen in a certain number of patients presenting for admission, whose nervous condition can be traced very definitely to financial stress. It appears likely that these will increase. In the early stages of the economic depression this was not seen. It appeared that the struggle and effort were keeping people out of hospital, but apparently long-continued stress is now causing very definite nervous breakdown. The patients appear to be those of middle age, and onwards. The younger people do not appear to be suffering so much nervously from this stress, as those who have achieved some competence, and now see their savings disappearing. I think it is quite likely that this class of patient will increase, even after the present economic stress has passed. It so frequently occurs that a nervous condition appears after stress is removed, rather than during the time of stress.

"Dental Service: Mr. Arthur Suckling, Honorary Dental Surgeon, has paid periodic visits to the institution, and his work and assistance to us are invaluable.

"Red Cross: The Red Cross continues to maintain the recreation-rooms and provide interests for the male patients. Their work is of great value both to the patients and the institution generally. At the present moment there is some reason to believe that the Red Cross may cease activities here, but the matter is still under consideration. I should be very sorry if their useful work should cease."

King George V Hospital, Rotorua (Medical Superintendent, Dr. Lewis).

"A review of the work of this institution for the past year shows a marked increase in the number of in-patients and out-patients treated; 882 in-patients received treatment, with an average daily bed-state of 49; 74 infants were born in hospital during the year. There were 1,535 consultations in the out-patient department, and 2,928 treatments given; 296 operations were performed.

"A rapidly increasing demand has been made upon the accommodation provided in the maternity department.

"The incidence of infectious disease in the district has remained very low, twenty-three cases having been admitted.

"Further concentration in the use of accommodation has been carried out. Two general wards are now in occupation. The female ward has as annexes the maternity department and an infants' ward.

"The I.D. Block functions as an annexe to the male ward."

Otaki Sanatorium (Medical Superintendent, Dr. R. S. R. Francis).

"Patients:—

"Patients in Sanatorium at beginning of year	51
"Patients admitted during year	66
"Total treated during year	117
"Discharged or died (2 deaths)	62
"Remaining in Sanatorium at end of year	55

"The great majority of patients left with the disease definitely quiescent. Some few had the disease so well arrested that they could be considered recovered. There were unfortunately a few, as there must be in any sanatorium, who went out unrelieved. There were two deaths, one dying suddenly and most unexpectedly from a severe hæmorrhage, the other dying from an acute broncho-pneumonia when her transfer to hospital was under consideration.

"Treatment: I have continued to use gold-treatment extensively, employing repeated small doses which appeals to me as being quite logical if the newer work on the action of gold salts is correct—viz., stimulation of the reticulo-endothelial system. The gold salt used is Solganal B, now available in oil, a preparation I am trying out. Of the benefits of this treatment there is no doubt, but, unfortunately, as time goes on, one grows dubious as to its permanency. Nevertheless, the gold salts do seem to control infectious sputum, and are of great value if for this alone.

"Entertainments: In so far as these relieve the tedium of sanatorium life they are a side of treatment not to be neglected. Happily we have been well provided for in this respect during the year. A talkie plant was installed during the year, the requisite funds being derived from the Brown-McWilliam Fund. Films are provided free by the Film Exchange (to which and to the various film companies concerned our best thanks are due) and an excellent programme is given once a week.

"Numerous concert parties have paid the Sanatorium a visit, and we wish to thank them all for their efforts to cheer up the patients during their long stay here.

"The wireless plant was completely remodelled, and is now giving every satisfaction. It is hoped in the near future to have pillow-phones installed for the bed-patients.

"Nursing Staff: I am greatly indebted to the Matron and nursing staff for their loyal and cheerful co-operation during the past year.

"General Staff: I wish to thank these also for the work they have done during the past year.

"Mr. Melrose, farm-manager, was taken ill last August and died on the 3rd of September. He has been here many years and had much to do with the planning of the grounds. Many of the beautiful trees which every visitor admires were planted by him twenty years or so ago, and are now very fine specimens. The trees and grounds remain as a memorial to his work."

R. A Shore,
Director, Division of Hospitals.

PART V.—DENTAL HYGIENE.

I have the honour to submit the following report on the work of my Division for the year ending the 31st March, 1933:—

SECTION I.—TREATMENT CENTRES, STAFF, ETC.

Treatment Centres.—At the end of the period under review (31st March, 1933) the School Dental Service was in operation at 213 centres. Of these, 139 were main treatment centres and 74 were sub-bases. New clinics have been established during the year at Gisborne (additional), Hastings (additional), Havelock (Marlborough), Middlemarch, New Plymouth (additional), Otaki, Rai Valley, Rotorua, Tawera, Te Araroa, Tinwald, Turua, and Wellsford. With the exception of Otaki and Rotorua, these new centres have been established for the purpose of extending the service in districts where it was already in operation. The following sub-centres have been made main-treatment centres: Carterton, Kaitangata, Manaia, Ngatea, Te Kopuru, Waipawa, Warkworth. The following centres, formerly regarded as main-treatment centres, are now operated as sub-bases: Kurow, Woodville.

Staff.—On the 31st March, 1933, the staff, disposed as under, numbered eleven dental officers and 205 dental nurses. Twenty-three dental nurses were appointed in March, 1933, but the retirements during the year were greater than usual, and numbered twenty-one. Thus the net increase in the staff for the year is only two.

	Dental Officers.	Dental Nurses.
Director	1	..
District Dental Superintendents	4*	..
Administrative and training staff, Wellington Clinic	3	2
Staff of school dental clinics—		
Auckland District	2†	43
Wellington District	..	51
Canterbury District	1	37
Otago District	..	22
Reserve group (Wellington)	..	27‡
In training	..	23
	11	205

Training of Dental Nurses.—At the commencement of the year under review (1st April, 1932) fifty-six probationer dental nurses were in training, thirty-five of these being in their second year, and twenty-one in their first year. Of the thirty-five in their second year all completed the course. During the year twenty-seven of this number were transferred to various parts of the Dominion to staff school dental clinics, while eight were retained in Wellington to assist in carrying out treatment at the Wellington Clinic. Of the twenty-one who were in their first year of training, nineteen have now passed into their second year, and two have retired. Although no new probationer dental nurses were appointed in 1932 there has not been a reduction in the amount of treatment carried out during the year at the Wellington Clinic. Moreover, in order to allow the work of this clinic to continue, it will be necessary to retain in Wellington next year the nineteen nurses who are now in the second year of their training. In February, 1933, twenty-three new probationer dental nurses were appointed. These entered the training-school in March, and have now commenced their training. The final examination was conducted by Mr. Millen Paulin, B.D.S., and the Superintendent of the Training School on the 13th and 15th March, 1933. Of the fifteen candidates eligible to sit all passed. Four nurses will sit for a special examination to be held in a few months' time.

Inspection and Supervision.—The system of decentralized control through District Dental Superintendents has now been in operation for fifteen months, and has proved most successful. Good supervision over the work of the clinics has been maintained (although in the larger districts some assistance for the Dental Superintendents is very desirable), and it is evident that the Dental Clinic Committees appreciate the fact that they can now keep in close personal touch with senior officers of the Department. This personal contact between the Department and the Committee has undoubtedly done much to ensure the smooth running of the Service during the past year. It is pleasing to note that the travelling-expenses connected with the supervision of the work are less under the present system than they were under the system of Inspecting Dental Officers. Thus the present system of administration makes for economy as well as for increased efficiency.

SECTION II.—STATISTICS.

Operations performed in the field and in the training school from the 1st January to the 31st December, 1932 :—

Fillings—		
In permanent teeth	139,225	
In " first " teeth	243,064	
		382,289
Extractions—		
Permanent teeth	2,696	
" First " teeth	71,937	
		74,633
Other operations		162,468
Total operations		619,390

The following figures illustrate the progress of the Service during the last four years :—

Year.	Number of Schools under Systematic Treatment.	Number of Children receiving Systematic Treatment.	Total Number of Operations.
1929	775	62,100	370,074
1930	930	67,652	463,204
1931	1,118	68,995	562,759
1932	1,297	72,584	619,390

Total operations since inception : 3,314,402.

* The Dental Superintendent of the Otago District is also in charge of the Central Clinic, Dunedin.
† Native Dental Officers working among Native schools in Bay of Plenty and East Coast districts.
‡ This number will be somewhat reduced by transfers to the field during the next few weeks.

SECTION III.—POLICY.

The change in policy that was introduced at the commencement of the year previous to the one under review, whereby Dental Clinic Committees are required to contribute a stated amount to the Department each year towards the expenses of the Service, has continued to operate during the past year. It took some time for Committees to adapt themselves to the new conditions, but, on the whole, the system of finance is now operating smoothly. The majority of Committees have exercised their power to levy a charge on individual parents, but in a number of cases Committees prefer to raise the necessary funds by other means, believing that the making of a direct charge would not be successful in their particular district. Most Committees seem to experience difficulty in raising the funds required, and at practically every centre there has been a drop in the number of children under treatment. This drop, however, cannot be attributed wholly to the charge, although this is undoubtedly a contributing factor. The raising of the school age from five to six has had a marked effect in this direction. The falling-off in numbers has been made good by linking up fresh schools with existing clinics. Many of these schools have waited for several years for treatment, and have welcomed the opportunity to be included. Thus the number of children under systematic treatment has been fully maintained during the year, and, in fact, even increased, as the statistics show. This policy of local extension has necessitated the establishing of a certain number of sub-bases. In every case the Committees concerned have provided the necessary accommodation without any cost to the Department. The same applies to clinics that have been erected at newly established main-treatment centres. In this connection it may be mentioned that the clinic at Dannevirke has been replaced by a modern brick structure, and this was done entirely at the expense of the local Committee. It is more than likely that during the next few years, as the parents become used to the system of charging, the numbers will gradually recover at the centres where they have fallen. Allowance will have to be made for this in calculating staff requirements for the future.

The total amount paid to the Department by Dental Clinic Committees during the year was £4,674 6s. 1d. In addition to their direct contributions to the Department, Committees pay certain local expenses in connection with the clinics, and these are approximately equal to the sum paid to the Department. The total contribution of local Committees towards the cost of maintaining the School Dental Service for the year under review is therefore in the region of £9,000.

It is pleasing to be able to refer to the very cordial relations that exist between the Dental Clinic Committees and the Department. Such friendly co-operation and understanding go far towards ensuring the successful operation of the Service, and undoubtedly the measure of success attained in a district depends largely on the local Committee.

SECTION IV.—WELLINGTON DENTAL CLINIC.

The Superintendent of the Wellington Dental Clinic, Mr. J. B. Bibby, reports as follows :—

Attendances at the Wellington Clinic and operations performed for the year ending 31st March, 1933, are as follows, 1931–32 figures being shown in parentheses :—

Attendances.	Fillings.	Extractions.	Other Operations.
49,922	31,539	3,046	27,546
(46,488)	(30,551)	(2,881)	(24,497)

The total number of attendances and of operations performed since the opening of the Wellington Clinic to 31st March, 1933, are : Attendances, 334,330 ; fillings, 221,680 ; extractions, 61,877 ; other operations, 175,898.

It is to be noted that the relative number of extractions to fillings continues to remain low, although the 1932–33 figures are slightly higher than those of the previous year, the figures for the year under review being one extraction per 10·4 fillings, and for the previous year one extraction per 10·6 fillings.

The following table shows the steady reduction that has taken place in the number of teeth extracted as compared with the number of teeth saved by fillings at the Wellington Clinic :—

	Fillings.	Extractions.	Ratio : Extractions per 100 Fillings.
1921–22	727	1,738	239·1
1922–23	9,223	11,093	120·2
1923–24	6,714	4,239	63·1
1924–25	5,136	2,994	58·2
1925–26	12,323	7,003	56·8
1926–27	19,896	8,499	42·7
1927–28	22,670	7,846	34·6
1928–29	19,783	5,712	28·9
1929–30	25,933	3,117	12·0
1930–31	38,185	3,708	9·7
1931–32	30,551	2,881	9·7
1932–33	31,539	3,046	9·7

The number of new patients who have attended the clinic for initial examination during the twelve months 1st April, 1932, to 31st March, 1933, is 1,660, a slight increase over the figure for 1931–32 (1,626), while the average number per year since treatment was first given is 1,857.

The following table shows the average age of patients attending the Dental Clinic, Wellington, for initial examination over the twelve years that the clinic has been in existence :—

	Years.		Years.		Years.
1921–22	8·6	1925–26	8·0	1929–30	6·9
1922–23	8·2	1926–27	8·1	1930–31*	5·6
1923–24	7·1	1927–28	7·8	1931–32*	4·9
1924–25	7·6	1928–29	7·3	1932–33*	4·9

The percentage of children attending the clinic for the first time in various age groups is shown below :—

Year.	Under Five Years.	Over Five Years and under Eight Years.	Over Eight Years.
	Per Cent.	Per Cent.	Per Cent.
1921–22	5·2	31·0	63·8
1922–23	8·0	36·0	56·0
1923–24	19·5	47·3	43·2
1924–25	17·8	41·1	41·1
1925–26	15·2	37·3	48·5
1926–27	17·6	34·9	47·5
1927–28	20·8	35·3	43·0
1928–29	27·1	36·1	36·8
1929–30	28·1	50·1	21·8
1930–31	39·7	49·0	11·3
1931–32	54·4	39·7	5·9
1932–33	54·4	40·3	5·3

At the 31st March, 1932, the number of patients under treatment was 7,295, and at the 31st March, 1933, 6,781.

During the year treatment was suspended for 727 patients on account of non-attendance, compared with 838 during 1931–32, 940 during 1930–31, and 2,195 during 1929–30.

Annual Registration Fee.—Registrations at the Wellington Clinic during the twelve months ending 31st March, 1933, totalled 4,155, compared with 3,765 for the first nine months of this charge ending 31st March, 1932; and exemptions granted were 684, or 16·5 per cent. of the total of those paying the registration fee, compared with 274, or 7·3 per cent. for the previous nine months. This large increase is almost entirely due to the growth in unemployment and the more general acceptance of relief among those who bring their children to the clinic for treatment. To date 71·4 per cent. of those eligible for continuation of treatment at 31st March, 1933, have renewed their registration or have been exempted, compared with 56·6 per cent. at 31st March, 1932.

The introduction of the annual registration fee has considerably reduced the number of new patients applying for treatment. At 31st March, 1931, the number of applicants awaiting treatment stood at 1,040; at 31st March, 1932, 184; while during November and December, 1932, an actual shortage of patients for clinical work occurred. Applications now stand at 359, but this only because a gradual reduction in the number of senior nurses operating, from thirty-six in 1932 to twenty-five at 31st March, 1933, and to a possible maximum of nineteen in the near future, has made the initial treatment of new patients inadvisable since the beginning of 1933. The indications are that very few new patients can be admitted for treatment during the next twelve months, as already considerable difficulty is being experienced in maintaining treatment for the patients who are at present attending the clinic.

The reduction in the number of operators at the Wellington Clinic and the absence of a junior year has naturally caused a measure of disorganization in the running of the institution, but although this has retarded the progress of the nurses in training, the work of the clinic as a whole has been well maintained. It has, however, been most pleasing to find that at all times the staff and nurses have been ready to meet the many extra demands that have been made on their time and energy.

SECTION V.—GENERAL.

Certain features of the work of the Division as disclosed in this report call for special comment.

Ratio of Teeth extracted to Teeth saved.—From time to time a certain amount of criticism has been levelled at the School Dental Service on account of the comparatively large number of teeth extracted, particularly deciduous or "first" teeth. It is fully recognized that the too-early extraction of these teeth may and does lead to irregularities in the permanent dentition. However, the Service has always been called on to deal with large numbers of children who have had no previous dental attention, and, in making these children dentally fit, there has been no alternative but to extract

* These are the ages on admission. Application for admission was made six to twelve months earlier.

numerous unsaveable teeth. The view has always been held, however, that as the Service extended, and with it the knowledge of dental hygiene, the number of unsaveable teeth would gradually diminish in number, and it is gratifying to note that this view is now borne out by statistics. Whereas in 1921–22, for every 100 fillings performed, 114·5 teeth were extracted, by 1926–27 the number had fallen to 62·8, while for the year just ended the ratio is reduced to 19·5 teeth extracted for every 100 fillings performed. In this connection it is interesting to note that one of the conditions laid down by the Board of Education in Great Britain as being necessary for a satisfactory dental service (Report for 1923, Appendix F) is being fulfilled in New Zealand—viz., "Treatment should be conservative in character—by filling rather than by extraction." (Note: Reference to Section IV of this report will show that the figures for the Wellington Clinic, as distinct from the Service as a whole, are much lower —9·7 extractions per 100 fillings.)

Geographical Distribution of Treatment Centres.—In view of the very limited extent to which the Service has been extended during the past year or two, it is interesting at this stage to study the geographical distribution of clinics in relation to the distribution of the population, and at the same time to note the progress that has been made to date in the matter of making dental treatment available for the children attending the primary schools of the Dominion. In making this study, it will be convenient to compare urban areas (as defined by the Government Statistician) with the remainder of the Dominion. Statistics show that approximately half of the population is in urban areas. With this fact in mind, it is of interest to note that of the 72,584 children who were receiving regular dental treatment at the end of 1932, 29,140, or 40 per cent., were attending schools in urban areas, the remaining 60 per cent. being in non-urban areas.

In regard to the development of the Service, there are 2,978 primary schools in the Dominion (including private schools), of which 1,297 are officially linked with the School Dental Service (31st December, 1932). The total number of children attending primary schools (including the primary department of private schools) is 251,906. Children are eligible for treatment only up to the Fourth Standard. Thus the total number of children eligible for treatment is approximately 201,525, and, of these, 72,584 (which includes the pupils of a certain number of non-State schools) were receiving regular and systematic treatment at the end of 1932.

As it takes several years for a clinic to work up to the maximum number of children that it can deal with, there are at the present time a considerable number of clinics at which the maximum number has not yet been attained. Therefore it is estimated that, even with the present staff, it will be possible in the course of a few years to deal with approximately 100,000 children, or, say, 50 per cent. of the eligible primary-school population.

Other matters, not dealt with elsewhere in this report, to which I wish to refer are:—

Dental Health Education.—As in previous years, this important subject has continued to receive attention as far as the resources at our disposal permit. By means of addresses to meetings of parents, talks over the air, talks to classes in schools, chair-side instruction, distribution of literature, &c., the principles of dental hygiene and of the prevention of dental disease are brought to the notice of parents and children. To what extent the principles taught are put into effect it is difficult to estimate. Certain it is that many parents are very apathetic in regard to the subject, and make little or no attempt to take active steps with a view to preserving their children's teeth, beyond seeking treatment at a clinic. On the other hand, it is encouraging to note the increasing number of parents (and children) who are keenly and actively interested in this vital subject.

Inspection of Dental Hospitals.—The inspection of the dental departments of the Public Hospitals at Auckland, Wellington, Christchurch, and Timaru, and an investigation of the arrangements made between the Hospital Board and the Dental School at Dunedin, were commenced just prior to the year under review and were completed during the year. The Boards concerned are providing what undoubtedly is a useful and much needed service. There are certain points of difference between the policies pursued by the various Boards, and a measure of co-ordination, particularly in regard to certain aspects, would appear to be desirable. This is so particularly in regard to the eligibility of persons for admission for dental treatment.

Co-operation with Dental Profession.—During the year the attention of the dental profession was directed to the desirability of evolving some scheme whereby the work commenced in the school dental clinics could be continued. The matter is still under consideration, and it is hoped that a satisfactory solution of this problem will be found.

Hostel for Student Dental Nurses.—Early in 1933 arrangements were concluded with the representatives of the Society of Friends by which their hostel in Kelburn, Wellington, was made available for dental nurses. The arrangement is a very favourable one from the point of view of the Department, as the dental nurses are accommodated together in a fine modern building, while the Department has no financial responsibility in connection with the matter.

In conclusion, I wish to acknowledge the assistance and co-operation that the Department has received during the year, directly and indirectly, from the Dental Clinic Committees, teachers, and Education Boards and their staffs. The loyal support given by all officers of the Division also calls for the warmest acknowledgment.

J. Ll. Saunders,
Director, Division of Dental Hygiene.

PART VI.—DIVISION OF NURSING.

I have the honour to present the annual report of the Division of Nursing for the year ending 31st March, 1933.

The year has been an extremely busy one, particularly so in view of the considerable amount of reorganization that has taken place not only in the field and institutional staffs of the Department, but also in regard to the training schools for nurses. With the assistance of Miss Moore, inspections of all public hospitals throughout the Dominion have been undertaken at least once, and an endeavour has been made to make these inspections of a more intensive character so as to obtain personal contact with the ward sisters. Special attention to various nursing procedures has been paid, and a definite improvement in method is noted in many places.

Health of Nurses.

Matters affecting the health of pupil-nurses have been the subject of special inquiries both by a committee set up by the Otago Medical School and the Health Department. It has been found, as is the case in other countries where investigations have been made, that the incidence of tuberculosis amongst this group of young women is comparatively high as in relation to the young women of the community at large.

A large majority of the entrants to the nursing profession are young girls who have had a more or less sheltered life in regard to exposure to infection, so that their immunity is practically non-existent.

It would appear that to obtain the necessary improvement it is essential that changes are necessary in three distinct measures:—

1. *A Careful Initial Medical Examination followed by Adequate Provision for Health Supervision during Training.*—There are still hospitals which accept candidates who only present a medical certificate from their family physician, and only a very limited number have an X-ray of the chest done for all candidates.

In regard to provision for routine health supervision during training, the position is more unsatisfactory, as the majority rely on nurses reporting themselves sick. This I consider too haphazard. Only two schools have a regular yearly health examination and four have provisions for monthly weighing.

Hospital authorities are apt to consider that these examinations take unnecessary time and tend to make the staff hypochondriacs. If, however, the examinations are carried out in proper routine manner they serve as excellent opportunities for teaching personal preventive hygiene, and, considering the economic aspect alone, the time taken is more than repaid if even one long illness is prevented.

As a protection against typhoid a few of the northern hospitals have a routine innoculation of all the nursing staff with T.A.B. vaccine; and, in the case of two hospitals, innoculations of toxin-antitoxin are also carried out.

2. *Better Preparation of the Pupil-nurse before entering the Wards.*—The Nurses and Midwives Registration Board has now definitely laid down in the curriculum that pupil-nurses must have certain lessons and demonstrations in elementary bacteriology, particularly as regards the conveyance of infection, during the first six months of training. It is the junior nurse who in the majority of instances handles all infectious material, therefore it is most necessary that she should clearly understand the dangers to which she is exposed.

3. *Better Medical Asepsis.*—If the principles of bedside isolation could be applied to all admissions to hospital until a thorough and extensive diagnosis was made, much trouble would be avoided, because frequently, for instance, a chronic tubercular patient may be admitted for some other complaint.

There is one matter which to my mind requires much more attention, and that is nurses' uniforms. There are only four hospitals in the Dominion where nurses in the wards wear overalls which are not taken over to the Nurses' Home. It is almost impossible for a nurse not to get her dress contaminated in some way during the handling of her patient. If she goes to meals in the dress she has worn in the ward even if her hands and arms are thoroughly scrubbed there is a definite risk of infection from her dress.

Nurses and Midwives Registration Board.

The personnel of the Board has seen no changes this year, the Board consisting of Dr. Watt, Director-General of Health (Chairman), Miss Muir, Miss Tennent, Miss Morgan, Dr. Young, Mr. Wallace, Miss Lambie (Registrar), and Mr. J. W. Buchanan (Secretary). The meetings of the Board have been held quarterly, the agenda being in each case lengthy, so that the deliberations of the Board have taken a full day.

At the present time on the register the number of registered nurses is 6,100; registered midwives, 2,778; and registered maternity nurses, 657. A very large number of these are not in active practice, and it is very probable that many of the names of those appearing on the register are those of deceased persons. It is most necessary that at an early date power should be given to provide for purging the present register if it is to be of the value it should be. Further, an "annual practising certificate," if

it was instituted, would enable practising nurses to be kept in touch with more adequately, and assist in eliminating the problem of the unregistered nurse. There would probably be a certain amount of opposition to commence with, because such a provision has never been put into force in New Zealand, but nurses themselves would soon realize the benefits.

Training of Pupil-nurses.

During the year a further number of the smaller training-schools have been regraded, affiliations with a base hospital being made in each case. A certain amount of argument has arisen round the question of who should pay the salary of the nurse at the base hospital, but in view of the fact that the nurse coming from the smaller hospital has to have special experience, and that she is not of the same value, in that her surroundings are new to her, it seems only fair that the salary should be paid by the original training-school. There are now only two A grade training-schools which have a daily average occupied-bed rate of less than sixty.

Educational equipment in all the schools has been very definitely improved; the majority of the Hospital Boards are now placing a sum on their annual estimates for this expenditure. These amounts are small, but in the present difficult times it would be impossible to ask for more. To assist in the formation of libraries a list of reference-books was drawn up and circularized.

The standard of the examinations has been maintained, the number of candidates being 385, the number of failures 113—*i.e.*, 29·35 per cent. This rate is in line with the rates obtaining in Great Britain and other State and University examinations. The actual forms and method of checking have been revised, which has simplified the clerical work involved both for the hospital authorities and the Department.

Obstetrical Training.—In view of the controversy which arose around this subject when the changes in the scheme of training were introduced in 1926, and the maternity certificate became a definite qualification, it is of interest to note that the present developments seem to indicate that a satisfactory situation has been arrived at. Last year, for instance, there were 65 midwives trained in the four State midwifery-training schools. In New Zealand we have 400 positions for midwives in our hospitals apart from those in the slowly increasing private midwifery practice, and on this basis I estimate that 65 midwives will be required each year to repair the natural wastage. Therefore it is satisfactory that at last a position has been reached where the number of midwives being trained is in definite relation to the needs of the community.

Furthermore, during 1932 a total of 284 women received training as maternity nurses as follows: 204 registered nurses and 20 untrained women in Hospital Board maternity annexes; 60 untrained women in the four State maternity-training schools. It has been found necessary, so that the midwifery course may be given its rightful and definite postgraduate standing, to have a type of nurse in hospital to assist in carrying out routine work so as to reserve the midwifery trainee for only actual nursing duties. This need is provided for by the appointment of untrained women as maternity trainees. As the period of their training is much longer than in the case of registered nurses undergoing this course, they are accordingly gradually introduced to their duties, and by the time they are registered as maternity nurses a matron is in a position to judge whether they are capable of undertaking the responsibilities of a midwife. This therefore ensures that only the best qualified are appointed to train as midwives. Owing to the specialized nature of the work, experience in New Zealand has shown that it is almost impossible to train registered nurses as maternity nurses, and as midwives, in the one hospital.

In regard to the maternity course, I consider the position is also more satisfactory, as a very large number of nurses (practically enough to cover the number of graduated nurses each year) are receiving this further training, which enables them, if necessary, to nurse an obstetrical case satisfactorily, while at the same time enlarging their outlook in gynæcological work and the diseases of women and children. No registered nurse should consider her training complete without this course. Further, it is sufficient to enable the registered nurse to make up her mind whether she wishes to specialize in midwifery or not.

Reciprocity.—Terms of reciprocity have been definitely drawn up between the registration authorities of the Union of South Africa and the Central Midwives Board of Great Britain. Various Australian States have also approached New Zealand in regard to the registration of their midwives as such, but in view of the fact that the New Zealand training is longer, and the requirements for clinical experience greater, it was felt impossible to agree to their request.

The Nursing Staff.

St. Helens Hospitals.—The work of these hospitals has progressed very satisfactorily. There have been several changes of staff, Miss Boyce taking charge of Christchurch, Miss Ward of Wanganui, following on her relieving at Invercargill for six months during Miss Arnold's absence on sick-leave.

Miss M. Bagley, who had been matron of Wellington for five years, and previous to that had also been matron at Wanganui and Christchurch, retired at the end of March owing to ill health. Miss Bagley was a valued officer of the Department and had done much to interest women's voluntary organizations in the work of St. Helens Hospitals. It is with the greatest regret the Department loses her services, and hopes with a long rest she may be sufficiently restored to health to enjoy her retiring years.

Other Institutions.—The reorganization of King George V Hospital, Rotorua, as a non-training school has taken place, and is working smoothly. The Department in this case has been able to show Boards with hospitals of a similar size that it is possible to staff for the same cost as under training-school conditions, and that generally it is more satisfactory, besides assisting in the absorption of registered nurses.

The staffs of Queen Mary Hospital, Hanmer Springs, and of Otaki and Pukeora have remained stationary. It is most gratifying that in the taking-over by the Palmerston North Hospital Board of the Otaki Sanatorium the entire nursing staff was absorbed.

Field Staff.—Miss Lea, one of the Nurse Inspectors for the Wellington District, has been granted a year's leave of absence to act as matron of the Wairau Hospital, Blenheim. Miss Helen Comrie, who has been the ante-natal clinic sister at Auckland St. Helens Hospital, has been transferred to Wellington to relieve Miss Lea.

The new North Auckland Health District came into being on the 1st April of last year, Miss Wise being transferred from New Plymouth to Whangarei to act as Nurse Inspector in this area. A reorganization of the district nurses' duties has taken place along the lines of the Gisborne district, so that each nurse is responsible for the complete public-health nursing programme in her area. The Hospital Boards in this area have been most co-operative, and the work of nurses employed by them has been included in this scheme, so the previous overlapping of services will be obviated in the future.

The South Auckland District nurses' duties have also been reorganized as from the 1st June last, the school nurses' duties in each area becoming definitely part of the district nurse's work.

The staff have been most willing to assist in overcoming the difficulties that have naturally arisen with such a complete reorganization, and I would like to take this opportunity of thanking them for their interest and co-operation.

In March a one-day meeting, which took the form of a round-table discussion, was held at Gisborne of district nurses in that area. As the combined district has now been in operation four and a half years, an opportunity was taken to review the work accomplished and make plans for future development. There is no doubt that such meetings are of definite benefit in building up the morale of the staff, and it is intended to hold further meetings in other centres throughout the year.

Negotiations have been entered into with various Hospital Boards so as to make the contributions from the Boards towards the district nursing services more comparable. These have met with definite success, and transport conditions are now more favourable than ever.

The work of the twenty district nurses employed by the Department deserves the greatest credit; these women are faced often with great difficulties and on their judgment much depends.

The attached table gives a brief summary of the amount of work accomplished during the year:—

Total number of—

Patients treated	20,539
Treatments given	30,050
Maternity cases	546
Visits paid to pas	2,759
Visits paid to schools	835

Post-graduate Training.—The post-graduate course for nurses continues to be held each year, the students thoroughly enjoying the wider contact this course gives them. The New Zealand Trained Nurses Association was generous in 1932, and again in 1933, by assisting students with bursaries.

It is most gratifying to those who have worked so hard in the past for the establishment of this course to see the good work the holders of this diploma are doing, and to know that their work is appreciated by those controlling them. Even from China have come remarks of appreciation where an ex-student is matron of a training-school.

Unemployment.—On the whole, for the last few months the situation regarding unemployment among nurses has been more satisfactory. During last winter the position was very acute, but owing to the smaller training-schools being cancelled and staffing largely with trained nurses, and to the co-operation of the larger hospitals in employing a greater proportion of trained staff, positions were made for ninety nurses. This has considerably helped.

A great deal of my time is still spent in interviewing and endeavouring to assist nurses to find work, the problem of the older women being particularly difficult.

Future Developments: Nursing Education.—Consideration of the training of nurses is at present a subject which is causing much thought all over the world among hospital authorities and those concerned in the actual teaching of nurses. The American authorities are definitely committed to an alliance with the University, so as to give the nurse University status and teaching. The English authorities, on the other hand, are much more conservative in their opinion, very probably because the Universities of Great Britain do not open their doors so widely as the American ones in regard to courses of study and degrees. In New Zealand it is very apparent in visiting hospitals that too much reliance has been placed on medical teaching rather than that given by nurses. The teaching of nursing is entirely different from the teaching of medical students, in that the nurse from the beginning must be taught the study of her patient as an individual rather than as a scientific case. It is true that she must have sufficient scientific knowledge to understand disease and its conditions, but a great deal more attention is needed in regard to the actual nursing procedures and to the humanitarian aspect of her work if she is to be a success. This can only be given to the pupil-nurse by a well qualified nurse teacher both in the class-room and ward.

Probably New Zealand's greatest need at present is a well-organized preliminary training of the pupil-nurse before her entry to the wards. This ensures her being trained in simple procedures in a specified manner, having an adequate knowledge of the prevention of infection, and relieves her from much of the study which is otherwise necessary in her first year of training, so making the adaption to hospital-life easier.

At present, out of twenty-eight training-schools only six give a preliminary course, four of three weeks and two of a month. When pupils are paid during this course it is hardly fair to expect a great deal from Hospital Boards, but there is no doubt our preliminary training is inadequate. In Great Britain where preliminary-training schools have been successfully in operation for many years, the course is from two to four months. As a beginning it would appear possible for our hospitals to inaugurate a two months' course, the pupil paying £10 for this course. This would allow sufficient finance for the hospital to board the nurse during these two months and pay for a tutor sister to teach her.

It is true that the number needed per year in some of our hospitals would not justify such a scheme, but there is no reason why New Zealand should not copy the plan adopted in Finland where there are five preliminary-training schools attached to the larger hospitals, the smaller ones sending their candidates to these centres to be trained. Probably six or seven such centres would adequately cover New Zealand, and it could be put into operation with very little cost to the Hospital Boards, as in places where such centres would be established there would be already sufficient accommodation and necessary equipment.

The realization that ward sisters are definitely part of the teaching-staff and are responsible for the largest portion of the nurses' training is a subject which has been again and again stressed. But it is impossible for the ward sisters to adequately care for their patients' well-being, administer their wards, and teach their staff, unless they have adequate assistance of other trained staff. A further point is that while sisters may be attached to one ward for too long a period of years, at the same time frequent changes are as bad if not worse. The sister must be attached to the ward long enough for her to build up that personal contact which is so invaluable. On the other hand, if she is left indefinitely in one ward her mind becomes so set in one phase of work that it is impossible for her to adapt herself to new requirements.

District Nursing.—For some time past the development of a district nursing service to alleviate the length of days' stay in hospital of many acute and chronic patients has been discussed. Auckland Hospital during the past two years has developed this type of work extensively. Under the charge of an experienced and well-trained district sister, staff nurses in their fourth year attend to early discharged cases. The average number of cases so treated per month for the last year has been forty-five and the number of nurses employed three. This, as can be understood, is a very cheap service to the Board, and is one that can be recommended strongly to other Boards with city populations.

Obituary.

In September of last year Miss Hester Maclean, R.R.C., Florence Nightingale Medal, passed away after an illness of some months.

Miss Maclean was appointed Assistant Inspector of Hospitals in 1906, Matron-in-Chief of the New Zealand Army Nursing Service in 1911, and with the reorganization of the Department in 1920, became Director of Nursing, finally retiring in 1923.

The nursing profession in New Zealand owes much to Miss Maclean's vision and courage. At the time of her appointment State registration had only just come into force, and the consolidation of this Act and stabilization of training-schools was largely her work. In addition, she carried out the formation of the New Zealand Army Service, as well as establishing a journal for New Zealand nurses and assisting in the formation of the New Zealand Trained Nurses' Association.

The fact that Miss Maclean was awarded the Royal Red Cross, 1st Class, at the termination of the war, and later the Florence Nightingale Medal (the first to be awarded in New Zealand) shows that her services were appreciated by her country, but probably her greatest appreciation lies in the warm regard she is still borne in by all those nurses who came intimately into contact with her understanding and generous personality.

In conclusion, I would like to thank the staff of the Department and the matrons of the hospitals for their ready interest and assistance. Such co-operation makes for a unity of purpose which in the present difficult times is doubly appreciated.

M. I. Lambie,
Director, Division of Nursing.

PART VII.—MATERNAL WELFARE.

REPORT OF INSPECTOR OF MATERNITY AND PRIVATE HOSPITALS.

T. L. Paget, L.R.C.P. (Lond.), M.R.C.S. (Eng.).

I have the honour to present my annual report for the year ended 31st March, 1933.

The decline in the maternal-mortality rate throughout New Zealand, which has continued without interruption since 1927, warrants the anticipation expressed in my report of last year that the measures instituted for maternal welfare would be justified by results.

The maternal-mortality rate for New Zealand of 4·06 places New Zealand in a position in which she can be favourably compared with those countries having a specially low maternal-death rate. This is shown in Table I, taken from the report of the Departmental Committee on Maternal Mortality and Morbidity of the British Ministry of Health, 1932, to which the figures pertaining to New Zealand have been added.

MATERNAL MORTALITY.

Table I.—Table of Vital Statistics as published by the British Ministry of Health (New Zealand Figures added).

——		England and Wales.	Netherlands.	Denmark.	Sweden.	New Zealand (Europeans only).	
						All Maternal Deaths.	Maternal Deaths, excluding Septic Abortion.
Officially recorded maternal-death rate per 1,000 live births	1920	4·33	2·4	2·8	2·6	6·48	4·41 (1927)
	1930	4·40	3·3	3·8	3·0	5·08	3·96
	1932	..	..	..	..	4·06	3·02
Year 1930—							
Population		39,806,000	7,952,634	3,542,000	6,130,826	1,425,084	
Population per square mile		685	627	237	35	13·75	
Live births		648,811	182,310	66,303	94,200	26,797	
Birth-rate		16·26	22·92	18·71	15·36	18·80	
General death-rate		11·4	9·0	10·8	11·70	8·56	
Infant mortality per 1,000 births		60	51	79	53	34·48	
Percentage of total deaths due to tuberculosis		7·8	8·2	6·5	10·6	4·33	

Number of training-schools for midwives:—

Country.	Number.
England and Wales	194
Netherlands	3
Denmark	1
Sweden	2
New Zealand	4

Number of training-schools for maternity nurses:—

New Zealand	22

It may be confidently anticipated that a continuance of the efforts to promote maternal welfare, brief particulars of which were given in my last annual report, will still further reduce the maternal mortality rate. Even at the present time, were it not for the high death-rate from septic abortions—which, as I have previously pointed out, are due to social and economic causes—the rate would be as low, or lower, than the Netherlands, Denmark, and Sweden. The statements frequently made that the accurate method of gathering information for statistics regarding maternal mortality in New Zealand gives a death-rate which is higher than would be shown if the figures were compiled in the same way as Sweden, Denmark, and probably the Netherlands, is justified by facts produced and opinions expressed in the above-mentioned British Ministry of Heath's valuable report.

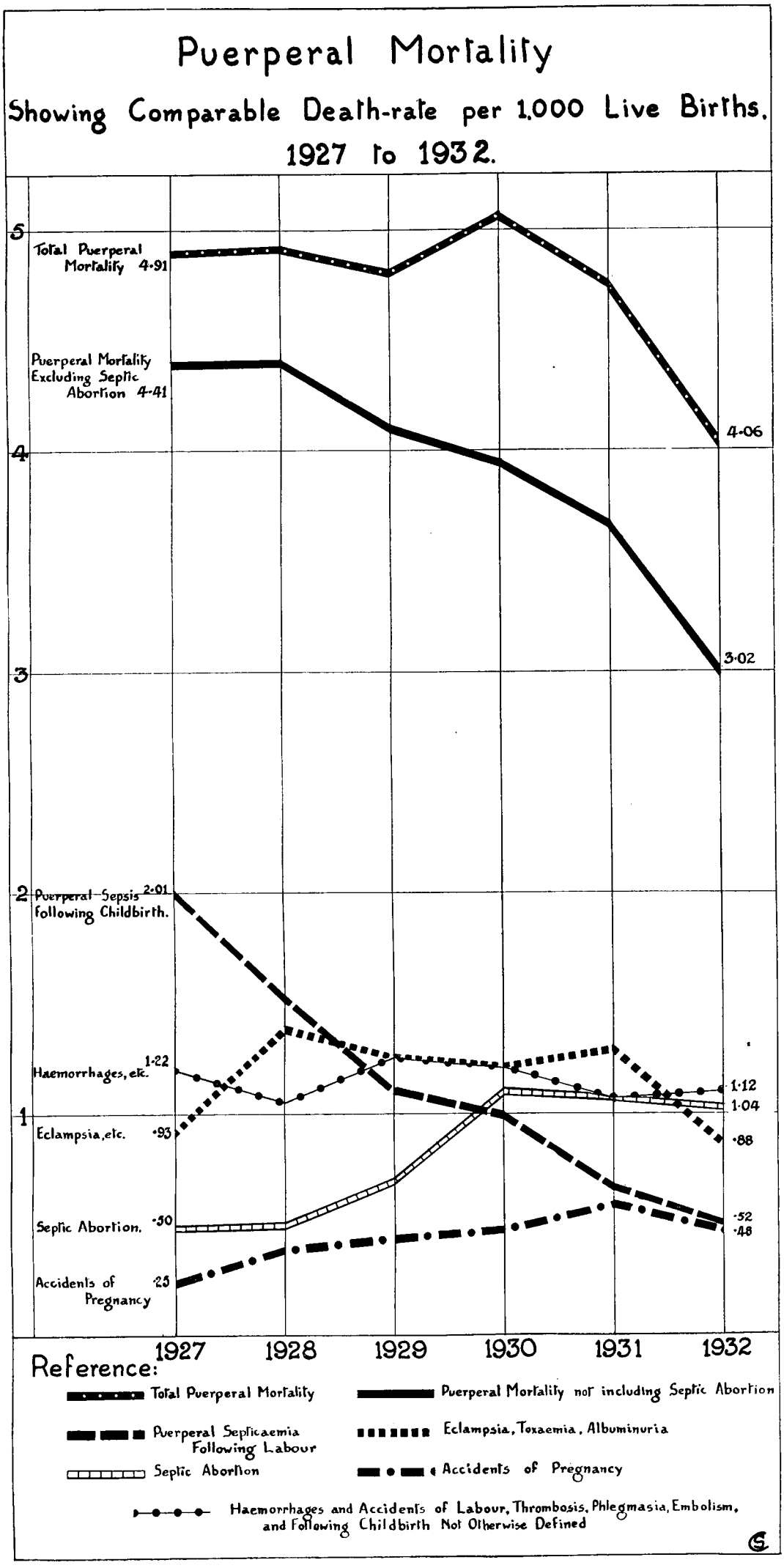
DETAILED STATISTICAL RETURNS FOR NEW ZEALAND.

Table II.—Showing the Number of Deaths from all Puerperal Causes, 1927–32.

——	1927.	1928.	1929.	1930.	1931.	1932.
Puerperal sepsis following childbirth	56	42	30	27	18	13
Hæmorrhages, accidents of labour, thrombosis, phlegmasia, embolism, and following childbirth not otherwise defined	40	29	34	33	29	28
Toxæmia, albuminuria, and eclampsia	26	38	34	33	35	22
Puerperal sepsis following abortion or miscarriage	14	14	19	30	29	26
Accidents of pregnancy (mainly non-septic abortions)	7	11	12	13	16	12
Total	137	134	129	136	127	101
Total maternal deaths, excluding septic abortion	123	120	110	106	98	75

This table gives in actual numbers the deaths from puerperal causes of which the rates per 1,000 live births are shown in graph form on the following Table IIA (page 39).

Table IIA.


Puerperal Mortality
Showing Comparable Death-rate per 1,000 Live Births.
1927 to 1932.
5
4
3
2
1
Total Puerperal Mortality 4·91
Puerperal Mortality Excluding Septic Abortion 4·41
4·06
3·02
Puerperal Sepsis following Childbirth. 2·01
Haemorrhages, etc. 1·22
Eclampsia, etc. ·93
Septic Abortion. ·30
Accidents of Pregnancy ·25
1·12
1·04
·88
·52
·48
1927
1928
1929
1930
1931
1932
Reference:
Total Puerperal Mortality
Puerperal Mortality not including Septic Abortion
Puerperal Septicaemia Following Labour
Eclampsia, Toxaemia, Albuminuria
Septic Abortion
Accidents of Pregnancy
Haemorrhages and Accidents of Labour, Thrombosis, Phlegmasia, Embolism, and Following Childbirth Not Otherwise Defined

These show a continuous reduction in the maternal-mortality rate since 1927 for all cases excluding septic abortion, the increase of which in 1930 caused a rise in the total rate. The fall in the rate from puerperal sepsis following childbirth has continued. The eclampsia rate has fallen for the first time since the unexplained rise in 1928. Whether this is as inexplicable as this rise or is due to the influence of better and more systematic ante-natal care given to a larger proportion of expectant mothers, time alone will show. I know that there is a greatly increased interest being shown in this work by the members of the medical profession practising obstetrics, and I am in hopes that the drop is an example of cause and effect. Deaths from puerperal sepsis following abortion due mainly to induced abortion have not shown any material reduction, and are not likely to as long as the present economic strain on the reduced domestic budget remains unrelieved, and the victims of induced abortion see no other escape than risking their lives in an attempt to terminate an undesired pregnancy. I can only point out again the very great risk to life of this proceeding, especially when the operation, which is illegal, is performed by the unskilled professional abortionist or the woman herself. Again the majority of the victims (twenty-four out of twenty-six) were married women.

MATERNITY HOSPITALS.

The maternity hospitals of New Zealand comprise seven State (St. Helens) maternity hospitals, providing 121 beds, seventy-four public maternity hospitals under Hospital Boards, providing 491 beds, and 189 private maternity or " mixed " hospitals, providing 884 maternity beds, a total of 1,496 maternity beds, or an average of approximately one bed to each 1,000 of the population. These hospitals, many of which provide only from three to four beds each, are fairly evenly distributed over the country and provide a valuable and essential means of giving good maternity services to the women of New Zealand. Their even distribution avoids any marked disparity in the risks to the rural and urban districts of New Zealand which is in evidence in some countries. Also the distribution of the population of New Zealand with comparatively a few large towns makes it impossible to sufficiently clearly define rural and urban conditions to make comparative statistics for rural and urban areas of special significance.

PRIVATE MEDICAL AND SURGICAL HOSPITALS.

There are ninety-four private hospitals licensed for medical and surgical cases only which, with thirty-three private " mixed " hospitals provide 1,399 beds. In spite of the older ones lacking many desirable conveniences the majority of them maintain a fairly high standard, and on the whole are in a satisfactory condition. Some of the larger hospitals are well equipped units with X-ray and bacteriological departments.

STATISTICS OF MATERNITY HOSPITALS.

Table III.—Summary of Maternity Cases in all Hospitals, 1932.

—	Number of Hospitals.	Patients admitted.	Confined at full Term.	Number of Patients confined between Seventh Month and Full Term.	Total Confinements.	Number of Abortions—*i.e.*, Delivery before the Seventh Month.	Number of Operations.							Hæmorrhages.			Eclampsia.	Number of Deaths of Mothers.	Number of Deaths of Infants who were born alive.	Number of Infants born dead.		Number of Patients transferred to other Hospitals.		Deaths of Transferred Patients.	Maternal Mortality.		
							Instrumental Delivery.	Version.		Dilation of Cervix.	Manual Removal of Placenta.	Cæsarian Section.	Craniotomy, &c.	Accidental Hæmorrhage.	Unavoidable Hæmorrhage (Placenta prævia).	Post-partum Hæmorrhage.				Probably before Labour.	Probably during Labour.	Before Delivery.	After Delivery.		Puerperal Causes.	Non-puerperal Causes.	Total Maternal Mortality.
								External.	Internal.																		
(*a*) *Maternity Hospitals—i.e.*, admitting maternity and urgent miscarriage cases only—																											
Group I: 1–100 cases per annum—																											
Totals	159	6,675	6,216	332	6,548	39	660	32	29	38	53	1	4	15	29	98	24	7	108	133	77	20	58	5	10	2	12
Percentages to total confinements	..	..	..	..	..	..	10·08	0·49	0·44	0·58	0·81	0·02	0·06	0·23	0·44	1·50	0·37	0·107	1·65	2·03	1·18	0·31	0·89	0·076	0·152	0·031	0·183
Group II: Over 100 cases per annum—																											
Totals	40	6,676	6,156	326	6,482	27	634	39	28	57	70	30	4	20	27	80	24	11	113	100	72	14	89	10	16	5	21
Percentages to total confinements	..	..	..	..	..	..	9·78	0·60	0·43	0·88	1·08	0·46	0·06	0·31	0·42	1·23	0·38	0·170	1·74	1·54	1·11	0·22	1·37	0·154	0·247	0·077	0·324
Group III: St. Helens Hospitals—																											
Totals	7	2,390	2,126	58	2,184	9	129	15	10	10	24	6	1	15	3	46	3	2	19	35	26	9	18	1	1	2	3
Percentages to total confinements	..	..	..	..	..	..	5·91	0·69	0·46	0·46	1·10	0·27	0·05	0·69	0·14	2·11	0·14	0·092	0·87	1·60	1·19	0·41	0·82	0·046	0·046	0·092	0·137
Total, Groups I, II, and III—																											
Totals	206	15,741	14,498	716	15,214	75	1,423	86	67	105	147	37	9	50	59	224	51	20	240	268	175	43	165	16	27	9	36
Percentages to total confinements	..	..	..	..	..	..	9·35	0·57	0·44	0·69	0·97	0·24	0·06	0·33	0·39	1·47	0·34	0·131	1·58	1·76	1·15	0·28	1·08	0·105	0·177	0·059	0·236
(*b*) Group IV: *Mixed Hospitals—i.e.*, admitting maternity and medical and surgical cases—																											
Totals	67	2,479	2,219	115	2,334	71	206	3	7	11	28	8	1	10	9	59	18	6	41	61	33	10	21	2	8	..	8
Percentages to total confinements	..	..	..	..	..	..	8·83	0·13	0·30	0·47	1·20	0·34	0·04	0·43	0·39	2·53	0·77	0·257	1·76	2·61	1·41	0·43	0·90	0·086	0·343	..	0·343
(*c*) *All Hospitals*—																											
Total, all hospitals	273	18,220	16,717	835	17,548	146	1,629	89	74	116	175	45	10	60	68	283	69	26	281	329	208	53	186	18	35	9	44
Percentages to total confinements	..	..	..	..	..	..	9·28	0·51	0·42	0·66	1·00	0·26	0·06	0·34	0·39	1·61	0·39	0·148	1·60	1·87	1·18	0·30	1·06	0·103	0·199	0·051	0·250
(*d*) *Cases confined in Private Houses and General Wards of Public Hospitals*—																											
Totals	..	..	..	..	7,919	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	20
Percentages to total confinements	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	0·25

Table III (page 41) gives a summary of maternity cases in the above hospitals, in which 17,548, or 69 per cent., of the confinements during 1932 took place. As before, these hospitals have been grouped into four classes. With the gradual improvement of the smaller maternity hospitals (Group I), and the precautions taken to exclude septic and suppurating cases from the maternity hospitals licensed to admit surgical cases (Group IV, mixed hospitals), satisfactory and fairly even results are shown in each of the four groups. Group V includes the results of all patients (7,919, 31 per cent.) confined in their own homes and/or in the general wards of public hospitals, to the latter of which the cases admitted were mostly unforeseen emergencies occurring during the course of labour commenced elsewhere. The gravity of these emergency cases when admitted may be estimated from the fact that the maternal-death rate in the general wards of public hospitals was 11·19 per cent. It is obviously desirable that such emergency cases should be admitted to obstetric hospitals instead of to surgical or medical wards of public hospitals, in which the facilities for special obstetrical work are seldom available. It is still more desirable that as many emergencies as possible should be avoided by more complete ante-natal care under skilled obstetricians and midwives. The maternal mortality of the whole of Group V is 2·5 per 1,000 confinements, a rate identical with the total of the maternity-hospital cases. The rates have been made comparable by excluding cases of abortion and ectopic gestation from Group V, since such cases are not admitted to maternity hospitals.

ST. HELENS HOSPITALS.

Table IV gives detailed results of patients attended in the internal and external departments of all St. Helens Hospitals and the attendances in the ante-natal clinics attached to these hospitals. It is interesting to note that an increase in the number of maternity outfits sterilized at these clinics for the use of midwives in private practice has corresponded with the decrease in the puerperal-sepsis rate. This is a valuable service given at a cost of 1s. to 1s. 6d. per outfit.

The forceps rate for the St. Helens Hospitals is 5·91 per cent., as compared with the rate of 9·76 per cent. for all other maternity hospitals. This low forceps rate can be attributed mainly to the fact that in all these hospitals normal deliveries are attended entirely by midwives, medical officers only being called in if abnormality is foreseen or arises during labour.

Table IV.—St. Helens Hospitals, General Statistics, 1932.

—	Auckland.	Christchurch.	Dunedin.	Gisborne.	Invercargill.	Wanganui.	Wellington.	Total.	Percentage to Total Confinements.
A.—Intern Departments.									
Total deliveries	617	308	138	141	277	165	545	2,191	..
Primiparæ	214	88	39	31	68	36	149	625	28·53
Multiparæ	403	220	99	110	209	129	396	1,566	71·47
Presentations—									
Vertex normal rotation	595	283	129	139	265	155	489	2,056	93·84
Occipito-posterior (persistent)	11	7	7	2	4	6	19	56	2·56
Face	4	2	1	1	..	1	3	12	0·55
Brow	1	..	..	..	..	..	1	2	0·09
Breech	15	20	2	5	8	3	20	73	3·33
Transverse	..	1	..	..	..	..	1	2	0·09
Twins	9	5	1	3	..	..	2	20	0·91
Complications of pregnancy—									
Hyperemesis	..	..	..	..	..	..	1	1	0·05
Hydramnios	..	..	8	..	..	1	3	12	0·55
Pre-eclamptic toxæmia	12	6	1	2	..	5	37	63	2·88
Eclampsia	2	..	..	..	..	..	1	3	0·14
Nephritic toxæmia	3	1	2	..	4	..	4	14	0·64
Hæmorrhages—									
Unavoidable	..	..	..	1	1	..	1	3	0·14
Accidental, external	3	2	1	..	1	2	4	13	0·59
Accidental, internal	..	..	1	..	1	..	..	2	0·09
Post-partum, atonic	15	4	9	1	4	5	7	45	2·05
Post-partum, traumatic	1	..	..	..	..	..	..	1	0·05
Lacerations of genital tract—									
Perinæum	155	29	11	15	34	17	..	261	11·91
Cervix	..	..	..	..	..	..	..	..	..
Uterus	..	..	..	..	..	..	..	..	..
Contracted pelvis, inlet	..	2	6	4	..	..	..	12	0·55
Contracted pelvis, outlet	..	5	..	..	4	..	..	9	0·41
Prolapse of cord	2	1	..	..	..	..	2	5	0·23

Table IV.—St. Helens Hospitals.—General Statistics, 1932—continued.

—	Auckland.	Christchurch.	Dunedin.	Gisborne.	Invercargill.	Wanganui.	Wellington.	Total.	Percentage to Total Confinements.
A.—Intern Departments—*continued.*									
Complications of puerperium—									
Sepsis, local	1	1	..	..	1	..	..	3	0·14
Sepsis, general	..	..	1	..	1	..	..	2	0·09
Pulmonary embolism	..	1	..	..	..	..	1	2	0·09
Insanity	..	..	2	..	1	..	1	4	0·18
Crural phlegmasia, venous	..	..	..	..	..	..	..	..	..
Crural phlegmasia, lymphatic	1	..	..	..	..	..	..	1	0·05
Mastitis	7	2	..	..	..	1	..	10	0·46
Operations—									
Internal pelvimetry	..	..	..	..	..	..	..	..	..
Induction of labour	20	15	8	..	1	..	49	93	4·24
Episiotomy	3	..	1	..	..	..	17	21	0·96
Impacted shoulders	..	..	..	..	..	..	3	3	0·14
Suture of perinæal lacerations—									
Complete	1	..	..	..	..	..	..	1	0·5
Incomplete	154	29	11	15	34	17	93	353	16·11
Suture of cervical lacerations	1	..	..	..	..	..	..	1	0·05
Forceps	48	13	5	8	14	8	34	130	5·93
Version, external	..	4	1	..	1	..	4	10	0·46
Version, internal	..	4	..	..	..	..	3	7	0·32
Version, combined	..	3	..	..	2	..	..	5	0·23
Manual removal of placenta	5	4	1	1	2	1	11	25	1·14
Cæsarean section—									
Abdominal, conservative	3	..	..	..	..	..	3	6	0·27
Abdominal, radical	..	..	..	..	..	..	..	..	..
Pubiotomy	..	..	..	..	..	..	..	..	..
Craniotomy	..	..	..	..	..	..	1	1	0·05
Cleidotomy	..	..	..	..	..	..	..	..	..
Decapitation	..	..	..	..	..	..	..	..	..
Morbidity—Total	15	15	2	2	5	7	19	65	2·97
Mortality—Total	..	1	..	..	1	..	1	3	0·14
Infant statistics—									
Total births	626	313	139	144	276	164	547	2,209	100·82
Premature—									
Alive	15	5	6	1	5	3	12	47	2·15
Dead—									
Recent	..	4	..	..	..	1	..	5	0·23
Macerated	5	1	..	3	..	..	3	12	0·55
Putrid	..	..	..	..	..	..	..	..	..
Full term—									
Alive	598	296	130	136	264	156	518	2,098	95·76
Dead—									
Recent	6	2	2	3	7	2	10	32	1·46
Macerated	4	1	..	1	..	2	4	12	0·55
Putrid	..	..	..	..	..	..	..	..	..
Children born alive who died in hospital	4	6	1	..	3	1	4	19	0·87
Total born dead or died in hospital	19	14	3	7	10	6	..	59	2·69
B.—Extern Department.									
Total attendances	103	94	..	..	..	..	57	254	..
Primiparæ	..	5	..	..	..	..	..	5	1·97
Multiparæ	103	89	..	..	..	..	57	249	98·03
Forceps application	5	2	..	..	..	..	2	9	3·54
Total morbidity	1	1	..	..	..	..	1	3	1·18
Total mortality	..	..	..	..	..	..	..	..	..
C.—Ante-natal Clinics.									
First visits—									
Primiparæ	212	109	44	30	84	33	167	679	..
Multiparæ	525	345	96	106	194	107	471	1,844	..
Return visits	3,350	1,896	316	286	670	384	3,058	9,960	..
Outside visits	113	309	6	..	..	..	269	727	..
Outfits sterilized	154	159	22	1	3	13	66	418	..

PUBLIC ANTE-NATAL CLINICS.

Table V.—Ante-natal Clinics.

Year.	Number of Clinics.	New Cases.	Total Attendances.	Average Number of Attendances by each Patient.	Outfits sterilized.
1925	16	2,289	7,816	3·0	..
1926	20	3,238	12,554	3·8	401
1927	20	3,919	15,406	4·5	515
1928	21	5,050	20,740	4·11	728
1929	24	5,177	17,555	3·39	924
1930	25	6,027	22,078	3·66	1,106
1931	28	6,306	22,869	3·63	1,221
1932	31	5,882	22,594	3·84	986

The returns shown in the above table are from thirty-one clinics only, returns not having been received from a number of public hospitals which are doing quite valuable ante-natal work. The clinics which have sent in returns show a slight decrease in the number of new cases attending, though the average attendance per patient has increased from 3·63 to 3·84. It is evident that a greater number of the medical profession is recognizing the valuable help given by these clinics, and I have no doubt that it will have an increasingly beneficial influence in reducing the danger to the expectant mother from eclampsia and allied conditions. The detailed reports of fifty-eight out of sixty-six eclampsia cases notified—a considerable reduction on last year's notifications—show not only that there have been fewer cases, but that a greater proportion of the cases have had the benefit or early treatment. I take this opportunity of acknowledging the material help afforded me by the co-operation of many medical practitioners. A continued and I hope increasing co-operation is essential to further reduction in the death-rate from eclampsia, which, as compared with other countries, is still unduly high.

INVESTIGATION INTO CASES OF PUERPERAL SEPSIS.

One hundred and forty cases were notified during the year, including Maoris, and 108 inquiry forms were returned. From these reports it is obvious that many of the cases were of trivial nature—if any case of puerperal sepsis can be termed trivial. In some a moderate degree of pyrexia lasted only two to four days. In forty recovery was complete on the fourteenth day of the puerperium. Of the 108 reported cases eleven were fatal. In a considerable number the infection is reported to have arisen later than the third day of the puerperium. Two cases which were normal up to the tenth day and in which pyrexia occurred two days after ceasing to use sterile vulvar dressings are of some interest, and give rise to the question, " When may unsterilized dressings be used without risk ?"

MATERNITY NURSES AND MIDWIVES.

I wish to emphasize the importance of the provision of well-trained midwives and maternity nurses in a scheme for maternal and child welfare. Both are essential. Midwifery training provides a skilled nurse fully qualified to take the full responsibility for attendance on normal labour and capable of filling a teaching position ; the maternity nurse provides skilled assistance for the practitioner both in the preparation and care of the woman before, during, and after labour and of the new-born infant. I finish with a question, " To what extend are the better results of a service conducted only by midwives during normal labour due to the elimination of the ' handy woman ' who in most countries is the only help available to the doctor ?"

New Zealand now provides a means of training midwives and maternity nurses which is exceedingly satisfactory, and which probably makes provision for training equal to that given in any other part of the world. The Director, Division of Nursing, will deal with this in detail, and I merely mention it here to emphasize the fact that it is an essential part of the Service without which our scheme of maternal welfare would have been ineffective.

In conclusion, I wish to express my sincere thanks to the very large and increasing number of the medical and nursing professions who by their kindly and helpful co-operation have made my work more agreeable, and I hope more effective.

APPENDIX.

INVESTIGATION INTO CASES OF TYPHOID FEVER IN HAWKE'S BAY CAUSED THROUGH CONSUMPTION OF POLLUTED SHELL-FISH.

By Dr. F. S. MACLEAN, Medical Officer of Health.

The reported cases of typhoid in Hawke's Bay for the last four years are as follow :—

1929 (22 cases)	.. 12 Europeans. 9 Maoris. 1 Tongan.	1931 (20 cases)	.. 4 Europeans. 16 Maoris.
1930 (8 cases)	.. 2 Europeans. 6 Maoris.	1932 (14 cases)	.. 3 Europeans. 11 Maoris.

Of the twenty-seven Maori cases in 1931 and 1932, twenty-six occurred between February, 1931, and July, 1932.

The history of several of the cases suggested the possibility of infection arising from the consumption of polluted shell-fish from Westshore, and during the year the matter was fully investigated with important results.

Statistically, the evidence tracing the infection to polluted shell-fish might be discounted by the suggestion that most Maoris in Hawke's Bay were in the habit of eating shell-fish, and that therefore the majority of those contracting typhoid fever would almost certainly have done so in the same way that they would have eaten bread or potatoes. If, however, one could prove that the shell-fish were polluted with sewage, and could quote specific cases in which mussels or pipis were eaten within the period of incubation, one would seem to be on more certain ground.

Before the earthquake of February, 1931, mussels and pipis were taken from different places within the inner harbour, which was then tidal, and the bulk of the Napier sewage was discharged at the harbour entrance and carried well out to sea on the outgoing tide. The amount of tidal water available to carry the sewage out to sea was very considerable. It is probable that even then there was some pollution of shell-fish, and possibly some of the enteric fever was caused in this way. A case in point is that of T. R., of Waimarama, a Maori, who ate mussels on 9th January, 1930, and became ill with typhoid fever on 20th January. J. T., of Moteo Pa, who became ill the following month, also gave a history of having eaten mussels from the inner harbour.

In November, 1927, ten Maoris suffering from typhoid fever were admitted to King George V Hospital, Rotorua. The outbreak was traced to a tangi held about a month previously at Oruanui at which there had been consumed a lorry load of mussels brought from Westshore. The mussels were gathered from the vicinity of the old bridge and were eaten raw or partially cooked. Those eating them felt sick after the feast, and became ill with typhoid fever two weeks later.

The earthquake so raised the floor of the lagoon that tidal water ceased to enter it, and the water remaining gradually became first brackish and then fresh. The result of this was two-fold ; there was no great body of tidal water to carry away the sewage, and most of the pipis and mussels inside the harbour entrance died out. A few pipis survived just inside the entrance, but they were buried in silt during a flood in May, 1932. At the present time the only shell-fish remaining in this locality are the mussels on a reef in the open sea a few chains to the west of the western mole, and about a quarter of a mile from the sewer outfall. There may be others on the rocks along the foreshore, but those mentioned are the ones from which the supply has mainly been taken since the earthquake. To any one looking over the harbour from the hills there is visual evidence that sewage remains round the harbour entrance, and discolours the water in the vicinity.

In May, 1932, a number of mussels were obtained from this reef and examined bacteriologically. Five mussels were opened and the liquor from shell and body extracted. Five others were " cooked " in the Maori fashion by heating in water until the shells opened. Their liquor was likewise examined with the following results :—

In each case five McConkey tubes were inoculated with 1 c.c. of liquor, five with 0·1 c.c., and five with 0·01 c.c. In the case of the raw mussels four tubes out of five showed the presence of *B. coli* in 0·01 c.c. of the liquor, while in the case of the " cooked " mussels three tubes out of five showed the presence of *B. coli* in 0·01 c.c. The evidence is fairly conclusive, therefore, that shell-fish from this locality may be heavily polluted, and any one eating three or four raw mussels at a sitting might easily consume also a large number of fæcal organisms.

Maoris commonly eat mussels and pipis in one of four ways : raw, scalded, fried, or cooked thoroughly, and pickled ; and infection from raw or scalded shell-fish would appear to be probable.

In the following cases evidence of infection in this manner is forthcoming :—

March, 1932, Mrs. D. (European) living at Westshore ate some mussels and was taken ill within three weeks.

March, 1932, Mr. N. and Mrs. N. (Maoris) attended at wedding feast at Tahoraiti Pa, Dannevirke, on 15th February, and ate raw mussels obtained from Westshore. Mr. N. became ill on 2nd March and his wife on 3rd March. Other guests at the feast ate the mussels cooked.

April, 1932, T. M. (Maori) ate pipis taken from near the site of the old bridge, and became ill a week later. This pipi-bed was later covered with silt.

In addition to these cases four other Maoris gave a history of having eaten shell-fish before becoming ill.

Between September, 1931, and July, 1932, there were altogether twenty-three cases of typhoid reported. Of these, eight gave a definite history of having consumed shell-fish, five other cases were secondary to one of these eight, and two cases occcurred in hospital nurses by direct contact. This leaves only eight cases not accounted for, and there is no conclusive evidence that these eight persons did not consume shell-fish.

In view of the evidence collected, it was considered advisable to take all possible steps to prevent the consumption of these polluted shell-fish. A warning notice was erected on the foreshore near the reef in question, Europeans in the habit of obtaining and hawking the shell-fish were warned, and the Maori Council was interviewed and given full particulars of the danger incurred by their consumption. The Council has agreed to adopt a by-law making it illegal to bring polluted shell-fish into any pa, and has given publicity to the matter although the by-law has not yet been gazetted. These precautions appear to have been justified, as only one other case of typhoid occurred in Hawke's Bay during the remaining five months of the year.

THE BACTERIOLOGICAL CONTROL OF MILK-SUPPLIES, EAST CAPE HEALTH DISTRICT.

By Dr. H. B. Turbott, Medical Officer of Health.

After four and a half years of close bacteriological control it has been demonstrated in Gisborne that, without added cost to consumer, a very high-grade milk can be produced, judged by the following standards :—

(1) The absence of living tubercle bacilli—guinea pig tests negative.
(2) The absence of epidemic-producing bacteria.
(3) A low bacterial content, enhancing the keeping-qualities.
(4) Good nutritional value—chemical analyses of high standard.

Five years ago milks in this district were supervised by regular samplings for fat and milk solids content, and for gross dirt by the cotton disk sedimentation test. On the initiation of the East Cape district, chemical analyses of milk were continued, but the sedimentation test dropped, and bacteriological control substituted. In Gisborne there are forty-five bulk milk suppliers. With the available laboratory manned by one bacteriologist it was impossible to control these forty-five suppliers continuously at the one time. Therefore monthly samples were taken from all suppliers in the first twelve months, and the supplies thereafter grouped " good " and " poor " as regards bacterial quality. Control work thereafter fell into three divisions :—

(1) The building-up, if possible, of quality milks of English " certified " standard.
(2) The intermittent control of " good " quality milks.
(3) The education of bad-quality-milk suppliers.

(Routine bacteriological technique was followed in agar counts and *Bacillus coli* determinations, the latter being set out in tubes of 10 c.c., 5, 2·5, 1, 0·1, 0·01, 0·001, and 0·0001. Presence or absence of *Bacillus coli* is indicated by + or — for these dilutions : thus, — means absent throughout ; + 10 means presence in 10 c.c. dilution, but absent in all higher dilutions ; + 0·1 means present in dilutions 10 to 0·1, absent in higher dilutions.)

I. A half-dozen of the " good " group were given continuous bacteriological control in an attempt to produce excellent-quality raw milk. The Health and Agriculture Departments' Inspectors worked in the closest co-operation in this work, involving—

(*a*) Inspection and improvement of farm plants.
(*b*) Physical examination and tuberculin-testing of cows.
(*c*) Laboratory examination of milk.

The producers responded by becoming interested, and are obtaining excellent and consistent results. At the district office histograms are compiled for each supplier, the monthly results being thus readily demonstrated, and variations graphically depicted to the producer. Meetings of suppliers have been convened, and jointly addressed by the Agriculture and Health Departments' Inspectors. At one such meeting the graphic records were produced with good educational effect. This group of interested suppliers are producing milk equivalent to the English certified standard. For example :—

1. Supplier S. N. has supplied raw milk of English certified standard for over three years. His cows are examined by a veterinary surgeon three or more times yearly and are tuberculin-tested at least twice yearly. The milk is cooled and bottled on the farm and delivered in bottles to the consumer. (As some customers prefer unbottled milk, this is also supplied.) *Bacillus coli* has been persistently absent in 0·1 c.c., and on only three isolated occasions in three and a half years has the general count exceeded 30,000 colonies per cubic centimetre. Apart from these, his average count has been 17,170 colonies per cubic centimetre.

2. Supplier C. B. maintains excellent standard. In three and a half years only twice have *B. coli* been present in 0·1 c.c., and 30,000 colonies per cubic centimetre have been exceeded three times, once in each year 1929, 1930, and 1932. His average count for all other tests has been 11,150 colonies per cubic centimetre.

Any marked deviation above the "certified" standard of 30,000 colonies per cubic centimetre and *B. coli* absent in 0·1 c.c. has been notified to the Government Veterinarian, and often a joint visit made to the farm for inspection of plant and animals. At times sources of contamination have been traced by testing the sterility of the plant as set up by the producer just prior to the commencement of milking.

This complete bacteriological testing has been most helpful in tracing weakness in sterilization and sources of pollution. Two examples are given below :—

(1) Supplier S. N.—	Colonies per Cubic Centimetre.	*B. coli.* Cubic Centimetre.
Bucket	1,740	—
Can (for bulk milk)	39,560	—
Cooler	36,640	—
Filters	5,140	—
Milk (from bucket)	11,590	—

When these results were shown to supplier S. N. he decided to change from boiling-water to steam sterilization, and has since altered his plant to this end, with consistently good results since.

(2) Supplier P. P. was spoiling a good effort by occasional bad results. His dairy was bacteriologically tested, with the following result :—

	Colonies per Cubic Centimetre.	*B. coli.* Cubic Centimetre.
Town water-supply to dairy	56	+ 1·0
Teat-washing water after twelve cows	114,000	+ 0·1
Milkers' hands—		
(1)	6,100	—
(2)	23,100	—
Teat-cups	1,518	—
Pipe-line—		
One section	100	+10·0
Remainder	617	—
Cooler	16,130	—
Milk-bottles, washed ready for use	12	—

The supplier thereafter heated the town water, changed the teat-washing water between cows, paid more attention to milkers' hands, and substituted refrigeration cooling for the open-air cooler. Since his results have been consistently good.

II. While attention was being given continuously to the above work of improving selected "good" group producers, the remainder of the "good" group were given intermittent control. For example :—

Supplier C. N.—	Bacteria per Cubic Centimetre.	*B. coli.* Cubic Centimetre.
1929—July	29,200	+ 2·5
October	21,500	—
December	7,560	+ 5·0
1930—February	9,500	—

has been expected to maintain his good standard while attention was given to others in the next two years. This satisfactory group were rechecked from time to time, and a backslider found occasionally. Thus supplier W. N., satisfactory in 1930, had fallen from grace disastrously after being left alone for over a year, as follows :—

	Colonies per Cubic Centimetre.	*B. coli.* Cubic Centimetre.
1930—August	17,000	—
September	21,800	—
1932—February	2,255,000	+ 0·001

Re-education was needed here. This rechecking process of supplies in the good group showed in general a pleasing maintenance of satisfactory standard.

(1) Supplier M. N.—	Colonies per Cubic Centimetre.	*B. coli.* Cubic Centimetre.
1929—July	19,500	— 2·5
October	12,000	— 1·0
1931—July	9,830	—
October	8,820	+10·0
1932—December	31,500	—
(2) Supplier H. Y.—		
1929—August	15,000	—
1930—August	88,000	+10·0
1931—August	31,100	—
1932—May	38,000	+ 0·01

This last result meant a visit from the Inspector to talk over the cause of the falling-off in the *B. coli* count.

III. In the "poor" group, the bad ones are being given continuous control in an attempt to raise their quality standard. This educative process takes time, and has its ups and downs as shown by the results, which results, nevertheless, reveal progress. The last few consecutive results of two suppliers in this category are as follows:—

	Colonies per Cubic Centimetre.	*B. coli.* Cubic Centimetre.
(1) Supplier W.—		
	207,900	+ 5·0
	26,700	+ 5·0
	1,297,000	+10·0
	15,600	—
(2) Supplier R. M.—		
	189,000	+ 0·1
	1,531,000	+ 0·01
	35,600	+10·0
	133,500	+ 2·5
	5,160	+ 0·1

Continuous bacteriological control quickly detects carelessness. Enough of supplier H. N.'s results in 1932 are given to show this:—

	Colonies per Cubic Centimetre.	*B. coli.* Cubic Centimetre.
1932—May	146,100	—
June	506,500	+ 0·1
August	15,100	+ 2·5
October	1,411,000	+10·0

The Inspector visited the supplier, and the response followed the same month:—

October	170,100	—

Another example of the success of the Inspector's work under this scheme is the case of supplier M. D., very bad in April, wonderfully improved in May, maintained good in September, and subsequently:—

	Colonies per Cubic Centimetre.	*B. coli.* Cubic Centimetre.
1931—April	2,457,000	+ 0·0001
May	43,300	+ 1·0
May	36,000	+ 2·5
September	21,670	—

The same system has been simultaneously in operation in Whakatane, Opotiki, and Wairoa townships, monthly samples from all suppliers coming in for bacteriological examination. In each place close co-operation is maintained with the Agriculture Department's Inspector. From the bacteriological results one is often able to indicate the presence of diseased cows. For example, a count of 2,293,000 colonies (streptococci present), negative *Bacillus coli*, lead to a wire to the Health Department's Inspector at Opotiki. He informed the Agriculture Inspector, who culled out two mammitis cows the same day from the herd in question.

In Gisborne this bacteriological control revealed the failure of pasteurization to maintain consistently good results. A pasteurization and bottling plant was in operation when bacteriological control was instituted, which gave unduly high counts and showed the presence of *B. coli* in the pasteurized product from time to time. Several of our "good" group producers under continuous control were able to market consistently better-quality raw milk. This fact was communicated to the pasteurization-plant manager, with a request for stricter control of pasteurization, but the owner preferred to cease pasteurization. The moral is easily read—pasteurization is an excellent safeguard against disease; it must be efficient, however, and should be bacteriologically controlled.

Finally, after four years and a half of bacteriological control, the raw milks of Gisborne Borough can be classified through monthly samples as follows:—

	Per Cent.
10,000 colonies or less	13
10,000 to 30,000 colonies	35
30,000 to 100,000	29
100,000 to 200,000	9
200,000 to 500,000	7
500,000 to 1,000,000	2
1,000,000 and over	5

This should be very encouraging to both Health and Agriculture Departments' Inspectors and to the milk-suppliers themselves, when it is remembered that the English Milk Order nominated 30,000 and 200,000 colonies per cubic centimetre as the level of "certified" and "Grade A tuberculin-tested" respectively. There is no doubt that the bacteriological laboratory is invaluable to a Medical Officer of Health attempting control and improvement of milk-supplies.

THE ICE-CREAM OF GISBORNE (SOLE BULK SUPPLY).

ICE-CREAM BACTERIOLOGICALLY CONTROLLED.

(Dr. H. B. TURBOTT, Medical Officer of Health, East Cape Health District.)

There is no longer any question about the ability of the manufacturer of Gisborne to produce ice-cream of a consistently low bacterial count. The struggle for purity was an interesting one, passing through phases to a standardized successful process :—

I. In 1929 and 1930 pasteurization of the ice-cream mix was by the flash process in a " stassinizer " plant. The mix was heated to 168° F. and held at that temperature for 2 minutes.

In 1929 the bacterial counts were frequently over 1,000,000 colonies per cubic centimetre.

In 1930, by rigid control, great improvement resulted, but the count still varied too much—for example, successive counts were :—

Colonies per Cubic Centimetre.	*B. coli.* Cubic Centimetre.	Colonies per Cubic Centimetre.	*B. coli.* Cubic Centimetre.
567,000	+ 1·0	3,780	—
27,000	—	5,000	+ 1·0
1,500	+ 2·5		

Bacillus coli was not consistently absent, and the manufacturer was asked to try out a longer holding-period pasteurization.

II. In 1931 the plant was altered to permit a holding-process pasteurization.

(*a*) 145° F. for 30 minutes gave the following consecutive results :—

Colonies per Cubic Centimetre.	*B. coli.* Cubic Centimetre.	Colonies per Cubic Centimetre.	*B. coli.* Cubic Centimetre.
63,200	—	11,400	+ 0·01
48,900	+10·0		

This was unsatisfactory as regards *B. coli*, and the holding-period temperature was increased to—

(*b*) 156° F. for 30 minutes, with satisfactory results :—

Colonies per Cubic Centimetre.	*B. coli.* Cubic Centimetre.	Colonies per Cubic Centimetre.	*B. coli.* Cubic Centimetre.
6,300	—	48,400	— (after three weeks' storage).
1,570	—		

At this stage the plant was improved by the addition of an homogenizer. While a delightfully smooth product was secured, this homogenizer also broke up the bacterial clusters and the count deteriorated—

Colonies per Cubic Centimetre.	*B. coli.* Cubic Centimetre.	Colonies per Cubic Centimetre.	*B. coli.* Cubic Centimetre.
233,100	—	569,700	+ 0·1
235,600	—	97,900	+ 0·1
17,500	+ 1·0		

III. In 1932 this unsatisfactory reappearance of *B. coli* and higher counts—

(*a*) Was counteracted by the use of pasteurized unsalted butter instead of cream. The results were splendid as regards agar count, but still unsatisfactory as regards presence of *B. coli*.

Colonies per Cubic Centimetre.	*B. coli.* Cubic Centimetre.	Colonies per Cubic Centimetre.	*B. coli.* Cubic Centimetre.
11,000	—	8,690	+0·01
640	+1·0	12,980	+2·5
1,330	+0·1	2,330	+0·1

(*b*) The pasteurizing temperature was now increased to 165° F. for 30 minutes, with excellent results, which later fell off in December :—

	Colonies per Cubic Centimetre.	*B. coli.* Cubic Centimetre.
November 12	430	—
November 22	880	—
December 10	1,100	+ 0·01
December 19	16,000	+ 1·0
December 29	1,700	+10·0

These results were disturbing, but the manufacturer discovered that his hypochlorite for chemical sterilization was unstable, and established continuous testing for chlorine content.

IV. In 1933, profiting by all the above experience, a consistently satisfactory product has been manufactured, as shown by samples of these consecutive batches :—

Colonies per Cubic Centimetre.	*B. coli.* Cubic Centimetre.	Colonies per Cubic Centimetre.	*B. coli.* Cubic Centimetre.
5,730	—	1,640	—
5,800	—	6,680	—
4,280	—	2,080	—
6,740	—	1,830	—
5,920	—	820	—
880	—		

This product is of high standard, as is readily shown on comparison with United States standards: —

California—Allowable limit of bacterial count	.. 150,000 per cubic centimetre.
Connecticut—Allowable limit of bacterial count	.. 100,000 per cubic centimetre.
Michigan—Allowable limit of bacterial count	.. 150,000 per cubic centimetre.
Iowa—Allowable limit of bacterial count ..	.. 250,000 per cubic centimetre.

This high-quality ice-cream is retailed in Gisborne, up the East Coast, south to Wairoa, and north to Motu. Retailers' premises are a source of danger, and regular attention is given to these, and samples taken from time to time. Each bulk supply is numbered by the manufacturer. The Inspector notes the number on the bulk carton, and by comparison with the bulk sample record in the office it is readily seen whether the retailer is spoiling a good product. The following examples are given :—

	Colonies per Cubic Centimetre.	*B. coli.* Cubic Centimetre.
1931—(1) Bulk product	4,680	+ 1·0
Mangapapa shop	Uncountable	+ 0·0001
(2) Bulk product	31,500	+ 5·0
Gladstone Road tea-rooms	2,369,000	+ 0·0001
1932—Bulk product	880	—
Wairoa shop	960,000	+ 0·0001

The retail distribution of good-quality ice-cream is full of pollution pitfalls, and the battle is really only begun when the manufacturer produces, as he is doing in Gisborne, an ice-cream whose purity is eminently satisfactory.

(In this paper presence or absence of *Bacillus coli* is indicated by + or — for dilutions 10 c.c., 5, 2·5, 1, 0·1, 0·01, 0·001, and 0·0001 : thus — means absent throughout, but + 0·1 means present in dilutions 10 to 0·1, absent in higher dilutions.)

The Sterilization of Ice-cream Factory Equipment.

(Applicable to any dairy equipment.)

Mr. H. F. Wise.

It can be seen from the survey of the bacteriological counts of ice-cream over several years that there has been no sudden sustained improvement at any period, but rather a steady improvement, with many setbacks from time to time as faults in the technique showed up and were eliminated. Even to-day, with an established routine of sterilization, much higher counts than the average seem occasionally to occur. This is probably due to some slight carelessness. Indeed, it is surprisingly difficult to get counts of under 1,000 per cubic centimetre as frequently has been done, the lowest being 350 per cubic centimetre. In such cases the greatest care must be taken, even down to such small details as sterilizing the graduate used for measuring the vanilla.

However, with present routine it is no trouble and practically no expense to keep the count consistently under 7,000 colonies per cubic centimetre.

It has been proved through local experience that the hypochlorite sterilizing-solution must be of a known strength. In the factory there has been evolved a quick and simple means of determining the parts per million (p.p.m.) of available chlorine in any rinse water. The formula for making stock hypochlorite solution and the simple test for p.p.m. of available chlorine are appended.

Equipment used.

Perhaps the equipment used should be first outlined :—

A. A mixing-vat of tinned steel, having a motor-driven agitator and used solely to dissolve sugar and milk-powder in the fresh milk.
B. A pump to transfer the mixture to C.
C. A glass-lined Pfaudler vat connected to hot-water service (by using hot water instead of steam there is no cooking on the sides of the vat even if heated to 180° F.).
D. Filter in pipe-line from C to E.
E. Homogenizer.
F. Double tube, contra-flow, internal water-cooler with water in inside tube and mix flowing in opposite direction in space between tubes, protected from flies and dust.
G 1 and G 2. Two glass-lined Pfaudler receiving-vats, brine-jacketed and insulated, on legs 5 ft. high, giving gravity flow to H.
H. Direct-expansion horizontal ice-cream freezer.

The only unusual feature of this lay-out is the use of the internal water-cooler. By this means the homogenizer is used to deliver the mix into the holding-vat without either having a surface cooler suspended in a high, more or less inaccessible position, or using another pump. Also, the cooler being entirely enclosed, the washing and rinsing solutions can be completely circulated through the whole pipe system by the homogenizer, and the whole left full of sterilizing solution for as long as desired.

The use of nothing but glass-lined vats for pasteurizing and storing is also an obvious advantage, being so easily washed and entirely free from germ-harbouring corners and joints.

The washing and sterilizing routine is as follows :—

Immediately the last of the mix leaves the pasteurizing-vat C cold water is turned in and pumped through by the homogenizer till it comes out clear at the other end, being discharged on to the floor. Meanwhile water connections to cooler have been broken to drain tubes of cooling-water.

The hot washing-water is now introduced into pasteurizing-vat C, circulated by the homogenizer, and discharged back into vat C. For this purpose 5 gallons of scalding water are used in which are dissolved 4 oz. tri-sodium phosphate and 2 oz. of washing-soda. Occasionally caustic soda is substituted for the washing-soda. This washing solution is circulated for 20 minutes or more.

A clean-water rinse is then used, and finally the sterilizing rinse containing not less than 100 p.p.m. of available chlorine. The whole system is filled with this and left for not less than 30 minutes. The pipes regularly have been left filled with sterilizing solution of this strength and even stronger for periods up to 3 days without apparent ill effects, but it is obvious if the pipes are to be left even overnight that a solution of 50 p.p.m. would be ample. The sterilizing rinse is then discharged into the holding-tank and brushed round with a special brush kept to be used in the sterilizer only. Then the pipe to the freezer is left filled for a while, and finally the batch tank and the freezer itself are flooded. The sterilizing solution is still good for rinsing out cans.

During this process all taps and valves are loosened and worked so that the sterilizing solution can get around the moving parts.

Special attention is given the freezer, as this item is the most liable to cause contamination through butter or stale mix working out of the rear bearing.

Inasmuch as it is inadvisable to introduce very hot water into the freezer soon after it has been in use, it is usually only hosed out with cold water and followed with warm water. Next morning it is filled with scalding water and given a short run, when the heat cleans the bearings. It is later sterilized as already mentioned.

Summarized, the essential points to be observed in using sodium hypochlorite for sterilizing dairy equipment are :—

(1) Achieve mechanical cleanliness first.
(2) Rinse everything well until no trace of " milkiness " remains, for the presence of anything of an organic nature greatly reduces the efficiency of the sterilizing solution.
(3) Flood or brush everything with hypochlorite solution of known strength.

Method of Preparing 1 per Cent. Stock Solution of Hypochlorite of Sodium.

1. Dissolve 3 lb. of fresh chloride of lime in 4 gallons of warm water (not over 120° F.). Do not use a metal container unless it is Staybright steel.
2. Dissolve 4 lb. washing-soda in 3 gallons of water.
3. Pour the soda solution into the barrel containing the chloride-of-lime solution. Stir the mixture at intervals for a few hours, and then allow to stand till clear.
4. Syphon the clear liquid into winchesters and cork tightly. Store in a cool dark place.

This stock being a 1-per-cent. solution, it is easily seen that 1 part of it in 100 parts of rinse-water will give 100 parts per million of available chlorine. Use ½ pint to 6 gallons of water for a solution giving 100 p.p.m.

Method of Testing Rinse-water for p.p.m. of available Chlorine.

First prepare the following stock mixtures :—

(1) Dissolve 9 grammes (approximately ⅓ oz.) of Kodak granular hypo in 16 oz. of boiled water. Keep corked.
(2) Mix thoroughly 1 oz. potassium iodide crystals and 2 oz. boric-acid powder. Keep this in a brown glass jar.

To make the test :—

(1) Put 4 oz. of the rinse-water in a clean flask and dissolve in it 1 gramme (a small heaped salt-spoonful) of the powder mixture. A brown colour results if there is chlorine present.
(2) Using a burette (graduated to $\frac{1}{10}$ c.c.) add hypo solution slowly, swirling the flask continuously until the brown colour is almost gone. Keep the flask moving, and add hypo solution drop by drop till the colour finally disappears.

Multiply the cubic centimetre of hypo solution used by the factor 23, and the result is the p.p.m. of chlorine in the rinse-water.

This is admittedly a more or less rough-and-ready test, but it has been found that any variations therein are within the limits of practical use.

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