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NEW ZEALAND.

DEPARTMENT OF HEALTH.

ANNUAL REPORT OF THE DIRECTOR-GENERAL OF HEALTH.

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HON. P. FRASER, MINISTER OF HEALTH.

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REPORTS.

The ACTING 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 1938-39.

PART I.—GENERAL SURVEY.

INTRODUCTION.

Progress in the State of the Public Health.

In the report, coming as it does just prior to the Centennial celebration, it was thought fitting to include in the various sections a short historical account of the activities and development of the Department of Health.

The distinction of being the first medical man to set foot in New Zealand belongs to Mr. Monkhouse the “sensible and skilful surgeon” of Captain Cook. Since that day in the year 1769 vast changes have taken place in the development of New Zealand, and particularly so since 1840, when it was proclaimed as being under the sovereignty of Queen Victoria. The population in that year has been estimated at 110,000 Maoris and 2,000 Europeans. To-day there are some 86,000 Maoris and over 1,500,000 Europeans, to whom some twelve hundred qualified practitioners render medical care.

It is doubtful whether prior to the advent of the Europeans epidemic diseases existed among the Maoris. Influenza (*rewharewha*) was introduced by the pakeha; and also venereal disease, but leprosy appears to have been endemic among the Maoris prior to their arrival. There is evidence that measles was raging amongst the Maoris about Foveaux Strait in 1835 and again in 1837, probably introduced by the whalers.

There is also evidence of a definite epidemic of influenza in 1844. The Rev. Taylor remarks :—

“ So generally did it prevail that scarcely an individual escaped, the poor Natives were affected so severely that many of them were cut off.”

According to other authorities whooping-cough appeared in 1847, mumps in 1851, scarlet fever and measles in 1854.* Tuberculosis, the present-day scourge of the Maori race, began to rapidly increase among them in 1820. Sir Maui Pomare, in a paper read before the Australian Medical Congress at Melbourne in 1906, states :—

“ Though the theory has often been advanced that consumption was unknown to the ancient Maoris and that it was introduced by the pakehas, yet this is not so. The Maori had several names for the disease, the common one being *mate koki* (the wasting malady).”

In 1855 compulsory registration of deaths was instituted, but it is only from 1872 that reliable numbers and rates of the principal causes of death are available. The European death-rate in 1855 was 13·48.

With the increasing European population it became evident that some form of sanitary government should be established to protect the health of the whole of the community from epidemic and endemic diseases. So it was in 1872 that the public-health system in New Zealand had its origin, when the first Public Health Act of the colony was placed on the statute-book. Prior to that date there does not appear to have been any real systematic public-health administration, although there was a crude form of negative sanitary government carried on by local bodies. However, on the passing of this 1872 measure preventive medicine received a new and established recognition, and a foundation was laid for future legislation. The Colonial Secretary, Hon. William Gisborne, in introducing the 1872 Bill, said :—

“ Health is one of the greatest blessings which any individual or community could enjoy. There was a time when questions affecting the health and physical comfort of the people were received in the legislative halls with covert sneers and careless indifference, but that time has happily passed away. In these days, if he might use the expression, the man who made two blades of health to grow where only one grew before, was recognized as in truth a public benefactor. Public health was the corner-stone of all sound legislation, and it was becoming more and more the pressing question of the day.”

This Act was founded on English legislation with slight modifications to render it applicable to the special circumstances of the colony, and was amended in 1875 and replaced by a consolidating measure in 1876. During the operation of this Act it is doubtful if its administration was carried out with any great degree of energy or thoroughness. Serious outbreaks of infectious disease frequently occurred, while typhoid fever, which is generally regarded as an index of the sanitary intelligence of a community, was a menace to the community.

During the next twenty-five years conditions improved slowly, and we find the *New Zealand Medical Journal* advocating public health reform in these words :—

“ Surely the community cannot now fail to become aware of many gross defects in the administration of our public-health laws and the urgent need for vigorous reforms. The attitude of some of our Local Boards of Health, when brought face to face with epidemics of infectious disease is, to say the least of it, reprehensible in the extreme, and shows most appalling ignorance of the very laws these bodies are expected to administer. We have no hesitation in saying that there is not one town in New Zealand where there exists anything approaching an orderly system of sanitary control. Public-health affairs are at present chaotic to a degree.”

However, the closing days of last century saw an awakening of the sanitary conscience of the people of New Zealand which had its outward and manifest expression in the passing of the Public Health Act, 1900. This measure, which placed public health in New Zealand on a sure foundation, provided for the creation of a State Department of Health under the control of a Minister of the Crown with a Chief Health Officer, District Health Officers, Sanitary Inspectors, &c. New Zealand in this way was nineteen years in advance of the Mother-country, where a Ministry of Health was not created until 1919. In introducing the 1900 health legislation to the House the Colonial Secretary, Mr. (later Sir Joseph) Ward, said :—

“ I think honourable members will agree with me when I say that the present condition of the health laws of this country is unsatisfactory. Under the law as it stands there is a Central Board of Health that is absolutely powerless for the purpose of carrying on the functions it was intended to discharge when the Board was created under the present Health Act. We have recently expression of that in more ways than one . . . Under the public-health law as it stands at the present time there is divided authority, and the division is between the Central Board of Health and the local Board of Health. The local Board of Health is invariably the Borough Council; and if the Health Officer considers it necessary for the material well-being of the people that something should be done he is at once confronted by the fact that the Local Board of Health, which is the municipal body, has pressure brought to bear upon its members from the ratepayers, with the result that undesirable and insanitary buildings cannot be removed or objectionable nuisances dealt with. Local pressure is brought to bear upon the municipal body, and a state of affairs is allowed to continue which is not conducive to the health or well-being of the people, and in some cases things are allowed to continue which are an absolute disgrace to the city or town in which they exist. In any reform of the health laws of the country it ought to be one of the first essentials that is should remove from the local public bodies the duty now devolving upon them, which is never, or hardly ever, carried out.”

It is of interest to note that Sir Joseph Ward was the first Minister of Health, with Dr. J. M. Mason, Chief Health Officer. Dr. Mason retired in 1909, to be succeeded by Dr. T. H. A. Valintine, who held office until 1930, when the present Director-General of Health was appointed.

* Dr. MacDonald Wilson : *N.Z.M.J.*, 1934.

The annual reports of the Department from 1900 reveal the honourable role that preventive medicine has played in the development of New Zealand. The following extract from a report by Dr. R. H. Makgill is an illustration of the difficulties the Colonial Secretary had in mind that faced the public-health pioneers in dealing with local authorities :—

“ It is impossible to report in a hopeful manner of the administration of the public health at the hands of these bodies. Even the largest of them, the Auckland City Council, appears scarcely to realize they are responsible for the conditions which affect the lives of the people whom they control ; while with a few exceptions the smaller bodies seem wholly ignorant of the fact. As regards the larger communities, this is doubtless owing to the general indifference to sanitary laws which had characterized the general public in the past. We are now about the stage of public opinion at which England was sixty years ago. The chief fault lies in the subdivision of the district into numberless small local bodies in which the spirit of Little Pedlington is the chief feature, increasing inversely as the size of the community diminishes.”

In face of such difficulties progress was still being achieved. Following on the Act of 1900 there was a more or less constant stream of enactments—viz., the Sale of Food and Drugs Act ; Acts for the registration of medical practitioners, chemists, nurses, and midwives. Quackery Prevention Act ; Poisons Act ; Plumbers Registration Act ; Hospitals and Charitable Institutions Act—truly evidence of progressive administration. In this period also the problem of prevention and treatment of tuberculosis was seriously tackled by the establishment of sanatoria in the North and South Islands, and hospital services and constructional work began to receive close and expert supervision. An outline of the development of the New Zealand hospital system is given in the Hospital Section of this report.

Medical supervision of school-children came into operation. St. Helens Hospitals were opened to provide a maternity service for wives of working men with moderate incomes. A safe milk-supply on similar lines as now adopted by the Wellington City Council was advocated by Dr. Frengley, and Dr. Pomare, with inspired diction and enthusiasm, was pleading and working for the health and well-being of the Maori race. Pioneers whose lives had been spent in the campaign for sanitary reform and care of the sick had cause to reflect with satisfaction on the steady progress of preventive medicine. The establishment in 1875 of a Medical School at the Otago University for the training of medical men was proving an important step towards the provision of skilled medical care of the people of New Zealand. Voluntary health organizations were inaugurated having for their object the diffusion of sound knowledge on infant welfare, first aid, and home nursing. These have played a definite part in the education of the public in such matters.

Since the passing of the 1900 Act many changes in the population and its distribution had occurred ; new facts had come to light in relation to preventive medicine, and evidence given before the Royal Commission on the Influenza Epidemic revealed a great need for simplification of health legislation, and the necessity for more clear definition as to the duties of local authorities, Hospital Boards, and the Department of Health. These were some of the reasons of the causes that influenced the introduction of the Health Bill for 1920, which eventually became law. The main features of this enactment were the creation of a Board of Health under the chairmanship of the Minister with advisory, or even, under certain circumstances, mandatory powers in regard to matters of public health ; the definite delegation to local authorities of certain routine matters ; and generally the strengthening and widening of the powers of the Department.

Among some of the outstanding reforms following this enactment are formation of new health districts ; increased personnel of the Department ; amalgamation of Hospital Boards ; better inspected, built, and conducted public and private hospitals ; legislation for control of venereal diseases was passed ; steps to ensure safer maternity ; improved standard of nursing education ; institution of Medical Research Council, Medical Council, Dental Council, and Opticians and Masseurs Registration Boards ; extension of school medical and dental services ; increased attention to health of Maoris ; formation of health camps for delicate children ; provision of free milk for school-children ; intensive health education of the public ; institution of a higher standard of sanitation and safer water-supplies and modern sewerage systems throughout the Dominion ; and extended power of supervision of food, dangerous drugs, and poisons in the interests of the public health. The establishment of a New Zealand Branch of the Royal Sanitary Institute and the Hospital Boards Association of New Zealand exerted a beneficial influence in the respective fields of sanitary science and hospital administration.

In addition to these progressive measures remarkable advances have been made in all branches of medicine which have added to the sum of human welfare. These great scientific and medical discoveries have been readily availed of for the conquest of disease. For instance, the discovery of insulin in 1922 has revolutionized the treatment and prognosis of diabetes, while the death-rate from diphtheria fell promptly with the introduction of diphtheria antitoxin, and to-day thousands of children are being immunized against this dread disease of childhood. Hydatid disease has been vigorously combated, while the formation of New Zealand Branch of the British Empire Campaign Fund has strengthened the attack against cancer.

It would be possible to enlarge on how science is gaining in its attack on other infectious diseases. As a result mainly of these advances in preventive and curative medicine human life has been greatly prolonged, as shown by reference to our vital statistics. The average standardized death-rate for the five-yearly period 1874–78 was 14·16 per 1,000 living, being nearly twice that of the average of 7·14 for the past five years. In 1872 the infant-mortality rate was 100·42, in 1938 it was 35·63 per 1,000 live births. In 1872 the tuberculosis crude death-rate was 12·66, in 1938 it was 3·93, and typhoid fever, once one of the principal causes of death, has dropped from a high position to a very lowly one. There were 2,548 deaths from this disease during the five years 1872 to 1876 in comparison with only thirty-six in the period 1934 to 1938. The expectation of life is also steadily increasing in New Zealand, and

is, so far as is known, higher than that of any other country. There has also been experienced a considerable reduction in the number of deaths associated with child-birth since the Department entered upon a campaign for the promotion of maternal welfare. These achievements signify nothing less than the saving of innumerable lives and prevention of a vast amount of sickness and invalidity.

The Social Security Act, 1938, with its provisions for profound changes in the system of medical care of the people, represents another important milestone in the progress of preventive medicine in New Zealand.

Still, the history of preventive and curative medicine in New Zealand is by no means a perfect record. Many largely preventable diseases have taken and continue to take a heavy toll of human life. Big problems still confront medical and social science and their application, but the future is full of promise and we can look forward with confidence to a steady advance in health, vitality, and happiness of the people of New Zealand.

VITAL STATISTICS.
(Exclusive of Maoris.)

Death-rate.—The death-rate was 9·71 per thousand mean population, as compared with a rate of 9·08 in the preceding year. The Government Statistician in his report on vital statistics for the year 1937, in commenting upon the rising death-rate, had this to say :—

“ The rising trend in the crude death-rate in recent years has its origin at least partly in the gradual ageing of the population as a whole. The effect of a constantly declining birth-rate operative in New Zealand for many years has now begun to exert an unavoidable influence upon the mortality experience of this country. The annual accretion of young people is insufficient to maintain its necessary proportion of the population, with the result that more and more people are being exposed to the degenerative diseases of old age. Consequently as every person must eventually die, the death-rate must continue to rise for some years to come, since the present death-rate is still much lower than could be regarded as possible in a population stable in respect of age and constitution.”

Infant Mortality.—The infant-mortality rate was 35·63 per thousand live births, being much higher than the rate of 31·21 in 1937. The widespread epidemic of measles and prevalence of diseases of the respiratory system associated with this disease has exerted a baneful influence on infant life during the year. In another section of this report the position is analysed.

Still-births.—The still-birth rate was 27·3, representing an improvement on the 1937 figure of 29·38. It is the lowest figure recorded for this rate.

Birth-rate.—The total births were 27,249, equivalent to a rate of 17·93 per thousand mean population. For the third year in succession the birth-rate shows a gratifying increase over the previous year.

Maternal-mortality Rate.—The maternal-mortality rate, including deaths from septic abortion, was 4·07 per thousand live births, as compared with 3·61 in 1937. The number of septic abortions was 30, against 24 in 1937. When the deaths from septic abortions are deducted the rate is 2·97.

The following comparative statement issued by the Census and Statistics Department of the death-rate from puerperal causes (with separate rates for septic abortion, other puerperal causes, and puerperal eclampsia) in certain countries for the latest available period of from three to five years is now given, as it may be of interest to overseas readers.

Puerperal Mortality in various Countries : Rates per 1,000 Live Births.

Country.	Period.	Septic Abortion.	Puerperal Sepsis.	Total Sepsis.	Puerperal Eclampsia.	All Puerperal Causes.	
						Including Septic Abortion.	Excluding Septic Abortion.
Norway	1932-36	0·54	0·70	1·24	0·65	2·74	2·20
Sweden	1931-35	0·76	0·91	1·67	0·53	3·32	2·56
Japan	1933-36	0·01	0·64	0·65	0·65	2·66	2·65
Estonia	1932-36	0·73	0·49	1·22	0·29	3·42	2·69
Italy	1931-35	0·18	0·95	1·13	0·55	2·87	2·69
Netherlands	1932-36	0·32	0·64	0·96	0·41	3·07	2·75
New Zealand	1933-37	1·04	0·50	1·54	0·73	4·15	3·11
Denmark	1933-37	0·33	0·98	1·31	0·41	3·78	3·45
England and Wales	1933-37	0·41	1·17	1·58	0·60	4·05	3·64
Switzerland	1932-36	0·66	0·76	1·42	0·53	4·49	3·83
Germany	1932-34	1·39	1·04	2·43	0·52	5·24	3·85
Australia	1933-37	1·44	0·83	2·27	0·81	5·36	3·92
Eire	1933-37	0·12	1·36	1·48	0·75	4·54	4·42
South Africa	1933-37	0·57	1·84	2·41	0·56	5·00	4·43
Canada	1933-37	0·59	1·20	1·79	0·98	5·13	4·54
U.S.A.	1932-36	0·97	1·31	2·28	1·14	6·01	5·04
Greece	1931-35	0·08	2·84	2·92	0·09	5·25	5·17
North Ireland	1933-37	0·26	1·64	1·90	1·00	5·64	5·38
Scotland	1933-37	0·37	1·94	2·31	0·82	5·76	5·39
Chile	1932-36	0·50	3·51	4·01	0·54	8·32	7·82

The above comparisons are affected to a greater or lesser extent through differences in methods of assignment and classification of these causes of death adopted in the various countries, especially in cases of their association with other causes of death. In some instances these variations of methods may affect the respective death-rates considerably.

INFECTIOUS AND OTHER DISEASES.

(Exclusive of Maori unless otherwise stated.)

The following table shows the average death-rate of some of the principal epidemic diseases from the quinquennia period of 1872-86.

Average Death-rates per 10,000 of Mean Population.

Quinquennia.	Typhoid Fever.	Measles.	Scarlet Fever.	Whooping- cough.	Diphtheria.	Influenza.	Total.
1872-76	5.09	2.07	1.05	3.48	6.08	0.38	18.15
1882-86	2.44	0.68	0.83	2.55	3.18	0.17	9.85
1892-96	1.67	1.59	0.06	1.59	2.58	2.07	9.56
1902-06	0.66	0.75	0.51	0.85	0.58	1.15	4.50
1912-16	0.45	0.42	0.24	0.72	0.90	0.68	3.41
1922-26	0.23	0.13	0.08	0.32	0.53	1.43	2.72
1932-36	0.05	0.09	0.04	0.26	0.20	0.82	1.46
1937	0.06	0.03	0.04	0.09	0.16	0.73	1.11
1938	0.05	1.07	0.01	0.14	0.20	0.88	2.35

It is satisfactory to note the reduction in death-rates of this group of diseases particularly since 1900, when public-health administration was placed on a sure foundation by the creation of a Department of Health under the control of a Minister of the Crown with a Chief Health Officer, District Health Officers, Sanitary Inspectors, &c.

The total number of cases of notifiable diseases in 1938 was 3,790, as compared with 4,230 in 1937. Apart from the measles epidemic, the Dominion was comparatively free from other infectious diseases.

Scarlet Fever.—There were 662 notifications of scarlet fever with 2 deaths, in comparison with 924 cases and 6 deaths in 1937. The death-rate was 0.01 per 10,000 (0.04 in 1937).

Diphtheria.—Seven hundred and eighty-six cases of diphtheria were notified in 1938, as compared with 599 in 1937. Thirty-one deaths were recorded, giving a death-rate of 0.20, as compared with 24 deaths and a rate of 0.16 in 1937.

Immunization of school and pre-school children against diphtheria has been carried out, particularly in the Waikato, Manawatu, and Wellington Health Districts. Dr. F. S. Maclean, Medical Officer of Health, in reporting on the Wellington City campaign states:—

“In view of the undue prevalence of diphtheria during the past year it was considered advisable to begin an active campaign of immunization in Wellington as soon as staffing arrangements permitted. As the services of Dr. Wyn Irwin became available in February of this year the campaign was opened soon after the beginning of the new school year, and considerable progress has already been made. The response of parents has been most gratifying. The schools so far dealt with include Mount Cook School, St. Anne's and Buckle Street Convents, and Taranaki Street Free Kindergarten. The school rolls totalled 1,035, and 829 consents were received, giving a percentage of 80. Consents were also given in respect of 110 pre-school children in the same area. Schick testing was carried out on 730 children, and of these, 128 were Schick negative. The Moloney test was made on 776 children, and of these, 5 gave sufficiently severe reactions to be excluded from further treatment.”

Dr. D. Cook, Medical Officer of Health, Palmerston North, advises:—

“The incidence of this disease was high in the Wellington-Hawke's Bay Health District, particularly during the months of May, June, July, and August, and on three occasions in that period the disease almost reached epidemic proportions. The incidence of the disease was highest in the Hawke's Bay area, and to combat it immunization was resorted to. The children of the Waipawa School, where two deaths had occurred, were the first to be inoculated, and after it the schools mostly effected in Napier and Hastings were attended to. The campaign of inoculation is still continuing, and a relatively high proportion of the children of each school are being immunized. Shannon school-children were the only ones outside the Hawke's Bay area that were inoculated, but it is proposed to immunize as many school-children as possible this year in the Palmerston North-Wanganui portion of the health district.”

Dr. H. B. Turbott, Medical Officer of Health, Hamilton, writes:—

“Of the 57 cases in 1938, 6 only were in Maoris. One death occurred in a European. The mass-immunization campaign throughout the health district, begun in 1937, was continued and finalized in 1938. 17,531 children were offered immunization with anatoxin. Parents consented in 10,034 cases, and these were duly dealt with before the end of the year. The main effect of this campaign, which has resulted in 52.7 per cent. of the school population being assured of protection, will be to popularize diphtheria-prevention. It is planned to continue immunization in future years by offering protection at the medical inspection at the school to all entrant and pre-school children whose parents consent.”

A report of this work by Dr. Helen Deem and Dr. H. B. Turbott appears as an appendix to this report.

The case for diphtheria immunization is strongly emphasized in the latest annual report of the Medical Research Council, Great Britain, in the following words :—

“ Parents would be well advised, therefore, to demand this prophylactic inoculation not only for their own children, but for all children. There seems no room for doubt that the general adoption of diphtheria prophylaxis would cause the virtual disappearance of the disease from the country. The family tragedies, the high public expense, and the waste of medical effort caused in Great Britain by diphtheria call for a united effort.”

Enteric Fever.—Sixty-four cases were notified, with a death-rate of 0·05 per 10,000, as compared with 55 cases and a death rate of 0·06 in 1937. Dr. C. B. Gilberd, Medical Officer of Health, reports that—

“ The low incidence of this disease in the North Auckland district clearly demonstrates the value of T.A.B. inoculations. Undoubtedly there must be carriers, especially among the Maori people, and under the conditions as some live there could be no doubt that typhoid would be prevalent were it not for the regular T.A.B. inoculations. The sanitary conditions in many Maori settlements are certainly improved, and this no doubt contributes to the low incidence of this disease.”

Dr. L. G. Davis, Medical Officer of Health, Gisborne, comments also on the value of such inoculations as follows :—

“ An interesting example of the efficacy of typhoid inoculations occurred in a very isolated school where typhoid infection was transported from an outside area. Over twenty cases of a very mild disease, but simulating mild typhoid, occurred in this school. The children had been immunized a few months previously, and I am of the opinion that they were all affected with typhoid, but that the inoculations prevented any serious consequences. This school was so inaccessible that complete investigations could not be carried out in order to prove this point, but one of the more severe cases was shown to be true typhoid.”

Dr. Hughes, Medical Officer of Health, Auckland, investigated three cases at the Avondale Mental Hospital, and, after a full discussion with the Medical Superintendent, recommendation was made with a view to preventing such outbreaks.

Bacillary Dysentery.—One hundred and sixty-one cases notified. There were 17 cases in the East Cape district—11 Europeans and 6 Maoris—the greater number being accounted for by cross-infection at the Cook Hospital, where three outbreaks of this nature occurred during the year. These were closely investigated, and measures for prevention of such outbreaks have been placed on a more satisfactory basis.

An outbreak involving twelve cases at an Auckland private hospital indicated that the source of the infection was an employee who was engaged in milking the cows at the premises from which the hospital received its milk-supplies. The precautionary measures were effective in preventing the further spread of the disease.

Influenza.—The death-rate from influenza (all forms) was 0·88 per 10,000, in comparison with 0·73 in 1937.

Poliomyelitis.—There is little to report in connection with this disease, apart from 13 cases occurring in the Nelson-Marlborough districts, one of which was fatal. Only 9 other cases were reported in the Dominion.

Lethargic Encephalitis and Cerebro-Spinal Meningitis.—Seven cases of the former disease (3 in 1937) and 24 of the latter (13 in 1937) were reported.

Puerperal Sepsis.—Sepsis following child-birth was responsible for 21 deaths in 1938, as compared with 14 in 1937. The deaths due to sepsis following abortion numbered 30 in 1938, as compared with 24 in 1937.

Whooping-cough and Measles.—Deaths from whooping-cough numbered 21 (13 in 1937), while 163 deaths were recorded for measles, in comparison with 4 in 1937.

Measles.—From 1875 there have been nine major epidemics of measles, namely those of 1875 (289 deaths), 1880–81 (199 deaths), 1893 (525 deaths), 1898–99 (193 deaths), 1901–2 (277 deaths), 1907 (101 deaths), 1915–16 (157 deaths), 1920–21 (109 deaths), and 1938 (163 deaths). During the intervening years the disease has never really been absent.

The 1937–38 epidemic which commenced in November in North Auckland and spread practically throughout the length and breadth of the Dominion brought both types of measles—i.e., *Morbilli* and *Rubella*. In the North Auckland district Dr. C. B. Gilberd advises :—

“ The number of cases is unknown, but a modest estimate would be between three thousand and four thousand. There were 76 deaths (66 Maoris and 16 European) resulting from measles and complications of measles—Under one year, 19 ; one to five years, 34 ; five and under ten, 9 ; ten and under fifteen, 4 ; fifteen and under twenty, 3 ; twenty and under twenty-five, 2 ; twenty-five and under thirty, 1 ; fifty and under fifty-five, 1 ; sixty-five to seventy, 1 ; seventy-five to eighty, 1 ; age not known, 1 (76). The measles was of a most toxic type, causing serious illness in a large number of both adults and children. A great number of cases of the toxic type ran a high temperature—105 to 106—with delirium, prostration, hæmorrhage from the mucous membranes of the nose, mouth and bowel, and cutaneous purpura and petechiae. Purulent conjunctivitis and extensive ulcerative stomatitis were prevalent. A summary of the main features which caused much concern is as follows : (1) Prostration and debility ; (2) frequency with which the heart was affected ; (3) high incidence of broncho-pneumonia ; (4) cerebral and meningeal complications ; (5) dormant tuberculosis became active ; (6) hæmorrhagic conditions.

In Wellington City it was decided to offer prophylactic treatment by the injection of an adult serum to susceptible contacts in the most congested residential area of the city. Dr. Mary Champ-taloup, in a report on this work, states :—

“Forty-two young child contacts of measles (ten months to five years and a half) were given prophylactic injections of adult human serum for the purpose of producing an attenuated attack of measles. The subsequent sickness of these children was compared with that of the forty-six unimmunized controls from the same families, observations extending over a period of three months. The results are favourable, in that 69·1 per cent. of the immunized were either protected or had very slight attacks, while only 21·7 per cent. of the controls (of a less susceptible age) had equally mild attacks. Three children, or 7·2 per cent. of the immunized, showed marked symptoms, but there were no severe cases, whilst among the controls 43·3 per cent. fell in the marked and severe groups. Recovery was more prompt in the immunized, and there were no serious complications, while 10·7 per cent. of the controls (five children) were seriously ill with pneumonia, with one death. The milder incidence of disease and absence of serious illness in the immunized group, as compared with the controls of less susceptible age, demonstrates the beneficial results from the injection of adult human serum for purposes of prophylaxis. It may reasonably be assumed that this work has prevented some serious illness and may have even saved life. The supplies of serum used in this work were obtained from the donors of the Blood Transfusion Service. Considerable assistance in the follow-up of cases was given by the nurses of St. John District Nursing Guild.”

Dr. Davis, Medical Officer of Health, Gisborne, reports :—

“Many of the schools were closed for varying periods, and it may be of interest to record the effect of this closure in a few cases. In two schools in the Urewera Country, very similar in size and general condition, when the epidemic had just commenced and the first few cases only had occurred in each school, one was closed and the other allowed to remain open. In the schools where the closure was not adopted the disease spread rapidly, and after about three weeks closure was necessary for a week of two, as barely a third of the children were present. After the school reopened about five weeks from the commencement of the epidemic attendances were good and very few fresh cases occurred. In the school where the closure was adopted the disease slowly simmered away, and after three months only half of the children had been affected. Again, in the case of another school where the disease commenced just prior to the Christmas holidays and the school was closed a week early, the epidemic appeared to be completely aborted, but commenced again as soon as the school was reopened. From these observations in other places I am of opinion that school closure does tend to slow up a measles epidemic, but that it does not prevent it.

“An excellent example of the infectious nature of measles was shown in one school where the only source of infection was one child present at school for one day, a stranger who sat by himself in the front of the class. That night he developed a rash and was kept at home. Nevertheless, out of this very small contact eight cases developed within ten days, all members of the same class.

“The actual number of cases is difficult to estimate, but it is safe to say that 50 per cent. of the children were attacked. Complications were numerous and severe. There were well over one hundred cases of pneumonia with at least twenty-four deaths from this cause, four cases of encephalitis with one death. In some districts as many as 50 per cent. suffered from severe conjunctivitis. Otitis media was a common complication, and one case each of pleurisy, jaundice, strabismus, and nephritis was recorded. The nephritis case died, making the total number of European and Maori deaths in the district from complications of measles twenty-six.”

Tuberculosis.—The death-rate from tuberculosis (all forms) was 3·93 per 10,000, representing a slight rise on the rate of 3·91 in 1937.

In 1872 there was a mortality rate of 12·66, so there has been a considerable reduction in this rate since that year. This is due largely to the active campaign waged against this enemy along lines outlined in the 1937 report. However, the ravages of tuberculosis, particularly among young adults, is still a matter of grave concern. Steps are being taken to organize more systematic and comprehensive methods in follow-up and prevention work.

The question whether there is or is not an abnormal prevalence of tuberculosis among nurses in general hospitals or in sanatoria received a good deal of publicity during the year. Dr. J. W. Craven, Medical Superintendent of the Auckland Hospital, investigated this question very closely, and as the result reported that in a five-year period 1934–38 only six nurses in training developed tuberculosis. The average daily number of nurses in training in this hospital was about 350. Careful selection and medical examination of nurses was one of the reasons given for the low incidence of the disease. The satisfactory position was also attributed to the diet of the nurses and the strict attention to their health, adequate sick-leave and constant instruction as to how to avoid contracting the disease, either from acknowledged or suspected cases. Dr. Craven considered that the result of the survey would indicate that employment in a properly controlled hospital is fraught with no greater risk than any other walk of life. However, the whole question of tuberculosis among nurses is to be considered by means of a special inquiry during the ensuing year.

The Committee of the Medical Research Council has undertaken a statistical survey of the incidence of tuberculosis in New Zealand.

Hydatid Disease.—The campaign against this preventable disease was continued vigorously along the lines outlined in previous reports. Some 375,000 phials, each containing four tablets, of one-quarter grain of arecoline hydrobromide have been supplied to local authorities for distribution to dog-owners. In conjunction with the Department of Agriculture, hydatid exhibits under the direction of Dr. E. W. Bennett, of the Department of Hydatid Research and Prevention, Medical School, University of Otago, have been exhibited at various agricultural shows throughout the Dominion. These exhibits have attracted much attention and proved very valuable in the campaign against this disease. By means of literature and press articles, lectures to farmers' unions, women's institutes, and radio talks, and intensive programme direction, particularly among rural communities, much has been done by the above Department, and in this work our officers have co-operated.

Cancer.—The New Zealand Branch of the British Empire Cancer Campaign Society continues as a live force in the control of cancer in this country, and works in close co-operation with the Department. The president at the last annual meeting said :—

“The society was distinctive in that it achieved a happy combination of Government, through the Health Department, Hospital Boards, medical profession, and the general public in a common attack upon the disease of cancer. The public no doubt will be very gratified to learn that the society could see after nine years a very definite improvement in the results of treatment given. It encouraged, the society to believe that it would, as time went on, get even better results.”

The holding of the Tenth Australian and New Zealand Cancer Conference in Wellington stimulated public interest and also gave cancer-workers in this country an opportunity of reviewing the problem as affecting New Zealand, and bringing their organization up to date and exchanging views generally.

The Government appointed a Medical Committee at the request of Dr. Ulric Williams to investigate a special treatment of cancer, known as the “Koch and Baker,” which had been widely advertised in the United States of America. With Dr. Ulric Williams was associated Professor Henry Brose, of Sydney, and Mr. McCulloch, who describes himself as a naturopath. The Committee consisted of Sir James S. Elliott (Chairman), Dr. H. Hardwick Smith; Dr. J. O. Mercer, Pathologist, Wellington Hospital; and Dr. T. R. Ritchie, Director, Division of Public Hygiene. This committee was not given an opportunity of completing its investigation as Dr. Ulric Williams broke up negotiations on the grounds that Baker and Koch declined to submit their products to test in their absence.

However, as a result of the examination of cases that had been treated with this method the Committee in its report states :—

“From our general knowledge and from the observations we were permitted to make in investigating the cases at Wanganui, we have no reason whatever to suppose that Koch's fluid has any effect in curing generalized cancer. All the evidence available, without exception, convinces our committee that the claim cannot be substantiated that the treatment which we saw practised at Wanganui has any merit as a cure or palliative for cancer. The claim that a cure has been found for cancer should never be made and promulgated until prolonged tests have shown that the claim is a reasonable one, otherwise patients who might be cured or their lives greatly prolonged by surgical or radiological means, because of their dallying with vaunted cures such as Baker's or Koch's, have thereby allowed their disease to advance from the early stages, when it can be treated by recognized and approved methods. This is all the more important when such alleged cures as Baker's and Koch's are sold as commercial products and when cancer patients are called upon to pay, in some cases, high fees for the treatment. Your committee considers that it is in the public interest that a statement should be made that our hope of finding anything useful in the treatment by Dr. Williams and his colleagues has proved illusory.”

The danger of raising false hopes in regard to the cure for cancer was also emphasized at the cancer conference, which issued the following statement after considering reports upon the nature and effects of treatment of cancer cases with the Baker and Koch fluids :—

“It is obvious that it would be a heartless proceeding to attempt to exploit sufferers from so dread a disease as cancer unless there was a reasonable belief, based on experience, that the remedies vaunted as cures are reliable. The mental anguish and suffering caused to patients so treated is the same whether they have been induced to try unreliable treatment through exploitation or through misguided enthusiasm.

“The patients that have been investigated in Australia and in New Zealand have not, in the opinion of the conference, derived any benefit from Baker's or Koch's treatment. These methods of treatment are of no value, and moreover, tend to cause patients to lose valuable time in adopting reliable methods of surgical or radiological treatment.

“The conference is of opinion that vaunted claims or discredited or doubtful remedies for cancer should be discouraged and that it is highly improper for any person, medical or lay, to claim success for an alleged cure unless such treatment has been investigated by competent observers, particularly when by so doing they are exploiting a secret and purely commercial nostrum.”

REPORTS OF DIVISIONAL DIRECTORS.

Public Hygiene.

Dr. Ritchie in this report gives further statistical information for the year. Throughout the Dominion close attention has been given by officers to problems of general sanitation and water-supplies. The policy of co-ordinating the work of local authorities in matters of sanitation and health have been actively pursued. Special attention has been given to the administration of the Food and Drugs Act and the Dangerous Drugs and Poisons Acts. A much higher standard in the keeping of records of dangerous drugs and poison records is reported. The supervising of milk-supplies and health camps and measures to deal with the measles epidemic entailed much additional work.

School Hygiene.

The problem of nutrition of our school-children has received close attention by officers of this division. The School Medical Service health leaflets on "Suggestions to Parents," "The School Lunch," "Care of the Eyes," &c., were revised and widely distributed.

Some work has been done in the formation of a health centre in the Central Wellington area, the main objects being (1) to provide closer and more frequent supervision and inspection of school-children in the area; (2) to provide more assistance for the teachers in the planning of health activities and health teaching; (3) to facilitate and stimulate the working of the Junior Red Cross in the schools in the area; (4) to reach by means of pre-school clinics pre-school children not attending kindergartens; (5) to participate to a greater extent in the formation of hygiene and sanitation in the school; (6) to assist medical officers of health to a greater extent in communicable disease control; (7) to form classes of instruction for mothers; (8) to do more intensive home visiting for the purpose of health supervision by urging correction of defects and by discussing disease prevention and control; (9) to meet in conference the members of existing organizations in the area so that overlapping may be overcome; (10) to provide suitable training ground for post-graduate and student nurses.

Dr. Mary Champtaloup reports in this connection that a health education group has been formed, the membership of which was drawn from all parts of the special health area of the city. Meetings are held periodically, and co-operation is being generously given by the staffs of the Plunket Society, the Taranaki Street Kindergarten, and primary schools. This is a form of health work which could, with advantage, be adopted in other centres. Not only is it a means of public education, but an agency for co-ordinating work in the district, and a nucleus for the development of a health centre.

Hospitals.

The maintenance estimate of all Boards for the year provided for a net expenditure of £1,483,889 7s. 8d., of which £724,843 9s. 1d. was required to be contributed by levy from local authorities and £759,045 18s. 7d. by subsidy from Consolidated Fund, a total increase of £202,023 2s. 5d. compared with the requirements of the previous year. In a few cases it was necessary for Boards to exceed the expenditure provided for in their estimates.

The increase in estimated hospital expenditure—viz., £252,436 15s. 6d.—was mainly responsible for these increased requirements, but it is worthy of note that estimated recoveries from patients fees and charitable aid increased by £76,968 13s. 1d. compared with the estimate for the previous year. A further reduction of £27,030 in charitable-aid expenditure to recipients of outdoor relief is gratifying. It is anticipated that payments to be made to Hospital Boards in respect of hospital and maternity benefits under Part III of the Social Security Act, 1938, which are expected to be available early in 1939-40 will afford a substantial measure of relief to the contributing local authorities and the Government. The increased monetary benefits under Part II of the Act will also materially assist in this direction.

Full statistical and financial information based on the final accounts for the years operations will be published in a special appendix to this report.

There was again considerable activity in building operations of Boards during the year, and this was reflected in the increase of £43,163 15s. 3d. in the estimated amount to be contributed by levy and subsidy for capital purposes. In the loans section of the estimates expenditure of £1,482,631 18s. 2d. was provided for, an increase of £898,412 8s. 5d. over that of the previous year.

Nursing Division.

Miss Lambie, in her report, outlines the various measures taken for the development and improvement of nursing in New Zealand. Reference is made to the conclusion of a four-years' statistical study on the health of nurses inaugurated by the International Council of Nurses. The findings have been referred to the Tuberculosis Committee of the Medical Research Council.

Among other matters to which attention is drawn are nursing education, post-graduate course for nurses, hospital staffing, and recommendations of the Training-schools Matrons' Conference forwarded to all Hospital Boards on the staffing of hospital wards.

Maternal Welfare.

The Committee of Inquiry into Maternity Services completed its work and submitted a valuable report. A deficiency was revealed in maternity services, particularly in rural areas, and especially among the Maoris. Attention is drawn to defects in hospital accommodation for maternity cases available in most of the towns. The Committee in its summary of recommendations found that the tendency in New Zealand was for attendance by both doctor and midwife, or doctor and maternity nurse in all cases, on women during pregnancy and labour, normal or abnormal, rather than attendance by midwife in normal cases, with a doctor acting in a supervisory capacity and available in abnormal cases.

They were satisfied that most hospitals have been improved, and recommended that any national maternity service should be based, in the main on hospital attendance. Their extensive survey of existing hospital facilities, both public and private, satisfied them that already the present hospital system is developing on sound lines. They found also that the Department's policy in insisting on essential equipment and a uniform standard of maternity care was clearly evident in a high level of general efficiency and safety, even in small hospitals which were by no means elaborate in their accommodation. Among other things they considered that the district nursing service could be developed to provide ante-natal care in association with the medical practitioners and clinics.

The Committee made certain recommendations whereby building on the existing structure a complete and uniform system may be developed suited to the needs of country districts, large and small. Among other subjects chosen for special reference were relief of pain in labour, training of midwives and maternity nurses, training of medical students, possibilities of research into the special obstetric problems of the Dominion, problems of Maori maternity attendance, and social and economic considerations involved. Dr. Paget, in his report, outlines the progress made to put into operation the recommendations of this Committee and other work undertaken in the interest of maternal welfare.

Dental Hygiene.

The establishment of twenty-two school dental clinics has been carried out, and a further forty-nine centres have been approved which will raise the current number from 279 to 328 schools. 94,261 children are now under dental supervision, and 826,598 operations were performed during the year. The total number of student dental nurses in training is 138. Amongst special matters reviewed in Mr. J. Ll. Saunders' report are the progress of expansion programme and training of dental nurses.

Maori Hygiene.

The Maori population was 87,157. The death-rate for the year 24·31 (18·29 in 1937); the infant-mortality rate was 153·26 per thousand live births (92·17 in 1937); the Maori birth-rate was 42·37 per thousand population, as against 46·64 for 1937. Excess of births over deaths gives the Maori race the satisfactory natural increase of 1·81 per cent.

The death-rate from all forms of tuberculosis was 42·11 per ten thousand of population (pulmonary 33·39, other forms 8·72).

The measles epidemic was particularly severe among the Maori race there being 212 deaths registered equivalent to a rate of 24·32 per ten thousand of the Maori population as compared with a rate 1·07 per ten thousand for the European population. Of the 212 deaths 65 were of infants under one year of age.

The reports of medical officers working among the Maoris indicate that earnest and continuous endeavour is being made to improve the standard of their health. Dr. Gilberd, Medical Officer of Health, Whangarei, reports in this connection:—

“There is encouraging evidence in most districts that our efforts in regard to Maori welfare are not entirely in vain. Many difficulties are encountered, and at times it is felt that many Maoris simply do not appreciate our point of view and cannot be made to realize the value of our efforts on their behalf. I have endeavoured, by attending Maori meetings, holding clinics at the office, calling together Maori Councillors, and visiting Maori homes, to study the Maori outlook and reaction to our teachings of hygiene, sanitation, and other health matters in order to solicit their whole-hearted co-operation. There is no doubt, as evidenced by the ready co-operation of many Maori people in following our teachings, that progress is being made, especially with the younger Maori adults. There is naturally the other side of the problem where ignorant and indifferent Maoris simply ignore and oppose our efforts. The same, however, applies to our pakeha population where the more gentle methods of education and persuasion are of no avail. The two essential factors for promoting satisfactory hygiene and sanitation are: (1) Adequate supply of wholesome water to Maori settlements; (2) an extension of the Maori housing scheme. When Maoris are properly housed and have plenty of wholesome water our teaching will mean something to them. It is pleasing to note the forward movement in these two schemes.”

In the East Cape District Dr. Davis, Medical Officer of Health, reports as follows:—

“Very much remains to be done for the Maori people, but I feel that we can faithfully report that a very great deal of service has been performed for the welfare of the Maori people by the staff of the district, and possibly almost as much as in the present state of development and education they are capable of absorbing. Further progress must go hand in hand with education, and in this connection I wish to comment on the very excellent service in the interest of their health performed by the teachers in the Native schools, whose efforts for the welfare of the Maori people are unceasing.”

The scheme of segregating tuberculous cases in suitable hutments is proving of value and so provision has been made for an additional expenditure of £3,500 on this item. Furthermore, as regards the prevention of typhoid fever, it has been decided to install some 2,000 bore-hole latrine units. This type of latrine has already been tried in Maori areas with satisfactory results. In addition, a sum of £10,000 has been set aside for expenditure on water-supplies and general sanitation.

A quarterly conference for exchange of views on improving the organization generally is now being held at Wellington by Medical Officers directly concerned in Maori health problems.

The booklet “Maori Infant and Maternal Welfare” has been revised and is being printed for distribution.

GENERAL.

Medical, Hospital, and Allied Benefits under the Social Security Act.

Legislation of far-reaching importance to the Department is contained in Part III of the Social Security Act, which was passed in September, 1938. This Part of the Act relates to medical, hospital, and other treatment benefits, and the legislation signalizes the Department's entry into a new field of responsibility that will profoundly influence health and hospital administration in this Dominion.

It is therefore desirable to give an outline of the scheme embodied in the legislation, together with a short description of the preparatory work that has thus far been undertaken with a view to making the benefits available.

The administration of the scheme of benefits is placed under the Minister of Health, who is authorized to delegate to the Director-General of Health any of the powers conferred on him by the Act. The co-ordination of the curative and preventive phases of public-health administration is thus provided for.

The classes of benefits proposed to be provided are as follows:—

- (a) Medical benefits :
- (b) Pharmaceutical benefits :
- (c) Hospital benefits :
- (d) Maternity benefits :
- (e) Such supplementary benefits as are deemed necessary to ensure the effective operation of the several classes of benefits hereinbefore specified or otherwise to maintain and promote public health.

It will be obvious that the benefits and services to be provided under Part III of the Act constitute an innovation of great magnitude. Their inauguration involves the negotiation of arrangements with hospitals, doctors, chemists, nurses, and others for the provision of services, the preparation of contracts and regulations, and the setting-up of the administrative organization which, of course, is largely dependent on the nature of the arrangements to be entered into with those providing the actual services. It was for these reasons that the legislation provided for the introduction of several classes of benefits step by step—that is, as soon as “arrangements for their effective administration can be brought into operation.”

A feature of the scheme that is thought to be unique in national health-insurance legislation is that the benefits are available to all persons ordinarily resident in New Zealand, without regard to race or nationality, and without regard to the economic status, or the period of residence in the Dominion.

The major aim is in effect to ensure that in the treatment of the sick the economic circumstances of the individual patient will cease to be a consideration either from the viewpoint of patients or of those actually rendering the services.

The provisions of the Act do not, however, operate to relieve any person of his liabilities to pay compensation or damages in respect of a negligent act. Section 81 provides that medical, hospital, or pharmaceutical services rendered in a case of this kind are not ordinarily the subject of payment from the Fund. The Minister may, however, make a provisional payment to any person who is entitled to claim in respect of the services actually afforded, but the amount of any such provisional payment still remains recoverable from the person liable for compensation or damages. The whole object of the provision is to ensure that a person shall not escape liability for negligence, but that the injured person shall, nevertheless, not be mulcted with the cost of medical and other services required.

It is recognized that as regards persons living in isolated areas and under special conditions—*e.g.*, in large institutions—the normal arrangements envisaged in the Act for the several classes of benefits are not applicable, and a general provision is therefore made in section 82 of the Act empowering the Minister to make any special arrangements which he considers necessary to provide medical and other services in lieu of the benefits provided under the general provisions of the Act.

Power is given under section 83 to appoint advisory and consultative bodies in connection with both the central administration and local administration of benefits. The intention is that members of the various professions giving the services under the Act shall, through their own nominees, have every reasonable opportunity of voicing their opinions on questions of administration affecting them as a profession.

The general nature of the arrangements for the provision of medical and other treatment services is a form of contract between the Minister and members of the respective professions, and other persons, to afford services or to supply medicines, drugs, &c. Registered medical practitioners, registered pharmacists, and registered midwives and maternity nurses are given an absolute right to afford services under the scheme in virtue of their statutory qualifications; that right may be taken away in a particular case only after an investigation in accordance with section 84 of the Act, by a tribunal consisting of (a) a President, who shall be either a Judge of the Supreme Court or a Stipendiary Magistrate, and (b) not less than two persons, who shall be members of the same profession or calling as the person to whose contract of service the investigation relates.

Preparatory Work.—Following the passing of the Act negotiations were resumed with representatives of the medical profession with a view to the drafting of the terms and conditions to be offered to practitioners as the basis of a contract for services in relation to medical benefits. Whilst some progress was made in the formulation of details of the proposed contract, the representatives of the profession with whom the departmental officers pursued discussions made it clear from time to time that the general body of the profession was opposed to the adoption of a contract basis of service except as regards that class of the population that were considered unable to afford to make their own private arrangements for medical services.

Owing largely to the difficulties met with in this connection it was decided that initial efforts to complete arrangements for benefits should be directed to maternity benefits, and that, when these arrangements were completed hospital benefits should next be proceeded with.

Accordingly in consultation with representatives of the medical profession and with representatives of practising nurses and midwives and licensees of private hospitals the terms and conditions of contracts were formulated, and regulations prepared. On the 28th April formal offers of contract were made by advertisement and by circular to licensees of private hospitals, doctors, midwives, and maternity nurses. At the time of writing the great majority of licensees of private hospitals have entered into contracts, and further applications are coming to hand each day. The response from obstetric nurses has been similarly gratifying. The response from medical practitioners, however, has been disappointing, and it is evident that the early provision of medical services in relation to maternity benefits necessitates further serious discussions with the representatives of the medical profession.

Milk-in-schools Scheme.

The milk-in-schools scheme was commenced on the 1st March, 1937, the object being to make available, free of cost, to all school-children in the Dominion a half-pint of pasteurized bottled milk on each school day.

Two alternative schemes—malted-milk powder or a supply of milk for cocoa-making purposes—were offered to schools where it was found impracticable to extend the pasteurized bottled-milk supply owing to areas of isolation and scattered school population, presenting insuperable difficulties. All types of schools are participating—State primary, technical, high, and Native schools, as well as denominational and other private schools and kindergartens. The scheme has progressed to a point where milk is now available to approximately 190,000 children, or over 67 per cent. of the school population of the Dominion.

It has been found possible to arrange for pasteurized bottled milk to be made available to 1,264 children attending seventeen Native schools and for malted milk to be made available to 2,364 children attending thirty-two Native schools. A complete report has been made on each of the remaining ninety-five schools, on the buildings and facilities required before the malted-milk-powder scheme can be put in operation. It is hoped that the malted milk will be available to the majority of the 6,204 children attending these ninety-five schools in the course of the next few months. Medical Officers of Health continue to testify as to the value of this service. Dr. D. Cook, Palmerston North, reports in emphasizing its good effects among the Maori children:—

“At Ratana Pa I have had personal evidence as to the value of the milk, and its use in the school has stimulated consumption in the home; a point of interest here is that there is no waste at this school, each bottle of milk consumed to the last lick.”

Dr. T. J. Hughes, Auckland:—

“The milk-in-schools scheme is working quite satisfactorily, and many appreciative references have been received expressing satisfaction with its operation.”

Health Camps.

The health-camp movement was placed on a more permanent basis by the formation of the National Health Camp Federation and the passing of the King George the Fifth Memorial Fund Act, 1938, for the administration of this fund for the establishment of children's health camps.

The national federation is now well organized and has experienced increasing demands for establishment of camps. Summer and secondary camps have been held in almost every province during the summer months, and permanent health camps are being established at Auckland, Christchurch, and Dunedin. The Wellington Camp at Otaki is in full working-order and has functioned throughout the year.

The good will of the public has been maintained for the purpose of raising funds to meet the needs of the health-camp scheme. Through the sale of the Christmas health stamps the finances benefited to the extent of £7,026, which result is well up to that obtained in any of the previous campaigns. In addition, the health-camp funds have been augmented by a grant of £10,282 from art-union proceeds, and this sum has been distributed among the district committees in the same proportion as the health-stamp proceeds.

Industrial Hygiene.

With the expansion of industries this sphere of public-health work is becoming one of increasing importance. Close co-operation has been maintained with the Labour Department. Published in the appendix to this report is a report by Dr. F. S. Maclean, Medical Officer of Health, Wellington, on cases of lead poisoning occurring in certain industries and measures taken and suggested for its prevention. Regulations to prevent lead poisoning amongst the employees in motor-body and electric-storage-battery industries have been drafted.

New Health District.

A separate health district, known as “the Nelson-Marlborough Health District” was constituted. Dr. Boyd, formerly Assistant Medical Officer of Health, Christchurch, was appointed to take charge of the district, with his offices at Nelson.

Health Education.

Through the activities of officers of all branches of the Department and such avenues as the press, radio, moving pictures, and journals health-educational work proceeded along similar lines as outlined in previous reports. A number of health films and strips were made available from the Department's library, and projectors supplied to certain district offices. These are appreciated by officers for health education in schools and amongst the general public. Some of the films proved invaluable during the Fitness Week Campaign, with which officers co-operated.

New sets of dental health posters are being designed, and when available will be distributed throughout the Dominion. The additional library accommodation now available will enable this important service to be extended to meet the needs of a growing Department. A special exhibit is being prepared for the Centennial Exhibition, and should prove a most valuable means of health education. Six thousand copies of the public address on Cancer by Dr. F. A. Maguire, C.M.G., D.S.O., delivered during the Tenth Australian New Zealand Cancer Conference were printed for distribution. The booklet "The Expectant Mother and the Babys' First Month" has, in association with the Plunket Society, been revised and is now being printed.

In many ways the Department is constantly furnishing the public with scientific knowledge on individual and communal health, and there is every reason to believe that this routine service is appreciated.

Boards associated with the Department.

The Boards associated with the Department are the Board of Health, Medical Council, Medical Research Council, Dental Council, Nurses and Midwives Registration Board, Opticians Board, Masseurs Board, and the Plumbers Board. The Boards continued their work along the lines of previous years. A special report of the work of the Medical Research Council appears in the appendix to this report.

Staff.

Dr. M. H. Watt, Director-General of Health, was granted leave of absence for a study tour abroad, arranged and sponsored by the Rockefeller Foundation. A Medical Inspector of Hospitals was appointed and four School Medical Officers. These latter appointments, however, owing to resignation and retirement of other officers, leaves the School Medical staff at the same numerical strength.

In conclusion, I wish to express my thanks for the support rendered me by officers during the year.

R. A. SHORE, Acting Director-General of Health.

PART II.—PUBLIC HYGIENE.

I have the honour to submit my annual report for the year ended 31st March, 1939.

INTRODUCTION.

There are, roughly, four periods in New Zealand's sanitary history. The first period extended from the commencement of organized settlement to the passing of the first Public Health Act in 1872. During this period there was little, if any, sanitary control, and conditions can only be described as primitive.

The Act of 1872 and the second Health Act of 1876 ushered in the second period, during which there was control by a Central Board of Health and Local Boards, the functions of the latter being carried out by the local authorities throughout the colony. It is difficult at this distance of time and in the absence of reports to form an opinion of the work of these Boards, but the remarks of the Colonial Secretary in introducing the second reading of the Public Health Bill in 1900 indicate that conditions were very unsatisfactory. His remarks are quoted in the Acting-Director-General's section of this annual report.

With the passing of the Act of 1900 and the establishment of a Health Department under a Minister of Health the third period commenced. It was a period of great activity, a period during which the small staff of this infant Department fought a long and strenuous fight to improve the very unsatisfactory conditions then prevailing. It was during this period that the Sale of Food and Drugs Act came into force, and this has without doubt had its effect on the health of the community by ensuring that the public obtain wholesome, unadulterated foods. The influenza epidemic of 1918 demonstrated weaknesses in the powers given the Department for the performance of its function of the conservation of the public health, and in 1920 the present Health Act was passed. This comprehensive Act has stood for nineteen years without amendment, a tribute to those who drafted it. With the advance made in aviation and the near approach of the time when the country will be in touch with both eastern and the western hemispheres by air, amendment to enable the Department to exercise sanitary control over air traffic is necessary. Experience has also shown that some portions of the present Act could be improved, and amendments in this connection are at present under consideration.

SECTION I.—VITAL STATISTICS.

(Exclusive of Maoris unless otherwise stated.)

POPULATION.

The mean population of the Dominion for 1938 was estimated to be 1,519,606, an increase of 14,780 over the corresponding figure for the previous year.

BIRTHS.

The births of 27,249 living children were registered during 1938, as against 26,014 in 1937 and 24,837 in 1936. The birth-rate per 1,000 of mean population was 17·93. The general course of the rate during the past five years is shown in the following table:—

Births (Number and Rate) in New Zealand, 1934–38.

Year.	Total Number of Births registered.	Birth-rate per 1,000 of Mean Population.
1934	24,322	16·51
1935	23,965	16·17
1936	24,837	16·64
1937	26,014	17·29
1938	27,249	17·93

During the years 1874 to 1880 the birth-rate per thousand of mean population was over 40. By 1935 it had decreased to 16·17, but since that year it has shown an increase each year, but is still lower than prior to 1932.

As the number of births is dependent upon the number of women of child-bearing age in the population, a more correct view of the trend in the birth-rate is obtained by calculating the birth-rate per thousand women between the ages of fifteen and forty-five years. This has been done for quinquennial periods from 1874 to 1938 and is shown in the following table:—

Birth-rate per 1,000 Women between the Ages of fifteen and forty-five years.

Period.	Rate.	Period.	Rate.
1874-78	217	1909-13	110
1879-83	196	1914-18	103
1884-88	164	1919-23	96
1889-93	137	1924-28	88
1894-98	117	1929-33	78
1899-03	110	1934-38	73
1904-08	114		

DEATHS.

The deaths registered during 1938 numbered 14,754, an increase of 1,096 over the figure for 1937 (13,658). Of this increase, 67 per cent. is accounted for by increases in deaths due to chest diseases (259), heart-diseases (220), measles (159), and violence (96).

Deaths (Numbers and Rates) in New Zealand, 1933-38.

Year.	Total Number of Deaths registered.	Crude Death-rate per 100,000 of Mean Population.	Standardized Death-rate per 100,000 of Population.
1933	11,701	799	677
1934	12,527	850	710
1935	12,217	825	675
1936	13,056	875	706
1937	13,658	908	711
1938	14,754	971	763

The crude death-rate reached its lowest point in 1933. Since that year it has shown a definite upward trend, a result which was to be expected with an ageing population. That the whole of the increase in the crude rate cannot be accounted for by the changing age-constitution of the population is shown by the standardized rates given above. The rate for 1938 is to some extent raised by the unusual number of deaths from measles and pneumonia. The standard used above and elsewhere in this report, unless otherwise stated, is the population of England and Wales at the time of the census of that country taken in 1901.

Since this is centennial year it may be of interest to show the improvement which has taken place in the general death-rate since 1874-78. Crude death-rates are of no value for this purpose, as both the age and the sex constitutions of the population have altered markedly during the long period taken. In the table given below the effect of these changes is eliminated by the compilation of standardized rates based on the age and sex constitution of the New Zealand population as disclosed at the census of 1911. Such rates for each year since 1872 have been published from time to time by the Census and Statistics Department, and from these quinquennial average rates have been calculated.

Standardized Death-rates, 1874-1938.

(Quinquennial average rates for the periods shown.)

Period.	Standardized Rate per 1,000 of Population.	Period.	Standardized Rate per 1,000 of Population.
1874-78	14.16	1909-13	9.31
1879-83	13.11	1914-18	10.26
1884-88	12.02	1919-23	8.85
1889-93	11.54	1924-28	7.85
1894-98	11.04	1929-33	7.30
1899-03	10.89	1934-38	7.14
1904-08	10.09		

It will be seen that the average death-rate during the past five years was almost exactly half that for the first five years shown.

The next table (Table A) does not go so far back into the past, but shows, for the sexes separately, and by quinquennial periods, the movement of the death-rate from all causes for each age-group. The rates have been calculated on the basis of the population in each age and sex group at the time of the census taken in the middle year of each quinquennium with two exceptions—for the age-group "under one year" the average of the births of the five years was taken, and since no census was taken in 1931 the estimated age and sex distribution in that year.

TABLE A.—DEATHS FROM ALL CAUSES: AVERAGE YEARLY NUMBER OF DEATHS PER 10,000 OF POPULATION BY SEX AND IN EACH AGE-GROUP.

Age.	Males.								Females.							
	1899-1903.	1904-1908.	1909-1913.	1914-1918.	1919-1923.	1924-1928.	1929-1933.	1934-1938.	1899-1903.	1904-1908.	1909-1913.	1914-1918.	1919-1923.	1924-1928.	1929-1933.	1934-1938.
0-1	879	792	660	557	514	437	374	399	739	635	518	436	402	340	279	312
1-5	76	57	51	55	48	37	31	30	71	54	48	49	43	37	27	24
5-10	25	21	19	23	20	16	15	13	20	17	17	20	17	14	12	11
10-15	18	17	15	16	15	13	11	11	18	16	13	14	12	10	8	8
15-20	29	26	24	32	21	19	20	19	27	29	22	24	20	16	14	12
20-25	41	36	30	67	31	27	24	23	37	35	31	38	29	26	21	19
25-30	45	39	35	71	35	29	26	24	47	44	38	52	37	29	26	22
30-35	47	47	44	77	43	35	27	25	50	47	44	54	41	33	30	26
35-40	66	55	58	83	51	43	40	36	64	54	55	57	48	38	36	30
40-45	74	69	67	89	62	54	50	50	70	63	58	62	52	44	41	41
45-50	99	98	93	100	84	76	71	67	84	81	72	75	69	64	60	56
50-55	142	126	125	131	116	110	102	102	121	100	99	105	96	92	80	78
55-60	194	177	179	182	163	157	145	152	157	147	148	148	137	124	120	116
60-65	258	259	255	250	254	247	233	239	228	217	212	211	203	189	186	183
65-70	415	392	407	402	384	394	366	370	358	326	330	322	316	305	296	299
70-75	684	655	615	665	630	585	577	593	554	549	539	546	530	509	473	494
75-80	1,067	1,027	1,000	979	1,005	952	967	945	903	914	910	855	922	851	852	818
80 and over ..	1,806	1,883	1,881	1,859	1,924	1,871	1,867	1,860	1,728	1,718	1,651	1,691	1,698	1,664	1,711	1,680

New Zealand has for many years prided itself on having the lowest death-rate in the world. As pointed out by the Government Statistician in the "Report on the Vital Statistics of the Dominion of New Zealand" for 1937, this position was challenged by the Netherlands in 1937, with a provisional death-rate of 8·7 per 1,000, as compared with 9·1 for New Zealand. Comparable standardized death-rates would, however, require to be calculated to obtain a reliable comparison of the mortality-rates of the two countries. The Government Statistician goes on to say—

"This superiority of New Zealand as regards the total death-rate tends to induce an unwarranted complacency in this country. When the death-rates of various countries are analysed by sex and age-groups it is discovered that some countries have a better record than New Zealand at certain ages, including in some cases the ages of greatest economic value."

In the case of the Netherlands the figures for 1930-32, compared with those for New Zealand for 1935-36, indicated a superiority of the former in the age-groups from forty years to sixty-five years in the case of males, and the Government Statistician stated that it was unfortunate that figures later than 1930-32 were not available for the Netherlands, it being probable that more recent figures would disclose an even better position for that country. Preliminary figures for that country for 1937 indicate that the Netherlands has improved its position.

More detailed analysis of the figures, showing death-rates by age-groups and by cause of death, will be necessary before it is possible to ascertain where New Zealand is falling behind.

Still-births.

A still-born child is defined as one "which has issued from its mother after the expiration of the twenty-eighth week of pregnancy, and which was not alive at the time of issue." Still-births have been compulsorily registrable in New Zealand since March, 1913. In 1938 still-births numbering 743 were registered, a decrease of 18 from the figure for the previous year.

Still-births (Number and Rate) in New Zealand, 1934 to 1938.

Year.	Total Number of Still-births registered.	Rate of Still-births per 1,000 Live Births.	Rate of Still-births per 1,000 total Births.
1934	687	28·3	27·47
1935	738	30·8	29·87
1936	732	29·5	28·59
1937	761	29·3	28·42
1938	743	27·3	26·54

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

There was a marked reduction in the still-birth rate, a reduction which more than balances the increase in the infant death-rate under two weeks. The infant-mortality rate, particularly mortality under one month, cannot logically be discussed except in association with the still-birth rate, and therefore in the discussion of the former later in this report still-births are again referred to.

THE PRINCIPAL CAUSES OF DEATH.

The following table gives the main causes of death during the year, the actual number of deaths therefrom, and the death-rates per 10,000 of mean population for each of the last five years:—

Cause.	1938.		1937.	1936.	1935.	1934.
	Number.	Rate.	Rate.	Rate.	Rate.	Rate.
Heart-disease (all forms)	4,171	27·45	26·25	24·43	23·34	22·72
Cancer	1,787	11·76	11·82	11·81	11·18	11·53
Violence	999	6·57	5·99	5·79	5·25	5·76
Pneumonia	613	4·03	3·36	2·68	1·62	1·74
Pneumonia (secondary to influenza), whooping-cough, and measles	187	1·23	0·47	0·68	0·22	0·38
Bronchitis	200	1·32	1·14	1·35	1·34	1·47
Broncho-pneumonia	354	2·33	1·72	1·61	1·63	1·47
Tuberculosis (all forms)	597	3·93	3·91	4·56	3·89	4·21
Kidney or Bright's disease	581	3·82	3·89	3·96	3·56	3·80
Apoplexy or cerebral hæmorrhage	852	5·61	5·37	5·09	4·87	4·95
Diseases of the arteries	550	3·62	3·62	2·99	2·96	2·57
Senility	401	2·64	2·37	2·55	2·39	3·10
Diabetes	285	1·88	1·83	1·59	1·53	1·70
Hernia and intestinal obstruction	110	0·72	0·81	0·66	0·67	0·64
Diseases and accidents of childbirth (puerperal mortality)	111	0·72	0·63	0·62	0·68	0·80
Appendicitis	117	0·77	0·77	0·80	0·72	0·79
Diarrhoea and enteritis	97	0·64	0·33	0·40	0·55	0·39
Epilepsy	48	0·32	0·37	0·33	0·29	0·35
<i>Common Infectious Diseases.</i>						
Influenza (all forms, including pneumonic) ..	133	0·88	0·73	0·94	0·74	1·26
Diphtheria	31	0·20	0·16	0·13	0·22	0·18
Whooping-cough	21	0·14	0·08	0·32	0·28	0·27
Scarlet fever	2	0·01	0·04	0·05	0·05	0·05
Typhoid and paratyphoid	8	0·05	0·06	0·05	0·07	0·01
Measles	163	1·07	0·02	0·02	0·01	0·31

Heart-diseases (all forms).—In the case of males, deaths from all forms of heart-disease increased by 165, from 2,195 in 1937 to 2,356 in 1938. There was an increase of 4 deaths under forty years of age, 14 between forty and sixty years, and 143 above the age of sixty years.

The female increase was 60, from 1,755 in 1937 to 1,815 in 1938. There was an increase of 3 deaths under forty years of age, 32 between forty and sixty years, and 25 above the age of sixty years.

The number of deaths and the crude death-rate from heart-disease continue to rise, an inevitable effect of our ageing population. Another factor which helps to increase the number of deaths and the crude death-rate is the decline in deaths from senility, as shown graphically in the annual report for 1936.

The standardized rate for males rose from 19·9 per 10,000 of population in 1937 to 21·2 in 1938, and for females from 15·9 to 16·4.

From Table B it will be seen that the death-rate in the age-groups under forty years is low, with a falling tendency. After the age of forty it increases rapidly, with an upward trend in the older age-groups. A great part of this upward trend in the older age-groups is due to the transference of deaths from senility, the latter term being viewed with disfavour, further inquiries being made when it is shown on the death-certificate as the cause of death. The marked downward trend in deaths from senility is shown in Table C.

TABLE B.—DISEASES OF THE HEART: AVERAGE YEARLY NUMBER OF DEATHS PER 10,000 OF POPULATION BY SEX AND IN EACH AGE-GROUP.

Age.	Males.								Females.							
	1899-1903.	1904-08.	1909-13.	1914-18.	1919-23.	1924-28.	1929-33.	1934-38.	1899-1903.	1904-08.	1909-13.	1914-18.	1919-23.	1924-28.	1929-33.	1934-38.
0-1	7·9	12·7	11·3	2·0	0·8	0·8	0·2	1·2	3·9	9·8	7·3	1·0	1·3	0·6	0·2	1·2
1-5	0·8	0·4	0·8	0·6	0·5	0·4	0·3	0·3	1·0	0·4	1·4	0·7	0·5	0·5	0·2	0·3
5-10	0·7	0·7	1·5	0·8	1·4	0·6	0·5	0·3	1·3	1·0	1·4	0·9	1·2	0·6	0·5	0·2
10-15	0·6	0·9	1·3	1·1	1·2	0·9	0·6	0·4	1·8	1·5	1·0	1·1	1·0	0·9	0·5	0·4
15-20	1·3	1·1	1·9	1·4	1·1	1·1	0·7	0·7	2·1	1·8	1·6	1·1	1·4	0·9	0·8	0·6
20-25	1·8	1·8	1·7	2·4	1·3	1·1	0·9	1·3	1·2	1·8	2·4	1·6	1·2	1·6	1·3	0·9
25-30	2·3	1·8	2·1	1·7	1·7	1·4	1·4	1·5	2·3	2·0	2·6	2·0	2·4	1·8	1·3	1·4
30-35	2·7	2·4	2·2	2·3	3·1	2·8	1·9	1·6	3·2	3·2	3·7	1·8	2·6	2·5	2·2	2·4
35-40	4·6	4·5	4·7	5·7	4·6	3·6	3·4	3·2	4·9	5·0	5·1	4·6	5·2	3·2	3·3	2·8
40-45	7·2	7·7	7·2	6·0	6·8	5·0	6·2	7·9	7·8	7·5	6·1	6·7	6·2	4·8	4·2	5·6
45-50	11·4	13·1	11·6	11·3	11·8	10·8	12·1	14·2	12·6	12·7	10·9	10·0	11·8	9·5	8·8	8·3
50-55	21·3	18·0	21·0	19·2	20·5	20·9	21·4	25·5	24·7	17·1	19·8	16·9	16·3	15·8	14·2	15·4
55-60	36·3	37·8	32·6	35·7	33·6	36·6	37·5	44·8	29·9	27·2	30·6	32·9	30·4	25·7	29·4	24·9
60-65	51·4	60·6	51·3	54·5	63·7	60·6	70·9	81·0	65·4	45·8	46·0	48·3	53·7	49·5	49·8	54·4
65-70	94·3	93·7	108·5	98·9	113·1	111·4	9122·1	134·3	83·6	71·1	83·4	78·6	90·2	90·0	95·6	105·0
70-75	143·6	152·5	156·5	160·1	178·8	170·4	202·4	221·0	112·5	118·7	134·7	125·2	154·0	161·6	171·6	190·2
75-80	205·7	210·9	255·6	225·6	267·6	285·6	353·4	391·0	148·9	170·2	205·5	201·8	238·0	254·6	328·7	348·5
80 and over ..	223·2	255·2	315·2	295·1	408·2	427·5	702·2	823·2	157·7	161·7	216·9	246·9	298·2	2409·3	642·9	728·8

TABLE C.—SENILITY: AVERAGE YEARLY NUMBER OF DEATHS PER 10,000 OF POPULATION BY SEX AND IN EACH AGE-GROUP.

Age.	Males.								Females.							
	1899-1903.	1904-08.	1909-13.	1914-18.	1919-23.	1924-28.	1929-33.	1934-38.	1899-1903.	1904-08.	1909-13.	1914-18.	1919-23.	1924-28.	1929-33.	1934-38.
65-70	23.4	16.7	21.0	29.8	24.3	17.2	7.2	8.9	15.9	17.1	16.3	19.0	16.0	10.2	5.5	4.1
70-75	100.6	87.2	75.5	100.7	73.9	49.1	29.7	24.2	73.5	85.4	69.0	78.8	55.4	41.4	18.6	17.0
75-80	233.7	235.8	194.6	215.7	192.8	118.9	69.2	50.6	243.0	229.3	184.0	205.3	173.2	122.3	60.4	43.6
80 and over ..	846.3	852.6	756.1	752.0	684.7	547.8	263.1	182.2	986.6	908.2	778.4	757.9	674.8	488.4	242.9	182.5

Cancer.—Cancer stands second to diseases of the heart as a cause of death, and in 1938 deaths attributed to this condition numbered 1,787, as compared with 1,777 in the previous year. The crude death-rate was 11.76 per 10,000 of mean population, a drop of 0.06 from that for 1937 (11.82). The crude death-rate has been increasing since records first became available in 1872. Records at that time were admittedly incomplete. In a statistical study of cancer in New Zealand by Mr. J. W. Butcher, the present Government Statistician, published in the Official Year-Book 1926, it is stated:—

“There can be little doubt that even up to the ‘seventies’ and ‘eighties’ the deaths from cancer were considerably understated, and that each succeeding decade has seen a greater proportion of the deaths due to cancer correctly assigned to that disease.”

The increase in the cancer death-rate for both sexes, both crude and standardized, was rapid until near the end of the century, the increase in the case of males being greater than that for females.

The average crude death-rate for the quinquennium 1899–1903 was 6.47 per 10,000 of mean population, and for 1934–38 was 11.62. Standardized rates for the same two periods were respectively 7.23 and 8.34. The latter rate (8.34) was actually exceeded as early as the quinquennium 1911–15, and the highest quinquennial average standardized rate was 8.52 for 1926–30. In the table given below the rates for each year from 1899 are given, and the accompanying graph prepared from these figures shows the trend of the rate since the beginning of the century. Five-yearly moving average rates have been taken, as these eliminate annual fluctuations and produce a smoother curve, the trend of the rate being more readily perceived. It will be noticed that since 1911–15 on only one occasion has the average rate exceeded 8.50 per 10,000 of population, the rate for 1926–30 being 8.52, and also that since 1911–15 the rate has remained markedly constant, fluctuating between 8.26 and 8.52.

Cancer: Standardized Death-rate per 10,000 of Population for the Sexes combined, 1899–1938.

Year.	Standardized Death-rate.	Year.	Standardized Death-rate.	Year.	Standardized Death-rate.
1899	6.91	1913	8.43	1926	8.76
1900	6.31	1914	8.60	1927	8.30
1901	7.47	1915	8.48	1928	8.38
1902	7.55	1916	7.98	1929	8.76
1903	7.90	1917	8.17	1930	8.39
1904	7.21	1918	8.05	1931	8.38
1905	6.90	1919	8.67	1932	7.98
1906	7.49	1920	8.65	1933	8.58
1907	7.91	1921	8.51	1934	8.73
1908	7.52	1922	7.89	1935	8.23
1909	7.60	1923	8.04	1936	8.44
1910	7.85	1924	8.71	1937	8.23
1911	8.28	1925	8.13	1938	8.08
1912	8.27				

Table D shows the average death-rates per 10,000 by sex and age-groups for the eight quinquennia since 1899.

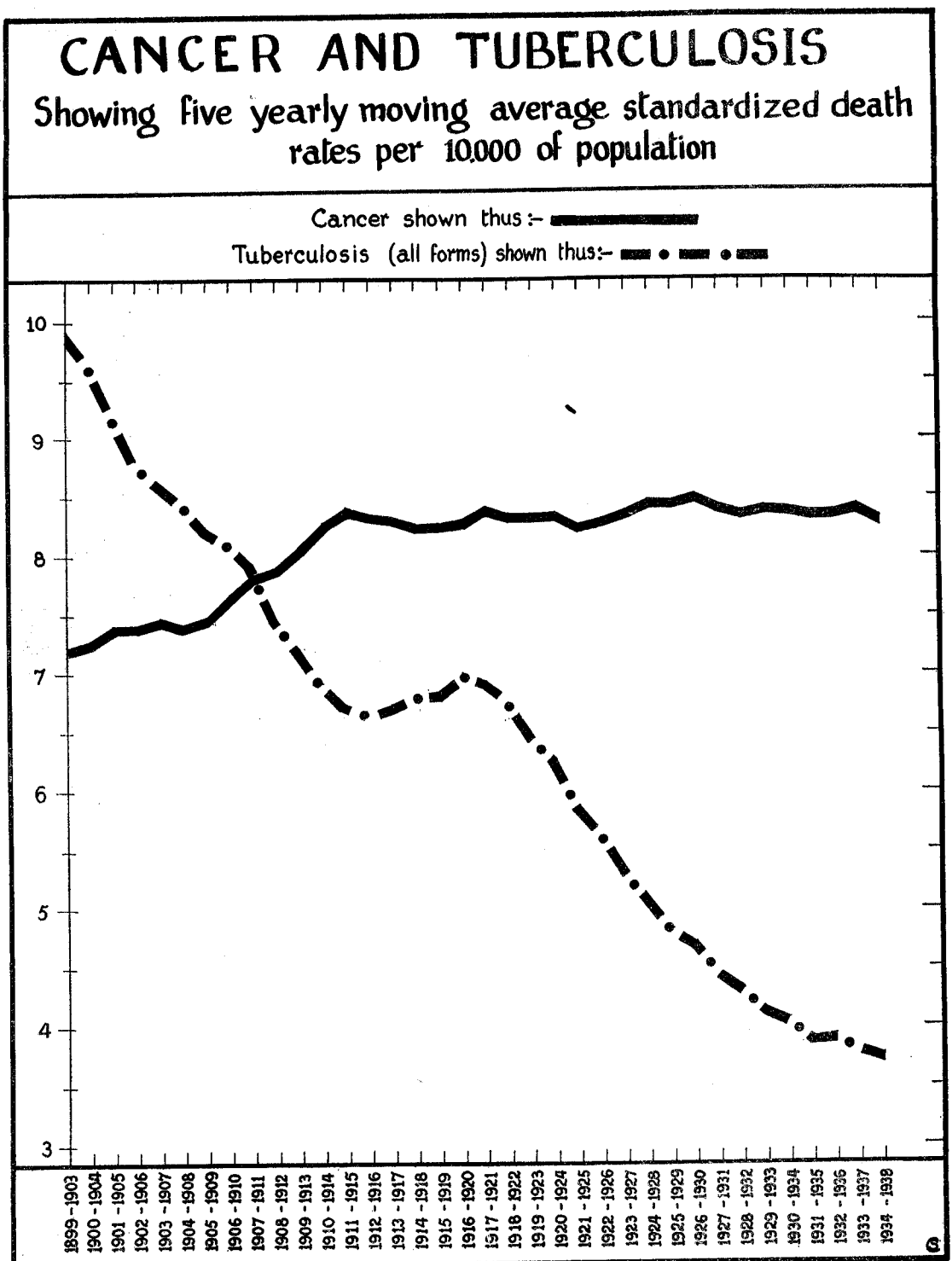
TABLE D.—CANCER: AVERAGE YEARLY NUMBER OF DEATHS PER 10,000 OF POPULATION BY SEX AND IN EACH AGE-GROUP.

Age.	Males.								Females.							
	1899-1903.	1904-08.	1909-13.	1914-18.	1919-23.	1924-28.	1929-33.	1934-38.	1899-1903.	1904-08.	1909-13.	1914-18.	1919-23.	1924-28.	1929-33.	1934-38.
0-1	0.2	0.5	0.6	0.3	0.8	..	0.2	0.2	0.4	0.5	0.6	0.1	0.4	..	..	..
1-5	0.1	0.2	0.7	0.5	0.4	0.3	0.4	0.4	..	0.4	0.4	0.2	0.4	0.3	0.3	0.4
5-10	0.4	0.2	0.2	0.1	0.2	0.1	0.3	0.3	0.1	0.1	0.1	0.1	0.2	0.2	0.1	0.2
10-15	0.1	0.1	0.1	0.3	0.1	0.3	0.2	0.1	0.05	0.2	0.1	0.1	0.3	0.1	0.2	0.3
15-20	0.4	0.4	0.3	0.4	0.4	0.3	0.2	0.3	0.3	0.1	0.1	0.2	0.2	0.1	0.3	0.3
20-25	0.4	0.3	0.3	0.5	0.4	0.8	0.5	0.8	0.5	0.1	0.3	0.2	0.3	0.3	0.5	0.5
25-30	0.6	0.7	0.6	0.9	0.3	0.5	0.9	0.6	1.0	1.1	1.0	0.6	0.6	1.0	0.9	0.7
30-35	0.7	0.9	1.3	0.7	1.0	1.0	0.9	1.5	1.8	1.7	2.1	1.9	1.9	2.5	2.5	2.1
35-40	2.8	1.9	2.3	2.2	2.3	2.5	2.6	2.7	4.7	4.6	4.7	4.0	4.3	4.4	4.5	3.9
40-45	4.6	4.3	4.6	4.7	4.5	4.1	3.8	4.4	10.4	9.9	9.6	7.9	8.5	8.4	7.3	8.8
45-50	10.7	8.8	8.3	9.6	8.4	8.8	8.4	7.5	18.4	14.9	16.6	17.1	14.7	15.8	14.8	14.9
50-55	16.1	17.0	19.1	16.8	16.6	15.4	17.1	14.1	22.9	21.0	22.3	23.5	24.5	24.3	20.9	21.6
55-60	29.2	24.5	30.0	27.2	27.7	29.3	23.7	25.9	32.7	33.0	35.2	32.2	31.7	30.0	28.2	30.7
60-65	37.0	45.1	46.0	41.1	47.4	50.1	44.6	42.4	39.9	44.5	41.1	44.1	42.1	43.5	42.5	41.1
65-70	51.4	53.3	60.5	68.2	65.8	76.6	75.3	66.1	46.8	56.3	58.1	61.9	55.7	55.7	55.1	55.3
70-75	73.7	80.1	81.9	94.7	91.7	96.7	94.4	108.4	462.4	62.0	73.0	70.6	84.0	82.0	79.6	77.1
75-80	83.2	90.3	87.9	90.4	105.1	130.5	137.8	130.3	77.4	75.9	102.5	82.5	99.0	93.5	102.8	97.3
80 and over ..	71.6	79.4	96.5	112.1	100.0	128.9	147.0	165.4	48.7	60.8	96.7	90.4	99.8	114.6	125.9	127.2

Tuberculosis (all Forms).

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.
1933	611	4.17	1936.. ..	680	4.56
1934	621	4.21	1937.. ..	589	3.91
1935	576	3.89	1938.. ..	597	3.93

Of the 597 deaths from tuberculosis last year 482 (or 3.17 per 10,000 of mean population) were assigned to tuberculosis of the respiratory system, and 115 (0.76 per 10,000) to other forms of the disease.



Tuberculosis other than of the Respiratory System.—The 115 deaths last year so assigned were distributed as follows (the figures for 1937 being given in parentheses):—

Tuberculosis of the meninges and central nervous system	..	..	35	(34)
Tuberculosis of intestines and peritoneum	..	..	19	(17)
Tuberculosis of vertebral column	..	..	18	(13)
Tuberculosis of bones and joints	..	..	5	(1)
Tuberculosis of lymphatic system	..	..	3	(1)
Tuberculosis of genito-urinary system	..	..	11	(7)
Tuberculosis of other organs	..	..	3	(2)
Disseminated tuberculosis	..	..	21	(17)
Tuberculosis of skin	..	..	..	(3)
			115	(95)

Unlike the diseases which have just been discussed, tuberculosis has shown a continuous and fairly steady decline. It is a social disease, most prevalent in countries where the standards of hygiene and of living are low, and becoming less prevalent as social conditions improve. Hygienic conditions in the Dominion were by no means good in the early days of settlement, and even up to the end of the century were very unsatisfactory.

The accompanying graph, which was prepared from quinquennial moving average standardized death-rates, shows the trend of the death-rate since 1899–1903. There was a definite rise in the rate during the war years and following the influenza epidemic, followed by approximately the same rate of decline as in pre-war days.

Tuberculosis in New Zealand has now reached a fairly low level, but it is probable that a more intensive campaign against the disease will be necessary if the rate of decline is to be maintained or improved.

Pulmonary tuberculosis has been a notifiable infectious disease since 1901, and it is now proposed to add other forms of the disease to the list of notifiable diseases. Insufficient investigation has so far been carried out for any definite statement to be made as to the percentage of tuberculosis other than of the respiratory system which is due to tubercle bacilli of human type or to those of the bovine type. What information is available points to the probability that the human type is responsible for about 80 per cent. of such cases, and the bovine type for the remainder.

The notification of all cases of tuberculosis will allow of more thorough investigation, with the discovery and treatment of many unrecognized pulmonary cases responsible for non-pulmonary cases.

Tuberculosis, often considered to be a family disease, is really a long-drawn-out family epidemic. Unrecognized cases spread the infection in the family or related circles to a greater extent than they do to others outside the family circle. The recognition of such cases is a necessary preliminary to the control of the disease.

Tuberculosis due to the bovine type of bacillus is a lesser problem than that due to the human type. It could be solved by the eradication of all tubercular cattle from our herds, or by the pasteurization of all milk supplied for human consumption. The former method of control would, however, only solve the problem of tuberculosis due to the bovine type of bacillus; pasteurization would solve both this and other problems.

The Medical Research Council is undertaking investigations into the incidence of the two types of tubercle bacillus in human cases, and also the incidence of tuberculosis amongst Maoris.

Pulmonary Tuberculosis.—With the exception of the years 1935 (471 deaths) and 1933 (476 deaths) the number of deaths registered in 1938 as due to this condition was the lowest recorded since 1888, when the population was slightly more than 600,000. The average crude and standardized death-rates per 10,000 of population in the eight quinquennial periods from 1899 are shown below:—

Pulmonary Tuberculosis : Crude and Standardized Death-rate.

Period.	Average Crude Death-rate.	Average Standardized Death-rate.	Period.	Average Crude Death-rate.	Average Standardized Death-rate.
1899–03	7·55	7·55	1919–23	5·06	4·92
1904–08	6·55	6·34	1924–28	4·19	4·03
1909–13	5·83	5·59	1929–33	3·53	3·26
1914–18	5·28	5·25	1934–38	3·32	2·94

Death-rates by age-groups are shown for the same period in Table E. It will be noticed that whilst for males the death-rate is highest in the age-groups above forty, the opposite is the case for females. Another interesting feature of the figures for the past five years is the further drop in the rate for females in the age-group twenty to twenty-five years. For a long period the death-rate in this age-group remained practically stationary, with a substantial fall for 1929–33. This downward trend has continued during the past five years.

TABLE E.—TUBERCULOSIS OF THE RESPIRATORY SYSTEM: AVERAGE YEARLY NUMBER OF DEATHS PER 10,000 OF POPULATION BY SEX AND IN EACH AGE-GROUP.

Age.	Males.								Females.							
	1899-1903.	1904-08.	1909-13.	1914-18.	1919-23.	1924-28.	1929-33.	1934-38.	1899-1903.	1904-08.	1909-13.	1914-18.	1919-23.	1924-28.	1929-33.	1934-38.
0-1	2.1	0.8	0.9	..	0.3	0.4	0.5	0.3	2.0	1.5	1.5	0.6	0.4	0.3	0.3	0.2
1-5	0.7	0.6	0.6	0.5	0.5	0.3	0.3	0.4	0.8	0.6	0.4	0.3	0.2	0.2	0.1	0.0
5-10	0.6	0.5	0.4	0.3	0.2	0.1	0.1	0.1	0.6	0.2	0.5	0.2	0.2	0.4	0.2	0.0
10-15	0.4	0.9	0.6	0.3	0.3	0.3	0.2	0.2	2.1	1.6	1.3	0.7	1.0	0.5	0.3	0.3
15-20	4.4	4.3	2.9	3.0	1.9	1.6	1.4	1.0	8.2	7.7	6.3	5.9	5.6	4.6	2.6	2.1
20-25	11.4	8.4	7.3	11.4	6.5	4.7	3.5	2.6	12.4	11.6	8.9	8.8	8.8	8.5	6.6	5.4
25-30	14.9	9.6	8.5	10.7	9.6	7.1	4.8	4.4	14.1	13.5	11.2	10.8	10.0	8.2	7.8	6.4
30-35	11.9	11.4	10.0	10.5	9.6	8.4	5.0	4.5	12.2	10.1	10.4	8.7	7.9	5.8	5.9	5.6
35-40	15.6	11.3	10.5	10.0	8.5	8.2	6.5	5.6	12.4	8.8	9.3	7.3	7.8	5.4	4.6	4.7
40-45	11.0	9.5	9.7	9.7	9.3	7.4	6.4	6.3	9.9	8.7	7.0	6.5	6.6	5.2	3.5	3.8
45-50	10.0	10.2	9.8	8.6	9.1	7.3	6.7	5.7	8.1	8.7	5.1	4.4	5.3	4.2	3.5	2.9
50-55	12.1	11.6	9.9	7.2	8.6	7.4	5.6	6.8	6.8	6.9	6.0	5.1	4.7	3.9	2.7	2.5
55-60	12.7	10.4	12.0	7.3	8.3	7.8	7.1	7.1	7.8	5.1	5.1	4.6	4.1	3.8	3.0	3.7
60-65	14.4	10.0	7.8	6.7	8.3	6.1	6.3	7.6	6.0	5.1	5.7	2.9	5.0	5.2	2.8	2.4
65-70	15.6	10.8	9.9	6.3	5.4	5.5	7.4	7.7	9.3	5.8	7.1	4.4	4.2	3.0	3.3	3.2
70-75	10.1	10.6	7.6	6.7	5.6	4.8	7.6	5.6	5.6	4.3	6.0	4.1	3.2	2.7	2.3	3.7
75-80	7.9	4.9	7.3	3.3	4.9	4.0	2.8	5.0	10.7	5.1	2.5	2.7	3.7	4.8	3.1	3.0
80 and over ..	8.4	4.3	2.9	4.0	3.4	3.7	2.4	1.3	3.4	2.6	0.9	1.4	2.1	1.3	1.2	1.0

Tuberculosis other than of the Respiratory System.—The number of deaths registered as being due to this condition was 115, an increase of 20 on the number for the previous year, which, however, was the lowest recorded since 1874. The average number of deaths during the past five years was 117.

TYPHOID FEVER.

This disease is widespread throughout the world, but is most common where sanitation is lacking. Its prevalence is a good index of the sanitary standard of a community. In the early days of settlement the standard was low and the incidence of typhoid fever high. During the final quarter of last century there was considerable improvement in sanitation in the larger centres of population and the prevalence of typhoid fever markedly declined. An example, that of Christchurch, may be cited not because it was worse than other towns, but because it was early in the field in the installation of drainage. The following extract is from a paper by Courtney Nedwill, M.D., and Edwin Cuthbert, M.Inst.C.E., read at the Congress of the Australian Association for the Advancement of Science, held in Christchurch in 1901.—1901

“Before the drainage-works were put in hand the subsoil water was generally to be found within from 2 ft. to 3 ft. of the surface, while in some places it frequently covered the land. The almost uninterrupted flow from the numerous artesian wells has a considerable influence in helping to make the district a waterlogged one. At this period Christchurch was undoubtedly very unhealthy. Slop-water, added to subsoil-water, saturated the ground, and common cesspits were then to be found in almost every quarter of the district. In the year 1875—the date we are now speaking of—the population of the city itself was only 10,611, yet there were no less than 49 deaths from typhoid fever and 21 from phthisis; while the infant-mortality rate, calculated by proportion of deaths under one year to 1,000 births, had reached the high figure of 184.2, the general death-rate itself being 30.4.

“If we compare the mortality bill of 1889 with this bad record we see at once the improvement that has taken place. From a town dangerous to live in Christchurch has been converted into a very healthy city. So soon as the effects of the works were felt the death-rate dropped. In the year 1882 it was 13.7; in the year 1888, 11.36; and in 1889, the latest year for which we have the returns, it was 9.77. In this last year the deaths registered from fever were only five, those from phthisis only eight, while the population had in the meantime increased from 10,611 to 16,785. It is to be regretted that reliable statistics cannot be obtained for the suburbs, so that we might deal with the larger population of thirty-five thousand, but there is every reason for believing that they have fully participated in the general improvement that has been so manifest in the city.”

In the *New Zealand Medical Journal* (Old Series), Vol. 9, 1896, in an article by Dr. Pabst on a typhoid epidemic in Auckland during the summer of 1895-96, when 153 cases were admitted to Auckland Hospital, it is stated:—

“The first case was admitted on September 6th, 1895, and the last on June 14th, 1896—i.e., for ten months of the year cases are arising and the experience of the previous year agrees with this. In fact, so prevalent is typhoid, and so certain, under present circumstances, does it seem that it will appear during certain seasons in the year, that a building is specially reserved for typhoid. This building, which is of wood, is detached from the main one, and consists of two wards, capable of holding in all forty patients. The months of July and August, during which no typhoid cases occur, are utilized in fumigating and thoroughly cleansing these auxiliary wards.”

In Wellington, from 1st January, 1890, to 30th June, 1892, exactly 400 cases of typhoid fever were treated in the Wellington Hospital.

In 1938 there were 57 cases of typhoid fever and 7 of paratyphoid fever notified for the whole Dominion, Maoris excluded.

The accompanying table shows the average annual crude death-rate per 10,000 of population for quinquennial periods since 1874.

Typhoid Fever Death-rates, 1874-1938.

Period.				Average Annual Death-rate.	Period.				Average Annual Death-rate.
1874-78	..	..	..	4.78	1909-13	..	..	..	0.57
1879-83	..	..	..	3.32	1914-18	..	..	..	0.38
1884-88	..	..	..	2.22	1919-23	..	..	..	0.31
1889-93	..	..	..	1.94	1924-28	..	..	..	0.12
1894-98	..	..	..	1.58	1929-33	..	..	..	0.08
1899-1903	..	..	..	0.95	1934-38	..	..	..	0.05
1904-08	..	..	..	0.69					

INFANT MORTALITY.

Deaths of infants numbered 971, and the infant-mortality rate was 35.63 per 1,000 live births, compared with 31.21 in 1937.

Infant Mortality in New Zealand, 1931-38 (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.
1931 ..	22.69	9.46	32.15	1935 ..	22.03	10.23	32.26
1932 ..	21.30	9.92	31.22	1936 ..	22.31	8.65	30.96
1933 ..	22.81	8.79	31.64	1937 ..	22.22	8.99	31.21
1934 ..	22.86	9.25	32.11	1938 ..	24.15	11.48	35.63

Analysis of Deaths of Infants under one Month of Age, 1938.

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.
Diphtheria	..	..	..	..	..	..	..	..	..
Whooping-cough	..	..	..	..	..	..	..	..	..
Influenza	..	..	..	..	..	1	..	..	1
Syphilis	..	..	..	..	..	..	..	..	..
Convulsions	..	..	..	..	4	3	1	..	8
Broncho-pneumonia	..	..	..	..	5	3	3	4	15
Pneumonia	..	..	..	..	3	3	1	1	8
Diarrhoea and enteritis	..	..	..	..	2	1	2	1	6
Congenital malformations	..	..	..	20	58	21	9	3	111
Congenital debility	..	..	..	3	5	2	1	..	11
Injury at birth	..	..	..	30	65	6	3	3	107
Premature birth	..	..	..	147	102	20	10	2	281
Other diseases of early infancy	..	..	..	21	55	7	3	1	87
Accidental mechanical suffocation	..	..	..	..	..	..	..	..	..
Other causes	..	..	..	1	8	4	1	9	23
Totals, 1938	..	..	..	222	307	71	34	24	658
Totals, 1937	..	..	..	244	239	59	26	10	578

Investigation is at present being made into the marked rise in the infant-mortality rate, a rise which makes it higher than in any year since 1928. A few comments, are, however, possible.

There was a fall in the still-birth rate per 1,000 of total births, from 28.42 in 1937 to 26.54 in 1938. There was at the same time a rise in neo-natal deaths—i.e., deaths in the first fourteen days after birth—from 20.24 per 1,000 total births to 21.44. When these two are considered together the rates for still-births and neo-natal deaths were 47.98 per 1,000 total births in 1938, and 48.66 in 1937, a decrease of 0.68. The decrease in the still-birth rate therefore slightly more than balances the increase in neo-natal deaths.

If the period taken be extended to one month after birth the rates for the two years 1937 and 1938 are almost identical, being 50.01 and 50.05 respectively per 1,000 total births.

As will be seen in the table given above, the death-rate per 1,000 live births for infants from one month to one year of age rose from 8.99 in 1937 to 11.48 in 1938.

The following table shows for the past five years the death-rate per 1,000 total births for still-births and for live births at various ages up to one month.

Rates per 1,000 Total Births.

Year.	Still Births.	Under One Day.	One Day and under Two Days.	Two Days and under One Week.	One Week and under Two Weeks.	Two Weeks and under One Month.
1934	27.47	8.84	3.28	6.12	2.56	1.44
1935	29.87	7.93	2.91	6.52	2.19	1.82
1936	28.63	8.88	3.01	5.55	2.54	1.68
1937	28.42	9.11	2.32	6.61	2.20	1.35
1938	26.54	7.93	3.04	7.93	2.54	2.07

SECTION 2.—NOTIFIABLE DISEASES.

Attached are tables showing the notification of infectious and other notifiable diseases in the Dominion for the year 1938. Tables A, B, and C, and unless otherwise stated, the comments and tables in this section deal with Europeans only.

GENERAL.

Apart from the severe epidemic of measles already referred to, the year was a quiet one as regards the prevalence of infectious diseases. As measles is not notifiable, the extent of the epidemic cannot be stated with any accuracy, but it was widespread and of more than usual severity.

The notifications of infectious and other notifiable diseases during the year numbered 3,790, compared with 4,203 in 1937 and 3,652 in 1936. Increases occurred in the following infectious diseases, the increase in each case being shown: Diphtheria (187), typhoid fever (8), pulmonary tuberculosis (116), cerebro-spinal meningitis (11), erysipelas (193), hydatids (2), lethargic encephalitis (4), bacillary dysentery (142), actinomycosis (1). In addition, there was an increase of four in the number of notified cases of chronic lead poisoning.

There were marked decreases in the notifications for scarlet fever (262) and poliomyelitis (743).

Tables and comments regarding the more common infectious diseases are given below:—

(a) *Scarlet Fever.*

Year.	Number of Notifications.	Deaths.		
		Number.	Rates per 10,000 of Mean Population.	Case-fatality Rate per Cent.
1933	783	4	0.03	0.51
1934	762	8	0.05	1.05
1935	863	8	0.05	0.93
1936	1,152	8	0.05	0.69
1937	924	6	0.04	0.65
1938	662	2	0.01	0.30

During the past seven years notifications of scarlet fever have on only one occasion (1936) exceeded 1,000. This condition, which in the past took a heavy toll of child life, has declined markedly in importance as a cause of death. In 1876–77 there was an epidemic which caused 331

deaths in a population of under 400,000, and in 1881-82 one which caused 257 deaths in a population of 500,000. The disease thereafter remained comparatively quiescent until 1902, when it killed 170 persons in that and the following year. In 1908 there was a smaller epidemic with 60 deaths. During 1915-17 there were 9,334 cases with 113 deaths, and in 1928-29, 10,975 cases with 82 deaths.

This disease, and also diphtheria, which is discussed below, are chiefly diseases of early life, the great majority of cases, and of deaths, occurring in those under fifteen years of age. It is of interest, therefore, to calculate the death-rate on the basis of the population under that age. In the accompanying table the results are shown per 10,000 of such population for quinquennial periods from 1874-78 onwards, and also the average death-rate per 10,000 of mean population.

Table showing Average Annual Death-rates for Scarlet Fever and Diphtheria by Quinquennial Periods 1874-1938.

Quinquennial Period.	Scarlet Fever.		Diphtheria.	
	Death-rate per 10,000 of Mean Population.	Death-rate per 10,000 on Basis of Population under 15 Years of Age.	Death-rate per 10,000 of Mean Population.	Death-rate per 10,000 on Basis of Population under 15 Years of Age.
1874-78	2·19	5·12	4·40	10·32
1879-83	1·23	2·87	3·06	7·17
1884-88	0·25	0·62	3·07	7·41
1889-93	0·25	0·63	3·01	7·56
1894-98	0·05	0·15	1·58*	4·34*
1899-1903	0·76	2·29	0·94	2·83
1904-08	0·28	0·89	0·58	1·83
1909-13	0·13	0·42	0·72	2·30
1914-18	0·32	0·98	1·46	4·42
1919-23	0·14	0·45	0·81	2·59
1924-28	0·15	0·49	0·49	1·63
1929-33	0·09	0·32	0·38	1·37
1934-38	0·04	0·17	0·17	0·71

* Anti-diphtheria serum introduced into New Zealand, March, 1895.

(b) Diphtheria.

Year.	Number of Notifications.	Deaths.		
		Number.	Rates per 10,000 of Mean Population.	Case-fatality Rate per Cent.
1933	963	27	0·18	2·80
1934	436	26	0·18	5·96
1935	747	33	0·22	4·42
1936	513	20	0·13	3·90
1937	599	24	0·16	4·01
1938	786	31	0·20	3·94

The incidence of diphtheria remains low, the notifications during each of the past seven years having remained under 1,000.

The remarkably low incidence of diphtheria in the South Island was commented upon in last annual report. During 1938 only 30 cases were notified, compared with 756 in the North Island. During the past seven years 4,846 cases of diphtheria have been notified in New Zealand, of which only 395, or 8 per cent. of the total, were in the South Island.

In a table under the heading "Scarlet Fever" are given tables showing the death-rate by quinquennial periods from 1874 onwards, and also the death-rate calculated on the basis of the population under fifteen years of age.

In the table given below the incidence of diphtheria is shown from another angle. Topley's experiments have shown that the spread of an endemic infection is determined by the introduction of non-immune contacts into an infected community. As New Zealand receives comparatively few non-immunes by immigration, the spread of infection is almost wholly determined by the number of births.

In the table ten-yearly moving averages have been taken and the attack-rate and death-rate per thousand births calculated:—

Table showing Decennial Moving Average Attack-rates and Death-rates from Diphtheria per 1,000 Births.

Period.				Number of Notifications of Diphtheria per 1,000 Births.	Number of Deaths from Diphtheria per 1,000 Births.	Period.				Number of Notifications of Diphtheria per 1,000 Births.	Number of Deaths from Diphtheria per 1,000 Births.
1910-19	..	..	..	83	4.6	1920-29	..	..	..	71	2.7
1911-20	..	..	..	88	4.5	1921-30	..	..	..	68	2.6
1912-21	..	..	..	93	4.6	1922-31	..	..	..	64	2.5
1913-22	..	..	..	97	4.7	1923-32	..	..	..	60	2.4
1914-23	..	..	..	102	4.7	1924-33	..	..	..	58	2.2
1915-24	..	..	..	108	4.6	1925-34	..	..	..	50	2.1
1916-25	..	..	..	108	4.5	1926-35	..	..	..	48	2.0
1917-26	..	..	..	107	4.1	1927-36	..	..	..	43	1.9
1918-27	..	..	..	92	3.4	1928-37	..	..	..	40	1.7
1919-28	..	..	..	78	3.0	1929-38	..	..	..	36	1.6

It will be noticed that whilst in the decade 1910-19, which included the epidemic of 1916-17, there were 83 notifications of diphtheria for every 1,000 births, and 4.6 deaths from that disease, in the decade 1929-38 the notifications and deaths were 36 and 1.6 respectively per 1,000 births.

There has been comparatively little diphtheria in New Zealand for some years, and as many children have never been exposed to infection and so have not acquired an immunity to the disease they are still susceptible. Delay in exposure to infection with the possibility of contracting the condition is an advantage, as the older the child when it contracts diphtheria the less the risk of a fatal termination. During the twelve years 1920-31 of those who contracted diphtheria the fatality-rate in various age-groups was as follows:—

Under one year of age	..	..	..	..	19.7 per 100 cases.
One year and under five years	..	..	..	..	7.5 per 100 cases.
Five years and under ten years	..	..	..	..	3.3 per 100 cases.
Ten years and under fifteen years	..	..	..	..	1.7 per 100 cases.
Fifteen years and under twenty years	..	..	..	..	0.7 per 100 cases.

As it cannot be expected that the incidence of diphtheria will not increase, and as young children are particularly susceptible, the opportunity should not be neglected of having such children immunized against the disease when immunization is being carried out in any district.

(c) *Acute Anterior Poliomyelitis.*

Following the epidemic of 1936-37, only 22 cases of poliomyelitis were notified during the year. Thirteen of these occurred in the Nelson-Marlborough Health District, an area which escaped lightly during the epidemic.

(d) *Pulmonary Tuberculosis.*

Year.		Number of Notifications.	Deaths.	
			Number.	Rates per 10,000 of Mean Population.
1934	..	824	491	3.32
1935	..	808	471	3.17
1936	..	934	540	3.62
1937	..	915	494	3.28
1938	..	1,031	482	3.17

INFECTIOUS DISEASES AMONGST MAORIS.

Table D attached gives the numbers of notifications of infectious disease received for members of the Maori race. The figures are not included in the European figures, as a large but decreasing number of cases amongst Maoris are missed, due to the fact that a proportion of Maoris fail to seek medical assistance when they become ill. With the extension of the district nursing service the position is improving.

Of the 423 notifications received, 219 were of pulmonary tuberculosis, 65 of typhoid fever, and 33 of bacillary dysentery. These figures show a slight rise (7) in the number of cases of tuberculosis reported, a marked drop in the notifications of typhoid fever, from 132 in 1937 to 65 in 1938, and an increase in bacillary dysentery from 11 cases in 1937 to 33 cases in 1938.

INTERNATIONAL AGREEMENTS.

Quarantine.

New Zealand is a signatory to the International Sanitary Convention, which was signed at Paris on 21st June, 1926. Ratification of the agreement by the Government of New Zealand was deposited with the French Government on 26th May, 1928. This convention, which has been ratified by the great majority of the maritime states of the world, aims at international quarantine co-operation. Part I of this agreement is the section with which New Zealand is concerned, and the sixty-six articles of this section detail the international code which governs the application of measures of quarantine in the signatory countries with respect of plague, cholera, yellow fever, epidemic typhus, and epidemic smallpox.

Venereal Diseases.

The Dominion has subscribed to an international agreement respecting facilities to be given to merchant seamen for the treatment of venereal diseases. This was signed at Brussels on 1st December, 1924, notification of the accession of New Zealand being made to the Belgian Government on 21st August, 1925.

The essence of this agreement is that the contracting parties undertake to provide in their main ports a service for the treatment of venereal diseases which shall be open to all seamen free of charge and without distinction of nationality. In New Zealand this service is provided by arrangement with the Hospital Boards in the main ports, and Table E, giving statistics of venereal disease clinics in the four centres, includes cases of seamen treated under the Brussels agreement.

Dangerous Drugs.

New Zealand is a party to the following international agreements in regard to the narcotic habit-forming drugs :—

(a) *Hague Opium Convention of 1912.*—This convention provided for the licensing of manufacturers of narcotics and the recording of the quantities of opium, morphine, and cocaine manufactured and distributed in the countries bound by the agreement. Ratification of the agreement was to some extent held up by the Great War, and the traffic in dangerous drugs was among the questions raised at the Peace Conference. The need was felt for more positive measures of limitation of the manufacture of dangerous drugs.

(b) *Geneva Opium Convention, 1925.*—This convention signed at the Second Opium Conference at Geneva on 19th February, 1925, resulted to a large extent from the work of a committee set up by the League of Nations in 1920, later known as the Advisory Committee on Traffic in Opium and other Dangerous Drugs. This agreement entailed strict control of imports and exports and the furnishing of statistics of exports, imports, manufacture, consumption, and stocks to the Permanent Central Opium Board.

(c) *Convention for Limitation of Manufacture and Regulation of the Distribution of Narcotic Drugs, Geneva, 1931.*—This establishes direct limitation on the manufacture of the various dangerous drugs and the regulation of exports and imports from each country according to quotas fixed from the statements of estimated requirements furnished by the various Governments to the Permanent Central Opium Board.

In New Zealand the Dangerous Drugs Act, 1927, and the Dangerous Drugs Regulations 1928 were enacted in compliance with the obligations undertaken. This Department is concerned with the distribution within New Zealand, and for the purpose of inspecting the records of persons licensed to deal in dangerous drugs officers with pharmaceutical experience are stationed in the four main centres. During the year the majority of the pharmacies in the Dominion have been inspected, the opportunity being taken at the same time to enforce the provisions of the Poisons Act, 1934, and the Poisons (General) Regulations 1937.

TABLE A.—NOTIFIABLE DISEASES IN NEW ZEALAND FOR YEAR ENDED 31st DECEMBER, 1938, SHOWING DISTRIBUTION BY MONTHS.

Month.	Scarlet Fever.	Diphtheria.	Enteric Fever.		Tuberculosis.	Cerebro - spinal Meningitis.	Polio-myelitis.		Influenza.	Typhoid.	Typhoid.	Puerperal Fever.		Relapsing.	Tetanus.	Hydatids.	Trachoma.	Ophthalmia Neonatorum.	Lethargic Encephalitis.	Food Poisoning.	Bacillary Dysentery.	Undulant Fever.	Actinomycosis.	Chronic Lead Poisoning.	Anthrax.	Totals, 1938.	Totals, 1937.	Totals, 1936.
			Typhoid.	Para-typhoid.			Paralytic.	Non-paralytic.				Following Childbirth.	Following Abortion or Miscarriage.															
January	72	32	3	1	76	2	8	1	..	22	12	24	3	4	..	4	1	..	..	2	2	2	2	1	..	266	302	266
February	65	25	7	..	86	3	1	..	1	16	9	11	4	4	..	2	..	..	..	2	2	1	1	..	..	237	282	221
March	83	44	7	..	82	3	3	..	..	31	13	18	10	10	1	3	..	2	2	3	25	3	1	2	..	336	361	292
April	68	84	1	1	59	..	7	1	..	25	8	10	7	7	2	4	1	3	1	15	75	3	2	..	..	369	500	288
May	77	100	7	1	91	..	1	..	3	46	5	12	7	10	..	5	1	2	1	..	35	3	2	..	..	403	444	317
June	82	110	7	..	78	3	..	..	4	39	3	5	10	2	2	5	1	3	..	..	5	1	..	..	..	354	409	322
July	72	74	5	..	94	1	..	..	7	74	11	14	11	10	3	5	..	2	..	..	..	..	..	..	..	365	335	328
August	45	87	2	1	78	..	..	..	5	70	13	11	14	10	1	1	1	3	..	1	10	3	..	1	..	342	366	394
September	23	56	..	..	73	1	..	..	10	60	14	5	5	4	1	..	1	4	1	..	3	1	..	..	..	253	318	313
October	25	48	2	..	102	6	..	..	2	52	14	10	8	6	..	4	2	4	2	2	1	2	..	1	..	279	333	281
November	25	56	2	..	116	2	..	..	4	49	10	8	8	6	..	4	2	2	2	..	3	2	..	1	..	295	307	266
December	25	70	14	1	96	3	..	..	..	38	13	10	10	6	..	9	..	..	..	..	3	2	2	1	..	291	246	364
Totals, 1938	662	786	57	7	1,031	24	20	2	36	522	125	138	138	74	10	46	6	21	7	23	161	21	3	8	..	3,790	..	..
Totals, 1937	924	599	45	10	915	13	557	208	42	329	113	185	185	75	12	44	9	32	3	37	19	26	2	4	..	4,203	..	..
Totals, 1936	1,152	513	58	3	934	12	87		77	291	95	121	121	97	15	49	6	20	7	32	62	15	1	4	1	..	..	3,652

TABLE B.—NOTIFICATIONS OF CASES OF NOTIFIABLE DISEASES BY HEALTH DISTRICTS FOR YEAR ENDED 31ST DECEMBER, 1938.

Name of Disease.	Northern Auckland.	Central Auckland.	Southern Auckland.	Thames-Tauranga.	Taranaki.	East Cape.	Wellington-Hawke's Bay.	Central Wellington.	Nelson-Marlborough.	Canterbury.	West Coast.	Otago.	Southland.	Totals.
Scarlet fever ..	..	69	22	8	18	2	35	95	50	200	17	92	54	662
Diphtheria ..	..	63	51	20	79	31	205	273	11	13	5	1	..	786
Enteric fever—	..	..	..	..	..	..	..	..	..	..	..	..	..	..
(a) Typhoid ..	2	13	23	2	4	6	5	1	..	1	..	..	..	57
(b) Paratyphoid ..	..	1	..	..	..	1	..	..	..	1	..	..	3	7
Tuberculosis ..	17	210	42	9	28	23	85	246	20	129	25	102	95	1,031
Cerebro-spinal meningitis..	..	1	3	1	3	1	3	5	1	2	2	2	..	24
Poliomyelitis—	..	..	..	..	..	..	..	..	..	..	..	..	..	..
(a) Paralytic ..	..	1	2	..	..	..	1	1	12	..	..	1	2	20
(b) Non-paralytic ..	..	..	..	..	..	..	..	..	1	..	..	..	..	2
Influenza ..	1	..	1	..	1	3	12	9	2	2	..	3	2	36
Erysipelas ..	6	105	22	3	16	6	73	115	4	125	6	29	12	522
Puerperal fever—	..	..	..	..	..	..	..	..	..	..	..	..	..	..
(a) Following childbirth ..	1	18	11	1	7	8	16	14	4	20	4	8	13	125
(b) Following abortion or miscarriage ..	..	83	7	1	..	3	8	8	..	21	..	4	3	138
Eclampsia ..	6	14	10	1	2	4	8	8	..	9	2	7	3	74
Tetanus ..	..	2	1	1	1	..	3	1	..	1	..	..	..	10
Hydatids ..	..	3	1	..	5	1	7	3	1	19	..	5	1	46
Trachoma ..	1	1	2	..	..	..	..	2	..	..	..	..	..	6
Ophthalmia neonatorum ..	..	8	..	..	1	..	4	2	..	2	..	2	2	21
Lethargic encephalitis ..	..	2	..	..	..	..	3	1	..	1	..	..	..	7
Food poisoning ..	..	16	1	6	..	..	..	..	..	..	..	..	..	23
Bacillary dysentery ..	..	48	10	..	15	11	75	2	..	..	..	..	..	161
Undulant fever ..	..	4	2	..	1	3	3	3	..	5	..	..	..	21
Actinomycosis ..	..	1	1	..	1	..	..	..	..	..	..	..	..	3
Chronic lead poisoning ..	..	2	..	..	..	..	..	5	..	1	..	..	..	8
Totals ..	68	665	212	53	182	104	546	794	106	552	62	256	190	3,790

TABLE C.—NOTIFIABLE DISEASES IN NEW ZEALAND FOR YEAR ENDED 31ST DECEMBER, 1938, 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.
Scarlet fever	M. 10 F. 15	M. 63 F. 76	M. 94 F. 156	M. 35 F. 59	M. 23 F. 35	M. 14 F. 25	M. 5 F. 15	M. 4 F. 10	M. 1 F. 1	M. 1 F. 2	M. 1 F. 2	M. 1 F. 1	M. 1 F. 1	M. 1 F. 1	M. 1 F. 1	M. 1 F. 1	M. 1 F. 1	M. 1 F. 1	M. 231 F. 411
Diphtheria	M. 4 F. 4	M. 76 F. 74	M. 182 F. 141	M. 63 F. 63	M. 20 F. 20	M. 12 F. 46	M. 6 F. 18	M. 4 F. 8	M. 1 F. 7	M. 2 F. 8	M. 3 F. 1	M. 1 F. 1	M. 3 F. 1	M. 1 F. 1	M. 1 F. 1	M. 1 F. 1	M. 1 F. 1	M. 1 F. 1	M. 378 F. 408
Etiotic fever— (a) Typhoid (b) Paratyphoid	M. .. F. ..	M. .. F. ..	M. 2 F. 5	M. 3 F. 3	M. 6 F. 6	M. 2 F. 2	M. 5 F. 5	M. 1 F. 1	M. 1 F. 1	M. 1 F. 1	M. 1 F. 1	M. 1 F. 1	M. 1 F. 1	M. 1 F. 1	M. 1 F. 1	M. 1 F. 1	M. 1 F. 1	M. 1 F. 1	M. 34 F. 23
Tuberculosis	M. .. F. ..	M. 1 F. 7	M. 10 F. 6	M. 18 F. 18	M. 35 F. 35	M. 63 F. 63	M. 89 F. 87	M. 49 F. 49	M. 55 F. 43	M. 49 F. 34	M. 20 F. 20	M. 16 F. 16	M. 33 F. 33	M. 30 F. 30	M. 18 F. 9	M. 6 F. 6	M. 5 F. 5	M. 2 F. 2	M. 3 F. 4
Cerebro-spinal meningitis	M. 6 F. 3	M. 3 F. 2	M. 3 F. 2	M. 1 F. 1	M. .. F. ..	M. .. F. ..	M. .. F. ..	M. 1 F. 1	M. .. F. ..	M. 2 F. 2	M. .. F. ..	M. .. F. ..	M. .. F. ..	M. .. F. ..	M. .. F. ..	M. .. F. ..	M. .. F. ..	M. .. F. ..	M. 14 F. 10
Poliomyelitis— (a) Paralytic (b) Non-paralytic	M. .. F. ..	M. 2 F. 3	M. 2 F. 2	M. 4 F. 4	M. 1 F. 1	M. 1 F. 1	M. 1 F. 1	M. .. F. ..	M. .. F. ..	M. .. F. ..	M. .. F. ..	M. .. F. ..	M. .. F. ..	M. .. F. ..	M. .. F. ..	M. .. F. ..	M. .. F. ..	M. .. F. ..	M. 12 F. 8
Influenza	M. .. F. ..	M. 1 F. 1	M. 1 F. 1	M. 1 F. 1	M. 1 F. 1	M. 1 F. 1	M. 1 F. 1	M. 1 F. 1	M. 1 F. 1	M. 1 F. 1	M. 1 F. 1	M. 1 F. 1	M. 1 F. 1	M. 1 F. 1	M. 1 F. 1	M. 1 F. 1	M. 1 F. 1	M. 1 F. 1	M. 20 F. 16
Erysipelas	M. 3 F. 1	M. 3 F. 6	M. 7 F. 3	M. 4 F. 4	M. 1 F. 1	M. 13 F. 13	M. 19 F. 19	M. 15 F. 23	M. 20 F. 32	M. 24 F. 30	M. 36 F. 30	M. 20 F. 22	M. 25 F. 25	M. 15 F. 19	M. 13 F. 15	M. 5 F. 5	M. 8 F. 12	M. 1 F. 2	M. 238 F. 284
Puerperal fever— (a) Following childbirth (b) Following abortion or miscarriage	M. .. F. ..	M. .. F. ..	M. .. F. ..	M. .. F. ..	M. 13 F. 10	M. 25 F. 24	M. 39 F. 46	M. 26 F. 33	M. 18 F. 18	M. 3 F. 7	M. 1 F. 1	M. .. F. ..	M. .. F. ..	M. .. F. ..	M. .. F. ..	M. .. F. ..	M. .. F. ..	M. .. F. ..	M. 125 F. 138
Eclampsia	M. .. F. ..	M. .. F. ..	M. .. F. ..	M. .. F. ..	M. 10 F. 10	M. 23 F. 23	M. 15 F. 15	M. 2 F. 2	M. 7 F. 7	M. 1 F. 1	M. .. F. ..	M. .. F. ..	M. .. F. ..	M. .. F. ..	M. .. F. ..	M. .. F. ..	M. .. F. ..	M. .. F. ..	M. 74 F. 1
Tetanus	M. .. F. ..	M. .. F. ..	M. .. F. ..	M. .. F. ..	M. .. F. ..	M. 2 F. 2	M. 2 F. 2	M. 1 F. 1	M. 1 F. 1	M. .. F. ..	M. 2 F. 2	M. 1 F. 1	M. 2 F. 2	M. 1 F. 1	M. 1 F. 1	M. 1 F. 1	M. 1 F. 1	M. 1 F. 1	M. 9 F. 1
Hydatids	M. .. F. ..	M. .. F. ..	M. .. F. ..	M. .. F. ..	M. 4 F. 4	M. 1 F. 1	M. 1 F. 1	M. 1 F. 1	M. 1 F. 1	M. .. F. ..	M. .. F. ..	M. .. F. ..	M. .. F. ..	M. .. F. ..	M. .. F. ..	M. .. F. ..	M. .. F. ..	M. .. F. ..	M. 30 F. 16
Trachoma	M. 1 F. 9	M. .. F. ..	M. .. F. ..	M. .. F. ..	M. 1 F. 1	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. 5 F. 9
Ophthalmia neonatorum	M. 12 F. 9	M. .. F. ..	M. .. F. ..	M. .. F. ..	M. 1 F. 1	M. 2 F. 2	M. 1 F. 1	M. 1 F. 1	M. 1 F. 1	M. 1 F. 1	M. 1 F. 1	M. 1 F. 1	M. 1 F. 1	M. 1 F. 1	M. 1 F. 1	M. 1 F. 1	M. 1 F. 1	M. 1 F. 1	M. 5 F. 2
Lethargic encephalitis	M. .. F. ..	M. .. F. ..	M. .. F. ..	M. .. F. ..	M. 2 F. 2	M. 3 F. 3	M. 3 F. 3	M. 2 F. 2	M. 1 F. 1	M. 1 F. 1	M. 1 F. 1	M. 1 F. 1	M. 1 F. 1	M. 1 F. 1	M. 1 F. 1	M. 1 F. 1	M. 1 F. 1	M. 1 F. 1	M. 12 F. 11
Food poisoning	M. 5 F. 2	M. 12 F. 8	M. 8 F. 7	M. 2 F. 2	M. 3 F. 3	M. 6 F. 6	M. 10 F. 10	M. 6 F. 10	M. 7 F. 7	M. 3 F. 5	M. 2 F. 2	M. 4 F. 4	M. 2 F. 2	M. 4 F. 4	M. 3 F. 3	M. 2 F. 2	M. 2 F. 2	M. 1 F. 1	M. 70 F. 91
Bacillary dysentery	M. .. F. ..	M. .. F. ..	M. .. F. ..	M. .. F. ..	M. 1 F. 1	M. 2 F. 2	M. 1 F. 1	M. .. F. ..	M. 1 F. 1	M. 2 F. 2	M. 1 F. 1	M. .. F. ..	M. .. F. ..	M. .. F. ..	M. .. F. ..	M. .. F. ..	M. .. F. ..	M. .. F. ..	M. 15 F. 6
Undulant fever	M. .. F. ..	M. .. F. ..	M. .. F. ..	M. .. F. ..	M. 2 F. 2	M. 1 F. 1	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. 2 F. 1
Actinomycosis	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. ..	M. 8 F. ..
Chronic lead poisoning	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. ..	M. .. F. ..
Totals ..	41 34	162 179	313 325	124 157	111 194	125 262	121 265	102 183	95 146	89 97	88 86	89 64	71 45	63 40	40 23	18 15	17 15	7 4	1,674 2,116

TABLE D.—MAORIS : NOTIFICATIONS OF CASES OF NOTIFIABLE DISEASES FOR YEAR ENDED 31ST DECEMBER, 1938.

Name of Disease.	North Auckland.	Central Auckland.	South Auckland.	Thames-Tauranga.	Taranaki.	East Cape.	Wellington-Hawke's Bay.	Central Wellington.	Nelson-Marlborough.	Canterbury.	West Coast.	Otago.	Southland.	Totals.
Scarlet fever ..	1	..	..	2	..	4	..	1	..	1	..	..	..	4
Diphtheria ..	3	..	6	..	..	..	1	..	..	..	..	..	..	28
Enteric fever—	..	..	..	..	..	..	..	..	..	..	..	..	..	..
(a) Typhoid ..	3	7	29	..	2	2	13	..	..	..	..	..	..	65
(b) Paratyphoid ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Tuberculosis ..	36	15	32	8	23	..	16	15	5	10	1	2	3	219
Cerebro-spinal meningitis ..	..	..	..	..	..	..	..	2	..	..	..	..	..	2
Polionmyelitis—	..	..	..	..	..	..	..	..	..	..	..	..	..	..
(a) Paralytic ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
(b) Non-paralytic ..	4	..	..	..	..	..	..	1	..	..	..	..	1	8
Influenza ..	1	2	1	..	1	..	2	2	1	..	..	..	..	10
Erysipelas ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Puerperal fever—	..	..	..	..	..	..	..	..	..	..	..	..	..	..
(a) Following childbirth ..	4	3	7	..	1	..	3	2	..	..	..	..	..	20
(b) Following abortion or miscarriage ..	1	..	1	..	..	..	2	..	..	..	..	..	..	4
Eclampsia ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Tetanus ..	..	..	..	..	..	..	2	..	..	..	..	..	..	2
Hydatids ..	..	..	..	..	..	..	1	3	..	..	..	..	..	6
Trachoma ..	2	2	4	..	..	..	2	2	..	2	..	..	..	10
Ophthalmia neonatorum ..	2	1	..	1	..	3	..	..	..	..	..	..	..	10
Lethargic encephalitis ..	..	..	..	..	..	..	..	..	..	..	..	..	..	1
Food poisoning ..	..	9	12	..	1	..	6	5	..	..	..	..	..	33
Bacillary dysentery ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Undulant fever ..	1	..	..	..	..	..	..	..	..	..	..	..	..	1
Actinomycosis ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Chronic lead poisoning ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Totals ..	58	40	92	11	32	51	92	21	6	13	1	2	4	423

TABLE E.—VENEREAL-DISEASE CLINICS: CASES TREATED DURING THE YEAR ENDED 31ST DECEMBER, 1938.

	Auckland.		Wellington.		Christchurch.		Dunedin.		Totals.	
	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.
Number of persons dealt with for first time and found to be suffering from—										
Syphilis	54	34	15	15	18	10	10	..	97	59
Soft sore	2	..	4	..	7	..	1	..	14	..
Gonorrhœa	520	168	329	61	336	99	118	71	1,303	399
No venereal disease	161	51	64	89	26	9	12	3	263	152
Total attendance of persons suffering from—										
Syphilis	1,511	1,840	1,691	1,046	1,969	439	323	170	5,494	3,495
Soft sore	7	..	8	..	44	..	..	..	59	..
Gonorrhœa	14,769	1,933	17,994	6,507	12,677	4,394	5,150	4,083	50,590	16,917
Number of persons suffering from—										
Syphilis	652	660	626	692	492	148	87	56	1,857	1,556
Gonorrhœa	1,327	684	1,358	730	1,983	854	693	631	5,361	2,899

SECTION 3.—PORT HEALTH INSPECTION.

TABLE I.—NUMBER OF VESSELS INSPECTED DURING THE YEAR ENDED 31ST DECEMBER, 1938.

Port.	Number of Vessels inspected.	Prohibited Immigrants.			
		Infectious-disease Cases.	V.D. Cases.	Infirm Cases.	Mental Cases.
<i>North Auckland Health District—</i>					
Russell	6	..	..	..	..
Whangarei	1	..	..	..	..
Dargaville	1	..	..	..	..
<i>Combined Auckland Health District—</i>					
Auckland	359	34	27	168	3
<i>Taranaki Health District—</i>					
New Plymouth	32	..	..	2	..
<i>Combined Wellington Health District—</i>					
Wellington	127	11	19	6	1
Picton	3	..	..	..	..
Napier	5	..	..	..	..
Wanganui	1	..	..	..	..
<i>Combined Canterbury Health District—</i>					
Lyttelton	50	..	7	1	..
Westport	8	..	..	..	..
Timaru	2	..	..	..	..
<i>Combined Otago Health District—</i>					
Oamaru	4	..	..	..	..
Port Chalmers	17	1	..	..	..
Bluff	50	1	..	1	..
Totals	666	47	53	178	4

SECTION 4.—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, 1938.

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 ..	178	22	94	21	15	2	4	..	4	2
Central Auckland ..	3,456	372	3,401	372	81	19	48	4	19	..
South Auckland ..	1,119	70	968	64	36	2	33	2	3	..
Thames-Tauranga ..	64	4	64	4	7	3	7	3	..	..
Taranaki ..	129	30	104	27	9	2	7	1	1	1
East Cape ..	198	60	166	53	5	8	2	8	1	..
Wellington-Hawke's Bay	412	69	400	60	17	4	9	4	8	3
Central Wellington ..	1,721	1	1,701	1	61	1	40	..	21	1
Nelson-Marlborough ..	121	..	118	..	3	..	2	..	1	..
Canterbury ..	2,314	175	2,215	175	215	23	140	14	57	9
West Coast ..	362	61	345	59	24	8	8	4	12	3
Otago ..	1,496	267	783	76	210	7	69	1	39	1
Southland ..	235	47	139	15	67	..	23	..	15	..
Totals ..	11,805	1,178	10,498	927	750	79	392	41	181	20

TABLE 2.—SHOWING INSPECTION OF PREMISES ENGAGED IN SELLING OR MANUFACTURING FOODSTUFFS DURING THE YEAR ENDED 31ST DECEMBER, 1938.

(Excluding Inspections performed by Officers Employed by Local Authorities.)

Health District.	Inspections.		
	Number of Premises inspected engaged in manufacturing Foodstuffs.	Number of such Premises where Defects occurred.	Number of Instances Goods were "seized" or "destroyed."
North Auckland ..	521	95	1
Central Auckland ..	1,221	72	34
South Auckland ..	1,356	194	11
Thames-Tauranga ..	392	52	1
Taranaki ..	274	50	15
East Cape ..	737	250	9
Wellington - Hawke's Bay	1,321	199	75
Central Wellington ..	526	70	34
Nelson-Marlborough ..	462	39	16
Canterbury ..	711	20	1
West Coast ..	635	47	12
Otago ..	1,182	144	5
Southland ..	713	108	1
Totals ..	10,051	1,340	215

T. R. RITCHIE,
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, 1939.

HISTORICAL.

In 1904 a scheme for the medical inspection of the New Zealand State school scholars was prepared under instructions from the Hon. Mr. McGowan, but although the scheme received the approval of the medical and educational authorities the Government of the day was unable to see its way to apportion the money necessary for its establishment. Had this scheme been put into operation then New Zealand would have been foremost in the matter of school medical inspection, for the English Act making provision for the medical inspection of public elementary schools was not passed until 1907. However, in 1912 authority for the compulsory medical inspection of children attending State schools was placed in the New Zealand statute-book. Previous to that time the only regular examinations that were made of school-children in New Zealand were in respect of scholars attending some of the larger secondary schools and private schools. At its inauguration the scheme was under the jurisdiction of the Education Department, but in 1921 the control of the School Medical Service passed to the Department of Health. The late Mr. George Hogben, M.A., then Director of Education, was the keenest advocate of universal medical inspection in schools and, with the School Medical Officer stationed in Wellington, gave much time and thought to the arranging and carrying-out of the scheme at its inception.

The service began unpretentiously. The original staff consisted only of four officers (two men and two women) one stationed in each of the four main centres, and children in Standard II—that is, children averaging eight to ten years of age—were selected for routine examination. The men did not remain long in the service, and their places were filled by the appointment of two more women. The two original women were Dr. Ada Paterson, who became Director of the Service in 1923, and Dr. Elizabeth Gunn, who was appointed Director after Dr. Paterson's death in 1937, and who still holds that position.

The actual scheme of the School Medical Service, the putting of it into operation, the raising of it from obscurity to generally recognized importance was the privilege of four young medical women who controlled the scheme from North Cape to Stewart Island. The adventure of launching a new branch of State activity, very urgently needed, the satisfaction of converting suspicion into friendliness, the interest of exploring a new field of medicine was fascinating work. The travelling then was of the hardest—bad roads, slow trains, horses and traps, bicycles, or walking made heavy work, where now the travelling is done in a motor-car. Few women travelled then, and the country hotels made little or no arrangements for their comfort. Many school-teachers and even Education Boards regarded the School Medical Officer as an interfering interloper whom they would have liked to order off the premises, and tact had to be used to enter the schools amicably, but when they came to understand the nature of the work and to realize that the School Medical Officer was there to help them in matters of cleanliness and sanitation and to advance preventive medicine the visits of the medical officers were demanded and welcomed.

When this work commenced there was no office accommodation, no nurses, no clerks, yet during the year 1913, 333 primary schools were visited and 12,357 children medically examined; of these children, 7,661 were pupils in Standard II taken at routine examination, and 4,696 were special cases thought by the teachers to be suffering from some defects. That year also the heights and weights of 17,000 children were observed and recorded.

In 1916 the addition of seven school nurses to the School Medical Service was an important step. Besides assisting the medical officer at the inspection of the children, school nurses visited the parents and gave advice and assistance in connection with such matters as diet, clothing, and the treatment of minor ailments and injuries; nurses also were able in a large number of cases to follow up the reports of the medical officers and by personal contact to persuade parents to obtain medical or dental treatment where this would otherwise have been neglected.

By 1917 the medical staff had increased to seven and the nursing staff to ten, while in 1919 the medical staff numbered ten and the nursing staff fifteen. The number of schools visited in 1919 was 704, while the number of children completely examined was approximately 30,000, and a much larger number were partially examined.

With the passing of the Health Act in 1920 the officers of the medical inspection of schools branch were transferred from the Education Department to the Department of Health. This transfer took place in 1921, when the branch came directly under the control of a Director appointed to take charge of the newly created Division of School Hygiene and the staff increased to thirteen School Medical Officers and twenty-seven nurses, distributed throughout the Dominion as follows:—

	Medical Officers.	Nurses.
North Auckland	1	2
Auckland Central	2	4
South Auckland	1	2
Wanganui and Taranaki	1	2
Hawke's Bay	1	2
Wellington	1	3
Nelson and Marlborough	1	2
Canterbury	2	6
Otago	2	3
Southland	1	1
	13	27

In 1921, 1,356 schools were visited and 78,980 children examined completely or partially.

It was later decided to include in the routine examination children in the primers, Standard II, and Standard VI, so that wherever possible children should receive three complete physical examinations during their primary-school life, and special examinations were carried out when parents, teachers, or the School Medical Officer considered them necessary. Examination of kindergarten and pre-school children has also been undertaken by the service, and it is hoped that the examination of all secondary-school pupils will soon be possible so that New Zealand children will then be under medical supervision during their whole school life.

Up to 1937 school nurses carried out the necessary preparation and follow-up work in connection with the School Medical Service, but their duties are being widened to include district nursing as well as school-work, and it is by district nurses that the whole of the school-work will in future be carried out. The areas apportioned to district nurses are now being limited, and it is considered that within these areas the district nurses will be able to undertake the school work and the necessary following up. At the present time there are ninety-eight nurses undertaking school-work throughout New Zealand.

In 1938, 1,406 schools were visited and 73,419 children examined completely and 34,137 partially, making a total of 107,556 examinations.

With the opening of district health offices at Whangarei, Gisborne, New Plymouth, and Nelson school medical work in these districts was undertaken by the respective Medical Officer of Health, and the staff of the School Medical Service as at the 31st March, 1939, was allocated as under :—

						Full-time School Medical Officer.	Part-time Medical Officer of Health and School Medical Officer.
North Auckland	..	..	..	..	..		1
Auckland Central	..	..	..	..	..	2	
South Auckland	..	..	..	..	..	(Vacant)	
Taranaki	..	..	..	..	..		1
East Cape (Gisborne)	..	..	..	..	..		1
Hawke's Bay	..	..	..	..	..	1	
Wanganui-Palmerston North	..	..	..	..	..	1	
Wellington	..	..	..	..	..	2	
Nelson and Marlborough	..	..	..	..	..		1
Canterbury	..	..	..	..	..	2	
Otago	..	..	..	..	..	1	
Southland	..	..	..	..	..	1	
On extended leave abroad	..	..	..	..	..	1	
Total	..	..	..	..	..	11	4

In addition, four School Medical Officers have been appointed and will take up duty in April, 1939.

From the beginning of the service it was recognized as a fundamental principle that medical treatment must be available for every child in need of it and that adequate provision must be made for the ill-nourished and neglected. The actual scope of the examination is, of course, limited by the conditions under which it is carried out, but the large numbers examined make it possible to judge effects, incidences, and results in the mass in a way that would be impossible with smaller numbers. In the past great difficulty was experienced in providing suitable accommodation for the School Medical Officer to work in, but it is now realized that adequate facilities must be available, and in some schools special rooms are being set apart for the regular visits of the nurse and the routine examination of the School Medical Officer.

The problem of education for dull and backward children was early recognized by the School Medical Service, and in 1916 it was recommended that special classes should be formed in the existing primary schools for the training of children incapable of progressing along the beaten tracks of knowledge. Such classes have now been formed by the Education Department in many centres, and where these children are found at medical inspection the School Medical Officer co-operates with officers of the Education Department in arranging their transfer. School Medical Officers also make arrangements for the entrance of mentally backward and feeble-minded children to special schools or other institutions as circumstances indicate.

The supervision of school buildings and sanitation has always received special attention from the School Medical Service as school premises should form a healthy environment for the child. At the commencement many defects of lighting, ventilation, and heating were found in the older schools; overcrowding was common and furniture clumsy and old fashioned. Great improvement has taken place since then—all newer schools make excellent provision for ventilation, and many of the recently erected buildings are of the open-air type.

Close co-operation is maintained by the School Medical Service with the Child Welfare Branch of the Education Department, under the supervision of which are all measures for the protection of destitute and neglected children,

The medical examination of candidates for entrance to the teaching profession was carried out by School Medical Officers for the first time in 1922, when 344 candidates were examined. In 1938 some 1,133 candidates were examined, of whom 11 were rejected as medically unfit. Wherever possible a preliminary examination is given to these candidates the year before they expect to enter training college, in order that advice may be given as to the treatment of any remediable defects before the final examination at the end of the year, and to allow them to choose another occupation if they are found to be physically unfit for teaching.

The work of the service is essentially preventive and educational. This latter aspect is particularly important, as the object is to instruct the pupil while at his most impressionable age as to the principles of correct living. Many thousands of pamphlets giving advice in simple language on health topics, such as care of the eyes, care of the ears, care of the nose and throat, care of the hair and scalp, school lunches, diet, clothing, &c., are distributed annually, and many popular lectures and radio talks on health matters are given by the School Medical Officers in various districts to teachers, parents, and children.

The activities of the School Medical Service now extend over a period of twenty-five years. The work of a School Medical Officer is not spectacular taken day by day; it is only on looking back over these years that it is realized how much has been achieved:—

- (a) The percentage of children suffering from such dirt diseases as pediculosis, impetigo, scabies, uncleanliness is much lower. Where formerly in a big city school forty children would be found at medical inspection with verminous conditions, perhaps one would be found now.
- (b) There is a decreased incidence of remediable and neglected physical defect. Children with neglected septic teeth, neglected discharging ears, children so short-sighted they kept falling down because they could not see inequalities in the ground, children absolutely blocked with tonsils and adenoids were found in all schools; these conditions are not seen untreated now, except occasionally in the entrant sections.
- (c) There is improvement in general nutrition and growth of New Zealand school-children, children are taller and heavier now than when the first survey was taken in 1913.
- (d) The tuberculosis death-rate is steadily declining. It is interesting to note here that in 1928 a system was established to enable children from homes where there was an inmate suffering from tuberculosis to be kept under supervision; the school nurse visits such homes and arranges for the children to be weighed periodically and for an examination (in most cases by a specialist) to be made annually or more often if considered necessary. The percentage of contacts showing actual signs of infection is extremely small, but in these cases early diagnosis is of the greatest value in successful treatment.
- (e) The hygiene of the school has improved (credit for this must be shared with the Education Department).
- (f) There is a widely increased public knowledge of the essentials for right living, for which the health instruction received in the schools during the last twenty-five years is to a great extent responsible.

During these years also several large-scale surveys have been made and special work carried out, of which the following are instances:—

Health Camps.—In 1919 Dr. Elizabeth Gunn, then School Medical Officer at Wanganui, inaugurated the first health camp for delicate children with the object of restoring them to health. This camp for fifty children was held on the property of the late Mr. B. P. Lethbridge at Turakina, and it was with his help and the help of the Wanganui Education Board that the camps, which were held in this district until 1930, were so successful. The health-camp movement has since spread all over New Zealand and, under the ægis of the late Dr. Ada Paterson, a National Federation of Health Camps was formed in 1936 which preserved the voluntary nature of the various organizations while ensuring that the available resources were utilized to the best advantage. That the benefits derived by children from treatment in a health camp are realized by the public is to be found in the success of the King George V Memorial Appeal, which resulted in the sum of approximately £89,000 being subscribed for the establishment of health camps in various parts of New Zealand; this sum carried a Government subsidy of £1 for £1, so that some £178,000 will be available for this work.

The *Milk-in-schools Scheme*, the object of which is to make available to every child attending school in New Zealand a half-pint of milk, is the outcome of the advocacy of the School Medical Service. This scheme was commenced by the Government on the 1st March, 1937, and up to the end of that month some 70,000 children in the four main centres were receiving the ration. The scheme is extending and as at the present time this free issue of milk is available to 190,000 children, or approximately 67 per cent. of the total school population of the Dominion.

Open-air Schools.—A crusade for open-air schools was initiated and fostered by the School Medical Service. On the recommendation of Dr. Elizabeth Gunn, then School Medical Officer in Wellington, the Education Department in 1914 granted the sum of £192 for the erection of an open-air class-room at the Wellington South School.

Classes for Speech Defects resulted from the efforts of the School Medical Service.

From the beginning of its operations, the School Medical Service advocated the establishment of special school dental clinics for the curative treatment of children suffering from dental caries and a report on Medical Inspection of Schools and School-children for 1916 presented to Parliament by the four School Medical Officers states :

“ With regard to curative treatment we feel that though the existing dental hospitals are doing valuable work for school-children they are not sufficient, and that the school-children require special school dental clinics, to which they can have direct access through the recommendation of the school medical staff. There should be no delay, and no question as to private means. Many parents would gladly take their children to a school clinic who would hesitate to attend a dental hospital although unable to pay private fees. Further—and this is important—the treatment times can be arranged specially to suit school-children, and to avoid unnecessary interference with their school-work.”

Immunization against diphtheria was first carried out by the School Medical Service in 1925, when treatment by toxin anti-toxin was made available in certain endemic areas. Since that time many thousands of children have been immunized throughout New Zealand, but anatoxin is now the agent used.

Many special investigations have been undertaken, amongst which are the following :—

- (a) An inquiry into the condition of rural school-children.
- (b) An inquiry into the incidence of tuberculosis among children of New Zealand.
- (c) An investigation into the physical growth and mental attainment of New Zealand school-children was carried out in co-operation with the Education Department.
- (d) A survey of goitre incidence.
- (e) Maori and pakeha : A study of comparative health.
- (f) The posture of New Zealand school-children.
- (g) Observations on physical condition and postural deformities of New Zealand school children.
- (h) Nutritional value of milk.
- (i) Maori susceptibility to certain diseases.
- (j) Height-weight-age survey.

It has been stated that the foundation of medical work in the schools is the periodical examination of children, and although it is hoped to give School Medical Officers the opportunity for research work and other investigations the routine examination of children must remain the fundamental of the Service.

REPORT FOR THE YEAR.

Staff.

At the present time the permanent staff consists of a Director, 11 School Medical Officers and 4 Medical Officers, who in their districts are appointed to act as Medical Officer of Health and School Medical Officer. In addition, four new School Medical Officers are about to take up duty.

Many changes have taken place among the medical staff during the year. It is with regret that we record the resignations of the following officers : Dr. Helen Bakewell, who was stationed at Wellington from 1923 ; Dr. Ellen Heycock, who was at Gisborne for three years ; Dr. Helen Deem, who spent two years and a half at Hamilton ; and Dr. Adah Platts Mills, who was at Wellington for two years. Doctors Teresa Craig and Beryl Bowden accepted temporary positions on the staff for three and six months respectively, but both officers have now left the service. Our permanent staff has been augmented by the appointment of Dr. Anna Lewin to Canterbury and Dr. Muriel Rippin, who is at present in Dunedin as Dr. Grace Stevenson is abroad on twelve months' leave of absence. In February the District Health Office at Nelson was opened, and Dr. Boyd, Medical Officer of Health from Christchurch, now acts in the combined capacity as Medical Officer of Health and School Medical Officer for that district.

Advertisements for School Medical Officers in New Zealand and Australia having brought no response, applications were called for in Britain, and we have been able to secure four officers, who take up duty next year. It is hoped that we shall soon be able to obtain sufficient staff to achieve the Government's aim of giving each school-child a complete medical examination each year. While we are short of officers, little but ordinary routine work can be undertaken. Research work and other investigations, which are so necessary if the service is to develop and if full benefit is to be obtained from our efforts, can only be carried out when we have a sufficient staff. To be able to spend time in undertaking some special investigation makes the duties of a School Medical Officer more interesting and widens the scope of our work, which is preventive medicine and the care of the school-child.

In order that the greatest advantage may be obtained from a School Medical Officer and her work, each School Medical Officer must be some years in the one district. This means that she has an intimate knowledge of all her schools, the Education Board considers her a member of their staff, and

she is consulted by them continuously: the school-teachers, the parents, and the children throughout the district know her personally. The School Medical Officer is part of their daily life, and her advice is sought on many questions. Officers realize that their work is a family matter; they know all the children in the family, whether at primary or secondary school, and are consulted upon them all. The same applies to the nurses in the district. Whereas if, as has been necessary during these last few years, medical officers are moved to different districts every two or three months, the same enthusiasm and interest cannot be maintained. They lose the personal contact. It must be admitted that an officer can stay too long in one district and a transfer to a new district is sometimes a fresh incentive, but it is hoped that we shall be able to obtain sufficient staff to give each School Medical Officer a more limited area, of which she can be in sole charge, and to allow her to remain in that district for a reasonable time so as to permit her to carry out investigations relating to children as well as her routine duties.

Nursing Staff.

All school nurses except two have now come under the designation of "district nurse," and one is sorry to see the title "school nurse" disappearing. As "school nurse" this officer has performed excellent service; she has become known throughout most districts to teachers, parents, and children as the "school nurse," and it will take some long time before it is understood that all that is changed is her name. With larger staffs the district nurse in the cities will be required to undertake more preventive work as well as to continue her school duties, which are to carry out the ordinary routine work in the schools, to earn the trust and seek the co-operation of the teachers in her own schools, to be personally known by all the pupils, and herself to know at least the more delicate and the more neglected pupils and their parents and their homes.

In the country districts the use of a district nurse as school nurse is an excellent plan. It makes her work more interesting, as well as giving her an opportunity of visiting many homes which she would not do in her ordinary district work, and country people have shown their appreciation of the visits of both school and district nurses as it enables them to discuss the minor ailments of their children and the correction of such. The most important work of the district nurse or the school nurse, is the personal contact with the teachers, the children, and the parents, and unless a nurse works in the same district and has the same schools for several years on end the best results cannot be obtained. The district nurse must not have so much purely district work to do that the schools become to her a secondary consideration, for school medical work can only be satisfactorily carried out when it is possible for both the school doctor and the nurse to pay regular visits to every school.

FIGURES RELATING TO WORK ACCOMPLISHED IN 1938.

The following summary serves to indicate the extent of work accomplished during the school period, February to December, 1938:—

Schools inspected—

Of roll under 100	..	..	..	..	..	894
Of roll 100 to 500	..	..	..	..	..	386
Of roll over 500	..	..	..	..	..	126
						— 1,406

Children examined—

Complete examinations	..	..	..	..	73,419
Partial examinations	..	..	..	..	34,137
					— 107,556
Number of children notified as defective	..	..	..	..	41,890
Number of addresses to school-children	..	..	..	..	569
Number of parents interviewed	..	..	..	..	13,505
Number of lectures or addresses to parents	..	..	..	..	102

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

Number of days assisted Medical Officer in schools	..	..	..	..	1,820
Number of days spent in schools without Medical Officer	..	..	..	..	1,541
Number of days spent in home visiting	..	..	..	..	848
Number of children examined for medical schedule (H. Sch. 14)	..	..	..	..	99,453
Number of days engaged wholly in clerical work	..	..	..	..	779
Number of children re-examined after Medical Officer's inspection	..	..	..	..	25,946
Number of children examined by special request	..	..	..	..	8,259
Number of visits to homes in—					
Large towns	..	..	..	..	8,969
Small country towns	..	..	..	..	1,570
Scattered districts	..	..	..	..	1,481
					— 12,020
Number of children taken personally to hospital, &c.	..	..	..	..	319
Number of children taken personally to dental clinic	..	..	..	..	26
Number of health talks given	..	..	..	..	1,558

SUMMARY OF COMPLETE EXAMINATIONS.

				European.	Maori.
Number of children examined	..	..	..	65,782	5,039
Percentage found to have defects	..	..	..	58.98	71.12
Percentage with defects other than dental	..	..	..	34.90	36.04
Percentage of children showing evidence of—					
Subnormal nutrition	..	..	..	4.37	5.24
Pediculosis	..	..	..	0.47	8.53
Uncleanliness	..	..	..	0.73	2.14
Skin—					
Impetigo	..	..	..	0.80	3.50
Scabies	..	..	..	0.35	15.30
Ringworm	..	..	..	0.12	0.18
Other skin-diseases	..	..	..	1.46	0.69
Heart—					
Organic disease	..	..	..	0.50	0.55
Functional disturbance	..	..	..	0.74	0.83
Respiratory disease	..	..	..	0.75	1.71
Total physical deformities	..	..	..	8.38	4.19
Mouth—					
Deformities of jaw or palate, including irregularity				2.81	1.10
Dental caries	..	..	..	33.89	54.28
Extractions of permanent teeth	..	..	..	6.88	5.87
Fillings	..	..	..	56.61	16.27
Perfect sets of teeth	..	..	..	4.30	16.43
Nose and throat—					
Nasal obstruction	..	..	..	2.41	1.82
Enlarged tonsils	..	..	..	14.86	16.45
Enlarged glands	..	..	..	5.42	4.31
Goitre—					
All degrees	..	..	..	13.44	4.36
Incipient	..	..	..	9.76	3.53
Small	..	..	..	3.28	0.59
Medium	..	..	..	0.36	0.22
Large	..	..	..	0.04	0.02
Eye—					
External eye disease	..	..	..	1.39	0.91
Total defective vision	..	..	..	4.50	1.53
Corrected	..	..	..	2.52	0.18
Uncorrected	..	..	..	1.98	1.35
Ear—					
Otorrhœa	..	..	..	0.22	0.91
Defective hearing	..	..	..	0.29	0.40
Defective speech	..	..	..	0.56	0.08
Mental—					
Feeble-mindedness	..	..	..	0.25	0.24
Epilepsy	..	..	..	0.03	0.04
Other nervous defects	..	..	..	0.07	0.02
Tuberculosis—					
Total	..	..	..	0.03	0.97
Pulmonary	..	..	..	0.01	0.65
Other tissues	..	..	..	0.02	0.32

When compiling these summaries in previous years the "Percentage found to have defects" included those children who on examination were found to be suffering from such complaints as pediculosis, uncleanliness, impetigo, scabies, ringworm, and slight degrees of postural deformity and children who had had dental fillings. As most of these complaints are remediable and transient it was decided to exclude such when computing the percentage of children found to have defects. It will be noticed, therefore, that the "Percentage found to have defects" has fallen from 66.47 in 1937 to 58.98 in 1938, and that the "Percentage with defects other than dental" is 34.90, against 48.17 for 1937. It is considered that this classification gives a truer picture of the New Zealand child.

The remarks of officers indicate that the health of the children generally is satisfactory. For instance Dr. Philipps (Auckland) states: "The cleanliness of the children, both in person and clothing, is in the main extremely good. It is rare to see a child at school who is not clean and tidy. Pediculosis and scabies are more rarely met with than used to be the case ten or fifteen years ago." Dr. Eleanor McLaglan (Christchurch) remarks: "The rank and file of the children are exceptionally well, rosy, sleek, and waggish. They are mostly clean, and vermin incidence is lower than ever before."

All School Medical Officers comment on the increased interest of parents in the medical examination of their children. Dr. Gilberd, Whangarei, in the course of his report, states that "the importance of interviews with parents is appreciated, and on a few occasions one has realized how often the manner in which the details of the defects from which a child is suffering are presented to the parents determines whether or not the advice given to parents is acted upon. The success of the school examination depends to a large extent on the parents, many of whom are anxious and willing to follow the advice of the School Medical Officer." From Christchurch, Dr. Anna Lewin reports: "I noticed that in most of the schools the standard of health was good, the schools in good order, teachers and headmasters very interested in the children's health, and parents very keen to attend the medical examination."

KINDERGARTEN AND PRE-SCHOOL CHILDREN.

This is a branch of preventive medicine in which School Medical Officers have always been anxious to increase their activities, but in which, owing to lack of staff, they have not been able to do more than touch the fringe. Children of this age take much longer to examine; they must always be accompanied by their parents, and special arrangements have to be made for their examination. However, 860 kindergarten and pre-school children were examined this year, as against 335 last year; it is hoped that next year this number may be very much increased. The result of the examinations in 1938 was as follows:—

Number of children examined	..	..	..	..	..	860
Percentage found to have defects	..	..	..	..	..	58.37
Percentage with defects other than dental	..	..	..	..	..	35.58
Percentage of children showing evidence of—						
Subnormal nutrition	..	..	..	..	..	5.93
Pediculosis	..	..	..	..	..	0.23
Uncleanliness	..	..	..	..	..	0.70
Skin—						
Impetigo	..	..	..	..	..	1.05
Scabies	..	..	..	..	..	0.35
Ringworm	..	..	..	..	..	0.23
Other skin-diseases	..	..	..	..	..	1.51
Heart—						
Organic disease	..	..	..	..	..	0.46
Respiratory disease	..	..	..	..	..	1.63
Total deformities of trunk and chest	..	..	..	..	..	6.28
Mouth—						
Deformity of jaw or palate, including irregularity	..	..	..	..	..	0.23
Dental caries	..	..	..	..	..	39.30
Fillings	..	..	..	..	..	7.32
Perfect sets of teeth	..	..	..	..	..	38.02
Nasal obstruction	..	..	..	..	..	2.67
Enlarged tonsils	..	..	..	..	..	21.28
Enlarged glands	..	..	..	..	..	7.67
Goitre, all degrees	..	..	..	..	..	6.39
Ear, otorrhœa	..	..	..	..	..	0.46
Defective speech	..	..	..	..	..	0.70

SECONDARY SCHOOLS.

It is hoped to include the inspection of secondary schools as a routine of our annual programme. Where School Medical Officers have been able to undertake these inspections it has been found that they are just as necessary as among primary-school children. School Medical Officers found the experience of value, and the great personal interest of teachers and pupils alike showed an appreciation of the service and advice given. Dr. Catherine Anderson, who examined some 1,300 secondary-school pupils in the Hawke's Bay district, states:—

“The defects in the secondary group of pupils are similar to those found in the primary schools, except that the skin conditions alter somewhat. This undoubtedly is the age of acne. Although diet helps to a certain extent in clearing up acne it was noteworthy that after the prolonged swimming season some of the stubborn cases cleared completely, which appeared to show that the sea-water had come tonic effect on the skin.”

Dr. McLaglan makes the following observations:—

“Arrangements for medical examination of high schools present difficulties to their headmasters which they did not realize till they had to make them. The difficulties can be summed up under two headings—(1) room for the School Medical Officer to work in, and (2) interference with time-tables. It is rather early to dogmatize, but as a result of my observations last year I concluded:—

- “(1) That the standard of health and growth of the high-school pupil was surprisingly good.
- “(2) That their teachers took great personal interest in their pupils as individuals, both physically and mentally.
- “(3) That the standard of happiness amongst the pupils themselves was very high and that fun and recreations were fostered by their teachers.
- “(4) That it was most important to get high-school pupils' eyes tested once a year.
- “(5) That feet of all pupils should be examined, chiefly for flat-foot. Japanese canvas shoes were, unfortunately, too common evidently because of their cheapness compared to good leather shoes, which are preferable in that they are a better support and protection for the feet.
- “(6) Adolescence of Girls: Chlorosis was virtually non-existent. Katamenia was almost always normal, and its onset seemed unaccompanied by physical or even much psychological upset. Dysmenorrhœa was rare, metrorrhagia more common, and there were some cases of irregularity and an occasional case of delayed onset.”

The physical examination of 263 Hutt Valley High School boys was undertaken by local medical practitioners, and remedial exercises are to be given for those pupils showing evidence of faulty posture, flat-foot, &c. It is hoped that arrangements will be made for a similar examination to be carried out next year. The girls of this school were examined by members of the School Medical Service.

The following is the summary of the 2,487 secondary-school pupils examined :—

Number of children examined	..	..	..	..	..	2,487
Percentage found to have defects	..	..	..	..	..	62.04
Percentage with defects other than dental	..	..	..	..	..	35.10
Percentage of children showing evidence of—						
Subnormal nutrition	..	..	..	..	..	1.61
Skin—						
Impetigo	..	..	..	..	..	0.08
Scabies	..	..	..	..	..	0.04
Ringworm	..	..	..	..	..	0.08
Other skin-diseases	..	..	..	..	..	5.99
Heart—						
Organic disease	..	..	..	..	..	0.68
Functional disturbance	..	..	..	..	..	0.28
Total deformities of trunk and chest	..	..	..	..	..	10.54
Mouth—						
Deformity of jaw or palate, including irregularity	..	..	..	..	..	2.89
Dental caries	..	..	..	..	..	31.20
Extractions of permanent teeth	..	..	..	..	..	31.44
Fillings	..	..	..	..	..	74.18
Perfect sets of teeth	..	..	..	..	..	0.84
Nose and throat—						
Nasal obstruction	..	..	..	..	..	1.65
Enlarged tonsils	..	..	..	..	..	4.10
Enlarged glands	..	..	..	..	..	0.44
Goitre—						
All degrees	..	..	..	..	..	18.53
Incipient	..	..	..	..	..	9.21
Small	..	..	..	..	..	8.32
Medium	..	..	..	..	..	0.92
Large	..	..	..	..	..	0.08
Eye—						
External eye-disease	..	..	..	..	..	2.45
Total defective vision	..	..	..	..	..	10.70
Corrected	..	..	..	..	..	7.16
Uncorrected	..	..	..	..	..	3.54
Ear—						
Otorrhœa	..	..	..	..	..	0.04
Defective hearing	..	..	..	..	..	0.28
Defective speech	..	..	..	..	..	0.36

NATIVE SCHOOLS.

This year some 1,300 more Maori children were examined than last year. As has been shown on previous occasions, the Maori children show a greater percentage of perfect sets of teeth than the pakeha children, and their incidence of goitre is much less; but, on the other hand, tuberculosis and skin-disease is much higher among Maori children. The problem of Maori hygiene is receiving constant attention, and endeavours are being made by teaching in the schools and by more frequent visiting to combat the existing conditions. As sufficient medical staff becomes available for the inspection of all Native children and with the appointment of district nurses with smaller areas to permit of a more intensive campaign, general improvement in skin and chest conditions can be expected.

The following extracts from the reports of officers are of interest:—

Dr. Gilbert, North Auckland, writes—

“Most of the teachers in Native schools are doing excellent work against great and discouraging odds, and they co-operate readily with this Department in Maori welfare and health problems. The Maori children are still a problem with their high incidence of skin-disease, which is everywhere apparent with the exception of one or two schools. Obviously the fault rests with the home conditions and the parents, because the school-teachers and district nurses are untiring in their efforts to eradicate this disturbing condition. Improved housing conditions and the teaching of hygiene and sanitation in schools to the children of to-day, who will be the parents of the future, will undoubtedly help to solve this and other problems in time.”

Dr. Dawson, Taranaki—

“General improvement in the condition of the Maoris has been noticed, and we may expect this improvement to continue. The present generation of parents have been trained in our schools and most of them appreciate the benefit they have received from the improved methods of cleanliness, dieting, and other health services. Whereas the older Maori was inclined to look with suspicion on pakeha innovations, the present Maori parent is anxious to assist us in caring for his children.”

Dr. Phyllis Moir, who spent some months in the North Auckland district, states—

“Amongst the Maoris a never-ending battle against scabies and head lice is carried on with results varying according to the time and energy spent. Dental caries is an almost untouched problem in North Auckland. Maoris suffer less from dental caries than white children, but a very large percentage were affected by spongy gums, exuding blood and pus. Conjunctivitis occurs frequently amongst the Maoris. The diet of both white and Maori children in North Auckland is deficient in many respects. Excess of starchy food is a common fault. Fresh vegetables in winter are scarce and very difficult to obtain. The staple food of the Maoris appears to be bread, tea, and kumeras.”

EXAMINATION OF CHATHAM ISLANDS SCHOOLS.

It is interesting to record the results of the examination of five schools in the Chatham Islands. These schools were examined last year by Dr. Knight, Medical Officer of the Chatham Islands, and it is noteworthy that out of 142 children examined 70 had perfect sets of teeth. Fifty-two children were notified as being defective, the greatest incidence being enlarged tonsils, 33; nasal obstruction, 26; dental caries, 23; enlarged glands, 11; and impetigo, 9. Three children suffered from subnormal nutrition. The following extract from Dr. Knight's report sets out the general state of health of the children at Chatham :—

“On the whole, Chatham Islands children are surprisingly healthy—surprisingly because there is nothing like the variety of diet obtainable by children on the mainland, particularly in regard to fruit and vegetables. From my own experience I expected the fruit question to be a difficult one, and was not surprised to find that probably 50 per cent. of the children never see fresh fruit. In the matter of vegetables the position is not quite so bad, but there are, nevertheless, some children who get little enough, and I found one Native family whose diet was meat and potatoes, bread and dripping, and a little milk for all, including an infant of eighteen months. There are many children who cannot be classified under any of the given headings but who would be improved with an occasional course of, say, malt and cod-liver oil. The children showed no evidence of lack of cleanliness, and all were warmly clad. It will be seen that the chief defects are the teeth and nasopharynx.”

MEDICAL EXAMINATION OF ENTRANTS TO TEACHING PROFESSION.

The following is a summary of the examination of 1,133 applicants for entrance to training college :—

Number of applicants examined	..	..	..	..	1,133
Number with any defects of vision	..	..	..	..	172
Number wearing glasses	..	..	..	..	129
Number with defective hearing	..	..	..	..	6
Number with any past or present aural disease	..	..	..	..	6
Number with nose defect	..	..	..	..	26
Number with throat defect	..	..	..	..	76
Number with enlarged thyroid	..	..	..	..	170
Teeth—					
Number with any caries when seen	..	..	..	..	156
Number with one artificial plate	..	..	..	..	92
Number with upper and lower plates	..	..	..	..	37
Number with malocclusion	..	..	..	..	15
Number with any heart or lung condition	..	..	..	..	15
Number deferred for immediate treatment	..	..	..	..	164
Number considered as excellent	..	..	..	..	228
Number considered as average	..	..	..	..	751
Number considered as fair	..	..	..	..	119
Number accepted	..	..	..	..	1,107
Number deferred for further examination	..	..	..	..	15
Number rejected	..	..	..	..	11

The preliminary examination of prospective entrants to the teaching profession is carried out by most School Medical Officers early in the year, and although one realizes it is impossible for all candidates to be so examined the number with defects requiring attention before their medical certificates can be completed (164) is too great. Many of these require dental treatment; some Education Boards notify candidates that they must present a dental certificate of fitness at the time of their medical examination, and it would appear that this practice should be followed by all Boards. If candidates are not examined until December and dental caries is found, the completion of their medical certificate is sometimes held over for many weeks and their entry into college delayed until they are dentally fit. While speaking of dental fitness it is to be noticed that on examination 129 candidates were recorded as being fitted with artificial plates, 37 of them with both upper and lower plates.

NUTRITION.

The rate of subnormal nutrition in New Zealand children has in the last few years shown a decrease, but this year a slight increase is shown over last year's figure, the figure for 1937 being 3·52 per cent. and that for 1938 being 4·37 per cent. The difference may be accounted for by the fact that this year has been considered by School Medical Officers and teachers to be one of the worst in their experience in respect of school attendance; infectious diseases, particularly measles, influenza, coughs, and colds reduced school attendance in certain classes to less than half its usual number, and many children returned to school pale and debilitated. Nor must we forget that in former years the staff of School Medical Officers remained fairly constant working year after year in the same district, whereas this year there have been many changes in the personnel of the examining officers, and it is recognized that the personal factor is a big one in determining degrees of nutrition. Therefore it is not considered that the slight increase this year should be taken as an indication that the nutrition of New Zealand children is deteriorating.

School Medical Officers continue to pay special attention to subnormal nutrition and endeavour to keep before parents the essentials for optimum nutrition. All reports contain special reference to this subject, of which the following are extracts:—

Dr. McLagan.—"There is scope for extensive work on the study of causes of malnutrition. Apart from obvious defects (such as septic tonsils) when such generally recognized factors as irregular life, insufficient or injudicious feeding, lack of sleep, of fresh air, of bathing, removal from unhappy or too fussy domestic atmosphere, are eliminated as at a health camp, the majority, especially the youngest ones, respond immediately. But there is a residue that does not respond; there is scope for research in this residue. Such conditions as latent T.B., chronic appendicitis, or pyelitis must first be eliminated."

Dr. Champaloup (Wellington).—"A considerable amount of poor nutrition exists in this district, which appears unfavourably in comparison with some other areas. It was noted in 1937 that Wellington Central compared unfavourably with other school districts controlled from this office (including Hawke's Bay, Wanganui, and Nelson). This view is supported by the more debilitated appearance of Wellington children at Otaki Health Camp in comparison with admissions from other districts. There is a preponderance of boys over girls in the applications for admission to the health camp, applications being received for 151 boys and 119 girls. This discrepancy raised the question as to the relative standard of nutrition in the sexes. Accordingly statistics have been kept separately for boys and girls. These are available for a limited number only, but serve to indicate that girls show some superiority. Returns on the medical examination of 2,700 children in the Wellington district are as follows:—

						Boys (1,350). Per Cent.	Girls (1,350). Per Cent.
"(1) Superior	..	..	..	..	..	13·0	19·2
"(2) Average	..	..	..	..	..	75·7	73·3
"(3) Poor	..	..	..	..	..	11·2	6·8
"(4) Excess	..	..	..	..	..	0·6	0·6

"These figures, pointing to a poorer state of nutrition amongst boys, are an indication for further inquiry, and suggest the desirability of allocating a higher proportion of health-camp accommodation for the use of boys."

Dr. Dawson (New Plymouth), writes: "In spite of a severe epidemic of measles, there is an improvement in the nutrition of the children, which is attributed to the supply of milk. Children supplied with milk no longer make inroads into their lunch at playtime, at lunch-time consuming a full lunch instead of the fragments left over from playtime."

Dr. Mary Wilson (Auckland).—"There is still too large a percentage of children having a diet containing excess carbohydrate and partial deficiency vitamins, but I consider that each year there is a gradual improvement and more families are realizing the importance of proper food. The correct food does not depend upon the income of the family as much as upon the knowledge of the parents in regard to food values. There is still a large proportion of parents who have the knowledge of food values, but fail to realize the importance of those values in every-day routine."

Dr. Helen Deem (Hamilton) gives a table showing the nutrition of 3,060 children and shows that 2,656, or 86·6 per cent., are normal, and adds that this finding does not necessarily mean that the existing nutrition could not be improved by better feeding, better home management, better school furniture and less crowding in the schools, and a better system of physical education. She found that share-milkers' children compared unfavourably with other country children.

An investigation is being made by the Medical Research Council of New Zealand into the vitamin content of New Zealand foodstuffs, and the result of their investigations will add considerably to our knowledge of the value of our diet.

view of this state of affairs I advised some of the headmasters to distribute the milk an hour earlier, and where this has been done no further complaints have been made. The beneficial effects of milk are reflected, especially in members of large families and those in the poorer districts, by general improvement in health, clearer complexion, and general alertness. In some of the better districts where an adequate amount of milk is being taken at home parents have stopped their children from taking milk at school owing to the excessive increase in weight."

Dr. McLagan.—"School milk has undoubtedly done much good. The trend of the times, the frequent discussions in the newspapers, the obvious improvement in pupils' physique, and the provision of school milk have all stimulated the teachers' interest in the physical well-being of their pupils. This interest should be fostered."

Dr. Deem.—"I have found that at schools where the teachers are genuinely interested in the physical well-being of the children they can do a great deal towards making the children drink the milk, and the percentage of children taking milk at these schools is markedly higher than at the other schools. At the schools where malted milk is being given practically all the children take the milk. The malted-milk scheme has now been in progress for eighteen months, and the teachers and children manage it without any difficulty."

Dr. Dawson.—"During the winter months some little difficulty was experienced in getting children at some of the schools to take the milk on account of its coldness, but this was soon adjusted, in some cases by placing the boxes containing the milk on the hot pipes or by using the milk to make cocoa."

HEALTH CAMPS.

Health camps continue to play a large part in the care of delicate and debilitated children, last year over two thousand children receiving the benefit of treatment in the many camps held. The medical inspection of these children before they can be admitted to camp entails much preparation and hard work. Most of these examinations are carried out by the School Medical Officers, but in some districts the work is voluntarily carried out by the local medical practitioners.

Camps were held throughout the Dominion, and the various organizations responsible for their conduct are to be congratulated upon the excellent results obtained. It is by the efforts of these disinterested people that this work has been carried on so successfully in the past, and it is to be hoped that their future efforts will meet with the same response. We look to the public, therefore, to support these organizations, without which the health-camp movement would cease to exist.

The plain, well-cooked food, with plenty of milk, plenty of rest and sunshine, and the orderly and disciplined routine of a health camp improves the children not only by an increase in their height and weight (which is attained by almost all the children), but in their happier and more sensible outlook, by the companionship of other children, the giving and taking. Spoilt only children discover there are other children in the world and become good campers. The rests after meals, the sun-bathing, the jobs about camp, the routine of regular meal-hours and regular hours of sleep in well-ventilated open-air sleeping-quarters with no wireless should illustrate to parents, teachers, and the public what children do under such conditions. Every New Zealand home could be a health camp. The children get in camp nothing that the average home in New Zealand cannot provide—rest, sunshine, good food, plenty of milk, long hours of sleep at night in well-ventilated and quiet rooms.

DENTAL CARIES.

All School Medical Officers comment on the excellent work done by the dental clinics in the preservation of the teeth of the younger children, but they all regret that although most of the children in the Fifth and Sixth Standards have had the benefit of continuous attention at dental clinics there is a great amount of dental caries amongst them. It should be incumbent upon parents to see that their children follow up this treatment when they are no longer eligible for attention at a dental clinic. It is a great pity that it is not possible to demand from parents that if their children have the advantage of dental-clinic treatment in the earlier years of their life they should follow up this treatment when the children are older. Parents should realize that when children leave the dental clinic as dentally fit constant attention by a dentist, say every six months, would mean very little expense in a year, whereas if they leave the child for two or three years, when dental caries has become firmly established, the cost of treatment becomes a serious matter and in many cases children of fifteen or sixteen are recommended to have all their teeth extracted.

In discussing this subject, *Dr. Philipps* states:—

"The shocking state of the teeth in New Zealand is hardly realized except by those who, like school doctors and dental nurses, see children in the bulk. The ordinary citizen is aware that A and B have very bad teeth, but he looks on them in a detached way, almost regarding them as isolated cases, and does not realize that they are in reality specimens of the general population. How many young adults have lost all their teeth and been fitted with artificial dentures—there are no statistics."

DIPHTHERIA IMMUNIZATION.

Diphtheria immunization was carried out in a more extensive manner than previously, and it is hoped that at least all the younger children in New Zealand will ultimately be protected against this disease. *Dr. Catherine Anderson* continued her campaign in Hawke's Bay, and *Dr. Platts Mills* spent some weeks in Taranaki inoculating children in eight schools. *Dr. Turbott* and *Dr. Deem*, in the South Auckland district, spent considerable time immunizing children in this area, and a detailed account of their work will be found in the appendix to this report.

INFECTIOUS DISEASES.

Throughout New Zealand last year there was an epidemic of measles, and in most places it would appear that there were two epidemics at the same time—true measles and German measles. This led to considerable confusion, parents and teachers considering children were having two attacks of measles when almost certainly they were having one followed by the other. Dr. Champtaloup reports that prophylactic treatment was offered in the more congested residential area of Wellington. Forty-two young child contacts (ten months to five and a half years) were given prophylactic injections of adult human serum for the purpose of producing an attenuated attack of measles. Treatment was given if possible before the sixth day after exposure to infection (two days after rash of first case), but was given up to the tenth day. The subsequent sickness of these children was compared with that of immunized controls from the same families, observations extending over a period of three months. Recovery was more prompt in the immunized and there were no serious complications, while five children of the unimmunized were seriously ill with pneumonia with one death. Dr. Gilbert states that “the measles which became epidemic was of a very toxic type; altogether there were 77 deaths of Maori and pakeha children up to the age of fifteen years in the North Auckland district. Many complications followed the measles, and a large number of children became so debilitated that it has taken months to regain their health.”

In addition to the measles, there have been mild epidemics of various non-notifiable diseases such as chicken-pox, whooping-cough, colds, &c.

PHYSICAL EDUCATION.

In February Physical Fitness Week was held throughout the Dominion, and an endeavour was made to get all children to take part in the many activities planned. Facilities were provided for all branches of sport and games as well as physical exercises, and every encouragement given to the children to participate in that activity best suited to their individual needs. That the week was a success is to be seen from the report of Dr. McLaglan, who states that Physical Fitness Week did for the average child what the health camp does for the child below par; she adds, “But there is still something wanting—some snap or verve.”

Dr. Irwin states:—

“The posture of children shows a satisfactory condition, and I am sure is improving from year to year. The institution of February as a month for outdoor activities seems particularly valuable, especially in the southern areas where the sunshine comes seldom. There are few observable cases of scoliosis and lordosis, and round shoulders seem less than formerly. Swimming, I feel sure, is an important help; also I think the mass drill is more stimulating and interesting to the children.”

Dr. Anderson reports:—

“No provision is made in any school in my district for drill when the weather is wet, windy, or too hot. In some playgrounds large areas of concrete are laid down so that there will be space available in the winter for drill and assembly, but in the summer-time it is difficult for them to use it on account of the glare. Drill, therefore, in the ordinary sense of the word is not consistently taken. The posture of the children is, on the whole, decidedly bad. It would appear to me that if nothing were done in the way of exercises for a whole year except to teach children to stand straight and walk and breathe properly much valuable work would have been done.”

Dr. Mulholland:—

“Whether posture is good, bad, or indifferent depends, I think, upon the interest displayed by both parent and teacher. Some parents do make an effort to correct the faulty posture of their children, but the majority are indifferent. In all cases where I have found generally good posture, and unfortunately these are few, an enthusiastic and interested teacher has been responsible. Two outstanding examples of this have been brought before my notice this year. At one school a full-time physical-culture instructress is responsible. Where gross postural defects occur individual and special classes are necessary to remedy defects, and this practice has been successfully adopted. The earlier the habit of good posture is acquired, the better for the child.”

Dr. Mary Wilson worked in active co-operation with the Headmaster of the Remuera School, where the children were placed on a special physical-education programme and an experiment carried out to show the effect upon groups of children of—

- (1) Quarter hour formal drill daily.
- (2) Quarter hour organized games daily.
- (3) Quarter hour having no activity whatsoever.

The children were grouped by Dr. Wilson according to (a) physical defects and (b) nutrition. There were twelve children in each group, four of whom were classed as good physical specimens, four suffering from some physical defect, and four with subnormal nutrition. The children were regularly examined and visited during the year. At the end of the period the drill group was easily picked out by Dr. Wilson for their excellence of posture and general deportment; they showed an alertness and brightness which was splendid to see and they responded in a smart manner to a word of command; there was a sense of rhythm and co-operation not found in the other groups. The second group played games during the period set aside for physical instruction; this included practice in ball sense training, running, passing, throwing, catching, &c., and a period devoted to a game. Although the children

in this group had been given an intensive course of postural training the previous year, after their seven months of games their posture, lordosis and drooping shoulders were very much in evidence; this shows that games alone will not maintain that upright easy posture which is so desirable. The "No activity" group showed poor posture at the final examination; of the three groups this group produced the worst physical appearance. The games group ran them a good second for poor posture, while the drill group was outstanding for deportment.

It would appear, then, from this experiment that physical instruction in schools should include definite training in posture which can only be given in formal drill. Games do not produce the desired effect. There are many muscles of the body which are not exercised in the average game. Timing and rhythm, so necessary for good muscular co-ordination, must in most cases be encouraged by formal drill performed to music. The ideal time-table would include thirty minutes physical instruction at least per day. The formal drill period should be no less than fifteen minutes. It is desirable that each class should have its own drill time—*i.e.*, when the playground is free—so that it can have use of playground space, gramophone and records, and apparatus (mats) for ground work when other classes are not using them. Then for the other fifteen minutes daily the class can do dancing, organized practice for team games, or mass drill. This time-table would provide sufficient training in deportment and does not forget the pleasure derived from the other recreational types of physical activity.

ACKNOWLEDGMENT.

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

ELIZABETH GUNN,
Director, Division of School Hygiene.

PART IV.—HOSPITALS.

INTRODUCTION.

HISTORICAL.

The founding of the Colony of New Zealand in 1840 brought with it an early realization by the white settlers that there was necessity for the organized establishment of places for treatment of ills both of Native and white people.

The collecting of authentic information regarding the earliest steps taken in this direction has been attended with some difficulty. Many valuable Government papers and public documents which may have thrown more light on attempts made were lost in the wreck of the "White Sean" when she was conveying the appurtenances of Government to Wellington in 1865 on the removal of the seat of Government from Auckland. This, in some measure, has had the effect of making it difficult to obtain a sequence of events.

It is, however, evident that in 1840, both at Kororareka, in the Bay of Islands, and at Wellington, the establishment of hospitals were considered.

On 19th June, 1840, a public meeting was called at Kororareka for the purpose of discussing the establishing of a general hospital. Captain Hobson, it would appear, was in favour of Russell, but did not wish to offer opposition to Kororareka. In spite of the support of the clergy and the willingness of the Government to assist, the attempt proved abortive.

Dr. J. Fitzgerald, who came to settle in Port Nicholson, was the first of the medical profession to stress the urgent need of such an institution being established in New Zealand. Speaking on this matter, he said :—

"A powerful reason apart from the fast increasing population, which should have weight, is the benefits that such an institution might extend to the Natives, who certainly have a claim on the cause of humanity, for it is truly deplorable to witness the frightful ravages disease has among them."

At this time the only provision for sickness was a temporary infirmary humanely provided by the New Zealand Land Co. for the reception of those members of their staff in need of medical attention.

In July, 1841, mention is made in the *New Zealand Government Gazette* of the appointment by the Government of the first Colonial Surgeon, with Auckland as his headquarters. Apparently there was some institution in existence, for European patients obtained admission by applying to the Colonial Secretary, who was the only person having this authority. In the case of Natives it was different; all that was required of them was to present themselves at the institution. Seamen off merchant vessels visiting the port were often treated for fractures and trusions, though more commonly for delirium tremens, but the majority of patients in the early days were working-people, and, although a nominal hospital fee of 1s. 6d. per day was charged, it was not until 1860 that even the small amount of £30 was collected for one year's maintenance. All convalescent patients were expected to assist with ward duties and the serving of meals, under pain of dismissal.

The Municipal Corporation Bill, passed in Auckland in July, 1842, embodied a useful clause which made it necessary that the good order, health, and convenience of the inhabitants be provided for. Leading citizens then interested themselves in the welfare of their sick, and for this purpose called a public meeting on 10th November, 1842, when Lieutenant Willoughby Shortland took the chair. The idea of establishing a mixed hospital gave rise to much discussion, the propriety of providing for the reception and entertainment of Maori patients being the stumbling block. It was then decided to form a committee, from those present, to go into the question thoroughly. The acting Governor, anxious that provision be made for both sections of the community, promised to donate twenty guineas to a fund, if such were established, "for the purpose of founding a dispensary and hospital, and affording surgical assistance to all classes of Her Majesty's subjects in New Zealand."

In 1844 the necessity of some organized establishment in which the Natives could be treated for their ills must have been felt by some of the Maori Chiefs, for in April, 1844, Jabez Bunting, Kati, and several other leaders petitioned the Governor to assist them to improve the conditions of their people by founding English hospitals.

It was not, however, until 1845, when Lieutenant-Governor Grey was appointed, that the matter of providing for the welfare of the sick was again considered by the Government. Captain Grey, who was a great friend of the Maoris and beloved by many of them, offered material support to a scheme for providing mixed hospitals throughout New Zealand, as he considered that such institutions would have a beneficial effect on the Natives.

Consequently it was due to Governor Grey's efforts, which were at first criticized by many, that in 1846 the Government consented to grant sufficient money for the erection of hospitals in each of the four centres—Auckland, Wellington, Wanganui, and Taranaki—for the treatment of sick and destitute Europeans, and free treatment for all Natives.

On 11th November, 1846, the foundation stone of the first of these institutions was laid by the Superintendent of the province on a Native reserve at Thorndon, Wellington. Tenders for the erection of a hospital at Auckland Park were first called on 10th October, 1846, but it was not until 4th January, 1847, that they were finally accepted.

In 1847 the Auckland Hospital was founded and administered by the General Government of New Zealand. The internal management of the institution was placed in the hands of a medical officer appointed by the Governor as Colonial Surgeon at a salary fixed by the Legislative Council. All expenses incurred in the administration of the institution were met out of general revenue, with the exception of a small rental derived from endowments.

It is interesting to note that during 1848, 158 Maori patients, coming from places as far distant as Rotorua, Tauranga, and Hokianga, were nursed side by side with Europeans. The free dispensary at Auckland was much appreciated, especially by the Maoris, whose ills to a great extent did not warrant admission to the wards. Returns for this year show that 376 outdoor Native patients were treated. These early results were very gratifying to Governor Grey, who, writing on the subject, said: "Notwithstanding the doubts of some as to the practicability of the plan of mixing Natives and Europeans in the same wards, it cannot be denied that it has been carried out as certified by the medical officers with perfect and satisfactory results."

The present-day citizen of Christchurch, when viewing the imposing block of buildings comprising the Christchurch Hospital, finds it rather difficult to imagine how the infant city, during the first ten or twelve years of its existence, managed to do without such an essential institution. True, the population was small and, for a time, Lyttelton was of greater importance. But by 1st March, 1851, twelve hundred persons had arrived by the ships that constituted the first expedition under the Canterbury Association, and each month saw an increasing number of immigrants arriving. Evidence of the greater importance of Lyttelton in the early years of the settlement is given by the fact that the seaport actually possessed the first hospital in the province. Strange as it appears to present-day readers, patients were conveyed from Christchurch to the Lyttelton Hospital; at any rate, an entry dated 1853 has been found setting out that a Mr. Wheeler received the sum of "£2 for conveying a sick man from Christchurch to the Lyttelton Hospital."

It is recorded that the first Dunedin Hospital was erected in 1851 on ground in the Octagon. An early writer states that, like the gaol of that city, it was ahead of its time, as for over two years not one of its beds was occupied. It was turned to a use never dreamed of. Three insane persons had to be cared for, and so the first hospital in Dunedin became the first asylum.

With the discovery of the goldfields in 1861 and the influx of immigrants the demand for hospital accommodation increased. It is related that the strain became severe, and during the next few years building after building was erected and beds totalling 210 were provided.

In 1875 the Otago Medical School began its classes, and this gave Dunedin Hospital a position of prominence and unique importance amongst hospitals of the Dominion.

The final and effectual grant of the constitutional system of Government was established by the Act of 30th June, 1852, which subdivided the colony into six provinces—Auckland, Taranaki, Wellington, Nelson, Canterbury, and Otago. The Constitution was promulgated on 6th September, 1853.

The control of hospitals was not vested in the Provincial Councils until 1854, when the General Government passed the Public Reserves Act, transferring hospital endowments to a Board of Commissioners.

In 1856, doubts having arisen as to the validity and effect of the three Crown grants, the Provincial Government passed the Validating Act whereby the Superintendent of the Province of Auckland assumed the control and management of both the hospital and its endowments.

That the Christchurch Hospital did not take actual form till 1862 through any lack of foresight is abundantly clear.

In Auckland a Sick and Destitute Act was passed, and came into operation on 3rd July, 1868. The electoral districts of Auckland constituted the twenty-eight districts for the purpose of the Act, and all male residents of twenty-one years or over were rated 10s. annually. Maoris were exempt, and Europeans unable to pay were granted exemption by a Justice or a member of the Council. Money collected under this Act was paid into the Provincial Treasury as a separate account, called the "Sick and Destitute Fund."

The Act for the abolition of the provinces was passed on 12th October, 1875, but it was not until 1st November, 1876, that the provincial institutions came under the control of the General Government, and this meant a change in the administration of the hospital.

On 1st November, 1876, the General Government took over the control of the hospitals in New Zealand.

During the next few years the General Government found itself the last appeal of all impecunious and embarrassed bodies concerned in the management of charitable institutions. Demands were made for financial aid such as could not in many instances be well refused, but which were still a constant source of irritation to those in charge of the Treasury. The demands naturally increased as grants made in any one direction impressed other committees with the comparative ease of an appeal to Government in contradistinction to the difficulty of procuring funds through local voluntary subscriptions. So many local interests were involved that the task of legislating to provide adequately, and yet economically, for hospital maintenance was not easy.

The first attempt to put the hospitals under districts supported by the contributions of local bodies instead of leaving them in the hands of voluntary subscribers and the central government appears in sections 24 to 27 of the Abolition of the Province Financial Arrangements Bill, brought down by Sir Julius Vogel in 1876, to make provision for carrying on the services of the provinces when abolition took place on 29th September of that year. This Bill was, however, withdrawn after its first reading following on Sir Julius Vogel's resignation from the premiership to take up the position of Agent-General in London.

The hospital question next became prominent when a Charitable Institutions Act was presented to the House in 1877 by the Honourable Donald Reid, Minister of Crown Lands. It denied the principle of local-body control altogether, and was withdrawn after a spirited and lengthy debate occupying two days. Mr. Rolleston, Avon, in advocating the state and municipal system, opposed the Bill. The first hospital districts as we know them now was the result of a conference, probably the first conference on hospital matters in New Zealand. This conference took place at the instigation of Mr. Vincent Pyke, Chairman of the Vincent County Council, between that Council, the Borough Councils of Cromwell and Clyde, and the Municipal Corporation of Alexandra. As the result of it the first two hospital districts in New Zealand were formed, based respectively on the hospitals of Dunstan and Cromwell. The control of these hospitals was left in the hands of the existing committees elected from subscribers, but the finance was arranged as at present. Voluntary subscriptions with Government subsidy £1 for £1, the deficit being made up by the contributing local bodies and the Government in equal shares. This is the true beginning of our present system of finance. Mr. Ballance, the Colonial Treasurer, at that time assured Mr. Pyke that it was the Government's policy to have similar hospital districts throughout the colony, but only in a few districts in Otago and Westland would the local bodies or the committees of the hospitals accept it.

As a result, however, of this movement the question became a burning one, and there were two large conferences of municipalities and the counties respectively held in Wellington in the last days of July and the beginning of August in the same year (1878) to discuss the question. The Atkinson Government had been replaced by the Grey Government the previous year, so that the Hospitals Commission to go into the whole question that the former had promised when the Charitable Institutions Act of 1877 was withdrawn was not set up. Parliament was getting impatient at the existing unsatisfactory state of affairs, and the conference of local bodies was convened in order to give a lead in regard to the best methods to adopt. We can imagine the city and country farmers of these early days gathering here in Wellington full of indignation at the centralization proposals which would compel them to co-operate with other counties to form hospital districts at all, and the equal indignation of the different hospital committees who resented any part of the control of their institutions being vested in a district board. Colonel Whitmore, the Colonial Secretary, soon realized that this conference would not help very much, and issued a rebuke in the Legislative Council in which he said:—

“In a few days the mind of the municipal conference would be patent to the Legislative Council, and he had no reason to believe the findings of the counties' conference would differ from it. The idea seemed to be practically ‘Do anything you like, but do not ask us to pay the money’.”

In the face of this, Ballance, who was then Colonial Treasurer, decided not to bring down any Hospitals Act as the opposition was too strong, and contented himself with four clauses in the Financial Arrangements Bill (sections 5 to 8), in which he recognized two systems as a compromise—(1) those hospitals which preferred to be supported by the Government, in which the latter would control the institution and simply deduct the cost from the local-body subsidies, and (2) those where the hospital was locally controlled and the Government subsidized £1 for £1 the contributions of local bodies and voluntary subscriptions.

The latter principle, which is the one in existence at present, was thus put on the statute-book in 1878 for the first time, and not in 1885 as generally supposed; indeed, it had been optional for local bodies to work under it in virtue of an Order in Council from the beginning of the year 1878, and, as we have seen, the Central Otago local bodies had put it in force at that time.

Meantime the passage of time had brought the Hall Government into existence, and there was no one who worked more insistently than Mr. John Hall to bring about some rationalization of the hospital system. He brought down Bills in 1879 and 1880, but the opposition of local bodies was again so strong that the Government would have been in danger if the Bills had been pressed, and they were both withdrawn after the first reading.

The Bill of 1879 was the first occasion on which it was laid down that charitable aid should be associated with hospitals. Previously it depended entirely on voluntary subscriptions. The only move made to stop the hospital drift at this time when the Consolidated Fund was supporting the institutions without any effective voice in their control was the appointment, on 3rd March, 1880, of the first Inspector of Hospitals in the person of Dr. F. W. A. Skae, M.D., F.R.C.S.E., who combined this post with that of Inspector of Lunatic Asylums. The idea was that Dr. Skae should inspect and report on all hospitals to the Government; but he died shortly after taking over the position, and the matter remained where it was. Indeed, the first report on New Zealand hospitals was made in 1882, based on the records of the years 1881 to 1882. In the interregnum between the death of Dr. Skae and the appointment of his successor, Mr. Loveday, of the Colonial Secretary's Office, presented the report based on an extensive questionnaire to the secretaries of all hospitals.

Mr. Hall again introduced his Hospital and Charitable Institutions Act, in the year 1881, and this time it reached the Committee stage after prolonged debate, only there to suffer the fate of its predecessors.

In introducing the Bill Mr. Hall made the significant statement that there was extreme difficulty in convincing the different districts that the scheme was in any way suitable to them.

He advocated large districts, as this was necessary to prevent patients passing over into the neighbouring district with the resultant disputes in regard to which local body was to bear the charges for maintenance. However, opinion was too strong. The Premier could not get his districts without risking his Government, and the Bill was withdrawn.

The withdrawal of the 1881 Bill disheartened the Government, and Sir Harry Atkinson, who had returned to power, was so averse to anything approaching the English Poor Law or throwing charitable aid on to the rates that he contented himself with promising the introduction of a hospital system based on universal mutual compulsory assurance, but no measure was brought down.

Meantime, on the 7th November, 1882, there was appointed to fill the vacant position of Inspector of Hospitals a gentleman who had had twenty-five years experience in hospital administration in England, in the person of Dr. G. W. Grabham, M.D., M.R.C.P., Lond. It was to Dr. Grabham's initiative and energy that we owe to a large extent the improvement in the control of hospitals. One of his first task was to bring down a full and detailed report of the hospitals in existence, and it seemed evident that in the face of this illuminating but damaging report something would have to be done.

It was not, however, till the Stout Government came into power towards the end of 1884 that Dr. Grabham presented a report to the House as a prelude to the legislation of 1885. He had cast his net widely to find an existing system suitable for New Zealand, and his approval of the Ontario system as put into force by the Charities Act of 1874 was the basis of his recommendations. He also took suggestions from the management of the Chelsea Hospital for Women and the Bolingbroke Pay Hospital.

He recommended that thirteen of the thirty-eight existing hospitals be closed, that the Government subsidy consist of a fixed amount per case per day, and in the case of any hospital keeping a patient for more than six weeks the rate on which this should be based was the cost of maintenance in a chronic institution and not in an active hospital. He advocated that power be in the hands of the Government to veto suggested buildings, appointments to staffs, and to deal with all irregularities.

He added the chief difficulty in any reform would be to map out the colony into acceptable districts. Again sentiment was too strong, and not a single one of the hospitals recommended was closed as the result of the Act of 1885, as is noted with regret in the next report.

In 1885 a further attempt was made to deal with the question of hospital control, when Sir Julius Vogel introduced the Hospital and Charitable Institutions Bill. In moving its second reading, Sir Julius Vogel gave as his reasons for introducing it:—

“The necessity of settling difficulties and incongruities due to varying systems of dealing with the ‘question of hospital and charitable aid, and to different usages in provincial institutions, and the consequent excessive demands on the Government, without any of those checks which existed in provincial days.’”

He laid down as three essentials conditions to be fulfilled in the preparation of any measure dealing with the question:—

- (a) That the committees of management should be essentially local and amenable to public opinion by being made elective.
- (b) That the expense should be somewhat localized.
- (c) That the Government, out of consolidated revenue, should meet a reasonable proportion of the cost of the institutions, but should not be the last resort of each committee in financial difficulty.

On 14th September, 1885, the first Hospital and Charitable Institutions Act was passed and came into operation on the 5th October, 1885. The primary object of the Government was to cast on the local bodies responsibility for the major part of the amount which the hospitals and charitable aid cost, and thus reduce what came out of the consolidated revenue. Two-thirds of the whole was to be provided locally by voluntary contribution, or by rates, according to the necessities of each district, and a subsidy of 10s. to the pound was to be the contribution of the general Government. Local taxation was thus materially increased, the only chance of lessening it being by an increase of voluntary contributions. As a set-off to this the local bodies were to elect the district boards of management, and so control the expenditure, the exception being in the cases of “separate institutions.”

The new Act placed the administration of New Zealand hospitals and charitable aid upon an entirely new basis, that on which they have rested ever since. The colony was divided into districts, each comprising a number of countries and boroughs, town districts, and road districts, situated within their boundaries. For each of such districts a Hospital and Charitable Aid Board was constituted.

With the passing of this Act the Hospital Committees vacated office to give place to representatives of local bodies of the district, upon whom the financial responsibility for the maintenance of the hospital and the arrangements for its management was then thrown. These members were to be appointed annually to the Board.

In the Act of 1885, however, the system of local-body control was established, under which, in many instances there was the anomaly of several Boards dealing with hospital and charitable matters in the same district—*e.g.*, in Wellington we found the Wellington Hospital Board, whose province was to find the money by way of levy on contributory local authorities for the Wellington Hospital. There was also the Wellington Hospital Trustees, a separate institution controlling the hospital, who, however, had the power to requisition upon the Hospital Board for grants. Then there was the Wellington-Wairarapa United Charitable Aid Board, which in turn drew upon the contributory local authorities for charitable-aid purposes in the Wellington and Wairarapa Districts; and they in turn were requisitioned upon by the Wellington Benevolent Institution, who had the administration of the Ohiro Home and of outdoor relief in Wellington. Under this Act all money raised by levy by the district Boards, whether for capital or for maintenance purposes, carried a Government subsidy of

£1 for £1. In other words, after deducting the voluntary contributions and the subsidy thereon, and patients' payments, the Government paid half the net estimated deficit in the amount required for the administration of hospitals and charitable institutions and the provisions of out-door relief, the remaining half being raised by rates.

The Acts of 1885-86 were tentative measures, and those introducing them acknowledged this freely, anticipating that experience would in a few years lead to rearrangement. The Government wished for a solution to the then pressing financial difficulty in connection with the hospitals by an apportionment of the expenses of management fair to all parts of the colony, and in this the Acts were a success.

However, the idea of supporting hospitals by voluntary contributions failed absolutely. The year previous to the Act (1884) the amount of voluntary contributions for New Zealand hospitals was about one-fourth the amount contributed from public funds; in 1903-4 it was one-fourteenth.

Another section of the Acts (1885-86) which gave rise to unfavourable comment was the possibilities of mismanagement in uncontrolled boards. Having fulfilled the main purpose of providing financial support, it was urged by many that further steps be taken to provide more efficient management, and thus supply a desideratum of national importance.

In 1886 the Hospital and Charitable Institutions Amendment Act was passed, giving power to two or more hospitals to join into a "united district" and control their own affairs.

Dr. MacGregor was appointed in 1886, and his reports from then onwards cry to high heaven against the iniquities and extravagances permitted by the Act of 1885 and its 1886 amendments. He advocated the closing of hospitals and the reduction in status to cottage hospitals of others. He inveighs against the multiplicity of local bodies that rendered decentralized control an impossibility and administration a farce, but in vain.

At last an improvement was to be effected in the contribution of the Hospital Boards. The Hon. George Fowlds presented the Hospital and Charitable Institutions Bill on 6th November, 1906, and, although many clauses were deleted, it had the effect of giving something like a continuous policy, so necessary for success, yet so impossible under the system of annual elections. This Amendment was passed the same year, giving the Board control of all trust properties, and extending the term of office for members to three years, when all must retire, but were eligible for re-election. It had been hoped by some promoters of the Bill that only a certain proportion of members should retire annually in rotation, but in this point they were unsuccessful. The first Board took office under these conditions in April, 1907.

Dr. MacGregor died, and the mantle fell upon Dr. Valintine, who presided at the 1908 conference and whose telling advocacy for reduced districts and base hospitals cannot be bettered to-day.

It was not until twenty-four years after the first Hospital and Charitable Institutions Act that an amendment whereby the controlling Boards were made elective was passed. The first election under this Act was held in Auckland on 16th March, 1910. By this system, which is operating successfully at the present time, each borough or district elects a member, representation being given on a population basis. Several amendments based on the result of experience have been passed in later years, and the present law relating to the subject is embodied in the Hospitals and Charitable Institutions Act, 1926, as amended in 1928, 1929, 1932, and 1936.

The above survey has been obtained from articles by Dr. Campbell Begg, and others, publications, Government Gazettes, early newspapers, and information supplied by Hospital Boards.

REPORT FOR THE YEAR.

HOSPITAL BUILDING ACTIVITIES.

The Division has been much occupied with building proposals for the various Hospital Boards.

Southland Hospital Board.

Kew Hospital.—Plans and specifications have been approved for the erection of a workshops block. The reconditioning of the present tuberculosis block is at present under consideration.

Riverton Hospital.—Proposals for a new laundry, boiler-house, and morgue, and alterations to provide accommodation for nurses, are being considered.

Gore Hospital.—Sketch plans for a children's ward have been prepared.

Vincent Hospital Board.

Building operations for extensions at Clyde Hospital and the new hospital at Cromwell have been commenced.

South Otago Hospital Board.

Balclutha Hospital.—Plans and specifications for additional nursing and domestic accommodation have been completed.

Otago Hospital Board.

Dunedin Hospital.—Additional land has been acquired to be utilized for future extensions. Final plans and specifications are under consideration for additions to Nurses' Home.

Waitaki Hospital Board.

Oamaru Hospital.—Lecture and demonstration accommodation for the training of nurses is being provided. Approval has been granted for excavation work in connection with the proposed new yard. Other works which have been considered in detail, but not yet completed, are: (1) New ward; (2) new operating theatre; (3) Medical Superintendent's residence; (4) new laundry and boiler-house; (5) additions to Nurses' Home.

South Canterbury Hospital Board.

Timaru Hospital.—The erection of the new ward block has been completed and the laundry and boiler-house are at present in course of erection.

Waimate Hospital.—Alterations are at present being made to this hospital. The theatre block commenced last year has been completed.

North Canterbury Hospital Board.

Christchurch Hospital.—Extensions to the present Nurses' Home have been agreed to. Alterations to the theatre block have been completed.

Subsidiary Hospital, Cashmere.—A competition was held to select a suitable design. Twenty-one entries were received from registered architects throughout the Dominion.

Kaikoura Hospital.—Approval has been granted for additions at Kaikoura Hospital.

Grey Hospital Board.

Greymouth Hospital.—Plans and specifications have been approved for a tuberculosis block. The new two-story ward block and additions to Nurses' Home have been completed.

Buller Hospital Board.

Westport Hospital.—Final plans and specifications are being considered for the new out-patients' block and operating theatre. Other proposals under consideration are additions to Nurses' Home and new laundry.

Westland Hospital Board.

Westland Hospital.—The children's ward, new theatre block, and the improvements to two wards have been completed.

Nelson Hospital Board.

Nelson Hospital.—Extensive remodelling proposals are at present under consideration. They comprise: (1) Replacement of ward unit; (2) provision of new laundry, boiler-house, and stores block; (3) erection of a new Nurses' Home; (4) Medical Superintendent's residence.

Temporary accommodation is being provided for nurses as a result of a section of the Nurses' Home being demolished by fire.

Marlborough Hospital Board.

Wairau Hospital.—Final plans and specifications are being considered for extensions to Nurses' Home and hospital.

Approval has been granted for additional domestic staff accommodation.

Wairarapa Hospital Board.

Masterton Hospital.—Approval has been granted for alterations to provide domestic quarters and alterations to mortuary.

Final plans and specifications have been approved for the alterations to provide an administration block, with Resident Medical Officer's quarters above.

Greytown Hospital.—Final plans and specifications have been approved for temporary nurses' quarters and alterations to main hospital.

Eketahuna.—Erection of a district nurse's cottage is about to be commenced.

Wellington Hospital Board.

Wellington Hospital.—The erection of a new operating theatre, temporary surgical ward, and extension to the boiler-house is being proceeded with.

A new stores block to include dining accommodation on the first floor is under consideration. The Board's major proposal for a new hospital and Nurses' Home is still under consideration. The site for the new subsidiary hospital at the Hutt Valley has been acquired, and sketch plans for the proposed buildings are being prepared.

Macarthy Home.—Additions and alterations have been effected.

Palmerston North Hospital Board.

Palmerston North Hospital.—The extensions to the laundry are proceeding. The alterations to children's ward have been completed.

Final plans and specifications have been prepared for a mortuary block. Proposals are being considered for: (1) Two-story isolation block; (2) ante-natal clinic; (3) addition to Nurses' Home.

Awapuni Home.—Final plans and specifications are under consideration for extensions to this institution.

Wanganui Hospital Board.

Wanganui Hospital.—The new isolation block has been completed. Additional nurses' accommodation is being provided.

Patea Hospital Board.

Patea Hospital.—Approval has been granted for the erection of additions to home for nursing and domestic staff. These are nearing completion.

Stratford Hospital Board.

Stratford Hospital.—Alterations to the kitchen, laundry and boiler-house are being proceeded with.

Taranaki Hospital Board.

New Plymouth Hospital.—The erection of the tuberculosis annexe has been completed.

Sketch plans have been prepared for a new administration building. Alteration in the X-ray block are under consideration.

Dannevirke Hospital Board.

Dannevirke Hospital.—The extensions at this hospital are nearing completion. Additions to boiler-house are contemplated.

Waipawa Hospital Board.

Waipukurau Hospital.—Preliminary proposals have been discussed for a new Nurses' Home, and a new ward is contemplated.

Final plans have been submitted for strengthening the administration building. Provision is being made for a nurses' tutorial block on the first floor of the old administration block.

Rathbone Maternity Hospital.

Additions are being contemplated.

Hawke's Bay Hospital Board.

Napier Hospital.—The isolation block has been completed. Other works under consideration are—(1) Mortuary; (2) new Nurses' Home; (3) new X-ray block; (4) Additional ward block.

Hastings Hospital.—The swimming-pool for the nurses is completed. Proposals which have received further consideration are—(1) Special ward for children; (2) additional accommodation for nurses; (3) Medical Superintendent's residence.

Wairoa Hospital Board.

Wairoa Hospital.—Consideration is being given to extensive additions to the hospital and Nurses' Home.

Cook Hospital Board.

Cook Hospital.—The additions to Nurses' Home have been completed and the new boiler-house and laundry are progressing satisfactorily.

Sketch plans have been considered for a tuberculosis block.

Taumarunui Hospital Board.

Taumarunui Hospital.—The additions to the Nurses' Home have been completed. Alteration to ward block to provide better isolation facilities are being considered.

Bay of Plenty Hospital Board.

Whakatane Hospital.—Plans and specifications have been approved for—(1) Medical Superintendents' residence; (2) additions to Nurses' Home; (3) additions to men's ward. Sketch plans have also been considered for—(1) Mortuary; (2) Taneatua district nurses' cottage.

Tauranga Hospital Board.

Tauranga Hospital.—Addition to the wards and new Nurses' Home are completed. New steam services are under consideration.

Thames Hospital Board.

Thames Hospital.—Additional nursing accommodation is being proceeded with.

Coromandel Hospital.—Approval has been granted for additions to this hospital.

Waikato Hospital Board.

Waikato Hospital.—The administration and out-patient's blocks, also the Board's offices in Hamilton, have been completed. Final plans and specifications have been prepared for a Medical Superintendent's residence.

Matamata Hospital.—Final plans and specifications are being considered for additions to this hospital.

Auckland Hospital Board.

Auckland Hospital.—Approval has been granted for the erection of a bathhouse and treatment department at Wilson Home. Final plans and specifications have been received for additions to Nurses' Home. A number of alterations of a minor nature to the Hospital have been approved. Consideration is still being given to the Board's major building scheme.

Whangarei Hospital Board.

Whangarei Hospital.—Additions to the hospital are nearing completion. The boiler-house, laundry, and additions to Nurses' Home are completed, and the removal of the maids' cottage to a new site has been effected.

Kaipara Hospital Board.

Dargaville Hospital.—Sketch plans for the new hospital at Dargaville are under consideration.

Bay of Islands Hospital Board.

Kawakawa Hospital.—Additional accommodation has been provided for nurses.

Mangonui Hospital Board.

Kaitia Hospital.—The erection of additions to the Nurses' Home, new Laundry, and boiler-house are progressing satisfactorily.

The replanning of the hospital is being proceeded with.

St. Helens Hospital, Christchurch.

The sketch plans have been finalized for a modern Maternity hospital. It is hoped to proceed with the plans and specifications necessary for the calling of tenders in the near future.

Queen Mary Hospital, Hanmer.

The following are extracts from the annual report of the Medical Superintendent, Dr. Chisholm :—

“*General.*—During the past year the number of patients presenting for admission has been well above the average, both on the male and female sides. The women's hospital continues to be busy and overcrowded. The male hospital has had more than the usual number of patients.

“*Women's Hospital.*—This section of the institution has been busy and active, and during the year has been, to some extent, overcrowded, but we have not had to refuse urgent cases for any length of time. The general conditions of the hospital are good. The equipment is satisfactory and the patients who pass through the hospital have been satisfied with the general administrative care.

“*Male Hospital.*—This side has been a little busier during the year, but the conditions are very unsatisfactory. The new hospital is now rapidly approaching completion, and the difficulties which we have experienced on the male side will then cease to concern us.

“*Medical Staff.*—Dr. Elmslie was appointed as senior assistant Medical Officer, *vice* Dr. Tovey, resigned.

“*Nursing Staff.*—Miss Hodges, who has been Matron for some fourteen years, terminated her services at the end of the year. Miss Hodges rendered valuable service to the hospital. I wish to take this opportunity of expressing to you appreciation of the work that Miss Hodges has done. Miss Trott, who has been sub-matron of the institution and Sister in Charge for so many years, has been appointed Matron. There have been many changes in the nursing staff, and it is difficult at the present moment to get nurses to stay more than approximately six months or a year. This fact of a rapidly changing staff is, I understand, not peculiar to this hospital, but it is found generally throughout all the hospitals. The hospital aide staff, also, has shown many changes, and there are times when some difficulty is experienced in obtaining the necessary number to staff the hospital.

“*Massage Department.*—This Department continues to work satisfactorily. On the female side conditions are good. The male side is not so satisfactory. Recently an inspection of the Massage Department was carried out by Miss Roberts, of the Dunedin School of Massage, whose report was that the work and the arrangements were satisfactory.

“*Tea Kiosk.*—This continues to satisfactorily serve the public and manages to cover its running expenses.

“*Bathhouse and Swimming-pools.*—There have been no alterations or improvements in the swimming-pool and bathhouses during the year. The pools are popular, and I understand that arrangements are now in hand in regard to extension of the swimming-pools and reconstruction of the bathhouses.

“*Electric Light.*—The energy from the power-house is sufficient for a limited supply to the village and the hospital, but arrangements are now well in hand for the extension of the Lake Coleridge power, by the North Canterbury Power Board, to Hanmer. This will prove of great benefit, as there is no doubt that the electric power available has been a great difficulty to us for many years.

“*Water Service.*—Considerable improvements have been made to the headworks at the reservoir, and also a filter tank has been installed on the hill behind the town. The headworks alterations have proved very satisfactory and the new intake works well. The filter tank will not be of great use until the new electric power is available from Lake Coleridge and the demands of the power-house for water lessens.

“Grounds and Public Gardens.—The public grounds and hospital gardens continue to be well cared for and give considerable pleasure both to the hospital patients and to the travelling public, and, I consider, well justify their expense.

“Buildings and General Maintenance.—The hospital buildings have been kept in repair and a considerable amount of painting has been done to the Nurses’ Home and Women’s hospital, and the buildings are in reasonable condition, excepting the male hospital, bathhouses, and pools. Certain of the departmental houses, occupied by the hospital staff, require some improvements and repainting, and this will be carried out during the coming winter. Considerable improvements are being made to the farm-manager’s house. The head gardener’s cottage is in poor condition, but this is under consideration and arrangements are being made for a new house.

“General.—The type of patient seeking admission to hospital remains the same, principally neurosis, with a certain percentage of arthritic and rheumatic patients.

“New Male Pavilion.—The new male pavilion is progressing very rapidly towards completion, and should be ready for occupation towards the end of this year.”

FIRE-ESCAPES.

This important question is receiving the attention of both the Department and the Hospital Boards with a view to effecting a more efficient and standardized equipment and method of exit in the case of fire or other emergencies.

IRON LUNG.

Following on advice received by the Government from the High Commissioner, applications were invited by the Department from Hospital Boards who desired these respirators which Lord Nuffield had generously offered to present to all hospitals in the British Empire. As a result applications were received for thirty-two iron lungs, and information to hand indicated that they will be shipped to New Zealand in July.

R. A. SHORE,
Director, Division of Hospitals.

PART V.—NURSING.

INTRODUCTION.

HISTORICAL.

I have the honour to present my annual report.

This year, which marks the Centennial of New Zealand's establishment, would appear to be a suitable time to review the development of our nursing services.

One hundred years is a short period in relation to time when thought of in terms of world evolution, yet it is difficult for those of us living to-day to picture our little country as it was when our grandmothers arrived on its shores.

The country, in a primitive state inhabited by a Native race, proud with its own social order, which included the *tohunga*, or medicine man, to treat either sick or ailing.

The intervening period between that state and our present highly civilized and organized condition may be usefully divided into four stages, which have to a large extent followed the political and social development of our country.

1840 to 1900.—Covering the introduction of hospitals and the inception of the training of nurses, together with the development of a consciousness that the State must safeguard the social welfare of the community.

1900 to 1919.—The regulation of the training of nurses under State supervision with the introduction of social and public-health services culminating in the Great War, which brought about the establishment of the Army Nursing Service.

1919 to 1930.—The necessary reorganization following on the war and the disastrous influenza epidemic of 1918 with the realization of the necessity for better-prepared women to guide these expanding services, and of giving the profession more authority in controlling its own development, as well as the need for more provision to safeguard the retirement of nurses.

1930.—The effect of social legislation and the recent advances in preventive and curative medicine.

1840 to 1900.—The first mention we read of in regard to nursing by nurses as we understand the term was at the first hospital in New Zealand, established at Auckland to serve as a general Military Hospital for the care of soldiers and their families, as well as the few white settlers. The conditions were, of course, most primitive. The staff consisted of a Master and a Matron and such help as could be procured from the refuge.

Gradually hospitals extended throughout the country—generally because of some local need, such as a military post, the opening of a settlement, or a gold-mine—until we find in 1882, when Dr. Grabham, the first Inspector of Hospitals, was appointed, there were twenty-eight, and in his report he states: "The distribution is irregular and appears somewhat capricious. A spirit of rivalry or emulation between neighbouring towns would appear to have had some part in this matter. Some of the establishments have an appearance of homeliness and great comfort; others look starved and poverty-stricken; while a third class present evidence of a very strict economy without detriment to the well-being of the patient."

Dr. Grabham's comments on individual hospitals show that the staff generally consisted of a Master and Matron with such help as could be obtained. The type of women employed were uneducated, rough, and uncouth often in their conduct, and this was reflected in the state of the wards and care of the patients.

But rapidly a change was brought about. The effect of the Nightingale system of training nurses was to be felt even in New Zealand, and we read with interest in Dr. Grabham's report of 1884: "A very excellent system of nursing is in full operation at the Wellington and Auckland Hospitals, where well-educated ladies may be seen serving their apprenticeship with other probationers. Trained nurses from these two schools will gradually become distributed in various parts of the colony. The example so set might with advantage be followed by others of the larger hospitals whose present nursing arrangements are not in accordance by any means with modern ideas."

In his reports on the individual hospitals Dr. Grabham draws the attention of Auckland to the need for better accommodation than a dormitory and the Board room being used for the nurses' meals and general use if a training-school for nurses is to be established. He also remarks on the eminent qualifications of Miss Crisp, the Lady Superintendent.

In the case of Wellington, where Dr. Truby King was Medical Superintendent, the report states: "The very successful introduction of the probationer system will also necessitate some structural addition of an inexpensive character. These nurses take the greatest possible interest in their calling, which they have chosen from other than pecuniary motives only, and I have no hesitation in stating that a foundation is here being laid for a considerable permanent benefit to the colony. In connection with this subject it may be well to mention that the salary of a probationer is only £25 a year, where an ordinary nurse would cost twice that amount."

Slowly the system extends, and in 1886 we read that at Dunedin, "In the female wards two probationer nurses are now learning their duties in addition to the regular staff."

Another step forward of which Wellington may well be proud is that in this same year, 1886, Dr. Grabham reports: "The nursing staff struck me as being particularly satisfactory. They are well trained, intelligent, and lady-like, being evidently drawn from a class very much superior to the old-fashioned hospital nurse of former times. The head nurses are on duty from 6.30 a.m. to 6.30 p.m. They get leave from 2.30 p.m. till 10 p.m. once a week, as well as Sunday afternoon. The assistants come on duty, one from 4 a.m. till noon, the other from noon till 8 p.m., while the night nurse is on duty from 8 p.m. till 4 a.m." So was introduced the eight-hour day and three-shift system to New Zealand for probationer nurses, a condition still unheard of in the majority of hospitals in the Old World.

It is interesting to note in 1890 Dr. MacGregor, who had succeeded Dr. Grabham, reporting on Auckland Hospital makes the following comment: "I think there will be a danger to the efficiency of the nursing staff if the proportion of experienced nurses to probationers is allowed to fall by pressing economy too far."

As time goes by the innovations at Auckland and Wellington extend to other hospitals, and we find in January, 1894, following a visit to Waikato Hospital, the comments are: "The nurses are most carefully trained by means of lectures and demonstrations. The number of nurses appears to be excessive, but it is explained by the fact that they work only eight hours a day. It looks as if the example of this hospital will soon be followed elsewhere, with, of course, a considerable increase of rates." And so it was found that a training-school for nurses with good living-conditions, suitable facilities for teaching, and reasonable hours immediately improved the nursing service given to the patient, and, in turn, benefited the whole community.

In 1895 Dr. MacGregor, who was a man with an intense interest in social legislation and who was working closely with the Liberal Government of Mr. R. J. Seddon, states that "owing to recent political and social development it was felt that the time had come when the numerous and delicate questions affecting women which have to be dealt with in connection with our system of charitable aid and our hospitals and asylums ought to be handled in the first instance by a woman. Mrs. Neill, who has been appointed Assistant Inspector, combines in a very high degree the ability, knowledge, and sympathy required for this position." Thus at a time when the University was opening its doors to women and women's franchise was established came this important step in the nursing world.

Mrs. Neill, a Scotch woman trained at Charing Cross Hospital, London, had lived in Australia, where she had been left a widow with a son to support. This had brought about her finding employment as a factory inspector, and it was no doubt due to her own hardships that she developed the far-sighted vision which afterwards had such a marked effect on New Zealand nursing.

The first three or four years of her service were spent in visiting the various hospitals throughout the country. Transport was very poor and the people lived in isolated communities, which tended to provincialism in outlook and separate development. Mrs. Neill was alive to the dangers of such a condition and saw the necessity for bringing the training-schools into conformity and establishing some means of protecting the public from charlatans and unskilled women. This aspect was brought home to her because of her close association with the charitable-aid system of her time, which showed her the dreadful plight of people who were ill and left to the care of the handy-woman.

She therefore represented to the Government the necessity for a State examination for nurses and the creation of a register. At the time there was, of course, considerable opposition, the various matrons and training-schools feeling they would lose their identity and be moulded into a common pattern to the detriment of individual development. However, the Government, with its progressive legislation, realized the forcefulness of her representations, and in 1901 the first Registration Act for Nurses in the world was passed, which inaugurated a course of three years' training with the State examination and the register. It is interesting to note the care that was taken in regard to the examination system—that of the New Zealand University being copied.

At the same time as Mrs. Neill's appointment was made another pioneer woman with vision saw the need for establishing a service for the care of the sick poor in their own homes. Miss Sybil Maude, who was at that time Matron of the Christchurch Hospital, resigned her position to develop such a service in conjunction with the Deaconesses of the Church of England in Christchurch. From the beginning Miss Maude laid down certain principles in regard to her service—first, that the patient and his family must be taught the care not only of the patient, but also of the home so as to try and avoid further sickness; secondly, that relief, even if only in the form of second-hand clothing, was only appreciated if the recipient felt it was hers by right of purchase, even if only an infinitesimal charge was made, as indiscriminate relief-giving harmed both the giver and the recipient; thirdly, that nurses so employed must be well trained and of the right personality and vision.

From these small beginnings has grown the public health nursing service of the Dominion.

During the last years of the century the Boer War was fought under the trying conditions of the South African veldt. Little New Zealand contributed her quota of troops to those sent from the various colonies to assist the Mother-country, and among them a very small band of nurses who served with their English sisters. Their service was favourably commented upon, and was the first occasion upon which a body of nurses from this country served in any capacity overseas.

1900 to 1919.—The principle of proper training and registration having been established, the new century brought plans to improve the welfare of the mother and child as it was realized its own citizens were New Zealand's greatest asset.

The first step was to ensure better care for motherhood. Up to this time there had been no training for obstetric nurses in New Zealand. The few nurses in the Dominion who were qualified as midwives had either trained in Great Britain or Australia. Mrs. Neill therefore planned training-schools for midwives and registration for those women who had been practising obstetrics for a certain period and who could be satisfactorily recommended, the number so admitted to the register to be limited to a period of grace.

Again, this scheme was approved and put into operation by the Government, in spite of the opposition of many medical men as well as the general public, who did not realize the significance of the new legislation which was passed in 1904.

This Act immediately brought under supervision the work of obstetric nurses and necessitated the appointment of additional Nurse Inspectors to the Department.

About this period also arises the question of nurses' uniforms. "Washing dresses, white aprons, removable sleeves represent the absolute cleanliness and neatness, together with freedom of movement required." Comment is made concerning the tendency for nurses to wear jewellery on duty and for the cap which was intended to cover the hair to have shrunk "into a small piece of starched linen crowning an edifice of pads and loose hair." Although fashions have changed, uniform and an aseptic nursing technique are still problems of our time.

In 1906 Mrs. Neill retired and was succeeded by Miss Hester Maclean, an Australian of Scotch parentage who had had an unusually wide and varied experience not only in the hospital world, but also in obstetrics and district nursing. She was a woman of strong character with a forceful personality who was interested in people as individuals, which made her well known and beloved by those with whom she came in contact. So, again, New Zealand was fortunate in its new leader.

Almost simultaneously the additional Nurse Inspectors referred to were appointed in the persons of Miss J. Bicknell and Miss Amelia Bagley, two New-Zealand-trained nurses who were also qualified as midwives, an unusual combination at this period.

The next stage in the development of New Zealand nursing lies largely in the hands of these three women, who were responsible for the supervision of nursing conditions in general.

In 1906 a new Private Hospitals Act was passed which brought the supervision of these hospitals under the Hospital Department as from January, 1907. Their inspection was largely the work of the new Assistant Inspectors. The Act laid down that there must be a certain proportion of registered nurses or registered midwives to so many beds, and as training and registration were comparatively new in this country the problem of providing sufficient staff was often difficult.

Again and again there was pressure brought to bear on the Department to permit these private hospitals to become training-schools, and we owe much to the wisdom of Miss Maclean, who always insisted that "the training in this country must be such that the nurses trained should be recognized throughout the world, and the standard must not be lowered, but rather improved." It would be impossible in these private hospitals to give the all-round clinical training.

This question of using the small country hospital or the private hospital as a training-school is one which remains a recurring one throughout the whole of this period.

Alive to the difficulties of bringing a health service to the Maoris, it was considered advisable to train carefully selected Maori girls, and co-operating with the Education Department, five girls were chosen and placed in hospitals. This was a new move, and it must have been a great effort for these Maori girls, who were required to follow the same course of training and pass the same examinations as their European sisters. All honour to these women who opened the door for their sisters for the future.

This period was further distinguished by the extension of the new conception of social and public-health services, as it was realized that prevention was better than cure.

Child-welfare, in the form of State supervision of the backward and unwanted child, was ensured by the passing of the first Child Welfare Act in 1907, and by the introduction of nurses as supervising officers in this new field of endeavour.

Dr. Truby King (as he then was) at this period inaugurated the Plunket Society, with Lady Plunket, the wife of the then Governor, as patroness, with the object of protecting the welfare and health of the women and children of the Dominion.

The first Baby Hospital and Dietetic Training Centre for Infant Welfare Nurses was established in Dunedin in 1907. This introduced nurses into a new field where their work would be principally in visiting homes to instruct mothers in the care of their babies and young children.

Two years later, in 1909, an appeal was made for district nurses in backblock rural areas to help settlers who were far away from medical and hospital help because roads and transport at this time were very deficient. This resulted in the appointment of the first rural district nurse at Ūrutu in Taranaki.

It was natural that when such attention was being given to the European population some thought should be given in this enlightened era to the care of the Native race New Zealand is responsible for, and it was felt that the same principle of appointing a nurse to work amongst their homes would be the best method of dealing with this complicated problem. These early nurses experienced great difficulties as they had to live very isolated lives, often under great hardships. The Maoris did not understand their work, and the breaking-down of age-old superstitions and customs and the winning of their respect and love took many years. Several laid down their lives in attempting the establishment of this important branch of our nursing services. Probably no one will ever fully realize the heroic deeds many of these women carried out so quietly and devotedly.

Attention had also been drawn by Dr. Mason, the Principal Medical Officer of Health, to the necessity for medical inspection of school-children and their care, but it was 1912 before the service was established and—probably owing to the war—1917 before any nurses were appointed by the Education Department to assist in this important field of preventive medicine.

One of the first impressions gained by Miss Maclean when she began her visits of inspection was the difficulty of conveying her own ideas to these scattered communities and the necessity for bringing together nurses if the best ideals were to be maintained. In Wellington as early as 1905 nurses who were engaged in private nursing had formed a small association with the object of protecting their interests. Another small group the following year came into being in Dunedin. In her travels Miss Maclean met these women and discussed with them the formation of a New Zealand Nurses' Association. The result was that a conference was called in Wellington in 1908, and the New Zealand Trained Nurses' Association came into being from 1909, the first president being Mrs. Kendall, of Wellington, and the first secretary Miss J. Bicknell, of the Health Department. The result of this was from the beginning a very close relationship between the nursing staff of the Health Department and the nurses' association, a relationship which has made for harmonious working and mutual benefit to an extraordinary degree. During the same period Miss Maclean decided that it was only by means of a nursing journal for New Zealand nurses that the profession could be kept informed of problems of mutual interest and of new developments both at home and abroad. As there appeared no one ready to assume this task she decided to publish and edit the journal as her own property, and thus came into being *Kai Tiaki* (the watcher; the guardian), the New Zealand nurses' journal. Miss Maclean owned this paper from 1908 to 1923, when she sold it to the New Zealand Registered Nurses' Association and remained its editor until the year before her death in 1932.

Looking back it can be seen how much these two steps—the formation of the New Zealand Trained Nurses' Association and the establishment of a nursing journal—meant in the moulding of nursing opinion and of developing a unity of thought and purpose. Many eminent nurses gave much time and thought to the future of these two new ventures, and in the process left their influence on the future of the profession they loved.

In 1912 Lord Kitchener was invited to visit New Zealand to advise the Government concerning matters of defence, and in making his recommendations concerning the medical services of the army he drew attention to the necessity for some form of army nursing service to care for the soldiers. The result was a small division was formed in August, 1913, as a branch of the Queen Alexandra Nursing Service. When war was declared in 1914, one year after, it was only after representations were made to the Minister of Defence that it was decided to send six Sisters with the first troops leaving New Zealand, who were sent to take over the German colony in Western Samoa.

Although permission was given for various New Zealand Sisters who were in England to join up with the Queen Alexandra Nursing Service (two had actually been with the first contingent to land in Belgium at Amsterdam in August, 1914), no steps were taken to form a New Zealand Nursing Service, in spite of the fact that troops were being trained and sent to Egypt. It was only after the representations of the New Zealand Nurses' Association to the Government that a body of nurses should be sent to care for their own men that finally, at the end of 1914, the New Zealand Government offered a contingent of New Zealand nurses to the English Government. The Secretary of State cabled back asking for fifty carefully selected nurses to be sent under a recognized Matron, and in February, 1915, the New Zealand Army Nursing-Service came into being with an establishment of 110, fifty of whom would be sent abroad and sixty remain at home. The first fifty were selected and set forth for England under Miss Maclean. The time to prepare was very short, orders for uniforms were given without being very certain what uniform should be chosen, and the badge consisting of the N.Z.A.N.S., which afterwards carried so much love and esteem, was introduced. Thus left our shores the first fifty of that band of five hundred nurses who so ably served their country during the period of the Great War. They saw service in the early days of the war in Egypt, the middle East, and on hospital ships and later in New Zealand hospitals in England at Walton-on-Thames, Brockenhurst, Codford, and Hornchurch, besides which many gave distinguished service in France.

The work of these women brought great distinction to New Zealand. They proved themselves very adaptable, confident, intelligent, and ready to expend themselves to the utmost in the care of their patients. Several gave their lives in the service of their country—a group of fourteen lost their lives when the troop ship "*Marquette*" was torpedoed in the Aegean Sea while *en route* to Salonika from Alexandria; two others were lost in the dreadful influenza epidemic which ravaged the troopship "*Tahiti*" off Las Palmas; while others died from the effect of their services. To many a "Digger" in Blighty the grey uniform, with its scarlet cape and snowy cap, meant relief and peace after torture and pain. The services of many of these outstanding women were recognized at the conclusion of the war by His Majesty the King with the decoration of the Royal Red Cross or the Assistant Royal Red Cross. The best record of their work, however, lay in the excellent reputation they left in England concerning the value of the New Zealand nurses' ability. This made an excellent contact for others following in their footsteps overseas.

Just at the termination of the war, in November, 1918, this country suffered its turn of the disastrous influenza epidemic which swept over the greater part of the world. The nursing service of the country, severely taxed already by the demands of the war, was quite inadequate to deal with the calamity and it was greatly to the credit of the St. John Ambulance Brigade and to the Red Cross Society that large numbers of volunteers who had received some training during the war years rallied to the help of their professional sisters.

This epidemic made plain that a new stage had been reached in New Zealand medical services, when there was need for a better co-ordinated service and a definite allocation of responsibilities. A Royal Commission of Inquiry was appointed in 1919, and as a result a new Health Act was passed in 1920 which reorganized the work of the Health Department.

1920 to 1930.—Originally there had been a Hospitals Department, which had continued as such until 1908, responsible for the supervision of hospital and charitable aid practice. Then in 1900 had become established a Health Department under a special Minister of the Crown, which was to be in charge of the health of the colony. Inevitably the two Departments became amalgamated in 1909, when the new system of hospital administration introduced a system financed by local rates with a Government subsidy and under State supervision.

But though this amalgamation had taken place partly because of the pressure of work during the war years and partly because of local interests the amalgamation was not complete. Some essentially health services were still carried out by Hospital Boards such as the follow-up of infectious diseases, and some were the responsibility of the Department. Again, medical supervision of the school-child was in the hands of the Education Department. The new Act set out to co-ordinate these services and provided for a central Department under a Minister of the Crown, the executive head being the Director-General of Health. The work of the Department was divided into Divisions, each Division having a controlling officer in charge of it, and so the Nursing Division of the Department came into being with a Director of Nursing in charge who was responsible for the policy and supervision of her division, which included the administration of the Nurses and Midwives Registration Act.

New Zealand was divided into four main Health Districts, each being in charge of a Medical Officer of Health and, as part of his staff, a Nurse Inspector who would be responsible for the supervision of the private hospitals and midwives and maternity nurses in that particular area.

In 1922, as Miss Maclean's retirement was drawing near, it was decided to send Miss J. Bicknell abroad for a year to gain an insight into the newer developments taking place elsewhere. But before Miss Maclean's retirement she was associated with the movement in which many nurses and members of the lay public—particularly Sir Lindo Ferguson and Miss Williams, of Dunedin—were interested, the establishment of a suitable and fitting memorial to those nurses who had given up their lives during the Great War and who had died during the influenza epidemic. Committees were set up in different parts of New Zealand, and the public and nursing profession were canvassed for funds the sum of £26,000 being raised. It was then decided to set up a perpetual trust to be known as the "Nurses Memorial Fund." The endowment, and such other sums as were contributed in the future, were to be invested and the interest used to assist nurses who through old age or sickness were in need of financial assistance.

Since its inception the trust has been administered by a Central Committee situated in Dunedin, who are represented by members in the principal centres of the Dominion. The overhead costs have been practically nil, as the work has been carried out voluntarily. Many nurses have received untold help from the fund, and the manner of its assistance has been such that they have been able to retain their own independence without this help being public property. New Zealand nurses owe a great deal to this very kindly committee in Dunedin, whose foresight and care have helped so many.

In 1923 Miss J. Bicknell was appointed Director of the Division of Nursing. Fresh from contact with the Old World and the new movements taking place there, Miss Bicknell's first action was to strongly recommend the establishment of a Nursing School in connection with the New Zealand University, where nurses would have the advantage of post-graduate study. She pointed out that schools considered it necessary to prepare their teachers for their onerous duties, and in the same way it was considered essential that the nurses' training-school should be in charge of a prepared teacher; added to which the rapid developments taking place in preventive medicine were demanding workers who required some additional training other than that given to the ordinary hospital nurse.

These views were first placed before the nursing world in New Zealand at a conference of the New Zealand Trained Nurses' Association held at Dunedin in 1923, and from this conference a strong recommendation went to the Government asking for the establishment at Otago University of a School of Nursing where a five-year course would be available giving two years in the University studying the elementary sciences; then two years in hospital, followed by a fifth year in the University; when the nurse would specialize in either hospital or public-health practice. The result of this recommendation, together with the Department's representations, was that it was decided to ask Otago University to establish a Diploma in Nursing, and this was done in 1925, the students registering at the Home-science School for the first two years' course. In the meantime it was decided to send two nurses abroad for further study, who would return to be in charge of this diploma course. Miss J. Moore, R.N.R.M., who trained at Dunedin Hospital and at that time was Matron of Waikato Hospital, was sent to London to take the course in hospital administration and teaching of nurses given by the International Committee of the League of the Red Cross Societies at Bedford College, and the writer, who trained at Christchurch Hospital and at that time was on the staff of the Department in Christchurch, was sent to Canada to Toronto University to study public-health nursing.

On the return to New Zealand of these two nurses in 1927 difficulties arose in that the Otago University considered it had not the funds to pay the salaries of these officers, and the Government did not wish to establish the precedent of doing so. Further consideration had also been given to the original idea, and it was felt to meet the situation at that period a modification was required, so the diploma course at Otago lapsed. Instead a committee of management was set up in Wellington representing the Department, Victoria University College, and the Wellington Hospital Board, to control a post-graduate course established to train nurses in hospital administration and teaching of nurses and public-health nursing with these two officers in charge. It is advisable that teachers should be experienced nurses rather than young girls just completing a five years' course, and as an inaugural movement there is no doubt that the present course has met the needs of New Zealand, and the work of the students from this course has been much appreciated.

Up to this time permission for a hospital to become a training-school was entirely a matter for the Minister of Health and the Department, and it was this Department which laid down the conditions governing training. The difficulties surrounding the staffing of small country hospitals was such that constantly pressure was brought to bear to grant this permission because such ensured a stable staff, rather than that the teaching facilities existed. Endeavours had been made to bridge the gaps by affiliations, but the negotiations and personal prejudices existing between institutions made for many complications.

Obstetrical nursing practice had also fallen under criticism as it was felt that the period of training was insufficient (six months for a registered nurse and one year for an unregistered woman) and, further, that many registered nurses trained as midwives who had no intention of practising, and so there was a shortage of well-qualified women. A Royal Commission of Inquiry had been held in 1924 concerning New Zealand's high maternal mortality rate, particularly from puerperal septicæmia, and among its recommendations were far-reaching reforms in regard to the training and practice of obstetric nurses.

Further, the English Registration Act which was passed in 1919 had set up a General Nursing Council, on which registered nurses were in the majority, to control the approval of training-schools, the State examinations system, and the registers.

These factors, therefore, induced the Government to introduce and carry through the House of Representatives an entirely new Act, entitled the Nurses and Midwives Registration Act, 1925. This Act set up a Board, to be known as the Nurses and Midwives Registration Board, the membership of which consisted of the Director-General of Health as Chairman; the Director, Division of Nursing as Registrar; a member of the medical profession, nominated by the Minister of Health; and two nurses, one of whom must be a midwife, nominated by the New Zealand Registered Nurses' Association. Following an amendment to this Act in 1930 the membership of this Board was increased to three nurses and one lay member representing the Hospital Boards' Association.

The functions of the Board are:—

- (a) To determine courses of training to be undergone by candidates for examination as nurses, midwives, and maternity nurses under this Act.
- (b) To approve hospitals or other institutions at which approved courses of training may be received.
- (c) To conduct examinations under the Act, to appoint examiners, and make all other necessary arrangements for the purposes of such examinations; and to issue certificates of having passed such examinations to persons entitled thereto.
- (d) To receive applications for registration under this Act and to authorize registration in cases where the conditions of registration have been complied with.
- (e) Generally within the scope of its authority to do whatever may in its opinion be necessary for the effective administration of the Act.

The first action of the new Board was to redraft the entire system of training obstetrical nurses. A great deal of difficulty was found in devising a scheme satisfactory to the hospitals from the points of view of staffing and to the Board from the point of view of adequate teaching. Various amendments were made, until, finally, in 1930, the present training course was approved. These conditions now consist of two courses of training—(a) that of a maternity nurse and (b) that of a midwife. The period of training for the first is six months for the registered nurse and eighteen months for the unregistered woman. At the conclusion of this period of training it is necessary for the trainee to sit for the State Maternity Examination. Should she pass she is eligible to be registered as a State Maternity Nurse. The second course is only open to those nurses who are registered as maternity nurses, whether registered nurses or not, and lasts over a period of six months, at the termination of which it is again necessary for the trainees to pass the State Midwifery Examination before being registered as a midwife.

The Board from time to time has entered into reciprocal agreements regarding the registration of nurses with other countries, has standardized the record system of the training-schools, and through the visits of inspection paid by the Registrar to all training-schools has insisted on improved teaching conditions both in regard to the theoretical and clinical instruction, and has laid down certain qualifications for the teaching staffs.

Up to 1930 only public hospitals were recognized as training-schools for nurses, but in this year, following on considerable agitation, an amendment was made to the Act which gave the Board power to approve as a training-school for nurses any private hospital or private charitable institution where such hospital or institution provided not less than forty beds to be available at all times for patients receiving nursing and hospital service without charge or for a charge not exceeding the actual daily cost of rendering such service and does not exceed the daily charge for the time being for in-patients in the nearest public hospital.

In addition, the Board must be satisfied that a complete course of instruction in theoretical and practical nursing can be given therein and that the training therein will not be lower in any respect than that given in the public hospitals.

To date only one hospital has qualified under this clause of the Act.

For many years the New Zealand Nurses' Association had made representations for the necessity for a superannuation scheme which would safeguard the retirement of nurses. In 1926 a Superannuation Act passed which, under the National Provident Fund, established a separate superannuation fund for nurses in the employ of Hospital Boards and gave power to extend these provisions to various voluntary bodies who were employers of nurses. The basis of this scheme is that after the first year of training nurses the Hospital Boards would each contribute a proportion of the annual

cost, the Government, through the National Provident Fund, subsidizing the fund. Retirement after the fund had been in operation for fifteen years, could be after thirty years' service, prior to that at fifty-five years of age if agreed to by the Hospital Board; otherwise compulsorily at sixty years of age, the annuity being based on the fraction formed by the years of service over sixty of the retiring salary—i.e., $\frac{20 \text{ years of service}}{60}$ of £300 a year.

This advance has meant relief and security to a large number of nurses, and as the years go by this will be increasingly so.

Preventive medicine, which had begun to play a part before the Great War, received a tremendous impetus after the cessation of hostilities, as more than ever the safeguarding of the youth of the community was important. Thus all organizations so engaged show during this period a great expansion of activities. The Plunket Society became a large organization made up of local branches financially independent, and levied by a Central Council which was elected from the Dominion Branches, and controlled by a central executive situated in Dunedin. The central executive employed a supervising staff, who supervised and advised the various branches regarding staff and their general policy and business.

The finance of the society was secured by voluntary subscriptions in addition to a Government subsidy, which is based on a certain set sum towards each infant hospital owned by the society and a certain proportion of each Plunket nurse's salary.

The work of the society rapidly expanded as its value became more and more appreciated by the general public. Sir Truby King, as Medical Adviser, carried out magnificent work, and by 1930 the society controlled six infant dietetic hospitals which are used as training-schools for Karitane (or well-baby) nurses, one centre in Dunedin for training Plunket nurses, and over 120 field Plunket nurses.

In the same way the staff of the Department had expanded both in regard to district nurses for Maoris and to school nurses. Tuberculosis and venereal-disease clinics had been set up at the principal public hospitals with nurses attached to these clinics to be responsible for the follow-up work among the patients attending; the voluntary district nursing organizations which were in Dunedin, Christchurch, Wellington, and Auckland had extended their staffs; and many Hospital Boards had also appointed district nurses, not only in rural areas but also in the smaller towns, to give bedside care on a visiting basis to the poorer section of the community.

The growth of the community and the aftermath of the war had also increased the social problems, so that we find the Child Welfare Division of the Education Department increasing its field officers to supervise the numerous foster-homes where children under the supervision of the State are placed.

A few industrial organizations had appointed nurses to undertake welfare work in their factories, and the New Zealand Red Cross Society had launched its Junior Red Cross programme to teach health and international friendliness among children, which again meant the employment of nurses in a new teaching field.

Hospital Boards who were responsible for the charitable-aid system also found that frequently nurses were most useful as welfare officers to supervise their relief organization.

To meet these increasing professional problems and the largely expanded number of registered nurses in the Dominion the New Zealand Registered Nurses' Association also adopted a policy of bringing the association nearer to the nurses themselves. An annual meeting, instead of a biennial meeting, of the Central Council was decided upon, and from the four original branches the association expanded into twenty. Education and public-health sections were formed, and suggestions for a separate Matron's Conference lapsed in favour of holding a meeting of training-school Matrons at the time of the annual conference.

The nurses' journal (*Kai Tiaki*) was bought by the association in 1923 from Miss Maclean, who retained the editorship until 1932. At that time Miss H. Inglis, who had acted as voluntary secretary since the war, also decided to retire, and the association decided to appoint a fully salaried joint Editor-Secretary in Miss C. Clark.

New Zealand nurses were opening up also a new field of opportunity in the tropics, as nurses had been appointed to the staff of the hospital at Apia, Western Samoa—the mandated territory of New Zealand—and to Niue and the Islands in the Cook Group.

1930.—For several years New Zealand had been experiencing a marked period of prosperity after the reorganization following on the war, but, as with all cycles, now came a time of difficulty and depression.

In 1930, and again in 1931, the country suffered disastrous earthquakes, and much damage was done to hospital property as well as to civilian life in general. In the first earthquake at Murchison, in the South Island, both the Westport and Nelson Hospitals suffered extensively, and in the second, at Napier, in the North Island, the damage was so disastrous that the hospital and nurses' home was almost completely destroyed and ten night nurses who were sleeping in the home were killed; in addition, considerable damage was done at Waipukurau, Dannevirke, Palmerston North, and Wanganui.

The conduct of the nursing staff was excellent, and at Napier, where the whole town had to be evacuated and where emergency conditions reigned for many weeks, a great deal of voluntary help from all over New Zealand was offered and accepted.

At the end of 1930 Dr. Valintine, the then Director-General of Health, retired, and Dr. M. H. Watt was appointed in his place, and early in 1931 Miss J. Bicknell retired and was succeeded by the writer. The new administration was almost immediately faced with the effects of a severe depression, when public finances and staff were to be severely curtailed, in addition to which there was marked unemployment amongst nurses as well as other members of the community.

With Dr. Watt's administration had begun a policy of decentralization, the large health districts being broken up to form combined health units under a Medical Officer of Health, who was also School Medical Officer with a supervising nurse in charge of the area; the area being again broken up into small areas, in each of which was located a district health nurse, who was responsible for all the public health services in that district.

The period of depression in a sense helped this organization, for as members of the staff were retired replacements were made of the new type of generalized work or breaking down the specialized services which had previously existed.

Similarly, the problem of the small training-school for nurses was assisted, as the hospitals which were used as such were cancelled and the controlling authorities advised to staff with registered nurses and nursing aids, so assisting in the absorption of unemployed nurses.

Thus over a period of three or four years a reorganization took place which laid the ground for supervision on fresh lines, so that in 1935, with the advent of an expansion programme, the opportunity was offered for an extension of the decentralization policy with a more generalized public health nursing service. Between 1929 and 1938 New Zealand was divided from four into ten health districts, and the complete reorganization of the district nursing staff along these lines has taken place in rural areas, while in urban districts a beginning has been made to co-ordinate the many existing services more closely.

Among the training-schools for nurses the loss of the small schools was far more than made up by the increased hospitalization of the sick, so that the actual number of nurses in training has increased by nearly one thousand over a period of ten years. New schemes of training such as the "block" system of teaching, when the nurses are withdrawn from the wards for periods of study, have been inaugurated, and some hospitals have adopted the living-out system for the registered staff who enjoy the freedom from hospital life.

The State examination was enlarged to include a paper on nursing procedures, and for the oral examination a practical examination in the wards of the hospitals was substituted.

To help the small hospital to try and bridge the gap for the girl who must earn between leaving school and entering hospital, a new scheme for training nursing aids is to be inaugurated. This training will cover a period of two years, the first year being devoted to domestic science, and the second to elementary nursing duties. Should this registered nursing aid proceed to do her general training she will be given some concession in regard to her period of training.

The new obstetrical training has become firmly established. There are twenty-six hospitals training maternity nurses and practically all registered nurses now acquire this additional certificate; but the midwifery training is only given at the four State St. Helens Hospitals, and only those registered maternity nurses who are prepared to practise obstetrics are taken for training.

Recently Tutor Sisters have been introduced to these State hospitals, and an endeavour made to make the conditions such as will attract the best professional women to specialize in this service.

The tropical nursing services were completely reorganized. In Samoa a training course was inaugurated for Native nurses which includes preparation in infant welfare and public-health nursing. Arrangements were made for the European staff to be sent on definite loan from the staff of a Hospital Board or from the Department for a period of two years, the Administration paying into the superannuation fund in New Zealand on their behalf during their absence.

The same arrangements were made for the Cook Islands, and in 1935 the Fiji Administration entered into a contract with the New Zealand Government that their nursing services should be linked to New Zealand in the same manner and come under the supervision of the Nursing Division of this Department. Miss L. M. Lea, a member of the staff of the Health Department, was seconded to be in charge in Fiji. This reorganization involved personal visits to the Islands by the writer so as to gain personal knowledge of the problems involved.

For some years after the inception of the superannuation fund for nurses representations were made to the Government asking that the Hospital Superannuation Fund and the Public Service Superannuation Fund, to which nurses employed in the Government contributed, should be made interchangeable. This principle was finally granted in 1938 and will enhance the position of nurses entering the Public Service considerably, as well as benefiting considerably members of the existing staff.

The post-graduate school, begun originally under such difficulties, has now a recognized place amongst not only nurses themselves, but also their controlling authorities. Many nurses have been granted bursaries by the Hospital Boards, the Department, and the New Zealand Registered Nurses' Association. It is only a matter of time before this school will become a school of nursing affiliated more closely, it is hoped, to the University.

The close relationship of the Nursing Division with the New Zealand Registered Nurses' Association has continued, and various educational studies in regard to nursing technique have been carried out in conjunction with the association. The association has further expanded to twenty-eight branches and has developed a Student Nurses' Association, each training-school having its own council. Such expansion has, of course, increased the functions and staff of the Dominion office.

The association, which was affiliated in 1912 with the International Council of Nurses, has for the last four quadrennial conferences sent representative delegates to attend these important international meetings, and they have brought back much inspiration gained from this contact.

In 1934 a Florence Nightingale Memorial Committee was set up in New Zealand consisting of equal membership of the New Zealand Registered Nurses' Association and the New Zealand Red Cross Society. In 1935 a study scholarship was awarded to Miss E. R. Bridges, a New Zealand post-graduate student, to take an advanced course in public-health nursing at the International Course at Bedford College, London, and in 1939 another scholarship was awarded to Miss V. Armstrong, the Assistant Matron of Wellington Hospital.

The Rockefeller Foundation most generously granted a travelling fellowship to the Director, Division of Nursing, in 1937 to visit the United States of America, Canada, Great Britain, and northern Europe; and, again, last year a study fellowship to Miss F. J. Cameron to attend a post-graduate course in Medical Social work at Toronto University, the intention being that on Miss Cameron's return to New Zealand the post-graduate school will include a course in this subject.

The new year again brought changes. The Department of Health, which for over thirty years had been housed in the old parliamentary buildings, was moved to the new Social Security Building, a building erected to house the staff necessary to put into operation the new social security legislation which introduces a national health service to the country on a contributory basis, as well as a national superannuation scheme—and so a new era again opens.

REPORT FOR THE YEAR.

The public health nursing staff was increased by one-third, and a reorganization of the work in the cities was introduced. The educational work was increased by the appointment of a necessary officer to carry out refresher work amongst obstetric nurses, while detailed studies were made in regard to various aspects of nursing technique.

The Preliminary State Examination for Nurses was inaugurated.

The record systems in regard to the establishment of a family record system and the nurses' daily records were revised.

A new scheme for the training of nursing aids was outlined and approved and is now in preparation for the necessary legislation to enable it to be inaugurated.

Many conferences were held with the Education Department, New Zealand Registered Nurses' Association, the Women's Section of the Centennial Exhibition, and other bodies concerning matters which affected the nursing profession.

In addition, the routine work of the Division covering the inspection and supervision of the nursing staffs of the public hospitals and the Department has been carried out, and during the year—with the exception of one small area—all training-schools and sanatoria and many other institutions were visited.

These developments have of necessity caused many changes in the personnel of our various institutions and health districts, and, in addition two of the senior members of the Division retired—Miss A. Buckley, Nurse Inspector at Christchurch, and Miss E. Hodges, Matron of Queen Mary Hospital—both of whom were nurses who have given many years of faithful and distinguished service to the Department.

Miss V. Oppenheim was transferred from Auckland St. Helens Hospital to Head Office; Miss A. Joyce was appointed Matron of St. Helens Hospital, Auckland; Miss M. Boyce, Matron of St. Helens Hospital, Wellington; Miss E. M. Sparkes, Matron, St. Helens Hospital, Christchurch; and Miss R. Paterson Matron, St. Helens Hospital, Invercargill.

Amongst the Nurse Inspectors Miss H. Comrie was transferred to Wellington, Miss A. Knight to Christchurch, and Miss M. Beswick to Palmerston North, while Miss A. Jewiss, Miss R. Cameron, Miss M. Burgess, and Miss H. Scott were added to the staff.

This year the Rockefeller Foundation granted a scholarship to Miss Flora Cameron—formerly district nurse at Wanganui—to proceed to Toronto University for a year's study in medical social welfare and public-health nursing. At the conclusion of her period of study in Canada Miss Cameron will visit centres in the United States of America and Great Britain before returning to New Zealand at the end of the year, when she will be attached to the teaching staff of the post-graduate course.

THE REGISTERS.

During this year the registers were again cleared by sending all registered nurses, midwives, and maternity nurses a registered letter asking if they wished their names to be retained in the active register.

The following table shows the present position and the position as it was when the register was cleared in May, 1937. The decrease in the number of nurses appearing in the active register is considerable and is largely due to marriage, emigration overseas, and a certain number of retirements. Probably the decrease is not as considerable as shown, as a group of nurses fail either to return the form sent to them or to notify that they are continuing their practice. Over five hundred registered letters were returned marked "Gone—No address."

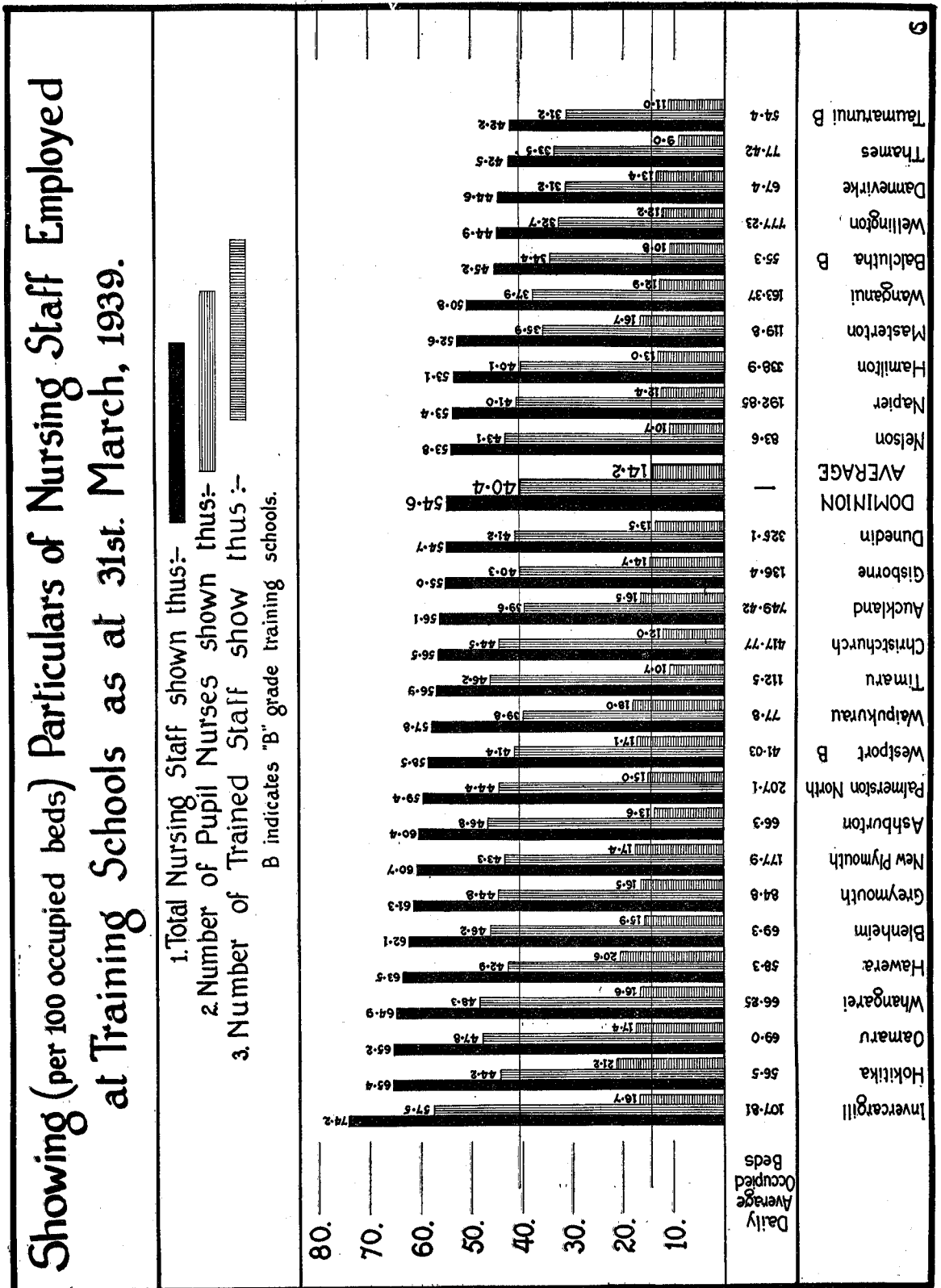
	January, 1939.	May, 1937.
General trained nurses on active list	3,101	4,250
General trained nurses on non-active list (mostly married, retired, or permanently overseas)	1,419	928
Midwives on active list	1,217	1,707
Midwives on non-active list	519	387
Maternity nurses on active list	1,124	1,423
Maternity nurses on non-active list	355	191

Of the "active" nurses appearing on the register, as far as is known to this office, the position is as follows:—

Public hospitals which are training-schools	725
Public hospitals which are not training-schools	222
Obstetrical hospitals (public) training-schools and non-training-schools, registered nurses	198
Private hospitals, general only	520
Tropical Nursing Service	24
Private nursing: Attached to Bureaux	378
Private nursing: Not attached to Bureaux (approximately)	300
Public Health Services	320
Overseas (approximately)	400

HOSPITAL INSPECTION.

The following graph sets out the position in regard to staffing in the training-schools. Balclutha, Taumarunui, and Westport are "B" grade training-schools, the pupil nurses from which do an additional six months' training at Dunedin, Waikato, and Christchurch Hospitals.



The following tables set out the increased number of occupied beds in the training-schools in comparison to the increase in nursing staffs, also the number of nurses qualifying by means of the State examination as general nurses, maternity nurses, and midwives :—

A. Daily Average Occupied Beds for all Training-schools.

31st December, 1932	..	..	..	..	..	..	3,981·72
31st December, 1933	..	..	..	..	..	..	4,059·30
31st March, 1935*	..	..	..	..	..	..	4,220·05
31st March, 1936	..	..	..	..	..	..	4,467·41
31st March, 1937	..	..	..	..	..	..	4,734·85
31st March, 1938	..	..	..	..	..	..	4,911·26
31st March, 1939	..	..	..	..	..	..	4,981·39

* Statistics changed from calendar to financial year.

B. Total Nursing Staff for all Training-schools.

	1932.	1933.	1934.	1935.	1936.	1937.	1938.
Total nursing staff ..	1,769	1,967	2,116	2,264	2,442	2,534	2,710
Total pupil nurses on staff ..	1,257	1,412	1,502	1,640	1,803	1,849	1,985
Total registered nurses on staff	512	555	614	624	639	685	725

C. Total Number of Nurses Sitting and Passing State Examinations.

	1932.	1933.	1934.	1935.	1936.	1937.	1938.
Number sitting ..	385	448	403	354	380	478	455
Number passed ..	272	338	280	262	315	366	364

MATERNITY NURSES.

Registered Nurses.

	1932.	1933.	1934.	1935.	1936.	1937.	1938.
Number sitting ..	152	158	170	190	195	201	218
Number passed ..	143	148	108	180	189	193	207

Unregistered Nurses.

	1932.	1933.	1934.	1935.	1936.	1937.	1938.
Number sitting ..	35	43	33	34	43	36	46
Number passed ..	30	35	30	33	37	30	44

MIDWIVES.

Registered Maternity Nurses who are also Registered Nurses.

	1932.	1933.	1934.	1935.	1936.	1937.	1938.
Number sitting ..	45	48	53	57	58	55	54
Number passed ..	39	44	47	53	56	54	52

Registered Maternity Nurses who are not Registered Nurses.

	1932.	1933.	1934.	1935.	1936.	1937.	1938.
Number sitting ..	14	14	18	14	9	19	11
Number passed ..	11	12	13	13	7	17	10

The provision of sufficient well-qualified obstetric nurses willing to practise obstetrics is still difficult. Where hours of work are reasonable and the salaries of the staff adequate public hospital authorities do not have the same difficulty as the private hospitals. This is largely because the conditions generally are better and the nurses' future, in the form of superannuation, is safeguarded:

Many authorities have stated that an insufficient number of obstetrical nurses who are not registered nurses are being trained, hence the shortage of supply, as registered nurses do not wish to practise obstetrics. A return was therefore obtained from all obstetric nurses (73 midwives and 176 maternity nurses) who have been trained during the past five years and who are not registered nurses, and it was found that 45 per cent. were not practising, the majority stating their reason as being because of the conditions of obstetric practice. This is an enormous wastage in such a short period of time, and it is hoped that the new conditions for obstetric nurses under the social security legislation may make this very essential service more attractive.

HEALTH OF NURSING STAFFS.

The four-year statistical study inaugurated by the International Council of Nurses has come to a conclusion. Internationally there have been difficulties in regard to arousing co-operation and interest in some countries and in regard to the political situation in others. New Zealand, however, owes the International Council a debt of gratitude for its assistance in this very important study. Our returns have emphasized the urgency of the problem and the need for reforms. Some of these reforms have already been made, but much still remains to be done. The majority of Hospital Boards are very sympathetic and willing to undertake measures which are for the betterment of their staffs. What is needed is more realization amongst the executive officers of the hospitals as to what measures can be recommended to their Boards, and willingness to give the necessary time and study to this question, which is a very important economic factor for all Boards.

The findings of the study so far carried out during the year were referred to the Tuberculosis Committee of the Medical Research Council, and it is hoped during the coming year to issue a pamphlet covering various principles in the avoidance of tuberculosis.

Apart from the more efficient medical supervision of the nurse, better teaching in personal hygiene and better supervision of nursing technique in general can do much to reduce nursing as a hazardous profession.

The Department intends to continue this study, as it is realized New Zealand has still much to accomplish in the field of investigation.

NURSING EDUCATION.

In conjunction with the Education Committee of the New Zealand Registered Nurses' Association, a study of the nursing technique as carried out in children's wards was made during the year by means of a questionnaire, followed by a suggested technique being circularized to all training-schools and also published in *Kai Tiaki*. It was found that there were so many points raised that it was decided to continue the study for a further year.

An essay competition was introduced, open to all second- and third-year nurses in training, the committee's object being to stimulate the preventive aspect of nursing. Each hospital was responsible for the selection of its own winning essay, a prize in the form of a book being awarded to the winning nurse in each hospital. The winning essays from the various training-schools were then submitted to the committee in Wellington, the final selection being left to an independent judge. The winning hospital was awarded a trophy in the form of a silver Florence Nightingale lamp. The subject of this year's essay was "Nursing Technique and its Importance as a Link in Preventive Medicine." Many of the essays showed marked originality of thought and good teaching, and it is the hope of the committee that this inauguration will serve a useful function.

PUBLIC HEALTH NURSING.

For some years past it has been apparent that the district nursing services in our urban areas while overlapping in some directions left gaps in others. It will take time to really reorganize and co-ordinate the various services, but a beginning was made during the year by regrading the school nurse of the past as a district nurse, and giving her wider functions so as to cover some of the existing gaps. Also the demonstration area in Wellington has become more established. After much consultation a family record card and a tuberculosis card have been drawn up, and it is hoped, using this record system as a basis, to build up a more co-ordinated service.

In the rural areas the work of the district nurses this year has been particularly difficult owing to the severe and widely spread measles epidemic. Among the Maoris, where the disease had been practically unknown before, the severe sickness-rate (and even death-rate) was heavy, and the staff generally had a most worrying and difficult year.

To those who are apt to be discouraged owing to the difficulties of Native work, I am sure that the following table will prove most encouraging. It shows what a rapid increase of young life is taking place among the Maoris. In this country, where we need population, surely we will do much for the future of our Dominion if we can assist these young New-Zealanders to develop as healthy, resourceful citizens:—

Age-distribution of Maori-European Population.

Percentage of Total Population.						Under Twenty-one Years of Age.	Under Fifteen Years of Age.
Maori	..	..	..	..	..	57	47
European	..	..	..	..	..	33	25

Return of District Nurses' Work.

Total number of nurses, 49.

					European.	Maori.
Total number of individuals treated	..	..	..	..	2,174	58,008
Total number of treatments given	..	..	..	..	3,393	79,025
Maternity cases—						
Confinements	..	..	..	..	12	336
During puerperium	..	..	..	..	4	898
Complicated maternity cases	..	..	..	..	..	37
Maternal deaths	..	..	..	..	..	4
Ante-natal and post-natal—						
Number of ante-natal cases	..	..	..	..	..	3,703
Number of post-natal cases	..	..	..	..	..	2,049
Infant-welfare—						
Number of infants seen	..	..	..	..	..	17,408
Number of attendances	..	..	..	..	..	24,631
Number of visits paid to Maori settlements	..	..	..	..	..	18,848
Schools visited—						
With doctor	..	..	..	..	346	78
Without doctor	..	..	..	..	2,454	1,320

EXCHANGE OF NURSES.

For some years the question of the exchange of nurses has been under discussion, and I have much pleasure in reporting that we have been able to conclude arrangements for the first exchange of a member of our district staff—Miss G. Uniacke, district nurse at Morrinsville—to go on exchange to the Metropolitan Health Board, Vancouver, British Columbia, for a year, and Miss D. Shields—who is a member of the staff of this controlling authority—is to be attached to our staff in New Zealand for the same period of time. The arrangements in connection with this exchange are similar to those which were made for the Sisters of the St. Helens Hospitals and the Melbourne Women's Hospital in that each nurse pays her own travelling-expenses, but remains on the pay roll of her controlling authority while abroad.

During the year a further exchange has also taken place between Wellington St. Helens Hospital and the Melbourne Women's Hospital, Miss B. Coutts, the Assistant Matron from Wellington, going to Melbourne, and Miss K. Stewart, from Melbourne, spending six months at Wellington St. Helens Hospital. The opportunity for this exchange has been of very definite benefit to members of our staff, as they have been able to gain experience in the larger institution where they are dealing with a large number of complicated and difficult obstetrical cases, and we hope that the Sisters from Melbourne appreciate what they see in New Zealand. Miss Stewart was a particularly fine woman who made a very favourable impression in Wellington.

POST-GRADUATE COURSE.

During 1938 and again in 1939 the Department granted leave on full pay to several members of the staff to enable them to take the post-graduate course. A large number of the Hospital Boards also granted bursaries. These, together with independent applicants, made it necessary this year, for the first time, to refuse candidates, as the facilities did not permit of larger classes.

The class-rooms have been improved, and, generally speaking, to look back ten years to the difficulties which were experienced when the course was first begun, it is most encouraging to see how it has become established and what the students are contributing to their profession in New Zealand.

In both the institutional and public-health aspects of field-work opportunity has been taken of giving the students wider and more varied experience. This has entailed making arrangements with various Hospital Boards, and the committee of management are very grateful for their co-operation and assistance.

TRAINING-SCHOOL MATRONS' CONFERENCE.

In February, at the time of the New Zealand Registered Nurses' Association Annual Conference, a meeting of the Matrons of all training-schools was held in Dunedin. The agenda included the nursing syllabus for the Preliminary State Examination; the proportion of nurses to patients as a basis of ward staffing; the health of nursing staffs; the work of the Students' Section of the Nurses' Association.

Very useful discussions took place, and in regard to the problem of ward staffing certain recommendations were made to the Department on the basis of a thirty-bed ward unit. Consideration has been given to these recommendations, and the following suggestions for ward staffing have been forwarded to all Hospital Boards as a basis for future requirements:—

Using as a basis a thirty-bed ward unit the nursing staff recommended will be as follows:—

Children's Ward—

Sister, 1.

Staff nurses, 2.

Nurses—M., 4; A., 4; N., $1\frac{1}{2}$; relief, $1\frac{1}{2}$.

Total, 14.

In children's wards it is considered this staff is required in view of the detailed technique necessary to prevent the spread of undiagnosed infections.

Infectious Disease Ward—

Sister, 1.

Staff nurses, 2.

Nurses—M., 4; A., 4; N., 2; relief, $1\frac{1}{2}$ –2.

Total, 15.

It is pointed out that much depends upon the type and number of infectious cases being nursed—i.e., typhoid patients require much more nursing care than some other infections.

Surgical Male Ward—

Sister, 1.

Staff nurses, 2.

Nurses—M., $3\frac{1}{2}$; A., $3\frac{1}{2}$; night, 1; relief, 1.

Total, 12.

Medical Ward (not Chronic)—

Although the number of staff required in a medical ward is subject to greater variation, it was agreed that the number should be the same as required for surgical wards—

Sister, 1.

Staff nurses, 2.

Nurses—M., $3\frac{1}{2}$; A., $3\frac{1}{2}$; night, 1; relief, 1.

Total, 12.

Chronic Ward—

Sister, 1.

Staff nurse, 1.

Nurses—M., 3; A., 3; night, 1; relief, 1.

Total—10 in male; 11 in female ward.

In male wards there would be a male attendant, but in women's wards an extra nurse would be required.

Gynaecological.—It was shown that gynaecological wards required as many nurses as children's wards.

Maternity Wards.—Require 1 nurse per patient (registered plus trainees). It is not possible to carry out the case-assignment system without such a staff.

THE PROBLEM OF HOSPITAL STAFFING.

All hospitals are concerned with one major problem—the question of staffing, both nursing and domestic. The new Hospital Employees' Union, with which practically all Hospital Boards have become parties in an industrial agreement, has regularized the rates of pay and hours of work for domestic workers, but the greatly reduced hours has made the problem of obtaining sufficient staff, particularly in country districts, a most acute one, and with the proposed increased industrialization of New Zealand this problem is unlikely to become less. So far it has resulted in many married women being employed who are willing to work for a certain number of hours per day, the work being so arranged that this organization can be put into effect. While satisfactory in one sense, this type of employee often raises difficulties, as disturbances in the routine of their homes are reflected often in irregularity in the attendance of the workers.

These difficulties have again resulted in increased demands being placed on the nursing staff to such an extent that at one small hospital the Matron was found to be undertaking the cook's duties two days a week to relieve her.

But a more serious position exists when it comes to the nursing staff. During the last ten years a very rapid hospitalization of the sick has come about in New Zealand. It is true that this condition exists in other parts of the world, but not to such an extent as in this country, for nowhere, for instance, is the hospitalization of obstetrical cases so high—where 87 per cent. of the total births take place in hospital—and a similar condition exists to a great extent in regard to other hospital services.

The total occupied-bed rate of hospitals used as training-schools has increased from 4,059·3 in 1933 to 4,981·394 in 1938.

Last year attention was drawn to this fact, and to the increased nursing staff required. The latest returns for 1938 show that there are 600 more girls in training than there were five years previously, in spite of the fact that the number of girls in the age-group eighteen to twenty-two was 69,700 in 1933 and 68,500 in 1938. Added to this, owing to the policy of shorter hours and expansion in the educational and business worlds, girls of that same age-group are greatly in demand.

If hospitalization is to continue, and the type of service which allows for more individual consideration for the patient (which means more staff) is to develop, what position are we gradually drifting into?

For several years, as a rough guide, the Department has advocated to Hospital Boards the proportion of one nurse to two total occupied beds, but experience has shown that with the plans for giving patients better individual care in smaller wards this is not sufficient, particularly where in the larger hospitals many registered nurses are absorbed in administrative, supervisory, and clinic positions. If nurses are to continue to undertake the same duties as previously, the need will arise for one nurse to 1·5 occupied beds if not one nurse to one patient.

It is obvious that such a position is impossible of attainment, so consideration must be given to reconsidering the whole situation if the training-schools are to retain the same standard of applicant because of the limitation of the supply to be drawn upon.

These considerations might follow definite lines:—

(1) *The Improvement of the Position of the Registered Nurse.*—So as to attract into the profession women of culture, a revision of existing conditions is needed, as every one is agreed that if this service, which comes so intimately in contact with the lives of people, is to be what it should be a background of good education is required.

It is true that much has been done in the last few years to improve salaries and hours of work. Also some Hospital Boards have provided living-out allowances which make the conditions of this section of the staff approximate the salaries and conditions of other women engaged, say, in the teaching profession. But even where this has been done, and found to be effective in that their staffs are happy and contented, murmurs that the system is "too expensive," that there is not sufficient "control" of the staff, &c., are heard.

Gradually the extension of public health nursing services and social services are absorbing many of the best members of the profession, and as these openings become more appreciated many girls who are interested in this more positive approach to health will be attracted into this avenue of the profession.

The New Zealand Registered Nurses' Association is considering the registration of this association as an industrial union, with the object of forming industrial agreements with the various employing authorities so as to improve further the working conditions of nurses. This may sound a very material approach to an important subject, but the conditions of work of the nursing service are long overdue for reform, and this reform must come from within the ranks of the profession first. There is a need for a new outlook and understanding among many nurses, and should the association's proposal eventuate many changes will, of necessity, be enforced which will require sympathetic understanding if the best results are to be gained.

(2) *A Re-organization of the Present System of Training Nurses.*—If the figures relating to training-schools for nurses in this country are examined it will be found that the proportion of registered nurses to unregistered nurses has decreased from one to two in 1933 to one to three in 1938, so that the increased staff required owing to increased hospitalization has been largely made by increasing the number of pupil nurses.

This is partly owing to the fact that there has been a shortage of young registered nurses due to the increased marriage-rate, emigration of nurses overseas, and the further absorption of staff owing to shorter hours; but also there is the reluctance of Hospital Boards to face increased expenditure, and of Matrons to use registered nurses in positions customarily filled by pupil nurses.

What is required is an entirely fresh approach to the subject. This can be attained only by thinking of the training-school as an educational unit, and not largely as a means of hospital staffing which ensures a comparatively cheap and stable staff. Although the original Nightingale School was founded with this idea it has long been lost sight of.

For instance, while it is necessary that young nurses should have some grounding in personal hygiene and good housekeeping, many duties assigned to them could be delegated to the domestic staff. Though all hospitals in this country employ domestic staff to a much greater extent than formerly, there are still duties assigned to nurses, even in their second year, which could not be termed of educational value; and what is of more importance still, though adequate, well-graded theoretical instruction may be given, clinical instruction (which is, after all, of paramount importance) is rarely regulated according to the educational needs of the pupil nurse, nor is it in any way correlated to the theoretical instruction being given.

The questions asked, therefore, by every training-school should be, How many registered nurses and domestics are required for each ward to ensure satisfactory staffing, and how many pupil nurses can be given adequate clinical training? rather than, How many pupil nurses are required to staff this hospital?

This point being determined, the next is the best method of approach.

Because nursing means bringing young girls into contact with disease at a period of their lives when they are susceptible to infection, and laying on them grave responsibilities, it is not the type of service to which it is advisable to introduce girls who are younger than eighteen to nineteen years of age. This immediately raises the question of bridging the gap between leaving school and entrance to the nurses' training-school for the girl who has to earn her living before she is eighteen years of age.

Various solutions have been suggested:—

(a) *The Retention of Girls at School* longer by means of grants or bursaries, during which time the teaching of anatomy and physiology and the elementary sciences should be carried out, these subjects being credited so as to make the adjustment to the first year of training-school life easier.

The objection to this course of action is a very real one in that the standard of teaching, if left to secondary-school teachers—because of their inadequate knowledge of the subject—would be inadequate and could not be given in the same sense as when given by a doctor who relates his teaching to the conditions to be observed by the pupil nurse. This objection would be exaggerated also by the fact that possibly only a percentage of girls in a class were going to nurse.

(b) *Central Preliminary Training-schools*, which would take the form of colleges where the same subjects would be taught by carefully selected medical and nursing instructors.

This scheme has very definite advantages, as the curriculum can be planned with a very definite preventive bias, so laying the foundation for the newer conception of the health services of the country. The cost of such schools or colleges would require to be borne by the State, the students being given bursaries as is done in the Teachers' Training Colleges.

Objections may be said to be (1) that these colleges should be residential so as to provide suitable living for their pupils, which would add very materially to the cost, and (2) that these colleges would be completely separated from the hospital and the patient, and so from the atmosphere which the pupil is looking for. But both objections could be overcome by making use of youth hostels until funds for residential colleges were available and by planning the curriculum to give these young girls a sound knowledge of the development of the normal individual before they are introduced to the abnormal atmosphere of hospital.

(c) *An Auxiliary Period of Training* planned to bridge the gap. In New Zealand a new form of training is to be introduced whereby the young girl of seventeen may be given a year's training in personal hygiene and domestic science before her introduction into the abnormal atmosphere of the hospital patient. If during this year she can be given a thorough knowledge of the normal individual and his requirements, a valuable basis for her future training will have been laid.

The new training is being devised in such a way that the training in domestic science shall be given under such conditions that it can be followed by training in the same elementary nursing duties which the pupil nurse normally carries out in her first year of training. Having completed this preliminary training as a "nursing aid" and registered as such, if she wishes she may continue with her training as a registered nurse, doing a period of two years and three months (instead of three years and three months) further training, but if she does not wish to continue she may practise as a "nursing aid."

This scheme has been devised with two distinct objects—(1) for providing a means by which girls who must earn earlier may receive a training based on their ultimate goal; and (2) for providing a training for those women who do not wish, and find it difficult to qualify, for full registration as a nurse, yet who fill a very necessary want in the community.

All of these schemes are planned to give the pupil nurse of the future a better background and to make her entrance to hospital life easier. Probably the second and third schemes are those on which New Zealand will concentrate.

Next comes the important problem of making the maximum use of the valuable clinical experience available in every training-school so that every nurse will leave her school well prepared for the demands the social life of the country will make upon her.

In New Zealand, with its extensive social and health legislation, it is most important that nurses should be health-minded, and all procedures should be taught with this positive approach to health rather than with the more limited aspect of the cure of disease. How then can this be done?

First, there should be a definite plan to allocate the clinical experience according to the stage of training so that a proper sequence is ensured, keeping in mind the balancing of the preventive and curative experience.

Secondly, there should be sufficient staff to ensure that nurses can be allocated a group of patients for their complete care so that the pupil has the satisfaction of the entire care of the patients assigned to her, and not just to one duty relating to that patient.

Thirdly, there should be adequate supervision by the registered staff, who should realize what supervision means—to assist in the development of the individual—not to inspect the individual's work.

Too much emphasis cannot be placed on these three factors in the training of nurses. Theoretical instruction, though important, is far subordinate to these requirements. The very fact that nurses must pass State examinations will force controlling authorities to pay attention to theoretical instruction when attention to the far more important clinical instruction will fail.

Various methods for giving theoretical instruction have been and are being tried. These may be grouped into two principal ways:—

- (a) Where the instruction is given concurrently with the practical experience spread out over the whole period of training. This may sound ideal, but has the disadvantages of being difficult to arrange so that the type of theoretical experience is really correlated with the practical experience—i.e., infectious-disease nursing while doing duty in the infectious-disease ward, &c.—of nurses having to leave their wards to attend lectures without being replaced; or of attending lectures when off duty.
- (b) Where the instruction is arranged in study periods of four to six weeks when the nurses are relieved entirely from ward duty. This system has the advantages that the theory in relation to the ensuing clinical experience can be given so that nurses should know what to observe, wards are not depleted of staffs, and nurses are attending lectures while they are fresh *within* their prescribed duty-hours.

If these periods of intensive study are followed up by careful clinical case studies during their period of clinical experience, many of the objects desired can be attained.

Another aspect of the training of a nurse which might be given attention is the present system of hospital discipline in the Nurses' Home as well as the hospital. Because the conditions of life were such as demanded protection for women when the original training-school was inaugurated in the last century, if educated women were to be encouraged to enter this new occupation a more or less military discipline was inaugurated, and though in New Zealand this discipline is much less severe than it is in some parts of the Old World, still the traditions of the service are such that this system is still more or less in vogue and still carried on even by the younger members of the profession when qualified.

To-day our educational system has as its object the development of the individual in its broadest sense, and the world presents opportunities for women far beyond that of the last century, so that the form of discipline necessary is rather of another type—self-discipline and the learning to discriminate; responsibility and the acquirement of the necessary courage and determination.

There has been some question as to whether life in a Nurses' Home is necessary for even the girl in training. University colleges in this country deplore the fact that they are not residential colleges, and so are denied the opportunity of giving their students that wider culture and training in self-government which residential colleges permit. Surely, then, the nursing profession should recognize the value the life in the home should be, provided that the life within the home is what the universities are aiming for. The inauguration of a students' section of the New Zealand Registered Nurses' Association with their own councils in each training-school should assist in this development very materially.

From these remarks it will be seen that the nursing world has already much, particularly in this country. We have reasonable hours and rates of pay, and means are being taken to improve these further; we are to inaugurate schemes to bridge the gap between school and nurses' training-school; we have the valuable clinical material for teaching purposes; we have even inaugurated theoretical

instruction on the lines of the block system in two of our training-schools; we have comfortable nurses' residential homes for nurses in training, and we have inaugurated living-out for registered nurses; we have supervision of the training-schools to ensure that conditions are reasonable—all points other countries are striving for. But there still remains a more general recognition for the need for reform first among nurses themselves, and then amongst their controlling authorities, if this very important problem is to be solved for the good of our country.

CONCLUSION.

With the conclusion of the financial year the Department moved its quarters from the old Parliamentary Buildings to the new Social Security Building. In the moving many old and valuable records were brought to light—for instance, the original draft for the first register and priceless letters (one being from Miss Lavinia Dock—the then editor of the *American Nurse*—congratulating Miss Maclean on the first issue of *Kai Tiaki*), as well as many evidences of the early close association of the Nursing Division of the Department and the New Zealand Registered Nurses' Association. Probably few of us realize what an important factor this oneness of thought and action has been to the nurses in New Zealand and how fortunate we are that our predecessors had such vision. May our new beginnings bear fruit equally well in the future.

Again I must thank the members of our own staff, the members of the Hospital Board staffs, and the voluntary organizations, as well as the New Zealand Registered Nurses' Association and the officers of the Education Department, for their ready help during the past year.

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

PART VI.—PRIVATE HOSPITALS AND MATERNAL WELFARE.

I have the honour to submit my annual report for the year 1938, including a history of the development of maternity services in New Zealand, a survey of the existing maternity services, European maternal welfare, Maori maternal welfare, and private medical and surgical hospitals.

SECTION I.—HISTORY.

BRIEF HISTORY OF THE DEVELOPMENT OF MATERNITY SERVICES IN NEW ZEALAND FROM 1882 TO 1938.

The earliest official references to the provision of public maternity services are those appearing in the annual reports of the Inspector of Hospitals, George Wallington Grabham, M.D., to the Hon. the Colonial Secretary. In his first report of 1882, he states:—

“*Dunedin Hospital*.—A small wooden annexe on the north side contains the lying-in department, which consists of two wards, a small kitchen, and a room for the midwife.”

Again, in 1883, we read with reference to the same hospital:—

“There are to-day 130 beds occupied—82 by males and 48 by females. Twelve of the latter are inmates of the lying-in wards, where I also saw four infants.”

In 1886 he reports, with reference to this ward:—

“I may again point out that the ‘lying-in ward’ is not well placed for this use. I strongly object to the existence of a lying-in ward as a portion of a general hospital. If needed at all, which I doubt, it should be erected elsewhere in the city.”

Ten years later, in 1896, Dr. D. MacGregor, M.A., M.B., Inspector of Hospitals, in his report on Hospitals and Charitable Institutions of the Colony, states:—

“The practice of granting midwifery certificates based on mere theoretical instruction ought to be discontinued.”

From 1896 to 1901 official records make no reference to any public maternity services. In the latter year a definite step was taken towards organizing nursing services by the passing of the Nurses Registration Act, 1901, and in 1904 this was followed by the Midwives Act. In moving the second reading of this Act the Right Hon. R. J. Seddon said:—

“I claim that the reproduction and preservation of life is one of the first duties of mankind, and if I am able to prove that this Bill goes in the direction of the preservation of life I feel sure that I shall have the support of honourable members. As I have said, reproduction is essential for the continuance of the human race. The risks attached thereto we all realize, and if we can minimize these risks and, as is provided in this Bill, ensure that those who are called in at that interesting and anxious time to which I have alluded are efficient, then I say we have so far done our duty. Have we in the colonies up to the present time devoted our attention to this matter, and have we made provision for that skill which is essential to the preservation of life at such an anxious time as that of maternity? Sir, the deaths at maternity are alarming, and I say without hesitation that if these proposals are given effect to the number of deaths will be decreased.

“I may say that up to the present time we have made no provision for the training of midwives. The midwife is generally a woman of advanced years, and in the country districts and on the diggings if you ask them the question how they became qualified, how they obtained their requisite knowledge, they would say, ‘Oh! I picked it up.’ Philanthropists and religious bodies do not provide, nor do they in the slightest attempt to provide, for that which is provided for in the Bill . . . I may be told that we have a large number of nurses at present training in our hospitals, but we must keep in mind, in connection with this phase of the question, the nurses trained in our hospitals know very little indeed in respect to the matter which is being dealt with specifically in this Bill.”

One clause in this Bill provided for the establishment of State maternity hospitals where pupil nurses could be instructed in all duties required for the welfare of the expectant mother and her infant.

Dr. MacGregor writes in his report of 1906:—

“With the passing of the Midwives Registration Act, 1904, the day of the dirty, ignorant, careless woman who has brought death or ill health to many mothers and infants will soon end. After 1907 every woman who undertakes the responsibilities of a midwife will have to show that she is competent to do so. This will necessarily limit the number of women who can be found in a district to attend a case of labour at a low charge. To meet this difficulty St. Helens Hospitals have been established in each of the four centres where the wives of working-men can obtain, at a fixed charge, care and attendance during childbirth. The success already met with in these hospitals testified to the need for them. There has hitherto been no hospital in New Zealand devoted to maternity work where nurses could be trained, and St. Helens Hospitals provide careful training for maternity nurses.”

Lavinia Dock, in her “History of Nursing Study,” writes:—

“Of all the great work which this man (Mr. Seddon), so gifted with the genius of statesmanship, accomplished for his adopted country perhaps none will have such lasting effect and do so much for the coming race of New Zealand as this of founding the four State maternity hospitals. They are a more enduring monument of his memory than any statue or tombstone can be.”

It is therefore from 1904 that we may now consider the evolution of the present maternity services in New Zealand. From 1904 only registered midwives might attend a woman in her confinement, except in case of emergency. As, however, midwives who had received no special training but had "just picked up their knowledge" had to be replaced on the register by virtue of having been in practice, it is not surprising that little improvement in the maternity mortality returns was shown.

In 1913 an outbreak of puerperal sepsis occurring in St. Helens Hospital, Auckland, was inquired into by a Royal Commission.

In 1921, in consequence of considerable publicity being given to the fact that New Zealand's maternal death-rate was placed second in a list of nations issued by the Labour Bureau of the United States of America, a special committee of the Board of Health was set up "to consider and report on the deaths of mothers in connection with childbirth." The report states that from 1877 to 1881 the death-rate was comparatively low with a minimum of 3.93 per 1,000 live births in 1880, and that from 1882 to 1890 there was "a somewhat extraordinary increase," the rate reaching 7.31 in 1885. From 1890 to 1913 there was a progressive decline from 5.42 to 3.58, while from 1913 to 1920 there was an abnormal rise to a rate of 6.48. The principal cause of this rise was puerperal septicaemia.

The next public inquiry was into an outbreak of sepsis in a private maternity hospital in Auckland in 1923. In this outbreak between July and October of that year six were infected, of whom five died. The inquiry showed that whatever efforts had been made to improve maternal welfare they had been ineffective as far as sepsis was concerned, and in 1924 the Health Department's personnel was strengthened by the appointment of an Inspector of Maternity Hospitals in May, a consulting obstetrician to the Department in July, and somewhat later a medical officer to be in charge of public ante-natal clinics.

The Inspector of Maternity Hospitals was instructed to draw up a scheme for the reduction of maternal mortality in New Zealand, and the following are some of the recommendations taken from that report. Briefly the report advised:—

- (1) The establishment of free ante-natal clinics in conjunction with maternity hospitals and the Plunket Society.
- (2) The establishment of public maternity hospitals efficiently equipped for dealing with obstetrical abnormalities and emergencies and the closer inspection by the Inspector of Maternity Hospitals of all private maternity hospitals.
- (3) The introduction of "an aseptic technique for midwifery that would be recognized and accepted as standard by the medical profession generally."

The report goes on to recommend—

The training of midwives and maternity nurses in the preparation and use of sterilized outfits, and in ante-natal care;

The provision of sterilized outfits available to all maternity nurses and midwives; and

The training of maternity nurses as distinct from midwives in order that the cases attended by doctors shall be efficiently nursed and the application of the aseptic technique ensured.

In 1925 the Nurses and Midwives Registration Act was passed, which provided for the training and registration of maternity nurses and made it unlawful, except in cases of emergency, for any person to act as a maternity nurse unless she was registered or received a certificate from the medical practitioner engaged to attend the case "that under the circumstances of the case, having regard to the welfare of the respective mother and child, he was willing to accept her" as the maternity nurse for that case. This Act immediately put out of Court the "handy woman" whose lack of knowledge of sepsis and the correct use of antiseptics constituted a menace to the health and life of patients attended by her.

The course of training for midwives and maternity nurses was drastically overhauled by the consulting obstetrician. The Nurses and Midwives Registration Board, which had been established in 1926, was given the responsibility of deciding from time to time what that training should be and of appointing suitable hospitals to carry on the training.

The regulations governing the training, conduct, and requirements of practice for midwives and maternity nurses were overhauled, and a pamphlet issued entitled "The General Principles of Maternity Nursing and the Management and Aseptic Technique of Labour and the Puerperium." The aseptic technique of labour was designed to apply to obstetrics the well-established principles of surgical asepsis.

The regulations governing the conduct of maternity hospitals were reviewed and brought up to date, and a general survey of all these hospitals was made by the Inspector of Maternity Hospitals and improvements instituted.

The Midwives Regulations were also drastically revised, and for the first time midwives were permitted to "administer chloroform or any other anæsthetic or sedative drug" *by the direction of a medical practitioner*. This regulation was designed to relieve a busy doctor from being called in personally to give the necessary alleviation from pain, a practice which had undoubtedly led to much inadvisable interference with the natural course of labour, particularly by the use of forceps.

The publicity given by these successive steps undoubtedly led to a much greater interest in obstetrics on the part of the medical profession, and a further impetus was given to this interest by the formation of the Obstetrical Society (New Zealand Branch) British Medical Association. So great was the interest taken that, due largely to the efforts of the honorary secretary of this society, a fund of £31,700 was raised by the women of New Zealand to endow a Chair of Obstetrics at the Otago University, while the surplus of the fund was put on one side to provide travelling scholarships in obstetrics for medical graduates.

Private maternity hospitals were greatly improved, more public maternity hospitals were built, public ante-natal clinics in connection with St. Helens Hospitals, public maternity hospitals and the Royal New Zealand Society for the Health of Women and Children (Plunket Society) were established, and have for many years done a valuable educational work among the women of New Zealand on the advantages of ante-natal care.

Until 1932 Hospital Boards were not legally responsible for maternity services for the indigent, though many of the Boards did make limited provision. In that year, by amendment of the Act, it was made the duty of Hospital Boards to provide these services.

By 1927 the scheme outlined in 1924 was well under way and has resulted in a marked diminution in deaths from puerperal sepsis and a slight reduction in those from shock, hæmorrhage, and other "accidents of labour." The eclampsia-rate, however, was not influenced by the extended facilities for ante-natal care. Tables VI and VII with the accompanying graph (see pages 84, 85, and 86) shows the results obtained up to the end of 1938. The education of the public in the necessity for foresight and for making better arrangements for attendance in labour, and the great improvement in the facilities and conduct of the public and private maternity hospitals led to the greatly increased hospitalization of patients. Graph No. I. (see page 76) shows that during the twelve-year period 1927-38 the percentage of patients attended in hospitals increased from 58.59 per cent to 87.33 per cent., and that, coinciding with this increase in hospitalization, the death-rate from sepsis fell from 2.01 per 1,000 live births to 0.33 in 1935, and for 1938 it was 0.77.

The above gives an outline of the development of maternity services provided for the mothers of New Zealand and the effect of those services to date.

SECTION II.—MATERNAL WELFARE.

MATERNITY HOSPITALS AND OTHER SERVICES.

The very important part that maternity hospitals conducted by well-trained nurses play in promoting maternal welfare will be made evident by reference to the graphs on pages 76 and 85, showing the relations between the decline in maternal mortality and the increase in hospitalization of maternity patients. Coincidentally with the decline in maternal mortality hospitalization has increased, and in 1938 over 87 per cent. of the confinements were conducted in public and private maternity hospitals.

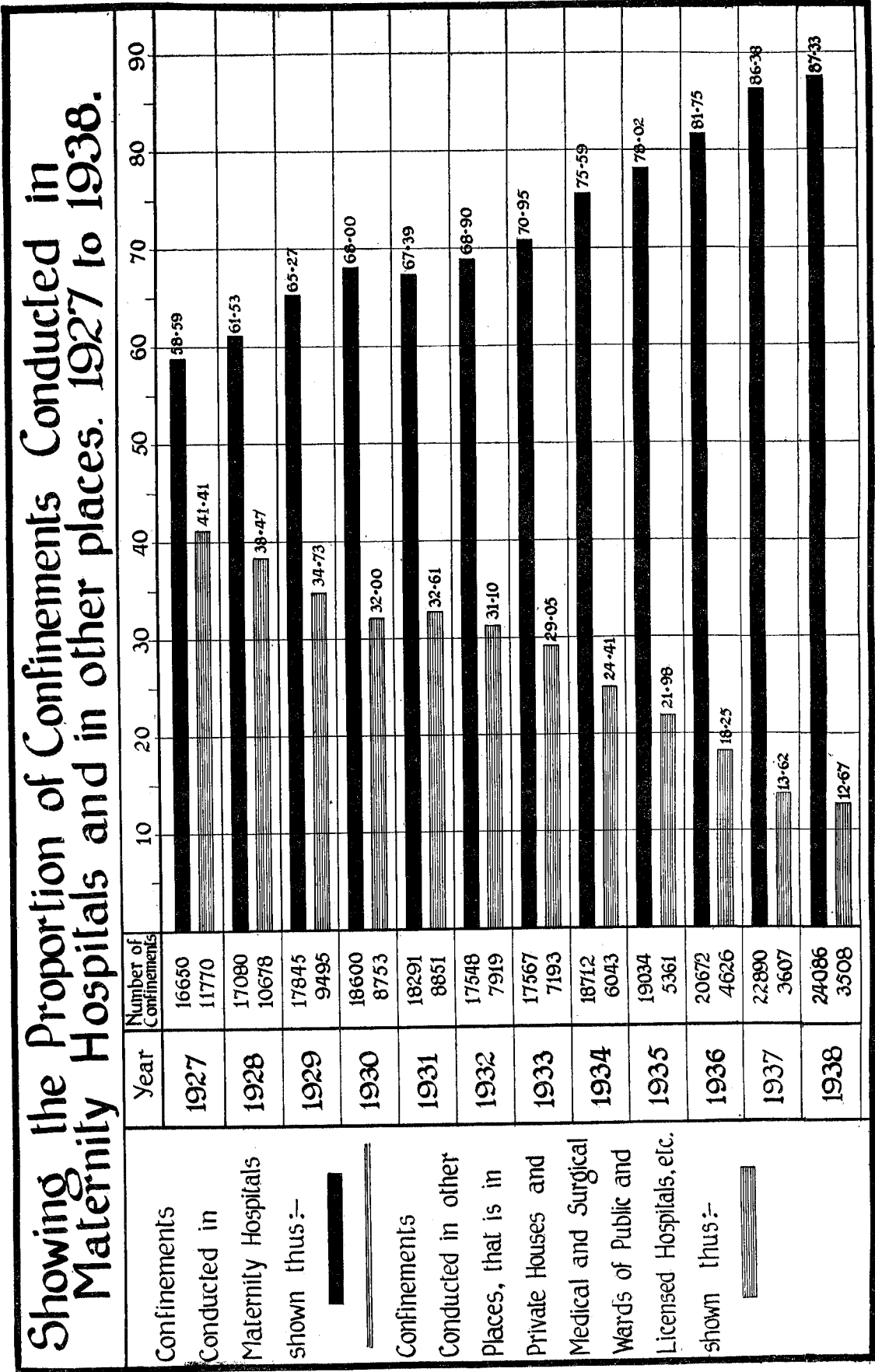
There are four State (St. Helens) Hospitals providing 85 beds, eighty-four public hospitals providing 524 beds, while 189 private maternity hospitals provide 978 beds, making a total of 1,587 beds. The largest of these maternity hospitals is St. Helens Hospital, Auckland, which has 32 beds, while eighty-two of the private hospitals have 4 beds or less. The above services are supplemented by approximately 120 one-bed maternity nursing-homes kept by registered midwives and maternity nurses. In these about 1,000 confinements took place, the number admitted to each nursing-home varying from one to about twenty per year, except in some cases in which it is obvious that due to stress of circumstances, in many cases unavoidable, more than one patient at a time has been admitted.

As was pointed out in my last report, the maternity beds provided are now occupied to very nearly their full capacity, and in some districts, particularly in those districts carrying a large Maori population, insufficient provision has been made. It is hoped that this will be remedied during the coming year. The circulation during 1938 to all Hospital Boards of the recommendations of the Committee of Inquiry into Maternity Services has been followed up by more detailed advice from the Department. The result has been to make the Boards more aware of the needs of their districts, and in most cases there has been a gratifying response. In others there has been a tendency to overstress the financial difficulties. The provision of maternity hospital benefits under the Social Security Act will relieve the ratepayers of a large part of the maintenance-costs. This should go far to help the more reactionary Boards to overcome their tendency to be over-economical in the provision of maternity hospitals in reasonable proximity to patients and doctors without which the best results cannot be obtained.

Table I on page 77 gives statistical information of the results of the 24,086 confinements conducted in maternity hospitals, an increase of 1,196 over the 1937 figures. All cases in which death has occurred, whether in the hospital or after transfer, have been recorded as if occurring in the hospital to which the patient was first admitted. Nevertheless the maternal mortality rate of 1.70 per cent. is not comparable with the rate for either Europeans or Maoris, as many of those suffering from abnormalities detected ante-natally are by preference attended in the larger general hospitals, and cases of abortion and ectopic gestation are not admitted, and, moreover, the rate is calculated on per 1,000 confinements and not per 1,000 live births. It will be noted that ten patients died from other than puerperal causes. The Government Statistician does not class those as maternal deaths, but as deaths associated with pregnancy. As the figures in this table are compiled from monthly reports sent in to the Medical Officer of Health of the district and are carefully checked, I regard them as being as accurate as is compatible with human fallibility.

Inspection of Maternity Hospitals.

Reports from the Medical Officers of Health and my own inspection show that all the hospitals are well and efficiently equipped and most are conducted well, but they have revealed the fact that in many instances antiseptics are not being used in their correct effective strength. This applies particularly to Dettol, an efficient antiseptic if used in a 2-per-cent. solution (3 drachms to 1 pint).



I have found that it is often being used at one-third the correct strength, and one cannot help connecting the rise in death-rate from puerperal sepsis with such carelessness. Licensees' attention has been repeatedly drawn to this, and information on the right strength of antiseptic supplied to all of them. It is to be hoped that it will not be necessary to take more drastic action.

Table I.—Statistics of Maternity Hospitals.

	Number of Hospitals.		Number of Beds in		Patients Admitted.		Confinements.		Number of Abortions— i.e., Delivery before the Seventh Month.		Number of Operations.						Hæmorrhages.			Number of Deaths of Mothers.		Number of Deaths of Infants who were born alive.		Number of Infants born during Labour.		Adult Patients transferred to other Hospitals.		Deaths of Transferred Maternity Patients only.		Maternal Deaths.					
	Private.	Public.	Private Hospitals.	Public Hospitals.	For Ante-natal Treatment.	For Delivery.	At Full Term.	Between 7th Month and Full Term.	Total.		Instrumental Delivery.	Versions.			Dilatation of Cervix.	Manual Removal of Placenta.	Caesarean Sections.		Other Operations.	Accidental Hemorrhage.			Uterine Hemorrhage (Placenta prævia).	Post-partum Hemorrhage.	Eclampsia.			Probably before Labour.	Probably during Labour.	Before Delivery.	After Delivery.				
												External.	Internal.	Combined.			Primary.	Secondary.		Accidental Hemorrhage.	Uterine Hemorrhage (Placenta prævia).	Post-partum Hemorrhage.													
Maternity Hospitals—i.e., admitting maternity cases and urgent miscarriage cases only— Group I: 1-100 cases per annum— Totals .. Percentages to total confinements	12	117	94	459	140	6,054	5,773	235	6,008	33	623 10-37	10 0-17	21 0-35	8 0-13	24 0-40	34 0-57	2 0-03	1 0-02	255 4-24	25 0-42	80 1-33	20 0-33	3 0-050	97 1-61	94 1-56	56 0-93	44 0-73	50 0-83	5 0-083	6 0-100	2 0-033				
Group II: Over 100 cases per annum— Totals .. Percentages to total confinements	30	52	361	432	597	14,544	13,506	666	14,172	49	1,504 10-61	74 0-52	23 0-16	15 0-11	80 0-56	71 0-50	15 0-11	7 0-05	582 4-11	58 0-41	175 1-23	58 0-41	23 0-162	247 1-74	200 1-41	143 1-01	86 0-61	196 1-38	11 0-087	28 0-198	6 0-042				
Group III: St. Helens Hospitals— Totals .. Percentages to total confinements	4	..	89	..	154	1,928	1,811	70	1,881	7	77 4-09	5 0-27	7 0-37	2 0-11	2 0-11	12 0-64	10 0-53	..	37 1-97	10 0-53	25 1-33	10 0-53	3 0-159	25 1-33	23 1-22	5 0-27	38 2-02	2 0-106	3 0-159	2 0-106					
Totals, Groups I, II, and III— Totals .. Percentages to total confinements	46	169	544	891	891	22,526	21,090	971	22,061	89	2,204 9-99	89 0-40	51 0-23	25 0-11	106 0-48	117 0-53	27 0-12	8 0-04	874 3-96	93 0-42	280 1-27	88 0-40	29 0-131	369 1-67	317 1-44	220 1-00	135 0-61	284 1-29	18 0-082	37 0-168	10 0-045				
Mixed Hospitals—i.e., admitting maternity and medical and surgical cases— Group IV: Mixed Hospitals— Totals .. Percentages to total confinements	25	20	102	87	72	2,079	1,906	119	2,025	35	219 10-81	6 0-30	1 0-05	6 0-30	5 0-25	8 0-40	10 0-49	..	125 6-17	9 0-44	44 2-17	6 0-30	2 0-099	52 2-57	36 1-78	15 0-74	10 0-49	18 0-89	2 0-099	4 0-198	..				
All Hospitals—Groups I, II, III, and IV— Totals .. Percentages to total confinements	71	189	646	978	963	24,605	22,996	1,090	24,086	124	2,423 10-06	95 0-39	52 0-22	31 0-13	111 0-46	125 0-52	37 0-15	8 0-03	999 4-15	102 0-42	324 1-35	94 0-39	31 0-129	421 1-75	353 1-47	235 0-98	145 0-60	302 1-25	20 0-083	41 0-170	10 0-042				

Causes of all deaths of patients admitted to maternity hospitals, including all cases transferred whether before or after delivery—

Puerperal Causes: Puerperal septicaemia, 10; post-partum hæmorrhage, 6; placenta prævia, 1; accidental hæmorrhage, 3; eclampsia, 6; acute yellow atrophy, 2; other toxæmias of pregnancy, 3; pulmonary embolism (non septic), 2; ruptured uterus, 2; shock following Caesarean section, 2; puerperal shock, 4.

Non-Puerperal Causes: Pneumonia, 7; heart-conditions, 2; embolism following accidental traumatism, 1.

ST. HELENS HOSPITALS.

The St. Helens (State) Hospitals, originally seven in number, have been reduced to four, two of them having been transferred to Hospital Boards of their districts, and one replaced by the Queen Mary Maternity Hospital, Dunedin, under the Otago Hospital Board. The four are situated in Auckland, Wellington, Christchurch, and Invercargill. Table II below gives numerical and statistical returns of their work.

Matters of special interest in connection with the figures for the Intern Department are that the primiparæ rate was 29·5 per cent., as compared with 39·5 per cent. for the whole of New Zealand. The still-birth and neo-natal death-rate was 3·67 per cent, as compared with 4·8 per cent. for the whole Dominion; forceps rate 4·9 per cent., as against 10·06 per cent. for all maternity hospitals (see Table I). Five deaths occurred in 1,881 confinements. Of these, 2 were due to intercurrent lobar pneumonia, 1 patient dying two days and the other four days after delivery. Two of the deaths were from eclampsia, both of interest, especially the one occurring in St. Helens Hospital, Wellington, on which the Medical Superintendent reports as follows:—

“A patient thirty-six weeks pregnant and normal in every way expressed the wish to spend the last month of pregnancy with relatives out of town. She was permitted to do so on condition that she consulted the local doctor or district nurse weekly. This she failed to do, and was admitted at term suffering from headache, albuminuria, œdema, and high blood-pressure. Within twelve hours of admission she developed fits, and died undelivered, of cerebral hæmorrhage. The child was already dead when the patient was admitted.”

The other eclampsia case occurred at St. Helens Hospital, Christchurch, and was of the fulminating type, no toxæmic signs having been detected at the ante-natal clinic, at which the patient attended regularly up to four weeks before delivery. At the next visit, fifteen days before delivery, the blood-pressure had risen from 120 to 130 systolic, with slight albuminuria. Treatment was immediately commenced under the supervision of a nurse in the patient's own home. In spite of this the albuminuria increased. The patient was admitted to hospital two days before labour commenced. There were only two fits, both prior to the commencement of labour, and followed by half an hour's coma. Labour lasted fifteen hours, the patient being delivered of a live child by forceps owing to the presentation being R.O.P. The patient died from sudden collapse seventeen hours later.

The fifth case was due to sepsis, the source of infection probably being an untreated septic sore on her leg.

As with most public maternity hospitals, the system of attendance is to combine the services of medical obstetricians with that of midwives. The obstetricians are all part-time officers with special qualifications. All ante-natal clinic patients are seen monthly by the Sister in Charge and by a medical officer at least twice and as more often as may be necessary during the period of their attendance. If normal, the confinement is in charge of the trained midwife staff, assisted by maternity nurses in training for their midwife's certificate. If certified by the medical officer as suitable, analgesics, amnesics, and anæsthetics are administered by the nursing staff according to the method decided by the Medical Superintendent. The medical staff attend all abnormalities during labour, supervise the patient during the puerperium, see every patient on discharge, and examine and treat, if necessary, all those who attend the post-natal clinic at a period four to six weeks after discharge from hospital.

Besides acting as local hospitals the St. Helens Hospitals are the only training-schools for midwives. This very important part of their work is treated fully in the report of the Director, Division of Nursing.

Table II.—St. Helens Hospitals Statistics, 1938.

	Auckland.	Wellington.	Christchurch.	Invercargill.	Totals.	Percentage to Total Deliveries.
A. INTERN DEPARTMENT.						
Total deliveries	669	544	374	294	1,881	..
Primiparæ	237	137	105	73	552	29·35
Multiparæ	432	407	269	221	1,329	70·65
Presentations and positions—						
Vertex normal rotation	616	505	350	272	1,743	92·66
Occipito posterior (persistent)	23	24	16	11	74	3·93
Face	1	2	2	..	5	0·27
Brow	..	..	..	..	..	..
Breech	27	18	9	12	76	4·04
Transverse	2	..	..	..	2	0·11
Twins (sets)	7	7	3	2	19	1·01
Complications of pregnancy—						
Hyperemesis	..	..	..	..	..	..
Hydramnios	2	..	4	6	12	0·64
Pre-eclamptic toxæmia	19	20	11	15	65	3·46
Eclampsia	4	4	1	1	10	0·53
Nephritic toxæmia	..	5	1	..	6	0·32
Hæmorrhages—						
Unavoidable (placenta prævia)	3	3	2	1	9	0·48
Accidental, external	6	1	1	..	8	0·43
Accidental, internal	..	1	..	1	2	0·11
Post-partum, atonic	9	5	8	2	24	1·28
Post-partum, traumatic	..	..	1	..	1	0·05

Table II.—*St. Helens Hospitals Statistics*—continued.

	Auckland.	Wellington.	Christchurch.	Invercargill.	Totals.	Percentage to Total Deliveries.
A. INTERN DEPARTMENT— <i>continued.</i>						
Lacerations of genital tract—						
Perinæum	98	72	41	37	248	13.18
Cervix	..	..	3	1	4	0.21
Uterus	..	..	..	..	..	..
Contracted pelvis, inlet	..	..	3	1	4	0.21
Contracted pelvis, outlet	..	..	5	1	6	0.32
Prolapse of cord	1	2	4	1	8	0.43
Complications of puerperium—						
Sepsis, local	7	7	..	7	21	1.12
Sepsis, general	..	4	..	2	6	0.32
Pulmonary embolism	..	..	..	..	..	..
Insanity	..	1	..	..	1	0.05
Crural phlegmasia, venous	..	..	..	..	..	..
Crural phlegmasia, lymphatic	..	..	..	..	..	..
Mastitis	13	10	3	2	28	1.40
Operations—						
Induction of labour	31	1	8	30	70	3.72
Episiotomy	4	22	3	..	29	1.54
Complications—						
Impacted shoulders	..	1	2	..	3	0.16
Suture of perineal lacerations	..	..	..	..	..	..
Incomplete	98	72	41	35	246	13.08
Complete	..	..	..	2	2	0.11
Forceps	28	18	23	8	72	4.09
Version, external	..	1	4	..	5	0.27
Version, internal	..	3	3	1	7	0.37
Version, combined	1	1	..	..	2	0.11
Manual removal of placenta	3	3	1	5	12	0.64
Cæsarean section	7	..	3	..	10	0.53
Craniotomy	..	..	..	1	1	0.05
Cleidotomy	..	..	..	..	..	..
Decapitation	..	..	..	..	..	..
Morbidity	41	50	31	18	140	7.44
Mortality	..	3	2	..	5	0.27
Infant statistics—						
Total births	669	556	377	295	1,897	100.85
Premature—						
Alive	21	21	13	5	60	3.19
Dead—						
Recent	4	3	4	1	12	0.64
Macerated	1	1	1	3	6	0.32
Putrid	..	..	1	..	1	0.05
Full term—						
Alive	636	535	350	285	1,806	96.01
Dead—						
Recent	8	6	4	1	19	1.01
Macerated	2	..	4	..	6	0.32
Putrid	..	..	..	..	..	..
Children born alive who died in hospital	7	8	6	4	25	1.33
Total born dead or died in hospital	22	18	20	9	69	3.67
B. EXTERN DEPARTMENT.						
Total attended	53	15	53	1	122	..
Primiparæ	..	..	1	..	1	0.81
Multiparæ	53	15	52	1	121	99.19
Forceps	..	..	4	..	4	3.28
Morbidity	4	..	..	..	4	3.28
Mortality	..	..	..	..	..	..
C. ANTE-NATAL CLINIC.						
First visits—						
Primiparæ	271	140	115	73	599	..
Multiparæ	571	428	319	211	1,528	..
Return visits	4,275	2,821	2,809	939	10,124	..
Outside visits	202	375	767	..	1,344	..

Special Investigations into Obstetrical Problems.

Thanks to the great interest taken by the staff of these hospitals into problems concerning obstetrics, much valuable clinical research work is being undertaken.

In 1937 a special investigation was made into the treatment of toxæmias of pregnancy by progesterone, and during the past year each of these hospitals has been active in investigating the best method of relieving the pains of labour.

REPORTS ON METHODS OF RELIEVING LABOUR-PAINS.

Dr. Selwyn Kenrick, St. Helens Hospital, Auckland, has been using sodium amytal, which has proved safe and effective. Most primiparæ have been given two 3-grain capsules unless some contrary indication has existed. He has recently been supplied with a Heidbrink gas and oxygen apparatus, and reports that eighteen selected cases have received this method of pain-relief with satisfactory results. By the generosity of Sir Julian Cahn two gas and air apparatuses will shortly arrive and will be put into use.

Dr. Sylvia Chapman, St. Helens Hospital, Wellington, has been carrying out an extensive and detailed investigation into the use of ether by means of Dr. Small's apparatus. In 1937 detailed reports were made on sixty-three cases. Pre-medication with one-sixth of a grain of morphia was given as a routine in the first stage to all primiparæ and those multiparæ who seemed to require it. In 1938 the use of this method was greatly extended, several hundred cases being given this treatment, fifty-five cases of which were reported in detail. Besides the one-sixth of morphia in the first stage, chloral hydrate gr. 30 and potassium bromide gr. 15 were given prior to the administration, and repeated in smaller doses where necessary throughout the first stages.

In the first series of sixty-three cases 49 per cent. of the patients got complete relief and 28 per cent. marked relief, the result being regarded as satisfactory in 78 per cent. of the cases. In the second series of fifty-five cases which received pre-medication with chloral and bromide, besides morphia, 76.3 per cent. experienced complete relief, 14.3 per cent. marked relief, and 9.1 per cent. slight relief, the results being regarded as satisfactory in 90.6 per cent.

A report on the use of gas and air by the Wellhouse modification of the Minnit apparatus was made by Dr. John Elam, Honorary Consulting Anæsthetist, Victoria Hospital, Barnett (*Journal of Obstetrics and Gynaecology*, February, 1939). The results of 1,800 cases were analysed, with the result that complete relief was shown to be given in 59 per cent. of the cases and considerable relief in 40 per cent. It appears from the records of Dr. Chapman (second series) that the ether administration by means of Dr. Small's apparatus, combined with the use of sedative drugs mentioned, has given equally good results. Dr. Chapman reports that the method is now used as a routine, and that the results in the several hundred cases other than those individually recorded appeared to have been equally satisfactory. The failures were in some cases due to temperament and in others to the nurse failing to exercise adequate control. A point in its favour is stated as follows:—

"Members of the senior nursing staff express satisfaction with the method, stating that in their experience patients are much more controllable than when barbiturate drugs are used.

"The opinion of a trained midwife who was confined in the hospital is worth recording. This patient had had a long and difficult labour ending in instrumental delivery with her first child, and was in a state of considerable apprehension regarding her second confinement. Owing to her previous history she was given a surgical induction three weeks before term. Bougies were inserted at 10 a.m. At 4 p.m. she felt the first pain, and at 10 p.m. the child was born, after an easy and normal labour. She stated that she felt no pain once the ether inhalation was begun, and was fully satisfied with the relief she received."

Dr. Averill, Christchurch St. Helens, reports on 100 patients anæsthetized with chloroform by Junker's inhalers as follows:—

Number of patients, 100.

Greatest amount used, 5 drams (6 on one occasion).

Average amount used, 2 to 3 drams.

Given after the administration of chloral only 23 patients.

Of these: Quiet and amnesia good.. .. 14

Restless but amnesia good 8

Quiet but amnesia poor 1

Given after the administration of chloral and seconal 16 patients.

Of these: Quiet and amnesia good.. .. 15

Restless but amnesia good 1

Given after the administration of seconal only 13 patients.

Of these: Quiet and amnesia good.. .. 10

Restless but amnesia good 2

Restless and amnesia poor 1

Given with no sedative—

Of these: Quiet and amnesia good.. .. 43

Restless but amnesia good 4

Restless and amnesia poor 1

Amnesia.—In fifty-five cases the patients had but little recollection of the baby being born.

In the remainder of the cases the amnesia was not so good; those who complained of having felt the delivery were in most cases those difficult to manage.

The general opinion of the nursing staff is that the patient gets much more relief than through the Murphy inhalers, but in many cases the nurse has to manipulate the apparatus as the patient seems to lose control; also she cannot make the same use of her bearing-down efforts, as she is manipulating the apparatus.

A few patients, mostly multiparæ, are nervous of the apparatus if they have to handle it themselves.

The advantage of the Murphy inhaler is that the Sister knows exactly the amount of anæsthesia it contains, but its disadvantage is that in many cases it gives very little relief.

With the Junker apparatus the Sister has to watch the patient more closely if the nurse is using it, as there is a possibility of giving the patient more than is required.

Margaret Morris Exercises.

In 1937 classes for the teaching and practice of the system of Margaret Morris exercises were introduced and conducted at St. Helens Hospital, Wellington. During the past year these have been continued, and have also been introduced at St. Helens Hospital, Christchurch. The Medical Superintendent of Wellington St. Helens Hospital states that the forceps rate for 200 patients who attended the classes was 1.5 per cent., as against 4.4 per cent. for other patients.

As stated by Dr. Chapman, while too much stress must not be laid on figures representing a small number of cases it would seem that the claim that the exercises promote easier and more natural delivery is supported by the figures as well as by the opinion of those attending the patients. Further results will be awaited with interest.

The Medical Superintendent at Christchurch, whose experience of them in the hospital under his charge is over a period of six months only, says of these exercises :—

“It is perhaps too early to comment on their value, but out of those patients who have taken up the exercises conscientiously we have had several surprisingly easy primiparous deliveries.”

Acknowledgments.

Acknowledgment is due to the many organizations which have assisted the officers of the different St. Helens Hospitals to provide various amenities which greatly increased the comfort, physical and mental, of the patients. In this connection I mention the Mayor's Relief Funds; Rotary Clubs; St. John Ambulance Associations; Friends of St. Helens, Christchurch; Girl Guides; St. Vincent de Paul Societies; St. Thomas's Guild; the Seatoun League of Mothers; Welfare Circle, Lyceum Club, Auckland; Auckland Hospital Auxiliary; and the various church organizations and old girls' societies.

MATERNITY SERVICES IN GENERAL MEDICAL AND SURGICAL HOSPITALS.

The number of small maternity hospitals necessary for the small and scattered population of New Zealand prevents their use for the graver obstetrical emergencies that occur and for the isolation of septic and other infectious conditions. The only provision for such cases are general hospitals, either public or private, in which facilities for surgical treatment are available, and in which cases of puerperal sepsis cease to be a menace to others. To provide full facilities they should have a small obstetrical unit specially staffed and equipped for the purpose.

The following table shows the nature of the cases admitted to these hospitals :—

Table III.—Maternity Cases admitted to General Hospitals.

	1938.		1937.		1936.	
	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.
For ante-natal treatment only	62	1	21	..	24	..
Admitted before delivery—						
For ante-natal treatment and delivery ..	10	1	13	..	29	..
For emergency cases without complications ..	52	1	27	..	20	..
For obstructed labour	131	4	117	7	109	3
Failed forceps	7	1	..	..	..	..
For accidental hæmorrhage	25	..	28	2	27	4
For placenta prævia	41	4	23	1	23	2
For eclampsia	19	..	25	2	29	3
For puerperal toxæmia without eclampsia ..	59	3	57	4	41	4
For other conditions	76	5	65	14	37	3
Totals	510	20	365	30	315	19
Method of delivery—						
Natural	173	10	146	11	133	7
Instrumental	24	..	23	..	16	..
Version	2	..	4	1	4	..
Cæsarean Section—						
Primary	181	6	151	10	127	4
Secondary to failed forceps	3	1	3	2	1	..
Induction of labour	35	..	34	3	17	1
Other operations	..	..	1	..	..	..
Undelivered	2	2	3	3	7	7
Totals	510	20	365	30	315	19
Admitted after delivery—						
For eclampsia and toxæmia	12	2	9	6	7	1
For post-partum hæmorrhage, shock, and embolism	14	3	7	7	6	..
For puerperal sepsis	141	9	112	9	72	9
For other conditions associated with parturition	169	5	133	7	112	5
Totals	336	19	261	29	197	15

It is to be regretted that such a large number of cases for ante-natal care only and uncomplicated emergency cases are being admitted as they would be better in maternity hospitals. When the maternity hospitals in the larger centres provide sufficient beds the general hospital will be relieved of such cases to their own and the patient's advantage.

The following table shows the increasing use of these hospitals and decreasing, though still high, death-rate :—

Year.	1932.	1933.	1934.	1935.	1936.	1937.	1938.
Number of cases	11·19	193	277	269	316	365	510
Death-rate, per cent.	11·19	8·28	5·78	8·18	5·69	6·47	3·92

The decrease in the death-rate may probably be ascribed to two main factors—greater obstetrical skill available, and the admission of cases in a sufficiently early stage. In other words, the general practitioners are to their credit recognizing the advantages to their patients and themselves of the help of the obstetrical specialist in a hospital staffed and equipped to deal with the graver emergencies.

ANTE-NATAL.

The following Table (No. IV) gives the returns from forty-eight public ante-natal clinics. Four of these are connected with St. Helens Hospitals, twenty-nine with other public maternity hospitals, ten conducted by nurses of the Plunket Society, and five by the licensees of larger private hospitals.

Table IV.

Year.	Number of Clinics supplying Returns.	New Cases.	Return Visits.	Total Attendances.	Average Number of Attendances per Patient.
1925	16	2,289	7,816	10,105	4·41
1926	20	3,238	12,554	15,792	4·88
1927	20	3,919	15,406	19,325	4·93
1928	21	5,050	20,740	25,790	5·11
1929	24	5,177	17,555	22,732	4·39
1930	25	6,027	22,078	28,105	4·66
1931	28	6,306	22,869	29,175	4·63
1932	31	5,882	22,594	28,476	4·84
1933	33	5,978	25,794	29,772	4·98
1934	34	6,191	24,929	31,120	5·03
1935	37	6,725	26,662	33,389	4·96
1936	39	7,069	29,103	36,272	5·13
1937	38	6,746	28,769	35,515	5·28
1938	48	8,221	33,808	42,029	5·11

In the St. Helens Hospitals and most of the public hospitals the work of the nurses is supplemented by examination of every patient by a medical officer, while patients attending Plunket clinics are referred to their own doctor.

I would again draw attention of those hospitals that do not provide such medical attention to the fact that they are not giving efficient ante-natal care and are subjecting the patients to grave risks by permitting a patient who has not been certified as suitable by a medical practitioner to have an anæsthetic or analgæsic drug administered during labour by a nurse; furthermore, in allowing their nurses to administer anæsthetic or analgæscs they are conniving at a breach of the Nurses and Midwives Regulations. I have had to call the attention of several hospitals to this, and do so again.

SECTION III.—CÆSAREAN SECTION.

Reports on 202 cases delivered by Cæsarean Section are summarized in Table V. The reports show that 0·73 per 1,000 total confinements were delivered by this method, as compared with 0·59, 0·64, 0·59, 0·53, and 0·44 in the five preceding years. The case-mortality rate for the mothers was

3·96, as compared with 7·64 for 1937, and that for infants was 14·85, as compared with 21·65 for 1937. I am not attempting to draw any conclusions from these figures as to the benefit of this method as compared with others, but it is hoped that the information will be of use to obstetricians.

Table V.

Group.	Reason given for Operation and Parity.	Number of Cases.	Number of Deaths.		Cause of Deaths of Mothers, and Notes on Special Cases.
			Infants.	Mothers.	
I	Contracted pelvis—				
	1 para	34	2	1	Syncope.
	2 para	18	1	..	
	3 para	8	..	..	One followed failed forceps.
	5 para	1	..	..	
	Not stated	1	..	..	
	Total	62	3	1	
II	Obstructed labour—				
	1 para	46	2	2	Both deaths due to septicæmia.
	2 para	13	..	..	
	3 para	6	1	..	Post-operative shock ; failed forceps.
	4 para	1	1	1	
	5 para	1	..	..	
	6 para	1	1	1	Ruptured uterus after twenty-four hours or more in labour.
	7 para	1	1	1	Ruptured uterus (Maori) ; labour, three days, conducted Native fashion.
	10 para	2	1	..	
	Total	71	7	5	
III	Placenta prævia—				
	1 para	13	3	2	One pulmonary embolism ; one hæmorrhage.
	2 para	7	1	..	
	3 para	2	..	..	
	4 para	3	1	..	
	5 para	1	..	..	
	6 para	2	1	..	
	8 para	2	..	..	
	Not stated	6	3	..	
	Total	36	9	2	
IV	Accidental hæmorrhage—				
	1 para	3	2	..	
	4 para	1	2	..	
	9 para	1	1	..	
	12 para	1	..	..	
	Not stated	1	1	..	
	Total	7	6	..	
V	Eclampsia—				
	1 para	6	1	..	
	6 para	1	..	..	
	Total	7	1	..	

Of the above 133 cases, five followed failed forceps of whom one died, three had rupture of uterus of whom two died.

Table V—continued.

Group.	Reason given for Operation and Parity.	Number of Cases.	Number of Deaths.		Cause of Deaths of Mothers, and Notes on Special Cases.
			Infants.	Mothers.	
VI	Toxæmia of pregnancy—				
	1 para	7	1	..	
	2 para	1	1	..	
	3 para	2	..	..	Pulmonary embolism, sixth month pregnancy.
	4 para	2	1	..	
	10 para	1	1	..	
	Total	13	4	..	
VII	Other conditions—				
	Heart-disease—				
	1 para	1	..	1	Twin pregnancy.
	Diabetes—				
	1 para	1	..	..	Thirty-seven weeks of gestation.
	Pyelo-nephritis—				
	1 para	1	..	..	Eight months' pregnancy.
	Asthma—				
	4 para	1	1	1	Age thirty-five ; tubes tied.
	Pyelitis—				
	Para not stated	1	..	..	With vomiting ; considered too ill to stand induction.
	General debility—				
	Para 10	1	..	..	Six severe P.P.H. ; tubes tied.
	Total	6	1	2	..
	Total cases	202	31	10	..

SECTION IV.—MATERNAL MORTALITY AND MORBIDITY.

PART I.—EUROPEAN.

The deaths following pregnancy and childbirth, excluding septic abortion, rose from 72 in 1937, rate 2·77, to 81 in 1938, rate 2·97. Graph No. II, page 85, and the following Tables VI and VII show the numbers of deaths from various causes as supplied by the Government Statistician.

Table VI.—Puerperal Deaths and Death-rate per 1,000 Live Births.

—		1927.	1928.	1929.	1930.	1931.	1932.	1933.	1934.	1935.	1936.	1937.	1938.
Puerperal sepsis following child-birth	No.	56	42	30	27	18	13	14	17	8	9	14	21
	Rate	2·01	1·54	1·12	1·01	0·68	0·52	0·58	0·70	0·33	0·36	0·54	0·77
Accidents of labour (hæmorrhages, shock, embolism, and accidents of childbirth not otherwise defined)	No.	35	30	39	36	31	30	29	19	24	25	12	29
	Rate	1·26	1·10	1·46	1·34	1·16	1·21	1·19	0·78	1·00	1·01	0·46	1·06
Toxæmia and eclampsia ..	No.	27	40	34	36	38	23	29	30	34	30	35	29
	Rate	0·97	1·47	1·27	1·34	1·43	0·92	1·19	1·24	1·42	1·20	1·35	1·06
Accidents of pregnancy (non-septic abortion)	No.	5	8	7	7	11	9	10	10	12	14	9	2
	Rate	0·18	0·29	0·26	0·26	0·41	0·36	0·41	0·41	0·50	0·57	0·34	0·07
Total maternal deaths (excluding septic abortion)	No.	123	120	110	106	98	75	82	76	78	78	72	81
	Rate	4·41	4·42	4·11	3·96	3·68	3·02	3·37	3·12	3·25	3·14	2·69	2·97
Septic abortion—													
Married women	No.	} 14	14	19	{ 26	26	24	16	29	17	13	16	20
Single women	No.				4	3	2	10	13	6	1	7	10
Totals		14	14	19	30	29	26	26	42	23	14	24	30
Rate		0·50	0·51	0·71	1·12	1·09	1·04	1·07	1·73	0·96	0·56	0·92	1·10

GRAPH No. II.

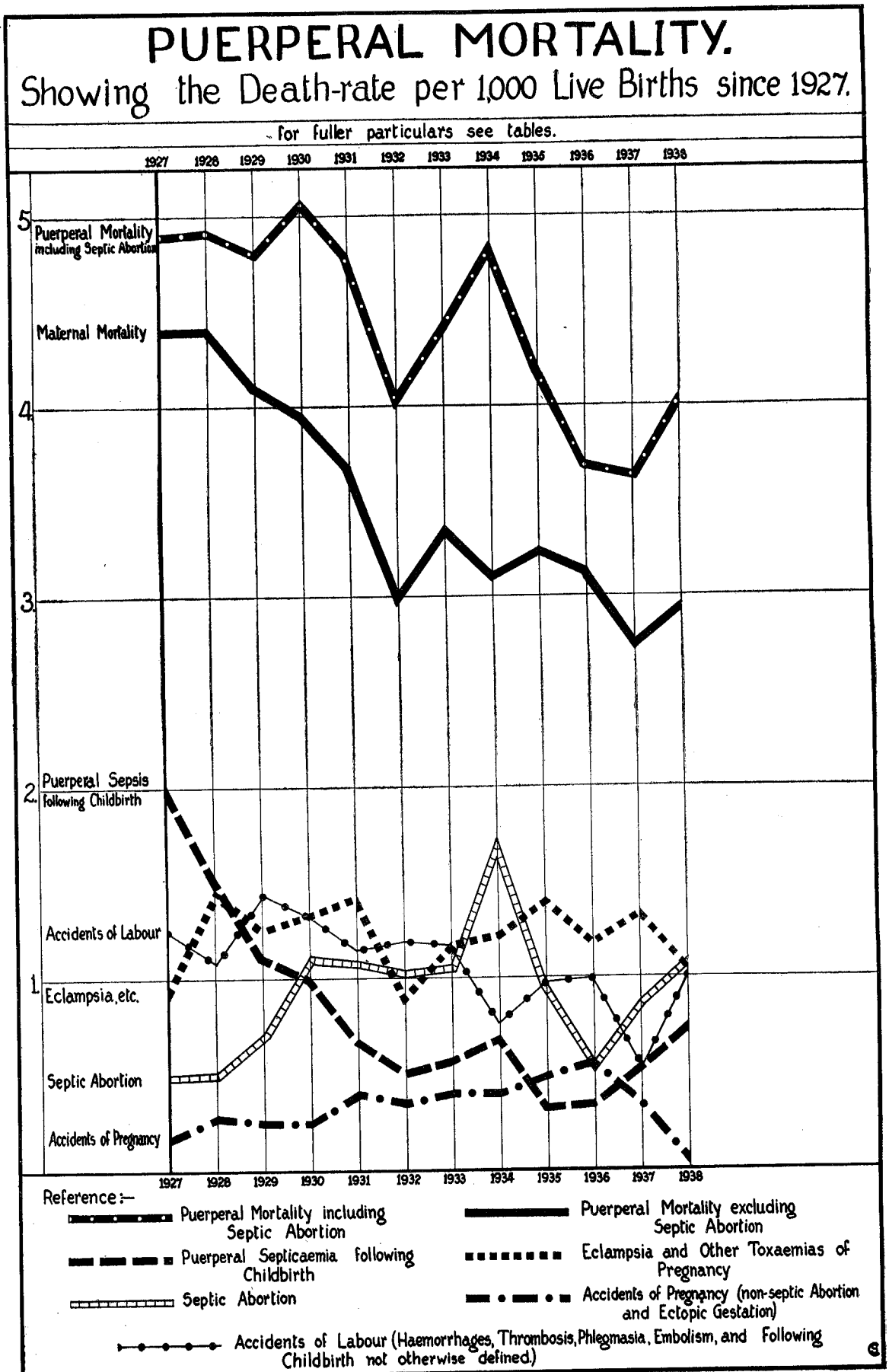


Table VII.—*Puerperal Mortality, 1938, Showing Number of Deaths and their relation to Live Births.*

	Number of Deaths.	Death Rate per 1,000 Live Births.
Puerperal sepsis following childbirth	21	0·77
Accidents of labour—		
Placenta prævia	3	
Post-partum hæmorrhage	8	
Puerperal embolism	8	
Other accidents of childbirth—		
Shock or syncope following—		
Cæsarean Section	2	
Obstetric shock and heart-failure	6	
Ruptured uterus	1	
Lobar pneumonia (non-septic)	1	
	10	
	29	1·06
Toxæmias of pregnancy—		
Eclampsia	10	
Puerperal toxæmia	9	
Hyperemesis gravidarum	5	
Acute yellow atrophy of liver	5	
	29	1·06
Accidents of pregnancy—		
(a) Abortion (non-septic)	2	
(b) Ectopic gestation	..	
	2	0·07
Total maternal deaths (excluding septic abortion)	81	2·96
Septic abortion—		
(a) Married women	20	..
(b) Single women	10	..
	30	1·10

Reference to the graph and tables show that the rise is due to increases in the number of deaths from puerperal sepsis from 14 to 21, and in those cases classed as "Accidents of labour" from 14 to 29. Deaths due to the various manifestations of puerperal toxæmias fell from 35 to 29, while the deaths classed as accidents of pregnancy fell from 9 to 2, both of which were due to non-septic abortion. Deaths under this heading last year included six abortions and three ectopic gestations. Deaths from septic abortion increased from 23, rate 0·88, to 30, rate 1·10.

ACCIDENTS OF PREGNANCY.

A comparison of the returns of 1937 with those of 1938 show a somewhat remarkable and inexplicable rise from 1 to 8 in deaths certified as pulmonary embolism (non-septic). One of the cases classed as "embolism" which occurred before delivery in the sixth month of pregnancy was the subject of a Coroner's inquest, it was certified as a case of air embolism. Deaths from "shock" rose from 4 to 8, 2 of them following delivery by Cæsarean Section. There was again 1 death from ruptured uterus and 1 from lobar pneumonia, classed by the Government Statistician as a puerperal death. The pneumonia was preceded by influenza and death occurred on the fourth day of the puerperium and was not complicated by sepsis.

TOXÆMIAS OF PREGNANCY.

A slight decrease in the deaths from this condition, the cause of which we are as far away as ever from knowing, was due to a reduction in the deaths from eclampsia which were, one hopes, the result of early detection and treatment of the antecedent toxæmia. The Committee of Obstetrical Research recently appointed is concentrating its efforts in an attempt to gain further knowledge as to the cause of this condition, which is the subject of so many theories, most of which are based on inaccurate knowledge.

SEPSIS FOLLOWING CHILDBIRTH.

The rise in deaths in the last four consecutive years from 8 in 1935, rate 0·33, to 21 in 1938, rate 0·77, which followed an uninterrupted decline from 56, rate 2·01, in 1927, to the low rate in 1935, is a matter for the concern of the Department, medical practitioners, and nurses practising obstetrics. The decline in the years 1927 to 1935 was undoubtedly due to the introduction of aseptic technique to the practice of obstetrics.

The question to be answered is, Why has it ceased to be effective? I am unable to give any positive answer, but from the reports by the Nurse Inspectors under the Medical Officers of Health and from my own observations the only changes in the technique of which I am aware have occurred during the years when the deaths increased were the use of masks which before 1935 were used in very few instances, and the substitution of an antiseptic ten times the cost per unit of lotion for the one previously used. Since the economic factor has always to be taken into consideration it probably accounts for the frequent use of this expensive antiseptic in the ineffective strength of 1 drachm to 1 pint instead of its proper strength of 3 drachms to 1 pint. In the proper strength it is effective, but costs ten times as much per unit as the one most generally used in the past.

What effect the increased use of masks has had it is difficult to say. I am, however, of the opinion that few midwives or maternity nurses have acquired a technique of using these effectively, and there is undoubtedly greater risk if bacteria intercepted by the masks are transferred to the hands than if no masks were used. In short, if the technique is so elaborated as to make it inapplicable by the person of average intelligence and training it is liable to become a danger. Every effort has been made, and will continue to be made, to correct the faults mentioned above. The matter, however, is a difficult one, as it means correcting the practice of many hundreds of nurses. Medical practitioners can do much to help.

During the past year 145 cases of sepsis were notified, of which 136 were the subject of inquiry by questionnaires. Of these, 114 cases occurred in Europeans and 22 in Maoris. I regret to say that the routine inquiries by questionnaire and occasionally by personal interview revealed very little of value. The returns show that only in the cases of 6 Europeans was faulty technique regarded as giving rise to the infection. In the cases of the Maoris, 15 out of the 22 were nursed under conditions in which asepsis was impossible to maintain.

The inquiry again reveals the fact that the most outstanding cause of sepsis is manual removal of the placenta. This method of delivery occurred in 22 out of the 136 investigated cases, a rate of 16·18 per cent., as against 0·52 per cent. in the 24,086 confinements reported in Table I. Four of the 22 patients died.

PART II.—MAORI MATERNAL MORTALITY.

The following table gives the Maori maternal-mortality rate and the numbers and rates under the different headings for the last nine years on the same lines as those for the Europeans.

MAORI MATERNAL MORTALITY.

Table VIII.—Showing the Maori Mortality by Causes for the Nine Years 1930–38.

Cause of Death.	1930.		1931.		1932.		1933.		1934.		1935.		1936.		1937.		1938.	
	No.	Rate.	No.	Rate.	No.	Rate.	No.	Rate.	No.	Rate.	No.	Rate.	No.	Rate.	No.	Rate.	No.	Rate.
Puerperal sepsis following childbirth	5	2·35	5	2·16	5	1·82	7	2·37	3	1·01	7	2·15	6	1·65	4	1·01	6	1·62
Accidents of labour (hæmorrhage, thrombosis, phlegmasia, embolism, and following childbirth not otherwise defined)	12	5·65	9	3·89	14	5·10	14	4·75	8	2·68	10	3·07	12	3·31	13	3·27	10	2·70
Toxæmia, albuminaria, and eclampsia	..	..	..	..	1	0·36	1	0·34	..	..	1	0·30	..	..	1	0·25	2	0·54
Accidents of pregnancy	3	1·41	2	0·87	1	0·36	..	..	4	1·34	3	0·92	..	..	5	1·26	2	0·54
Total, maternal causes (excluding septic abortion)	20	9·42	16	6·92	21	7·65	22	7·46	15	5·03	21	6·46	18	4·96	23	5·79	20	5·41
Septic abortion	..	..	..	..	..	..	2	0·68	3	1·01	3	0·92	2	0·55	3	0·76	..	..

The total rate, 5·14, remains approximately the same as those for the five years 1934 to 1938, a substantial drop having occurred in 1934. No deaths from septic abortion among Maoris were reported during 1938.

It is impossible to expect any material lowering of the maternal-mortality rate among the Maoris as long as they follow the obsolete methods of delivery dictated and sanctified by old customs and followed by the uninstructed members of the hapu who act as midwives and whose knowledge of the causes and methods of dealing with complications is on a par with the ignorant European midwives of a hundred or more years ago.

If we are right in considering the ordinary European house as lacking the facilities necessary to safeguard women in childbirth except in absolutely normal cases, how much more so does this apply to the Maori whare with its earthen floor, no bedstead, no bed linen, and the most meagre facilities for washing. If it is correct to attribute the reduction in European maternal mortality over the last twelve years to the attendance of the majority of the cases in hospital where skilled nursing and a doctor are available for the slightest abnormality, it is logical to conclude that the same improvement may be effected among the Maoris if the same conditions are applied to them.

PART III.—COMBINED EUROPEAN AND MAORI MATERNAL MORTALITY.

The separate statistics for Maori and pakeha, whose conditions in obstetrical practice are so entirely different, is necessary for one's own information and for the purpose of comparing our European maternal-mortality rate with that of Europeans and Maoris. For comparison with such countries as the United States of America, which has a large population living under similar conditions to the Maori, I have combined the maternal deaths in both races for which the rate is 3·26 per 1,000 live births.

SECTION V.—STILL BIRTHS AND NEO-NATAL DEATHS.

Under the heading "Infant Mortality," page 22 of the report of the Director, Division of Public Hygiene, the rates are given for the past five years of still births and deaths of infants at varying ages from one day to under one month. I quote from that report the following statement :—

"Investigation is at present being made into the marked rise in the infant-mortality rate, a rise which makes it higher than in any year since 1928. A few comments are, however, possible.

"There was a fall in the still-birth rate per 1,000 of total births, from 28·42 in 1937 to 26·54 in 1938. There was at the same time a rise in neo-natal deaths—i.e., deaths in the first fourteen days after birth—from 20·24 per 1,000 total births, to 21·44. When these two are considered together the rates for still births and neo-natal deaths were 47·98 per 1,000 total births in 1938 and 48·66 in 1937, a decrease of 0·68. The decrease in the still-birth rate therefore slightly more than balances the increase in neo-natal deaths."

The comment that the decrease in the still-birth rate therefore slightly more than balances the increase in the neo-natal death-rate appears to indicate that better obstetrical practice has led to the birth of live infants which, under less favourable conditions, would have been born dead.

SECTION VI.—PRIVATE MEDICAL AND SURGICAL HOSPITALS.

The following table shows the number of licensed medical and surgical hospitals, mixed medical, surgical and maternity hospitals, and the licensed convalescent hospitals :—

Classification by Number of Beds.	No. of Hospitals.	Total Beds.
<i>Private Medical and Surgical Hospitals.</i>		
50 to 118 beds	4	367
20 to 35 beds	15	379
10 to 19 beds	36	496
5 to 9 beds	21	150
Under 5	5	17
		1,409
<i>Private Mixed Medical, Surgical, and Maternity Hospitals.</i>		
.. .. .	32	120
		1,529
<i>Convalescent Hospitals.</i>		
.. .. .	18	132

The largest of the medical and surgical hospitals compare favourably in equipment, and facilities for specialization, with the larger public hospitals. Of necessity equipment and facilities for specialization diminish with the number of beds, the smaller hospitals having the necessary staff and equipment for surgical work requiring only the barest essentials for simple operations; nevertheless, they provide all that is required by the general practitioner for the treatment of his patients, who would otherwise have to depend on the already overtaxed public hospitals and be deprived of his services. From the point of view of the surgeon the mixed hospitals are equivalent to the smaller medical and surgical hospitals. The convalescent hospitals are licensed, staffed, and equipped to receive convalescent medical and surgical patients, and aged persons requiring more skilled and constant attention than can be provided in their own homes or boardinghouses. They provide an essential service.

SECTION VII.—INSPECTION OF PRIVATE HOSPITALS.

Co-operation between the licensees and the inspecting officers of the Department has been most helpful in maintaining a reasonably high standard of efficiency. Without the co-operative spirit on both parts the benefit of the inter-change of ideas between the licensee and Inspector is impossible. I am pleased to say that in most cases the relations between Inspectors and inspected is excellent. The main difficulty has been the introduction of the hours of work regulations for the nursing staff, a most necessary provision to prevent the overworking of nurses, both registered and unregistered, which in some cases varied from sixty to seventy hours per week, with no days off. The average forty-eight-hour week with one day off has required an increase of staff by 20 per cent. to 25 per cent. in the larger hospitals. In the smaller hospitals of under ten beds, in country districts, in which an increase in the permanent staff is economically impracticable, and where relief nurses are not available, the difficulty of providing for regulation hours and the day off per week has been considerable, and I wish to record my appreciation of the attempts made by licensees to overcome them. It is pleasing to put on record the statement of a licensee who had some difficulty in giving effect to the regulations that the staff were much happier and more contented since they had been made effective.

ACKNOWLEDGMENT.

I again wish to acknowledge the very helpful co-operation of the New Zealand Obstetrical Society and its very cordial relations with the Department. Without its help and that of the practising medical obstetricians and obstetrical nurses, particularly the licensees of hospitals, but little could be accomplished towards promoting maternal welfare. To those mentioned above and to my fellow-officers in the Nursing Division and the Medical Officers of Health and other staff who have so ably seconded my efforts, I extend my sincere thanks.

T. L. PAGET,
Director of Maternal Welfare.

PART VII.—DENTAL HYGIENE.

I have the honour to submit the following report on the work of the Dental Division for the year ending 31st March, 1939. A brief historical review is also included on this occasion.

HISTORICAL.

The inception of the Division of Dental Hygiene dates back to the year 1919, when, immediately following the Great War, the Government of the day decided to institute a School Dental Service. To this end six dental surgeons were appointed, and were attached to the staff of the Education Department. They were stationed at Warkworth, Auckland, Wanganui, Wellington, Christchurch, and Dunedin. In 1920 a Chief Dental Officer was appointed, and the officer selected for this position was Colonel T. A. Hunter, C.B.E., Director of the New Zealand Army Dental Service during the Great War.

Colonel Hunter's proposal for developing the School Dental Service was that the main personnel should consist of specially selected young women trained as school dental nurses. This proposal was regarded by many as a revolutionary one, and it gave rise to a spirited controversy within the ranks of the dental profession, a large section of whom feared that a satisfactory school service could not be built up on such lines.

The controversy continued for many months, and was even carried into the daily press. Eventually, the New Zealand Dental Association gave their formal approval of the proposal, and the first draft of young women to undergo training as dental nurses was appointed in 1921.

At the time of writing, nineteen years after this controversy took place, the dental-nurse personnel of the School Dental Service is accepted by the profession and the public alike as an established part of the dental organization of the Dominion. The services of school dental nurses are in demand throughout the country, an indication that they have earned the confidence of the public. On the professional side it can be said that, within their special sphere, the dental nurses maintain a standard of treatment that meets with the approval of the profession. This is evidenced by the reports of successive external examiners (practising dental surgeons) who conduct the final examinations for dental nurses, as well as by the comments of dental practitioners into whose hands school dental clinic patients have passed.

The first dental nurses, then, to commence training were appointed in 1921. Thereafter, except for one or two years, drafts varying in number from fifteen to forty were appointed annually between the years 1921 and 1930.

In the meantime an administrative change had been made, and the School Dental Service, along with the School Medical Service, was transferred from the Education Department to the reconstituted Department of Health, and the former Chief Dental Officer of the Education Department became the Director of the Division of Dental Hygiene in the Department of Health.

Premises to be used as a training-school and headquarters of the Dental Division were secured in the Army Base Records Building, which had been built during the war in the grounds of the main Government Building, Wellington, and this new clinic was equipped, for the most part, with equipment taken over from the Army Dental Corps.

Mr. Richmond Dunn was appointed to take charge of the training of the dental nurses, and he continued in that capacity until 1924, when he retired.

A two years' course was decided upon, and in 1923 the first dental nurses completed their course, and were allocated to school dental clinics in the field.

From 1923 onward new clinics were established in the field each year, according to the number of dental nurses available. By the year 1930 the School Dental Service had been developed to the extent that approximately half of the pupils of the primary schools of the Dominion were receiving regular and systematic dental treatment. The staff at that time numbered 188. There were 147 treatment centres, and 60,289 children were under treatment.

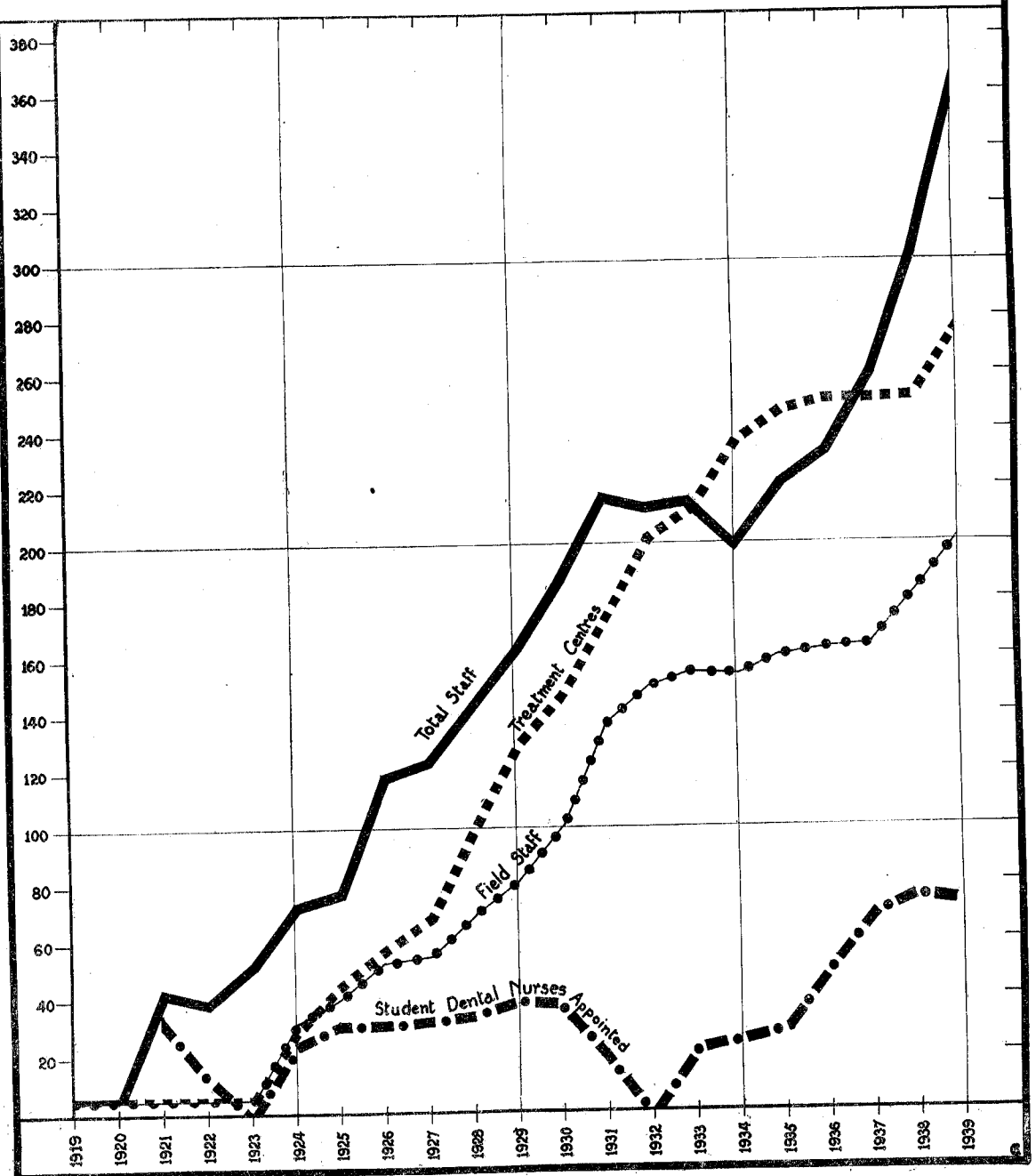
At this stage the world-wide financial depression made itself felt in the Dominion, and from then until early in 1936 it was impossible to do more than maintain the position that had been reached. An administrative change was made in 1930, when, owing to the growth of the service, it was deemed necessary to have more localized control. A policy of decentralization was therefore carried out, the Dominion being organized into four districts, each under the control of a District Dental Superintendent. This number has since been increased to five.

At the end of 1935 a policy of rapid expansion of the School Dental Service was decided upon, with the object of completing the service, and making it available to all the primary schools in the Dominion, within a period of five years. The progress that has been made in this connection is described in detail elsewhere in this report. It may be stated here, however, that the plans for expansion included the erection of a modern dental clinic and training-school in Wellington, which would fulfil the dual function of a treatment centre for the children of the Wellington metropolitan area, of whom there are some 15,000, and at the same time be a training centre to supply the whole Dominion with school dental nurses. The foundation stone of this building was laid by the Prime Minister (Right Hon. M. J. Savage, P.C., D.C.L.) on the 30th April, 1938, and it is expected that the building will be in use before the end of 1939. At the date of this report—31st March, 1939—the School Dental Service had been developed to the extent that the treatment centres numbered 279, and 94,261 children were receiving regular dental treatment and instruction in oral hygiene. The professional staff had increased to 18 dental officers, 3 trained nurses, and 210 school dental nurses, together with 138 student dental nurses undergoing training, a total of 369.

SCHOOL DENTAL SERVICE

Showing the Development as at the 31st. March of each year

- Shows the Total Staff
- ■ ■ ■ ■ Shows the Number of Treatment Centres
- ● ● ● ● Shows the Number of Staff in the Field
- ● ● ● ■ Shows the Number of Student Dental Nurses Appointed



In addition to making good the ravages of dental disease by means of suitable treatment, the teaching of oral hygiene, and of the principles of prevention of dental disease, is regarded as an essential function of the School Dental Service. During the last twelve months no less than 1,403 separate activities have been recorded under this heading. These were mainly talks to classes and groups of children, but they also included competitions, inspections for clean teeth, tooth-brush drill, &c., as well as addresses to meetings of adults. Many of the dental nurses show considerable ingenuity in devising means for interesting the children in this direction.

Other activities of the Division of Dental Hygiene include the inspection of the dental hospitals of the Dominion, and, since 1936, the administration of the Dentists Act which was passed in that year, and of the regulations made under it. Among other things, the Act provided for the setting-up of the Dental Council of New Zealand, and for the Director-General of Health, or his deputy, to have a seat on the Council, and to be Chairman for the first three years. For this purpose the Director of the Division of Dental Hygiene acts as the deputy of the Director-General of Health.

The Division is actively associated with the work of the Medical Research Council, which was set up in 1937. The Director is a member of the Dental Committee of the Council, and an officer of the Dental Division is carrying out the preliminary investigation for the Council in connection with dental disease.

The successful development of the School Dental Service has been assisted in no small degree by the ready and willing co-operation of local dental clinic committees, teachers, staffs of Education Boards, and others. Ever since the inception of the service dental clinic committees have been responsible for the local administration of treatment centres, and of recent years their responsibilities in this direction, which are undertaken entirely in a voluntary capacity, have increased considerably. The influence exerted by these committees locally has done much to facilitate the progress of the service.

During the twenty years that have elapsed since the inception of a Government dental service steady progress has, on the whole, been made. There is every reason to believe that within another two years the completion of the School Dental Service as an integral part of the primary-school system of the Dominion will be an accomplished fact.

SCHOOL DENTAL SERVICE: PROGRESS OF EXPANSION PROGRAMME.

The expansion of the School Dental Service is proceeding steadily according to plan. The decision to expand the service was made in December, 1935. At that time, the field staff consisted of 4 dental officers and 169 school dental nurses, and there were 46 student dental nurses undergoing training, of whom 28 were in their first year and 18 in the second year. A preliminary investigation was made into the staff requirements of a complete service, and a programme of expansion was drawn up. The first requirement was to assess what the ultimate task would be, in order to calculate the number of dental nurses that would be required. The annual report of the Director of Education for the year 1935 furnished the necessary statistics of the number of pupils in the primary schools of the Dominion. The figures were:—

State primary schools (including the Correspondence School) ..	198,680
Private primary schools	26,869
Total	225,549

Taking four-fifths of this number as the approximate number of pupils up to and including Standard IV (the point at which dental treatment ceases at present), 180,440 would be eligible for dental treatment.

Allowing 500 patients per dental nurse (the basis on which the service has been organized for many years), 360 school dental nurses would be required to deal with the pupils up to Standard IV. If Standards V and VI (Forms I and II) were to be dealt with in addition, a further 90 dental nurses would be required, making a total of 450. Allowing an arbitrary estimate of a further 50 for children of pre-school age, the total staff required was estimated to be approximately 500.

The task set the Department was to expand the School Dental Service so that it would be available to the children of all the primary schools in the Dominion within five years. The programme that was prepared for carrying out this expansion policy visualized three stages. The first stage was to be a preparatory period, during which training facilities would be expanded and arrangements made for the appointment of increased numbers of student dental nurses. As it takes two years to train a school dental nurse it was evident that the main expansion in the field could not commence until at least two years after the expansion programme had been launched. Thus the first stage would cover the years 1936 to 1938. During the second stage, 1938 to 1941, new clinics would be opened, and existing clinics would be reinforced, so that more and more schools would be linked up each year. In the third stage training to maximum capacity would be continued probably for two years, in order to build up a sufficient staff to extend treatment to Standard VI (Form II), and to children of pre-school age. Thereafter the number of nurses trained annually would be reduced to a sufficient number to maintain the service at full strength.

Such is the programme which is now being carried out. When entering upon the first stage it became obvious at once that the training facilities then existing were totally inadequate either to build up or to maintain at full strength the staff that would be required. Accordingly the training centre at Government Buildings, Wellington, was extended, and the training facilities were further augmented by the conversion of the official residence of the Prime Minister into a temporary training centre. While these arrangements were in progress a draft of 50 student dental nurses commenced training in April, 1936, this being the largest draft to enter training in any one year up to that time. Coincident with these preparations arrangements were made for the erection in Wellington of a modern

training-school and dental clinic, which would be adequate to provide dental treatment for the school-children of the Wellington metropolitan area, and at the same time provide school dental nurses for the whole Dominion. This building is now approaching completion.

It was recognized, however, that annual drafts of 50 entering training would not be sufficient to supply the staff required within the time allotted. The instructional staff was therefore further augmented and the training arrangements reorganized to permit of each annual draft being entered in two divisions at six-monthly intervals, instead of in one group. By these means it has been possible to still further increase the number of entries to the training-school each year. Thus, following the 50 appointments in 1936, 70 were made in 1937, 77 in 1938, and a further 75 appointments have been made for entry during 1939.

It is fitting that acknowledgment should be made at this juncture of the manner in which the members of the instructional staff have responded to the unusual and sustained demands that have been made upon them in connection with these activities. It is satisfactory to note that the dental practitioners who have acted as external examiners in the final examination for school dental nurses have all expressed satisfaction in regard to the standard that is being maintained.

While these arrangements for ensuring the necessary supply of trained dental nurses have been in progress, the plans for extending the service in the field have received attention. A careful survey has been made covering the whole Dominion, with a view to determining—

- (a) Where treatment centres should be established; and
- (b) How the smaller schools can best be grouped in order to be served by a school dental clinic.

This survey is now complete, and maps have been prepared to show the proposed grouping of schools and the locations of future clinics. These dispositions form the basis of the organization on which the expansion of the school dental service is being carried out.

The second stage of the expansion programme, the expansion of the field organization, commenced during the year under review, the 1936 appointees having completed their training in 1938. Forty-eight dental nurses became available for the field in April, 1938, and they were allocated as under:—

To open new clinics	22
To reinforce existing clinics with a view to extending to additional schools ..	14
To fill vacancies, and in reserve	12

At the date of this report—31st March, 1939—a further 28 dental nurses had recently completed their training, and arrangements had been completed to allocate them as under:—

To open clinics in new districts	14
To reinforce existing clinics with a view to extending to additional schools ..	4
To fill vacancies, and in reserve	10

Thus good progress is being made with the second stage of the programme, and, provided local committees do their part and have clinics ready for occupation at the time required, there is every prospect that every primary school will be served by a school dental clinic not later than 1941.

STAFF OF DENTAL DIVISION.

On the 31st March, 1939, the professional staff of the Division, disposed as under, numbered 369. Of the 138 student dental nurses shown below 28 had completed their training and were about to be transferred to Districts and a further 75 had been appointed for entry to the training-school during 1939.

	Dental Officers.	Trained Nurses.	Senior Dental Nurses.	School Dental Nurses.	Student Dental Nurses.	Total.
Director	1	..	..	..	..	1
Principal Dental Officer	1	..	..	..	..	1
Principal, Wellington Dental Clinic ..	1	..	..	..	..	1
Senior Dental Officers—						
(a) In districts	4	..	..	..	..	4
(b) In training-school	1	..	..	..	..	1
(c) Seconded to Medical Research Council	1	..	..	..	..	1
Dental officers—						
(a) In districts	3	..	..	..	..	3
(b) In training-school	6	..	..	..	..	6
Trained nurses—						
(a) Matron, Wellington Dental Clinic ..	..	1	..	..	..	1
(b) Home Sisters, Hostels	..	2	..	..	..	2
Senior dental nurses—						
(a) In districts	..	..	3	..	..	3
(b) In training-school	..	..	6	..	..	6
School dental nurses	..	..	..	201	..	201
Student dental nurses	..	..	..	..	138	138
	18	3	9	201	138	369

SCHOOL DENTAL SERVICE : SUMMARY OF ACTIVITIES DURING PAST YEAR.

The statistical section of this report shows that steady progress has been made during the period under review. The total number of operations shows an increase over the previous year—namely, 826,598, as against 759,873 for 1937-38. The number of patients under treatment at the end of 1938 was 94,261, as against 89,483 in 1937.

New school dental clinics were established during the year at twenty-two centres—viz., Aniseed ; Beresford Street, Auckland ; Cornwall Park, Auckland ; Howick ; Kaponga ; Katikati ; Kawakawa ; Mercury Bay ; Morningson, Dunedin ; Oaro ; Ohura ; Okato ; Opunake ; Phillipstown, Christchurch ; Rawene ; Tairua ; Tahuna ; Takapuna ; Te Karaka ; Tuakau ; Tokaanu ; and Whangamomona. In addition to these new centres, the following eleven existing centres were reinforced : Beckenham ; Dannevirke ; Ellerslie ; Linwood ; Napier ; Rotorua ; Tauranga-Te Puke ; Thames ; Warkworth ; Wellsford ; Westland ; and Whangarei. In the case of Warkworth-Wellsford and Tauranga - Te Puke, the additional staff was appointed to Wellsford and Te Puke respectively, thus giving these former sub-bases the status of main-treatment centres.

Forty-nine new clinics have been authorized at centres which were not served before, and thirteen existing centres are to be reorganized in the immediate future, and their scope extended, by the appointment of additional staff. Details of these are given in another section of this report.

In order to facilitate the control of the rapidly increasing number of clinics the dental districts have been reorganized, and a new one created, with headquarters at Hamilton. This district (the South Auckland Dental District) includes the South Auckland, East Cape, and Taranaki Health Districts. The former Auckland and Wellington Dental Districts have been reduced accordingly.

STATISTICS.

Operations performed in the field and in the training-school from 1st January to 31st December, 1938 :—

Fillings—					
In permanent teeth	..	..	..	..	262,546
In deciduous teeth	..	..	..	..	308,653
					571,199
Extractions—					
In permanent teeth	..	..	..	..	2,154
In deciduous teeth	..	..	..	..	65,818
					67,972
Other operations	..	..	..	..	187,427
Total operations	..	..	..	..	826,598

The following figures illustrate the progress made during the last nine years :—

Year.				Number of Schools under Systematic Treatment.	Number of Children receiving Systematic Treatment.	Total Number of Operations.
1930	..	..	..	930	67,652	463,204
1931	..	..	..	1,118	68,995	562,759
1932	..	..	..	1,297	72,584	619,390
1933	..	..	..	1,430	78,391	623,625
1934	..	..	..	1,551	83,433	626,878
1935	..	..	..	1,590	84,738	674,374
1936	..	..	..	1,629	89,803	725,069
1937	..	..	..	1,568	89,483	759,873
1938	..	..	..	1,620	94,261	826,598

Total number of operations since the inception of the service, 7,550,819.

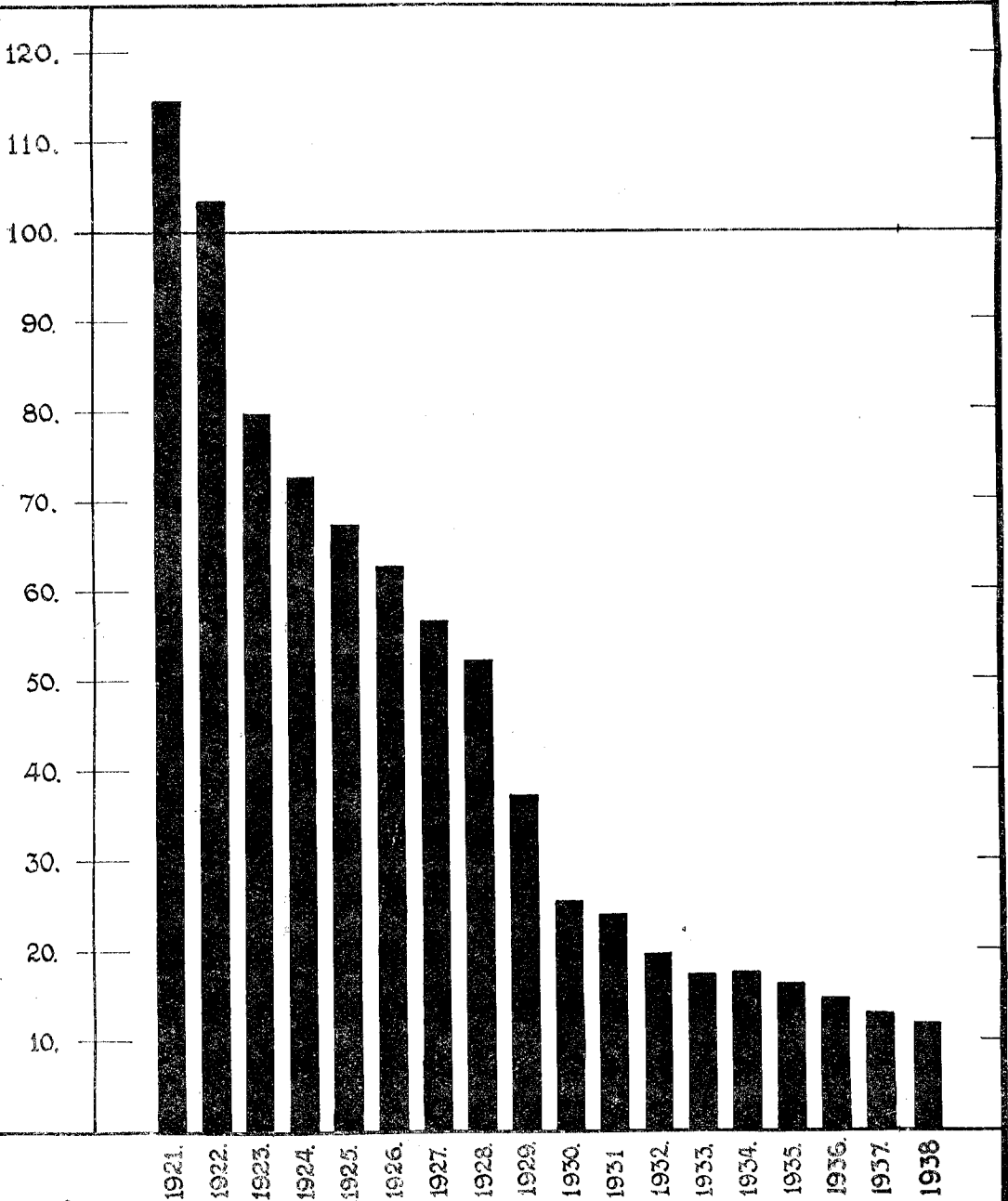
RATIO OF EXTRACTIONS TO FILLINGS.

The number of teeth extracted as unsaveable as compared with the number of fillings performed shows a further decrease. The figure for the year under review is 11·9 extractions per 100 fillings. The steady decrease since the inception of the service is shown in the following table :—

				Fillings.	Extractions.	Ratio : Extractions per Hundred Fillings.
1921-22	..	..	..	13,047	14,939	114·5
1922-23	..	..	..	24,603	25,436	103·3
1923-24	..	..	..	47,610	37,978	79·7
1924-25	..	..	..	59,322	43,181	72·6
1925-26	..	..	..	61,506	41,339	67·2
1926-27	..	..	..	84,723	53,232	62·8
1927-28	..	..	..	116,916	66,523	56·8
1928-29	..	..	..	146,354	76,555	52·3
1929-30	..	..	..	190,934	71,128	37·2
1930-31	..	..	..	258,546	75,973	25·5
1931-32	..	..	..	334,827	80,389	24·0
1932-33	..	..	..	382,289	74,633	19·5
1933-34	..	..	..	397,437	69,208	17·4
1934-35	..	..	..	399,560	70,207	17·5
1935-36	..	..	..	450,727	72,782	16·1
1936-37	..	..	..	498,121	72,088	14·6
1937-38	..	..	..	535,441	68,832	12·9
1938-39	..	..	..	571,199	67,972	11·9

The above figures include both permanent and deciduous teeth. For permanent teeth alone the ratio is 0·8 extractions per 100 fillings.

Showing the ratio of Extractions
per 100 Fillings.



NEW-TREATMENT CENTRES.

At the date of this report—31st March, 1939—arrangements were well in hand for establishing school dental clinics at forty-nine new centres and for the strengthening the staff at thirteen of the existing centres in order to enable local extension to additional schools to be carried out. These centres are shown hereunder:—

(1) *New Centres*.—Balmoral; Kaitaia; Kaikohe; Kaeo; Kamo; Mangonui; Maungaturoto; Meadowbank; Napier Street, Auckland; Newton Central, Auckland; Newton West, Auckland; Newmarket; Okaihau; Point Chevalier; St. Heliers; Parnell; Silverdale; Waiuku; Waimamaki; Kawhia; Mahoenui; Matawai; Putaruru; Tolaga Bay; Whakatane; Manaroa (Pelorus Sound); Paraparaumu; St. Omer (Pelorus Sound); Te Puru (Pelorus Sound); Te Towaka (Pelorus Sound); Albury; Akaroa; Cheviot; Darfield; Kumara; Moana; Oira; Oxford; Riccarton; Spreydon; Waltham; Clydevale; High Street, Dunedin; Kaikorai; Lumsden; Orepuki; Riverton; South School, Invercargill; Tuatapere.

(2) *Existing Centres to be reinforced*.—Avondale; Otahuhu; Pukekohe; Sandringham; Tauranga; Wairoa; New Plymouth; Rangiora; Rotorua; Hastings; Palmerston North; Lower Hutt; Addington.

TRAINING OF DENTAL NURSES.

Dr. J. B. Bibby, Principal of the Wellington Dental Clinic, reports as follows on the training of dental nurses and the work of the clinic:—

“(1) *Staff*.—In addition to the Principal, the training staff consists of seven dental officers, a matron, and six senior dental nurses. Mr. G. H. Leslie, B.D.S., Mr. J. G. Epsie, B.D.S., and Senior Dental Nurses Clarkson, Cornwall, and Wain were appointed to the staff during the year. In view of the further increase in the number of student dental nurses it was necessary again to augment the staff of Dental Surgeon Instructors by appointing further trained dental nurses in a temporary capacity as Dental Nurse Instructors.

“Those who served in this capacity during the twelve months passed are Nurses M. V. Duncan, M. M. Grocott, F. G. McDonald, G. McQueen, J. R. Robbins, and M. M. Wade. The services of these officers have been of the utmost value during a period of rapid expansion, and it is very gratifying that Nurses Clarkson, Cornwall, and Wain are now attached permanently to the instructional staff of the training-school.

“Mr. A. D. Brice, who has been Acting-Principal of the institution since 1935, relinquished this position at the end of 1938 on my resuming my normal duties, after being engaged on special work.

“Dr. R. M. S. Taylor left on transfer to Hamilton, being promoted to the position of Senior Dental Officer, South Auckland District, while Mr. J. F. Fuller resigned in order to enter private practice.

“(2) *Student Dental Nurses* (as at 31st March, 1939):—

“In second year of training—

“First group (fifteenth draft) 33

“Second group (fifteenth draft).. .. 27

“In first year the training—

“First group (sixteenth draft) 38 (41 commenced; 3 transferred from second group, second year; 4 transferred to second group, first year; 2 resigned).

“Second group (sixteenth draft) 40 (36 commenced; 4 transferred from first group, first year).

“The year has seen a still further increase in the number of student dental nurses. Of the total number approved by the Government for the sixteenth draft (1938), 41 commenced training in April, and a second group of 36 took up duty in October. The total number of nurses now in training is 138. This number will be further increased in April next.

“(3) *Annexe*.—Brought into use to give additional accommodation pending the completion of the new dental clinic and training-school, the annexe has functioned efficiently during the last twelve months.

“Certain sections of the training of both first- and second-year students are now being concentrated upon in this building.

“The Senior Instructor, Mr. G. H. Leslie, is in charge, and associated with him has been Miss Haines as Senior Dental Nurse. To give more efficient working an endeavour has been made to station certain members of the staff permanently at the annexe, while students at certain stages in their training transfer to or from the main training-school. It does not seem possible to overcome the loss of time by the instructional staff in transit between the two institutions, nor the objection raised by parents in travelling to this clinic.

“(4) *Examinations*.—(a) It was necessary to hold two final examinations during the year. The first one, in September, 1938, was for those members of the fourteenth draft who had failed to pass the final examination in March, 1938. The six candidates were all successful in passing.

“The second final examination was held in March, 1939, for the 35 members of the fifteenth draft. Of this group, 32 were successful, the remaining 3 being required to be present for a special final examination in September next.

"The external examiners on these two occasions were respectively Dr. J. Y. Warren, D.D.S., of Auckland, and Mr. J. H. Don, B.D.S., of Timaru.

"(b) Primary examinations were also held for the first and second groups of the sixteenth draft. The first being in September, 1938, and the second in March, 1939. The details are as shown below :—

—	Number of Candidates.	Passed.	Failed.	Remarks.
First group ..	38	38	Nil	Three other members of this group did not qualify to sit the examination.
Second group	40	37	2	One failed both papers; one failed one paper; one absent.

"The examiners were—1st Group: Dr. A. Platts Mills and Dr. M. Rippin; 2nd Group: Dr. B. Wyn Irwin and Dr. S. L. Mullholland.

"(5) *The Course of Training*.—The readjusted syllabus, consequent on the introduction of two drafts per year, has been followed with minor variations. This has proved satisfactory, but calls for sustained effort on the part of the staff and sacrifice of their own time to maintain class-work.

"A most pleasing feature of the year's work as regards the training-school has been the manner in which the individual members of the training staff, so many of them comparatively new, have combined to work in a spirit of unity for the furtherance of the best interests of the service.

"(6) *Hostels for Student Dental Nurses*.—The Department's Hostel, 'The Mansions,' Gluznee Street, has continued to function very satisfactorily under the control of Miss E. Pengelly. The 'Friends' Hostel, under the control of Miss E. Searell, is also giving good service, and the Department is again indebted to the Society of Friends for the continuance of the arrangement whereby student dental nurses are so well catered for.

"To meet the increase in the number of student nurses the Department acquired the former Girls' High School Hostel in Hobson Street as a further Dental Nurses' Hostel. With renovation and some alteration this has been made into an attractive and comfortable home for some forty students. Much credit is due to Miss Hooper for supervising the whole of the renovation and the furnishing of the building, and also to Miss Stanton who has so capably controlled the home life of the institution.

"(7) *Statistical* :—

"(a) *Attendances and Operations*: Attendances recorded and operations performed in the Wellington Dental Clinic for the years from 1936–37 to 1938–39 are shown below :—

	Attendances.	Fillings.	Extractions.	Other Operations.
" 1936–37 ..	23,588	15,748	1,444	17,569
" 1937–38 ..	47,238	31,014	3,141	31,931
" 1938–39 ..	52,997	42,419	3,894	33,894
" Increase since last year	5,759	11,405	753	1,963
" Total increase since 1936–37	24,409	26,671	2,450	16,325

"Total attendances recorded and operations performed to 31st March, 1939 :—

Attendances.	Fillings.	Extractions.	Other Operations.
552,893	375,483	76,408	314,654

"(b) The number of patients under treatment as at 31st March, 1939, 6,702.

"The number of admissions for the year is as follows :—

" New patients commenced ..	..	..	..	..	2,271
" Transferred from other centres ..	..	..	..	..	133
" Total ..	..	..	..	..	2,404

"The total loss of patients during the year—

" Patients reaching maximum age for treatment ..	..	..	..	248
" Patients transferred to other centres ..	..	..	..	164
" Patients whose treatment has lapsed through failure to attend ..	..	..	..	269
				681

"The net increase of patients under treatment is therefore 1,723, compared with 2,078 for the previous year.

"(c) *Waiting List*: The number of names on the waiting list as at the 31st March for the last three years is as follows: 1937, 3,398; 1938, 1,095; 1939, 229.

"During this year 2,271 new patients commenced treatment, thus completely eliminating those names standing at 31st March, 1938. Of the 229 now waiting none have been listed for more than six weeks.

"Contrary to expectations (and in spite of a great increase in the number of operators over that of former years) it has been found necessary to maintain a small list of patients waiting for treatment. Applications are becoming steadily greater in volume as the increased facilities for treatment are more widely known. The rate of absorption, however, varies with the various stages of training of the student dental nurse, and thus a waiting list becomes essential to ration the supply to the varying demand.

"As mentioned in the last annual report, it is of interest to know that in addition to the 'official' waiting list there is an unofficial waiting list containing the names of children under the age of two years and a half. When these children reach two years and a half it is the custom to place their names on the 'official' list, and call them up for examination at the earliest possible date.

"At the 31st March, 1938, there were 350 on this list. In spite of calling up over 200 during the last twelve months, the list has increased to 469.

"In conclusion, I would like to express my appreciation of the efficient way in which Mr. Brice, the Acting-Principal, organized the work of the institution during the period of change and rapid growth.

"I would also like to extend my thanks to the members of the staff, who by their loyal co-operation have maintained the smooth running and efficiency of the training-school and dental clinic, to the Principal and officers of the Teachers' Training College, and the Director and officers of other Divisions of this Department who have assisted in various ways in the course of training, and finally, to those members of the dental profession who continue to co-operate and assist with the work of the Wellington Dental Clinic."

DENTAL HEALTH EDUCATION.

Treatment alone, if unaccompanied by preventive teaching, will not bring about that improvement in the standard of dental health which is the aim of a School Dental Service. Operative treatment shows immediate results, and of necessity it figures prominently in school dental activities. Preventive teaching, on the other hand, shows little in the way of tangible results, and to carry it out with any degree of success calls not only for knowledge, but also for imagination, sustained enthusiasm, and the gift of arousing and holding the interest of listeners.

School dental nurses are encouraged to foster and develop these attributes. Their training includes not only instruction in the principles of prevention of dental disease, but also a short course at the Teachers' Training College in methods of teaching. This is followed by the giving of prepared talks before primary-school classes and before their fellow-students for criticism by instructors. In addition, they are required to draw up dental health education programmes and to submit original work in posters and other educational material.

As a result, a considerable proportion of the dental nurses show commendable enthusiasm in regard to this matter. This is evidenced by the fact that during the year under review educational activities carried out by dental nurses numbered 1,403, exclusive of chair-side instruction, which is carried out as a routine procedure in conjunction with treatment. I look forward to the time when dental health education will be carried out on an organized basis, just as treatment is now.

One of the chief obstacles to early success in health education is that, however enthusiastic children may become in regard to carrying out the precepts that they are taught, it is the parents who ultimately control the situation, in that it is they who provide the food for the family and pay for dental and other attention. Not until parents as a whole become imbued with the principles governing the prevention of dental and other diseases will satisfactory results be apparent.

Those who would carry out health education must be possessed of vision, patience, and persistence.

SENIOR DENTAL NURSES.

Reference was made in the last annual report to the fact that the instructional staff of the Wellington Dental Clinic had been augmented by the appointment of several selected dental nurses as dental nurse instructors. During the past year the system of utilizing the services of experienced dental nurses in a senior capacity has been extended to the districts, and four dental nurses have been appointed as Senior Dental Nurses to assist the officers in charge of the dental districts. The system is operating satisfactorily, both in the training-school and in the districts.

RESEARCH.

The Medical Research Council, through its Dental Committee, to which reference was made in the last annual report, has commenced a survey with a view to ascertaining the factors that are associated with dental caries in the Dominion. For this purpose the services of Mr. A. D. Brice, B.D.S., of this Department, have been made available to the Medical Research Council for a period of one year.

ACKNOWLEDGMENTS.

Again I take the opportunity of expressing the thanks of the Department to Dental Clinic Committees, teachers, staffs of Education Boards, and all others who in various ways have rendered valuable assistance in furthering the work of the School Dental Service. This help, which has been so readily forthcoming, has contributed in no small measure to the smooth running of the service and to the rapidity with which it is being expanded.

The staff of the Division has rendered splendid service throughout the year, and I wish to express my keen appreciation of the loyal and efficient service which they have given. I wish to acknowledge especially the manner in which the training staff and the controlling staffs of districts have responded to the unusual demands that have been made upon them in connection with the rapid expansion of the School Dental Service.

J. LL. SAUNDERS,
Director, Division of Dental Hygiene.

CENTRES AT WHICH SCHOOL DENTAL CLINICS WERE ESTABLISHED AS AT 31ST MARCH, 1939.

Main Treatment Centres.	Authorized Sub-bases.	Main Treatment Centres.	Authorized Sub-bases.
<i>Auckland District.</i>			
Avondale	Blockhouse Bay.	Onehunga	..
Birkenhead	..	Otahuhu	..
Beresford Street	..	Paeroa	..
Cornwall Park	..	Papakura	..
Dargaville	Te Kopuru, Ruawai.	Ponsonby	..
Devonport	..	Pukekohe	..
Ellerslie	Howick.	Rawene	..
Normal School	Mount Eden.	Sandringham	..
Gladstone Road, Grey Lynn	Auckland.	Takapuna	..
Helensville	Huapai.	Tauranga	..
Henderson	Glen Eden.	Te Puke	..
Kawakawa	..	Thames	Coromandel, Mercury Bay.
Manurewa	..	Tuakau	..
Maungauhau	Auckland.	Waihi	Kati Kati, Tairua.
Mount Albert	..	Warkworth	..
Mount Eden	..	Wellsford	..
Mount Roskill	..	Whangarei	Hora Hora, Whau Valley.
New Lynn	..	Whangarei Country	..
Ngatea	Kaihere, Kerepehi, Turua, Waitakaruru.		
<i>South Auckland District.</i>			
Cambridge	Kaponga.	Pio Pio	..
Eltham	..	Rotorua	Mamaku.
Gisborne No. 1	..	Stratford	..
Gisborne No. 2	..	Tahuna	Kakahi
Hamilton East	..	Taumarunui	Tokaanu.
Hawera	..	Taupo	..
Huntly	Pukemiro, Te Kauwhata.	Te Aroha	..
Inglewood	..	Te Awamutu	..
Manaia	..	Te Karaka	..
Matamata	..	Te Kuiti	Waimiha.
Morrinsville	..	Te Paroa Totara	Maketu, Matata, Poroporo, Pukehina, Ruatoki, Ta- wera, Te Teko, Waiohau.
New Plymouth	..		Ruatoria, Te Araroa.
New Plymouth Country	Glen Massey, Raglan.	Tikitiki	..
Ngaruawahia	..	Wairoa	..
Ohura	..	Waitara	Awakino.
Okato	Taneatua, Torere, Maraenui.	Whangamomona	..
Opotiki	..	Whitiora	..
Opunake	..	Hamilton	..
Otorohanga	..		
<i>Wellington District.</i>			
Blenheim	Greytown.	Palmerston North (College Street)	..
Carterton	Pongaroa.	Palmerston North (Terrace End)	..
Dannevirke	..	Palmerston North (King Street)	..
Eastbourne	Tiraumea, Woodville.	Patea	Waverley.
Eketahuna	Martinborough, Pirinoa.	Petone	..
Featherston	..	Picton	Havelock, Rai Valley.
Feilding	..	St. John's Hill, Wanganui (Mobile Clinic)	Country schools from Nuku- maru to Turakina.
Gonville	..	Shannon	..
Hastings	..	Taihape	..
Hastings (Country)	..	Upper Hutt	..
Hunterville	Mangaweka.	Waipawa	Otane.
Levin	..	Waipukurau	Porangahau.
Lower Hutt	..	Wanganui (Keith Street)	..
Marton	..	Wanganui East	..
Masterton	..	Wellington	..
Masterton (Country)	..		
Napier	Raetihi.		
Ohakune	Takapau, Otaki.		
Ormondville	..		
Pahiatua	..		

CENTRES AT WHICH SCHOOL DENTAL CLINICS WERE ESTABLISHED AS AT 31ST MARCH, 1939—*continued.*

Main Treatment Centres.	Authorized Sub-bases.	Main Treatment Centres.	Authorized Sub-bases.
<i>Canterbury District.</i>			
Addington .. ..	.. ..	Phillipstown .. ..	.. ..
Ashburton West .. ..	.. ..	Rakaia .. ..	.. ..
Ashburton East	Tinwald.	Rangiora .. ..	.. ..
Beckenham	Opawa.	Reefton .. ..	.. ..
Brightwater	Richmond, Stoke, Tahuna- nui, Wakefield.	Runanga .. ..	.. ..
Christchurch East .. ..	.. ..	St. Albans .. ..	.. ..
Fairlie	Pleasant Point.	Shirley .. ..	.. ..
Geraldine .. ..	.. ..	Somerfield School, Christ- church.	.. ..
Greymouth .. ..	.. ..	Southbridge .. ..	.. ..
Hawarden	Aniseed, Hanmer Springs, Kaikoura, Oaro.	Sumner .. ..	.. ..
Hokitika	Harihari, Kokotahi, Ross, Waiho Gorge, Wataroa, Weheka.	Sydenham .. ..	.. ..
Hornby .. ..	.. ..	Takaka .. ..	.. ..
Kaipoi	Waimairi.	Temuka .. ..	.. ..
Linwood .. ..	.. ..	Timaru (Main) .. ..	.. ..
Linwood Avenue .. ..	.. ..	Timaru (Waimataitai) .. ..	.. ..
Lyttelton .. ..	.. ..	Waimate .. ..	.. ..
Motueka	Upper Moutere, Tasman.	Westport .. ..	.. ..
Nelson .. ..	.. ..	.. ..	.. ..
New Brighton .. ..	.. ..	.. ..	.. ..
Papanui .. ..	.. ..	Woolston .. ..	.. ..
<i>Otago District.</i>			
Alexandra	Clyde, Cromwell, Pembroke, Queenstown.	Oamaru .. ..	.. ..
Balclutha .. ..	.. ..	Oamaru (Country) .. ..	.. ..
Dunedin Central .. ..	.. ..	Otautau .. ..	.. ..
Dunedin (Macandrew Road)	.. ..	Palmerston, Otago .. ..	.. ..
Forbury .. ..	.. ..	Port Chalmers .. ..	.. ..
Gore	Mataura.	.. ..	.. ..
Invercargill .. ..	.. ..	Tapanui .. ..	.. ..
Kaitangata	Clinton.	Winton .. ..	.. ..
Milton .. ..	.. ..	Woodlands .. ..	.. ..
Mornington .. ..	.. ..	Wyndham .. ..	.. ..
Mosgiel	Green Island.	.. ..	.. ..

N.Z. SCHOOL DENTAL SERVICE

showing

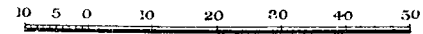
LOCATION OF TREATMENT CENTRES,

at 31st March, 1939,

REFERENCE.

Existing Main Treatment Centres	- shown thus:	●
Existing Sub-bases	- - - - -	▲
New Clinics authorized	- - - - -	○
New Sub-bases authorized.	- - - - -	△
Centres where additional Staff authorized	- - - - -	⊕
Boundaries between Dental Districts	- - - - -	---

Scale of miles.



Crown Copyright reserved.

Auckland Dental District.
Headquarters, AUCKLAND.

AUCKLAND

- BERESFORD ST.
- BIRKENHEAD
- CORNWALL PARK
- DEVONPORT
- ELLERSLIE
- EPSOM
- GLADSTONE RD.
- GREY LYNN
- MAUNGAWHIAU
- MT. ALBERT
- MT. EDEN
- MT. ROSKILL
- NEW LYNN
- ONEHUNGA
- PONSONBY
- SANDRINGHAM
- TAKAPUNA

- AVONDALE
- OTAHUHU
- BALMORAL
- MEADOWBANK
- NAPIER ST.
- NEWMARKET
- NEWTON CENTRAL
- NEWTON WEST
- PARNELL
- POINT CHEVALIER
- ST. HELENS

- Avondale South
- Howick

HAURAKI PLAINS

- NGATEA
- Kaihere
- Kerepehi
- Turua
- Waikakaruru

NEW PLYMOUTH

- NEW PLYMOUTH
- INCLWOOD
- STRAITFORD
- KAPONGA
- ELTHAM
- OPUNAKI
- PHARMACY
- MAHIA
- NORMANBY
- HAWERA
- MANUTAHU
- KAKARAMEA
- WAIKAREMOANA
- WAIKAREMOANA
- WAIKAREMOANA

WANGANUI

- CENTRAL WANGANUI EAST
- CONVILLE
- MOBILE CLINIC
- serving schools from
- Nukumarua to Turakina

PALMERSTON NORTH

- CENTRAL COLLEGE ST.
- TERRACE END

Wellington Dental District.

Headquarters, WELLINGTON.

WELLINGTON
(Training Centre)

Existing Main Treatment Centres	-	-	-	-	shown thus:	●
Existing Sub-bases	-	-	-	-	„	▲
New Clinics authorized	-	-	-	-	„	◐
New Sub-bases authorized.	-	-	-	-	„	△
Centres where additional Staff authorized					„	⊖
Boundaries between Dental Districts	-				„	— · —

10 5 0 10 20 30 40 50

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-CHRISTCHURCH

ADDINGTON
BECKENHAM
CHRISTCHURCH EAST
LINWOOD
LINWOOD AVENUE
NEW BRIGHTON
PAPANUI
PHILLIPSTOWN
SHIRLEY
ST. ALBANS
SOMERFIELD
SUMNER
SYDENHAM
WAIMAIRI
WOOLSTON

▲ Opawa

 { RICCARTON
SPREYDON
WALTHAM

DUNEDIN

● { CENTRAL
FORBURY
MACANDREW RD.
MORNINGTON

● { HIGH ST.
KAIKORAI

Otago Dental District.
Headquarters, DUNEDIN.

Stewart Island

APPENDIX A.

REPORT OF THE MEDICAL RESEARCH COUNCIL.

As stated in the last annual report, a Medical Research Council was established in December, 1937. At its first meeting the Council decided that the subjects which should be taken up for research should include those which are of vital concern to New Zealand, and the Council therefore selected nutrition, goitre, tuberculosis, hydatid disease, and dental caries. Later, an investigation into the causes of maternal deaths was added to the list.

The Council decided that its best course would be to set up for each research a small Committee of persons directly interested in the subject in hand, and to ask such Committee to prepare and submit for the Council's consideration a programme of work and an estimate of the cost involved. Those approached on the subject willingly responded to the appeal from the Council, with the result that the following Committees have been established:—

- Nutrition*: Professor J. Malcolm (Chairman), Dr. Muriel Bell, Professor C. E. Hercus, Dr. E. Gregory.
Goitre: Professor C. E. Hercus (Chairman), Professor J. Malcolm, Dr. N. L. Edson, Mr. R. L. Andrew, Dr. R. A. Shore.
Tuberculosis: Dr. T. W. J. Johnson (Chairman), Dr. Chisholm McDowell, Dr. W. Gilmour, Dr. T. R. Ritchie, Dr. H. B. Turbott.
Hydatid Disease: Sir Louis Barnett (Chairman), Dr. C. S. M. Hopkirk, Dr. T. R. Ritchie.
Dental Caries: Professor R. B. Dodds (Chairman), Mr. J. LL. Saunders, Dr. R. E. T. Hewat, Mr. D. V. Donaldson.
Obstetrical Research: Professor J. B. Dawson (Chairman), Dr. T. F. Corkill, Dr. Ian Ewart, Dr. T. L. Paget, Dr. Hilda Northcroft, Dr. F. O. Bennett.

The reports for the year of the Research Committees dealing with nutrition, goitre, hydatid disease, dental caries, and obstetrics appear as annexures to this report. In the case of the Tuberculosis Research Committee, considerable delay took place in arranging for work to be commenced owing to circumstances largely outside the control of this Committee, and, therefore, no report was submitted for the year ended 31st March, 1939, but research work is now being actively pursued.

The Government and the country are under a debt of gratitude to those who, in a voluntary capacity, are giving their time and services in the furtherance of research into the problems named.

NUTRITION COMMITTEE.

As an initial step the Nutrition Committee began its survey of the problems of nutrition in New Zealand by getting the opinions of as many of the medical practitioners as possible in a questionnaire designed to gather information as to the incidence of diseases that are considered to have some dietetic basis. The practising doctors were also asked to give their impressions regarding the consumption of certain particular foodstuffs believed to be used in excessive amounts. Altogether some seven hundred doctors were circularized, from 47 per cent. of whom replies were received, probably as satisfactory a percentage as could be hoped for. It was not expected that the answers would give adequate scientific basis for determining a clear line for future work, and indeed many state that they have filled in the answers on "impressions only." But the questionnaire has been valuable if only to get into touch with any who are keen to collaborate or who know of places where experiments have been or could be done.

Of the *diseases* listed as having dietetic or possible dietetic etiology there is outstanding comment on dental caries, though it is stated by some to be improving. Goitre, rickets, gastric and duodenal ulcer, rheumatoid arthritis, constipation, diabetes, hypertension are classified by the majority as "common."

Of the *foodstuffs* upon which comment was invited the general opinion seemed to be that there is no underconsumption of meat, and 50 per cent. say that there is too much, which agrees with statistical data on this item in New Zealand.

There is also the widely held opinion that too little fish is eaten, pointing to the factors of undersupply and cost.

Cheese and brown bread are listed as not sufficiently popular. On the adequacy of vegetable consumption, opinion was about evenly divided.

Comments were made on the cost of fruits (especially citrous), green vegetables, fish, on the difficulty of obtaining them, and on the fact that oatmeal had been supplanted by patent foods.

The majority think that insufficient attention is paid to mineral requirements during pregnancy; the main minerals thought to be lacking are iron and calcium.

Iodized salt is apparently not in general use for cooking, though it is used for table purposes.

On the *relation of food to disease* suggestions were made that there was—

- (1) Overeating ;
- (2) Excess meat ;
- (3) Too many tinned foods (lack of domestic help being blamed) ;
- (4) Too much tea ;
- (5) Too much carbohydrate ;
- (6) Too little water ;
- (7) Bad cooking, particularly in boardinghouses ; and that
- (8) The public should be educated in regard to food values.

Many suggestions were made regarding possible further work ; for brevity, only a few will be cited : The diets in pregnancy in relation to toxæmias, nutritional anæmia in the first year of life, issuing of a pamphlet on food principles, and other means to better education on matters of diet.

Many offers of collaboration were received, and we hope that we may turn these to good account in future work.

In regard to the *Plunket system*, 70 per cent. of those replying are of the opinion that the Plunket system is good on the whole—that, at a time when the doctors were not alive to the importance of infant feeding, it systematized where methods had previously been haphazard and based on ignorance and “instinct.” But about the same percentage mention some fault—viz., that the babies are “fat,” “flabby,” “anæmic,” “show general malnutrition,” “good at first, but falling off later,” “delayed dentition and dental caries,” while some say that the diet as prescribed is rarely adhered to, more usually being given.

It is obvious that the comment varies to some extent with the type of Plunket Nurse in their particular district.

About 80 per cent. offer suggestions for improvement, the commonest being earlier mixed diet and more elasticity. Others occurring frequently are : Increase in solids ; increase in protein ; less dilution of the milk ; less fear of overfeeding ; replacement or modification of the emulsion ; more co-operation between the Plunket Nurse and the doctor, particularly in the field of actual disease.

The recent modifications have been approved by about 45 per cent., as compared with 10 per cent. who disapprove.

Frequently our attention is drawn to the necessity for supervising the diet and general health of the pre-school child.

Miss Wilson's activities have been the following during the year :—

- (1) Inquiries into adequate low-cost dietaries (done for the Social Science Bureau).
- (2) Classifying and summarizing the replies to the questionnaire.
- (3) Studying the percentage absorption of fat of the Plunket emulsion (Kariol). This experiment was performed on rats, which, however, are apparently capable of absorbing fats to a much greater extent than human beings. It is proposed, therefore, to repeat the investigation on babies at a later date.

Kariol was found to have a greater percentage of fat in the upper than in the middle or lower layers, indicating that, on standing, the fat globules tend to coalesce and rise in the emulsion.

- (4) Studying the effect of high butter intake on rats, an experiment designed to test whether our high intake of butter is deleterious. The experiment is as yet incomplete.
- (5) Some sixteen urines collected at the Otekaike School for iodine estimations were analysed for their nitrogen content, from which the daily protein intake was ascertained. It varied from 56.1 gm. to 113.2 gm.
- (6) During February and March, 1939, Miss Wilson has been continuing the work on dietaries begun with the Social Science Bureau. She will be thus occupied (in Wellington, Auckland, and Christchurch) probably till the end of April.

LADY KING SCHOLARSHIP.

Soon after the last meeting of the Medical Research Council the Dunedin members of the Council and the Chairman of the Nutrition Committee called on the Plunket Committee. The Plunket Committee expressed its willingness to co-operate with the Medical Research Council in the appointment of the Lady King Scholar, accepting the Council's offer to contribute £350 to make the total salary up to £600.

The Nutrition Committee has agreed to help the women's institutes with an inquiry into the quantity of milk consumed in the average home.

POSSIBLE FIELDS FOR FUTURE WORK.

- (1) Further investigations into possible specific dietetic errors, such as high consumption of butter ; low intake of calcium, vitamin C, vitamin B, cobalt.
- (2) Examination and report on technical-school dietaries collected by Dr. Hercus.
- (3) Co-operation with the Goitre Committee on iodine metabolism.
- (4) Inquiries into the effect of the milk ration at schools.
- (5) Comparison of a series of Plunket-fed children with other artificially fed children in a suitable area, such as the Kaikoura district, in which the Acting-Chairman made some preliminary inquiries during the vacation.

GOITRE COMMITTEE.

STUDIES ON THE THYROID: I.

CHAPTER I.—INTRODUCTION.

A Goitre Committee has been set up under the auspices of the Medical Research Council with its headquarters in the Otago Medical School in Dunedin. Researches on thyroid problems which have been in progress in the Medical School for many years are in large measure being carried on by this Committee, and this report by C. E. Hercus, N. Edson, T. H. Kennedy, and H. D. Purves constitutes the first official publication from the Council on thyroid problems. Further investigations on the role which iodine-lack plays in the production of goitre are presented, particularly as regards the level of iodine metabolism as measured by the urinary excretion correlated with the incidence in goitre in various districts in New Zealand and in certain other countries which have been accessible to us. One of the objectives of the investigation has been to detect and define the part which factors other than iodine-lack are playing in the production of goitre. It has also been the aim to determine with more precision the manner in which iodine-lack produces thyroid derangement. The study also presents the results of certain experiments in goitre prophylaxis. In addition to the financial assistance provided by the Medical Research Council, work is embodied in this study which was carried out before the advent of the Council, and was made possible by financial aid from the Sir John Roberts' fund for Medical Research.

CHAPTER II.

Thyroid Physiology and Experimental Goitre.

(a) Hercus and Purves (1936) reported results of investigation of goitrogenic activity in *Brassicæ* species in New Zealand. They showed that the seeds of various *Brassicæ* when fed to rats caused hyperplasia, hypertrophy, and loss of colloid and iodine from the thyroids.

Further tests have been made with these materials. The diets employed were made up as follows: Ground seed, 45; skim milk, 30; maize-meal, 20; marmite, 3; cod-liver oil, 1; sodium chloride, 1; total, 100.

The iodine content of such diets averaged 270 micrograms per kilo, equivalent to approximately 67 micrograms per 1,000 calories. Such a diet is a comparatively iodine-rich one. The duration of each experiment was thirty-days.

Table I.

Diet.							Weight of Thyroid.	Activity.
							Mg.	
(a)	Control	..	..	..	..	..	11	..
	Radish-seed	..	..	..	..	..	14	Slight.
	Old cabbage-seed	..	..	..	..	..	15	"
	Fresh cabbage-seed	..	..	..	..	..	41	Marked.
	Turnip-seed	..	..	..	..	..	47	"
(b)	Steamed white mustard	..	..	..	..	..	25	Moderate.
	Steamed mustard, ether and alcohol extracted	..	..	..	..	..	14	Slight.
		..	..	..	..	..	31	Marked.
(c)	Turnip-seed	..	..	..	..	..	14	Slight.
	Turnip-seed and iodide	..	..	..	..	..		

Diet.					Weight of Thyroid.		Activity of Steamed Diet.
					Diet unsteamed.	Diet steamed.	
					Mg.	Mg.	
(d)	Rape-seed	..	..	..	24	12	Inactive.
	Cabbage-seed	..	..	..	41	15	} Activity greatly reduced.
	Turnip-seed	..	..	..	47	21	

Table I shows the results obtained.

Of the two seeds not previously tested, one, radish, proved almost inactive, while the other, turnip, showed the highest activity yet found in this group, producing an enlargement of the thyroid to four times the normal size in thirty days. The experience with cabbage-seed shows that there is a loss of activity on storage. This loss was almost complete after two years' storage.

The steaming experiments are interesting since Webster (1932) recorded that steaming enhanced the activity of cabbage-leaves. Our results show for the seeds a considerable loss of activity from ten minutes' steaming, though turnip still retained a moderate activity after steaming.

It is proposed to continue these investigations by testing the effect of water, ether, and alcohol extracts of active seeds. If active extracts are obtained it is proposed to attempt the isolation of the active substance.

Effect of Goitrogenic Factor on Metabolic Rate of Rats.

(b) Dr. Lawrence Malcolm (1937) has made measurements of the metabolic rate of rats on an active turnip-seed diet supplied by us, and has permitted us to summarize the results here.

Table II.

Diet.	Oxygen Consumption, in Litres per Square Metre, per Twenty-four Hours.	Difference.
		Per Cent.
Control (steamed rape-seed) ..	191 (15 determinations)	..
Active (turnip-seed)	174 (17 determinations)	-8.9

The interpretation of the results was complicated by a progressive fall in oxygen consumption during the experiments, presumably due to a deficiency in the diet. The histological examination of the thyroid glands showed in the rats on the active diet an extreme hyperplasia with many mitotic figures. The results are consistent with either of the two hypotheses :—

- (1) Active *Brassicae* seeds contain a substance with a depressant action on metabolism ; or
- (2) They interfere seriously with the assimilation of iodine.

The thyroid hyperplasia is in each case compensatory. A direct stimulating action on the thyroid, which would entail an increase in metabolic rate, is excluded.
It is proposed to repeat and extend these observations.

CHAPTER III.—IODINE METABOLISM.

For the purpose of making a survey of the level of iodine metabolism throughout New Zealand, we have made use of estimations of the twenty-four-hour urinary iodine excretion. We have been indebted to outside helpers for the difficult task of collection of twenty-four-hour specimens of urine. In many cases we have been unable to secure twenty-four-hour specimens from districts we desired to study.

The twenty-four-hour excretion of iodine as an index of iodine intake has the advantages that the estimation is relatively easy and that fewer analyses are necessary to establish the level of iodine metabolism than would be necessary if foodstuffs were studied. The results of all determinations are given below.

Table III.—Urinary Iodine Excretions, in Micograms per Day: Results of All Determinations.
(Median values are shown at foot of each column.)

New Zealand.											Outside New Zealand.						
Cromwell.	Waikato.	Otago.	Gisborne.	Raetihi.	Whangarei.	New Plymouth.	Thames.	Stewart Island.	Wanganui.	Clydevale.	Melbourne.	Perth.	Brisbane.	Abalang (Gilbert and Ellice Islands).	Sydney.	Adelaide.	Samoa.
11	17	21	20	23	32	10	38	21	27	30	39	47	61	55	83	80	80
13	19	27	24	27	33	24	39	25	31	37	42	63	78	70	99	82	128
18	27	30	26	39	35	27	49	37	32	45	59	63	83	72	107	114	153
22	31	34	27	41	39	27	53	42	53	56	63	71	90	74	118	119	192
23	35	37	31	43	39	32	65	46	70	57	72	77	91	91	145	120	209
23	39	37	35	45	41	32	66	51	87	58	78	79	97	107	147	121	230
23	39	41	42	45	41	33	111	61	144	65	79	80	104	114	159	173	
24	46	41	43	77	42	37		80	285	66	88	85	122	119	165	175	
24	61	42	46	80	46	41		82		76	176	98	128	135	288	182	
25	119	50	54	101	51	46		97		145	267	110	170	136	613	267	
27	167	59	55	123	53	47		98		155	401	161	209	168		885	
29	305	78	55	155	54	48		142		228	834	687		232		894	
31		82	61		64	49											
32		85	63		66	58											
47		97	76		85	58											
48			87		93	68											
58					104	70											
					108	78											
						81											
						83											
						87											
						87											
						98											
						110											
						112											
						914											
24	39	41	43	45	48.5	53	53	56	61	61.5	78.5	79.5	96	110	146	147	172

The median values have been given rather than the mean values, as the latter are in some cases extensively influenced by occasional high iodine excretions. These high values are attributed to the taking of medicines containing iodine or iodide, and in some cases this was verified by subsequent inquiry.

The combined data from our investigations are :—

New Zealand average	..	..	..	..	65 ; median value, 46.
Non-New-Zealand average	..	..	..	..	165 ; median value, 114.

It is evident that all districts of New Zealand have relatively low iodine excretions compared with districts outside New Zealand. The average for New Zealand is 100 less than the average of non-New-Zealand determinations.

CHAPTER IV.—THE INCIDENCE OF GOITRE IN NEW ZEALAND AND CERTAIN ISLANDS OF THE PACIFIC.

A wealth of publication is now available to substantiate the claim that thyroid derangement is widespread throughout New Zealand. An analysis of the official vital statistics of New Zealand as it relates to this subject has been published by two of us (Hercus and Purves, 1936). This study revealed an eight-fold increase in the death-rate between the quinquennia of 1889–93, and 1929–33, and a twenty-five-fold increase in the admissions to the public hospitals of the Dominion over the same period. A summary of these findings is shown in Annexure B.

Subsequent records show no substantial alteration in incidence since 1933. A positive correlation was found between the incidence of simple and toxic goitre in the provinces. In addition to this record of what may be regarded as end results of thyroid derangement, field surveys, mostly confined to school-children, are constantly being made, and year by year the annual reports of the Director-General of Health bear evidence to the widespread and persistent nature of the endemic. Comparatively few surveys have been made of sections of the community other than school-children. Turbott (1932) in a survey of 300 adult women in Hawke's Bay records 44 per cent. with enlargement of the thyroid gland. Irwin (1935) found an incidence of 34 per cent. among 341 mothers in attendance at Plunket clinics throughout New Zealand, and of 403 children under eight years of age who were under the supervision of the same society he found 19 per cent. with thyroid enlargement. For some years family surveys have been carried out under the supervision of one of us (C.E.H.) in certain endemic areas in New Zealand by senior medical students. We believe that these family surveys give a more reliable indication of the true incidence of thyroid derangement than do surveys limited to selected age-groups. Table IV shows the results of such investigations in the districts studied. Table V shows death-rates and hospital admissions from thyroid diseases for New Zealand provinces. For comparison Table VI shows death-rates from thyroid diseases for Australian States. It is evident that all districts of New Zealand are goitrous, though to varying degrees. By comparison Australia is evidently less goitrous. Indeed, from our inquiries it would appear that Adelaide and Sydney may be regarded as non-goitrous.

Table IV.—Incidence of Goitre in Family Surveys.

District.	Percentage Goitre Incidence in Family Surveys.	Observer.
Cromwell	45	Duncan and Harrison (1937).
Waikaia	44	Armour and Malver (1937).
Gisborne	34	Burnard and McGeorge (1938).
New Plymouth	25	Law and Lomas (1937).
Stewart Island	20	Hunter and Miller (1935).
Clydevale	74	Aitken (1937).

Table V.

Province.	Mean Annual Death- rate from Diseases of Thyroid per 10,000 (1929–33).	Hospital Admission Rate for All Thyroid Diseases per 10,000 (1929–33).
Auckland	0.25	1.75
Hawke's Bay	0.40	5.90
Taranaki	0.57	1.00
Wellington	0.41	1.91
Marlborough	0.21	3.80
Nelson	0.38	2.00
Westland	1.59	2.64
Canterbury	0.64	4.00
Otago	0.57	2.30
Southland	0.62	1.16

Table VI.

State.					Death-rate from Thyroid Diseases per 10,000 (1934).
New South Wales	..	..	..	..	0·26
Victoria	..	..	..	..	0·29
Queensland	..	..	..	..	0·23
South Australia	..	..	..	..	0·27
Western Australia	..	..	..	..	0·18

With the assistance of collaborators, we have obtained data as to the incidence of thyroid derangement in certain islands of the Pacific. Dr. James, recently in charge of the Stewart Memorial Hospital at Rabaul, New Guinea, informs us that there are extensive areas of endemic goitre in New Guinea, that the distribution is very irregular, and is largely confined to villages in the mountainous inland parts of the country. Natives living within reach of the sea make extensive use of sea food cooked in sea-water, and among them he has not detected any cases of goitre. He has operated on two cases of thyroid toxicosis, both in females, one aged thirty-five, the other aged seventeen, both coming from endemic areas. Dr. Steenson in 1928 examined 15,000 people of all age-groups in the British Solomons and detected but two cases of thyroid enlargement. Dr. James, who has recently been transferred to the British Solomons, reports that in an investigation of 4,000 people on the Island of Choiseul he saw one case of thyroid enlargement in a female aged thirty-four years. Doctors Dovi and Satyanand, who have carried out thyroid surveys in Fiji, report that goitre is extremely rare among the Fijians and the Indians living in Fiji, except in the closely-inhabited Singatoka River valley on the Island of Vitilevu, where a high degree of endemicity is present. Dr. Turbott, when acting as Chief Medical Officer to Samoa, in 1936 travelled widely through the villages of the country carrying out physical examination of the people, and he reports that he saw but one case of simple goitre in Samoa. Dr. Ruhen in 1926 examined 3,000 people in Tonga, and recorded only two thyroid enlargements. Dr. Ellison in 1935 reports two cases of goitre in a survey of over 5,000 people in Raratonga in the Cook Island group. Dr. Cook in 1937 examined all the inhabitants of Pitcairn Island, and did not find a single case of thyroid enlargement. Dr. Steenson in 1937 reports that he has seen only four cases of simple enlargement of the thyroid in the people of the Gilbert and Ellice groups. We may therefore state that the Gilbert and Ellice Islands, Pitcairn Island, the British Solomons, Tonga, Raratonga, Samoa, and most of Fiji are non-goitrous.

CHAPTER V.—THE RELATION OF IODINE METABOLISM TO GOITRE INCIDENCE.

Hercus and Purves (1936) showed that the relationship between urinary iodine excretion and goitre incidence which was found to exist in Europe also held in this quarter of the globe. The more extensive data presented in Chapters III and IV confirm this relationship. The average urinary iodine excretions are: New Zealand (goitrous), 65; Australia, Samoa, and Abaiang (relatively non-goitrous), 165.

The median values of urinary iodine excretion and the goitre status of the individual districts are tabulated in Table VII.

Table VII.

Cromwell	..	..	..	..	..	24	Goitrous
Waikaia	..	..	..	..	..	39	"
Otekaike	..	..	..	..	..	41	"
Gisborne	..	..	..	..	..	43	"
Whangarei	..	..	..	..	..	48·5	Moderately goitrous.
New Plymouth	..	..	..	..	..	53	"
Thames	..	..	..	..	..	53	"
Stewart Island	..	..	..	..	..	56	"
Clydevale	..	..	..	..	..	61·5	Goitrous.
Melbourne	..	..	..	..	..	78·5	Slightly goitrous.
Perth	..	..	..	..	..	79·5	"
Brisbane	..	..	..	..	..	96	"
Abaiang	..	..	..	..	..	110	Non-goitrous.
Sydney	..	..	..	..	..	146	"
Adelaide	..	..	..	..	..	147	"
Samoa	..	..	..	..	..	172	"

It is evident that there is in general a close inverse relationship between goitre incidence and the level of iodine metabolism. Such an inverse relationship was found by Hercus, Benson, and Carter (1925) between goitre incidence and the iodine content of the soil. However, both they and Shore and Andrew (1929) drew attention to certain anomalies. The most outstanding of these anomalous districts was Thames, where the average soil iodine was low and yet the incidence of goitre but 9 per cent. We have found for Thames a median urinary iodine excretion of 53 micrograms per twenty-four hours, which is greater than the iodine content of the soil would suggest. Watson

(1936) investigated this problem. He found the use of iodized salt to be but 20 per cent. of the domestic consumption. Thames is the scene of an extensive fishing industry, and iodine-rich fishes were found to be widely used in the dietary. Table VIII shows the iodine content of some varieties of fish from Thames.

Table VIII.—The Iodine Content of Fish from Thames.

Variety.					Iodine Content.
Trevalli	..	..	..	..	700 micrograms/kilo fresh weight.
Kahawai	..	..	..	..	128 "
Snapper	..	..	..	..	780 "
Pipi	..	..	..	..	540 "

Watson was unable to detect the operation of any other factor which would account for the low goitre incidence.

In Table VII Clydevale would appear to be anomalous in that it has a higher goitre incidence than the level of urinary iodine excretion would suggest. However, the possibility of error and the disturbing influence which iodine medication and seasonal variation may have on iodine metabolism render it necessary to interpret the result with caution. Until this district is re-examined it will be necessary to suspend judgment.

CHAPTER VI.—PROPHYLAXIS.

(a) *Consumption of Iodized Salt.*—The history of goitre prophylaxis in New Zealand was reviewed by Hercus and Purves (1936). The importations of iodized salt showed a slow rise up to 1934, when they were equivalent to 1.82 gm. per head of population per day, estimated at less than 30 per cent. of the total domestic salt-consumption. The extent to which iodized salt is used varies considerably from district to district. The results of some recent inquiries are shown in Table IX.

Table IX.

District.				Observer.	Percentage.
Cromwell	..	..	..	Riley (1936)	90
Thames	..	..	..	Watson (1936)	20
Gisborne	..	..	..	Burnard and McGeorge (1937)	68
New Plymouth	..	..	..	Lomas and Law (1937)	14
Westport	..	..	..	Foote (1938)	55
Plunket Society	..	..	..	Irwin (1937)	58

It is apparent that for New Zealand as a whole the result is unsatisfactory and that a much greater utilization of iodized salt would be necessary to make prophylaxis effective.

(b) *Level of Iodization.*—There is as yet no general agreement as to the level of iodine supplementation necessary to maintain the health of the thyroid gland.

Table X gives the standards for iodized salts in different countries and illustrates the wide differences in supplementation which prevail.

Table X.

Country.		Supplementation.	Micrograms Iodine, per Gram.
Switzerland	..	1 part of potassium iodide/200,000 ..	3.8
Norway and Sweden	..	1 part of potassium iodide/80,000 ..	9.6
Michigan, U.S.A.	..	1 part of sodium iodide/10,000 ..	84.7
New Zealand	..	1 part to 2 parts potassium or sodium iodide/250,000 ..	3.1 to 6.8

From the data in Chapter V it is apparent that there is a wide difference in iodine intake between goitrous and non-goitrous countries. It is plain that goitre prophylaxis cannot be expected to be satisfactory unless the supplementation raises the urinary iodine excretion to the level found in non-goitrous countries. In New Zealand even with the present use of iodized salt the level is 100 micrograms per day below this level. We have found the average daily ingestion of domestic salt in New Zealand to be 5 grams to 6 grams per head per day. At the present level of supplementation this would supply from 17 micrograms to 37 micrograms. It is evident that even if 100 per cent. utilization of iodized salt were to obtain the supplementation would be grossly inadequate.

The exact amount of supplementation necessary to raise the excretion by 100 micrograms depends on the proportion of the iodine intake excreted in the urine, which is at present unknown. Until this information is available and the exact relationship of urine examination to total iodine intake determined

we have approached the problem by the expedient of adding sufficient iodine to the salt of the Nurses' Home of the Dunedin Hospital to bring the urine excretion to a level comparable with that of non-goitrous countries. We found it necessary to add one part of potassium iodide to 20,000 parts of salt to secure the required level, and for the last two years this supplementation has been maintained.

The essential facts with regard to the supplementation adopted will be found in Table XI.

Table XI.

Period.	Salt used.	Salt-consumption, Gms./Person/ Day.	Estimated Iodine Supplement, Mgm./Day.	Average Urinary Excretion of Iodine, Mgm./Day.
Before June, 1926	Ordinary	..	Nil	..
June, 1926, to December, 1935	Commercial iodized, 4.7/gm.	5.4	25	57 (6)*
January, 1936, to March, 1937	Special, 22/gm. ..	5.5	121	90 (24)*
April, 1937, to December, 1938	Special, 41/gm. ..	5.7	234	138 (9)*

* Figures in brackets give the number of individual determinations.

Throughout the period both table and cooking salt has been iodized. While a certain amount of wastage of table salt occurs it has been found to be small, and all the salt used in cooking has been entirely consumed without wastage. The essential aims of the experiment were to determine what proportion of iodide needs to be added to salt to raise the excretion level to that found in non-goitrous areas, to find approximately what proportion of the intake is excreted in the urine, to determine the harmlessness or otherwise of such supplementation on goitre, to observe the prophylactic and curative value of such supplementation. The results show that a daily supplementation of at least 200 micrograms is necessary to raise the level of iodine metabolism to that of non-goitrous countries. No untoward effects have been observed from the utilization of this supplementation, while the prophylactic and curative results have been satisfactory. It is difficult to express these results statistically, as the turnover of nurses is a rapid one and the incoming nurses have shown a relatively high incidence of enlarged thyroids. No goitres have developed during the last two years among nurses who were free from thyroid enlargement on entering the hospital, whereas in the period 1926–35 a number of such goitres developed. The therapeutic results have been uncertain.

This study has been supplemented by similar experiments in a local orphanage and a boarding-school, but the duration of the experiment has been too short to enable a full report to be made. The results to date, however, are consistent with the nurses' experiment.

This experiment shows that a daily supplementation of 200 micrograms to 250 micrograms of iodine per day would give satisfactory prophylaxis. The necessary concentration of the iodine in the salt to secure this will depend on whether iodized salt is used for the commercial preparation of salted foods such as butter, bread, bacon, cheese, &c., as well as for domestic purposes. If used for domestic purposes only (cooking and table salt) the necessary supplementation will be provided by 5 grams to 6 grams of salt iodized with 1 part of potassium iodide per 20,000. If iodized salt is also to be made compulsory for commercial preparation of salted foods, a lower level would be permissible. It would theoretically be more satisfactory to adopt this course, but the amount of salt used for this purpose and ingested in New Zealand is at present unknown. This, however, should be capable of measurement.

CHAPTER VII.—SUMMARY.

(1) Evidence is submitted to show that goitrogenic activity is widely distributed in the seeds of *Brassicæ* species.

(2) This goitrogenic factor appears to depress the metabolic rate of rats.

(3) The average urinary iodine excretion in New Zealand is found to be 100 micrograms per day lower than that of adjacent countries. This difference is related to the goitre distribution.

(4) Iodized salt containing 1 part of potassium iodide in 20,000 parts of salt supplies an adequate supplementation for goitre prophylaxis if used for cooking and table purposes.

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ANNEXURE A.

IODIZATION OF SALT.

The salt to be iodized must be free from acidic substances and hydrolysable chlorides. For this reason commercial iodized salt is taken which has been treated with sodium carbonate in sufficient quantity. A solution of the salt should react neutral or alkaline to phenol red indicator.

The salt is weighed and lumps broken up. Fifty-six pounds of salt is treated at a time. Five to six pounds of the salt are spread out in a thin layer on enamelled trays. The requisite quantity of iodide dissolved in 70 per cent. alcohol is sprayed on with an atomizer. When dry this iodized portion is mixed thoroughly, with the remainder to give the final product. A sample is retained for analysis.

ANNEXURE B.

ADMISSIONS TO PUBLIC HOSPITALS OF ALL THYROID DISEASES FROM 1889 TO 1933, WITH MEAN ANNUAL RATES PER 10,000 POPULATION.

Reprinted from *The New Zealand Medical Journal*, April, 1936.

Year.	Total Diseases of the Thyroid.	Rate per 10,000.
1889-1893	64	0.21
1894-1898	152	0.43
1899-1903	175	0.44
1904-1908	206	0.45
1909-1913	No data	No data
1914-1918	1,051	1.92
1919-1923	1,503	2.53
1924-1928	2,702	4.00
1929-1933	3,996	5.50

HYDATID DISEASE COMMITTEE.

1. INTRODUCTORY REMARKS.

With the establishment last year of the New Zealand Medical Research Council, of which the Department of Hydatid Research and Prevention, Medical School, University of Otago, is recognized as a branch with some degree of autonomy, a very considerable stimulus has been applied to the important research and propaganda work associated with this public-welfare movement.

2. PREVENTION PROPAGANDA.

By means of posters, folders (of which a new and improved edition is now being circulated), articles, and letters in the lay and medical press, lecturettes to farmers' unions and women's institutes, radio talks, agriculture show exhibits (conducted with outstanding success throughout the Dominion by Dr. E. W. Bennett, the Hydatid Research Officer), cinema films (for which we are largely indebted to Dr. Marcus Fitchett, of Dunedin), and in other ways, including much individual correspondence, an intensive programme of education, particularly amongst the rural community, has been carried out and will, of course, be continued.

3. LABORATORY WORK.

A great deal of time and trouble has been devoted to the study of the vermifuge medicine, arecoline hydrobromide, which is to be supplied to all dog-owners at the time of the next dog registration. Careful investigations have been made as to its efficiency, safety, and best method of administration, and all these points are made clear in the card of instruction which is to accompany the issue of the vermifuge tablets.

Various other lines of laboratory research are being prosecuted, dealing, for example, with the structure and development of the parasite in the adult and larval stages, the latter in man and animals and in artificial cultures.

4. FIELD-WORK.

Investigations on hydatid prevalence on sheep and cattle farms, on farm hygiene, and on other matters connected with the hydatid infection have been carried out in co-operation with field-workers from Professor Hercus' class of preventive medicine. Demonstrations on the most efficient method of dosing dogs have been given on an intensive scale.

5. STATISTICAL RESEARCH.

A very extensive tabulation of figures has been obtained and published regarding hydatid incidence in human beings and in farm animals. A brief abstract of these particulars appears in the August number of the *New Zealand Medical Journal*.

6. CLINICAL RESEARCH.

With the co-operation of the Hydatid Registry of the Royal Australasian College of Surgeons, a series of clinical records, amounting in number to nearly 1,300, is now available and is being increasingly made use of for collective research work.

DENTAL CARIES COMMITTEE.

The progress of the dental survey has reached this point—that a Dental Survey Officer, Mr. Brice, of the Department of Oral Hygiene, has been seconded for duty. He has presented a preliminary report of the proposed survey, which has been discussed and amended by the Dental Committee on 11th March. This report has been put into précis form. It is expected that the survey will take at least one year. The Dental Committee hopes to obtain by this means data upon the incidence of dental disease in this country upon which to base a sound programme of research, keeping in mind that our whole object is to determine in what way the incidence of dental disease in New Zealand can be lessened.

The survey will be undertaken in order to estimate the caries index of the age-groups normally dealt with by the School Dental Service. Those groups are known already to exhibit variation from normal either in the direction of susceptibility or immunity to be surveyed in detail on approved chart. The choice of groups should be based on records already in possession of the Department of Dental Hygiene (average groups). Average groups also to be investigated.

Those proving on examination to have the highest and lowest caries index to have the investigation extended to include the higher age-groups.

Exact estimation of the caries index in districts where soil analyses have or are being made.

Survey of institutions :—

(a) Orphanages : (1) Caries ; (2) controls outside ; (3) time factor.

(b) *Diet*.—Boarding Schools : Comparison of two or more in same locality. With outside controls. General outline of diet, yearly. (Estimation of onset of caries.)

Immunity of groups or individuals (record, existence of, only).

Seasonal variations, investigate possible existence of, in onset of caries.

Effect of economic factors on incidence of caries in schools in same locality.

OBSTETRICAL COMMITTEE.

At its first meeting the Committee decided that investigation into toxæmias of pregnancy and its manifestations be the major line of investigation at the present time.

As a commencement of the investigations information has been and is being obtained from :—

(1) Medical Officers of Health : The number of cases of eclampsia notified since this condition was made a notifiable disease in 1923 has been obtained. This information is to be summarized to obtain particulars of incidence and geographical distribution of “ eclampsia ” :

(2) The Government Statistician : Particulars have been supplied of all deaths from eclampsia and toxæmias of pregnancy.

(3) Ante-natal Clinics : Ante-natal clinic charts (form H.—Mt. 50) for all cases confined during the calendar year 1938 and receiving ante-natal attention have been obtained from the majority of ante-natal clinics in New Zealand. This information is to be summarized to obtain information on the incidence and geographical distribution of toxæmia of pregnancy ;

(4) Results of investigations carried out overseas.

INVESTIGATION INTO PUERPERAL INFECTIONS.

At the second meeting of the Committee it was decided to investigate the possibility of developing an organized laboratory service for the examination of swabs for the purpose of typing streptococci, and that the Chairman (Dr. J. B. Dawson), be asked to investigate the possibility of establishing such a service in Dunedin, and during his visit to England to obtain information on equipment and service in England.

MEDICAL RESEARCH OFFICER.

The Committee has appointed Dr. F. O. Bennett as its Medical Research Officer.

APPENDIX B.

RECENT CASES OF INDUSTRIAL LEAD POISONING.

By F. S. MACLEAN, M.B., B.Ch., D.P.H., Medical Officer of Health, Wellington.

In the six years 1931 to 1936 there were 14 cases of lead poisoning notified in the whole of New Zealand. In the period of two years three months from 1st January, 1937, to 31st March, 1939, there were 13 cases notified for the whole country, and of these, 10 occurred in the Wellington industrial area. The industries in which these cases occurred were :—

(a) Paint-manufacturing industry	2 cases.
(b) Motor-body industry	6 cases.
(c) Electric storage battery industry	2 cases.
Total	10 cases.

PAINT-MANUFACTURING INDUSTRY.

The two cases connected with paint-manufacture were similar to others that have occurred from time to time, and were due to carelessness in the handling of lead carbonate, or undue susceptibility to the metal. This type of case is familiar to every one interested in industrial hygiene and need not be further commented on.

MOTOR-BODY INDUSTRY.

The introduction of the all-steel motor-car body of streamlined type has introduced a new hazard into the motor industry. After the sheets of pressed steel have been joined together to form the bodies all irregularities in the surface, along the lines of junction, are filled in with a soft solder which contains 70 per cent. of lead, and this is later smoothed down by hand filing and finished off with an electrically-driven buffing-wheel covered with abrasive. The first process produces fairly coarse metallic lead dust, and the second a much finer metallic dust which has a tendency to scatter owing to the high speeds at which the buffing-wheels revolve.

In February, 1937, a visit was paid to a new and well-planned motor-assembly plant, and this process was seen for the first time. Its dangerous potentialities were recognized, and the management was advised as to the precautions necessary. The motor-car bodies are handled on a moving line, and at one point on the line pass into an enclosure formed by heavy canvas curtains, and it is inside this that the buffing-wheels are used. The curtains prevent the dust from scattering, and, being relatively heavy, it quickly settles. Each man working inside the curtained enclosure is provided with a respirator, or with a positive pressure helmet fitted with an air-line. Overalls also are worn. This factory was well lighted and ventilated, and at the request of the Department adequate wash-hand basins with hot and cold water were installed, and soap, nail-brushes and paper towels supplied. The facilities provided and the precautions taken appear to have been successful, and up to the present no case of lead poisoning is known to have occurred here. One supposed case of lead poisoning was notified, but fuller investigation, including examination of the blood, failed to confirm the diagnosis.

A second motor-assembly plant where the same class of work was carried on was less well equipped, and supplied three cases of lead poisoning early in 1938. This factory was older than the one first mentioned and its production had greatly outgrown that for which the buildings were originally designed. The body-assembling shop was found to be very crowded, and it was in fact difficult to move about in it without coming into actual contact with motor-car bodies in various stages of completeness. The lighting was poor and ventilation was bad. The same type of curtained enclosure was provided, but the curtains were too short and served a nominal purpose only. Respirators, and, at one time, positive pressure helmets were provided, but the men being dissatisfied with the general conditions in the factory had given up using the helmets and were careless in using the respirators. The lavatory accommodation was inadequate and inconveniently placed, and the men were in the habit of neglecting the washing of their hands and even the removal of their overalls, which became covered with fine metallic lead dust, and at the dinner hour proceeded straight from their work to the canteen.

An additional hazard also had been introduced in that nearly all the employees brought bottles of milk and other food into the workshop and indulged in frequent "snacks" during working-hours. At the time of the first visit numerous half-empty bottles of milk were seen scattered about on the work benches, and many of them were uncovered and the surface of the milk was seen to be well sprinkled with dust. Under the general conditions prevailing it was surprising that more cases of lead poisoning had not occurred.

To remove the risks the following measures were taken :—

- (1) The ventilation of the shop was greatly improved by the installation at considerable cost of a system of mechanical ventilation. Large extraction ducts were provided with several large intakes at a low level along each side of the shop, and powerful extraction was provided by two large fans ;
- (2) Additional ablution basins were provided in a convenient position close at hand, and were supplied with hot and cold water, soap, nail-brushes and towels ;
- (3) An improved light type of overall helmet with air-supply was introduced ;
- (4) The taking of food, and especially milk, into the workshop was forbidden ;
- (5) Adequate curtains were provided for the enclosure where the buffing-wheels were used ; and
- (6) All employees in this department were given a talk explaining the manner in which lead could be absorbed, and the precautions they should themselves take in order to guard against it.

No further cases have been reported since the above-mentioned improvements were made. It should be stated that the management co-operated willingly in improving the conditions.

In February and March of this year two further cases of lead poisoning were notified from a third motor-assembly plant, and investigation showed that the men concerned had also been engaged on the same process. The shortcomings in this factory were not, however, so conspicuous. The men had been employed there for three months and six months respectively, and each had previously worked at the second factory mentioned above for a period of two years. The last place of employment may therefore have contributed to their condition, but not as the sole cause.

This factory was clean, well ventilated, and not in any way overcrowded. The following defects were, however, noted :—

- (1) The men working in the curtained enclosure had a good type of respirator provided for them, but no overalls.
- (2) All washhand basins and clothes-lockers were situated in the canteen—a most undesirable location—and no soap, nail-brushes, or towels were provided. The men had been in the habit of fetching hot water for themselves from an adjoining part of the factory and washing in buckets.
- (3) It was found that food, and sometimes bottled milk, was brought into the workshop, and partaken of during the hours of work. Smoking during work was also frequent.

The management were requested to provide suitable overalls and caps, to wash them at weekly intervals, and to provide lockers both for outdoor clothing and for overalls in a separate place adjacent to the place of work. Satisfactory washing facilities, outside the canteen, with hot water, soap, nail-brushes and towels were required. A leaflet of instructions was issued to each man concerned in which was stressed the necessity of removing his overalls and thoroughly washing his hands before eating food and before leaving the factory, and the prohibition against taking food and milk into the workshop and smoking during work was explained.

A sixth case of lead poisoning was notified in October, 1938, from a motor-body factory, and the man concerned was employed in the dry-rubbing-down of motor-bodies that had received a first coating of filler paint. There was much dust on the floor from the rubbed off paint, and the dust on analysis was found to contain the equivalent of 23 per cent. of lead carbonate. The presence of lead in the paint, which was an imported one, was not stated on the label. The washing-facilities at this factory also were found to be inadequate.

Improvements effected in this case were the substitution of wet rubbing down for the dry process, and more adequate provision was made for washing. Later the firm reverted to dry rubbing down, but changed to a filler paint which does not contain lead.

The importers of the lead paint were notified of their obligations regarding the correct labelling of the containers, and were requested to inform all their customers throughout New Zealand that the paint contained lead, and that dry rubbing down, if practised, should be discontinued.

ELECTRIC STORAGE BATTERY INDUSTRY.

A case of lead poisoning was notified in October, 1938, from a factory manufacturing electric storage batteries, and a second case from the same factory in March, 1939. The factory was built in 1937, and all processes of battery-manufacture, except the making of cases, are carried on there. The Department was consulted when the factory was built, and secured satisfactory conditions. The mixing-room and pasting-room are separated from the rest of the factory, extraction apparatus is provided, and the floor and benches kept constantly wet. The washing arrangements were satisfactory, with showers, basins, plenty of hot water, soap, nail-brushes and towels. Each man was provided with two clothes-lockers—a lower one for overalls and an upper one for outdoor clothing. There was a small dining-room with table, benches, and a supply of boiling water.

There is one undesirable feature about the lay-out of this factory which was commented on at the time of the first inspection. The most direct way from the work-rooms to the lavatory and changing-room is through the small dining-room which has one door into the factory and one leading to the changing-room. The alternative way to the lavatory necessitates going outside. The works-manager was instructed to insist that all employees should go outside to the changing-room, and enter the dining-room only after removing their overalls and washing their hands. This precaution was not observed, although it was also impressed upon the employees themselves in a talk given to them in October, 1938.

Both cases of poisoning occurred in men working in the pasting-room. The investigation showed that the overalls provided were inadequate in that the upper garments were not protected. Men were wearing shirts and cardigans, which were said to be kept exclusively for working in, but there is some reason for thinking that this was not the case. More important than this, however, it was found that the dining-room was a constant right-of-way between factory and lavatories, so that men were coming there direct from the pasting-room and contaminating the floor with lead paste from their rubber boots. When the factory was inspected in March, after the second case of poisoning, dried lead paste was to be seen on the floor, on the legs of the table, on the benches, and even on the table-top. Either the same broom was used for sweeping both floor and table, or the men were sitting at the table in their working-clothes. Under these conditions the cases of poisoning were easily explained.

The management has been asked to provide more suitable overalls that will completely protect the other clothing worn, to keep the dining-room properly cleaned, and to insist absolutely that no man enters it until he has passed through the changing-room, removed his overalls and rubber boots, and washed his hands. If there is any future indication that this is not being complied with it is intended to insist on the door leading from factory to dining-room being boarded up.

This factory also was equipped with a poor type of drinking fountain with obvious facilities for contamination of the nozzle by the hands of the workers.

The industry of storage-battery manufacture is expanding very rapidly in the Wellington district, and while some firms plan their factories in a satisfactory manner and co-operate well with the Departments of Health and Labour others are inclined to neglect some very necessary provisions and show a general lack of co-operation. This is partly accounted for by our present lack of suitable regulations dealing with this industry.

Early in this year such a factory was found to have commenced production, and to demonstrate almost every shortcoming possible. The mixing-room was inadequately separated from the rest of the factory, and drums of lead-powder had been opened outside it and the lead scattered about. There was no extraction apparatus where the lead-powder was weighed, and the hoods over the mixing-machines were inadequate. The pasting-benches were in the middle of the factory—not in any way separated off—and both benches and floor were dry. One paster who was seen at work was wearing no overalls and was standing in a heap of lead dust. Only one locker was provided for each employee, there were no washing-facilities except for one cold-water tap, and the dining-room was unlined and had no table or seats. No overalls were provided. All these shortcomings are now in process of being remedied.

In dealing with all the cases mentioned above, and particularly with the storage-battery factories, the lack of adequate regulations that can be strictly enforced has been severely felt. The existing regulations were drawn up to deal with the manufacture and use of paint only, and it is open to question whether any of their provisions could be enforced in a Court of law when dealing with any other class of industry. The exact detailed requirements for each class of work need to be specified both as a guide to manufacturers commencing operations and as a means of enforcing a high standard of safety at all times. Details which should be included are—

- (1) Specification of the type of overall is required. For battery-manufacture the one satisfactory overall is one that will completely cover the other clothing. Rubber footwear used at work should be included in the term "overalls," and their removal required before entering any dining-room.
- (2) Provision for the regular blood-testing by a competent pathologist of all employees engaged on the more hazardous occupations is necessary.
- (3) Prohibition of smoking while at work is essential, as otherwise contamination of cigarettes and hence the lips is inevitable.

In addition to regulations dealing specifically with electric accumulator factories, additional regulations are required setting out in more general terms the precautions necessary in other industries which involve the handling of lead, and might be made applicable to any industry at the discretion of the Director-General.

With reference to the use of milk, there appears to be a very widespread opinion among employees generally that milk is the antidote *par excellence* for all forms of industrial poisoning, and particularly for lead poisoning. This is shown by the attempt by the Paint and Varnish Workers' Union to have incorporated in their most recent award a clause requiring the employer to provide milk gratis for his employees. As stated above also, men in contact with lead in motor-assembly works were found to be drinking milk freely and even while at work.

There is no scientific foundation for this idea, which may be harmful in inducing a false sense of security and leading to the neglect of other necessary precautions and safeguards. During the period of acute symptoms of lead intoxication a high calcium diet, including large quantities of milk, assists in removing the lead from the blood and more vital organs and fixing it in the bones, where it will do least harm. As soon as the acute symptoms have subsided calcium must be withheld so that the lead will gradually leave the bones and be excreted from the body. In so far, therefore, as milk hinders the excretion of the lead it would appear to be harmful. Obviously the wisest course to follow is to provide such facilities and safeguards, and to exercise such care in the handling of lead, that the amount absorbed will be reduced to a minimum, and to do nothing which will hinder the excretion of the small amount of lead which must inevitably be taken into the body. This is best secured by provision of the proper equipment with good conditions of work, and the exercise of scrupulous care and cleanliness by the workman, who should take an ordinary nutritious diet with avoidance of constipation. It only remains to state that periodic blood-examinations will indicate undue absorption or unusual susceptibility, and the necessary corrective measures can be taken before much harm is done.

In one battery-factory in Wellington routine blood-examinations were discarded, and reliance placed upon estimation of hæmoglobin and testing of the urine for albumen. Compared with the microscopic blood-test these tests are very crude, and would hardly serve to indicate any case of lead intoxication before it had given rise to obvious symptoms. This same factory, after two cases of poisoning, recommenced the microscopic test, and five employees were thereby found to be showing signs of lead absorption.

In conclusion it may be stated that during the past fifteen months an unduly large number of cases of chronic lead poisoning have occurred in the Wellington Health District. Most of them have arisen in direct connection with the recent expansion of the motor industry, and have affected the Wellington district particularly, as there is there a concentration of the motor-assembly factories as well as several factories which manufacture electric storage batteries. The introduction of adequate regulations dealing with the hazards of these industries would do much to awaken manufacturers to the risks involved and the precautions that must be taken. Finally, cases of this nature might be prevented if there were available an adequate-trained staff to carry out routine inspections of factories where any dangerous occupation was undertaken or likely to arise.

APPENDIX C.

DIPHtheria IMMUNIZATION IN SOUTH AUCKLAND HEALTH DISTRICT, NEW ZEALAND, 1937 to 1938.

By HELEN DEEM, M.D., and H. B. TURBOTT, M.B., D.P.H.

During 1937 and 1938 immunization against diphtheria was offered to all children between ages one and sixteen years in the South Auckland Health District. Parents were invited to bring pre-school children to the schools, the chosen centres for the immunization work. Anatoxin was used throughout the campaign, at first two doses only $\frac{1}{2}$ c.c. and 1 c.c., but later three doses, $\frac{1}{2}$ c.c., 1 c.c., and 1 c.c. when the early schools Schick tested after immunization revealed the need for the third dose. Altogether 10,034 children attended for immunization. 7,538 children were Schick tested. Unfortunately, owing to the scattered and difficult rural nature of some of the health district, the Schick test could not always be employed from revisiting difficulties. The Moloney test was employed in 8,141 children. At times even this test became impossible from transport troubles in hilly back-country areas, and anatoxin was given direct to 1,893 children, subsequent dosage being judged by the reaction to the first injection.

The response at pre-school age was disappointing, 783 children under five years of age attending, 180 receiving one dose, 315 two doses, and 288 three doses of anatoxin. It proved difficult to persuade mothers of toddlers to continue for three injections, and throughout the whole health district parents preferred to have their school rather than their pre-school children protected. Only 14, or 1·7 per cent., pre-school children were upset by anatoxin, suffering a general reaction with some fever and *malaise*.

Of school-children, 17,531 were offered protection, and parents of 9,251 agreed. The school campaign was worth while, 52·7 per cent. of available school population being dealt with. The publicity earned for diphtheria immunization while these 9,251 children were being tested or immunized will ease the way for future work, and help popularize a process still sceptically regarded or neglected by parents of almost half the school-children and of the majority of pre-school children of this health district.

Primary Schick testing reduced the immunization work required, a valuable help in a mass campaign. Preliminary Moloney testing eliminated many sensitive to anatoxin. Anatoxin from the Commonwealth Serum Laboratories was given to 6,585 school children, 4,357 children received the full course of three injections at three-weekly intervals, 1,531 two doses, and 697 one dose only. The two and one dose group are accounted for by absences from school, the employment of two dose immunization for the first three months of the campaign, the change of heart and refusal of parents after first or second doses, and the deliberate dropping of those who have general reaction to first or second doses of anatoxin.

SCHICK TEST AND DIPHtheria SUSCEPTIBILITY.

Of the 7,538 children Schick tested, 5,372, or 71·2 per cent., proved positive. Readings were taken at seventy-two hours, at seven days, and sometimes at forty-eight hours where exigencies of rural travel made this necessary. The majority readings were at seventy-two hours, including all the secondary Schick testing, this latter being checked at the seventh day. Redness and infiltration of 1 cm. and more was regarded as positive. At present 28·8 per cent. of the children of this health district are naturally immune. By employing the Schick test, 2,166 courses of injections were avoided, and much work saved.

In pre-school ages a proportion were Schick tested. One hundred and forty-four toddlers and children under five years gave 133 positives, or 92·4 per cent. From ages five to fifteen years 7,394 tested gave 5,239 positives, or 70·8 per cent. Susceptibility rises from 55 per cent. at age one to 100 per cent. at age three, falls but remains high till age seven, and thereafter falls steadily to 54 per cent. at age fifteen. The accompanying graph portrays diphtheria susceptibility by ages. The table gives the figures :—

Diphtheria Susceptibility by Ages.

Age, in years.	Number Tested.	Schick Positive.	Percentage Positive.
1	9	5	55·5
2	32	30	93·7
3	34	34	100·0
4	69	64	92·7
5	536	453	84·5
6	754	616	81·6
7	814	668	82·0
8	882	658	74·6
9	862	615	71·3
10	881	584	66·2
11	802	519	64·7
12	809	507	62·6
13	633	382	60·3
14	313	172	54·9
15	72	39	54·0
16	36	24	66·6
	7,538	5,372	71·2

The Moloney Test and Anatoxin Sensitivity.

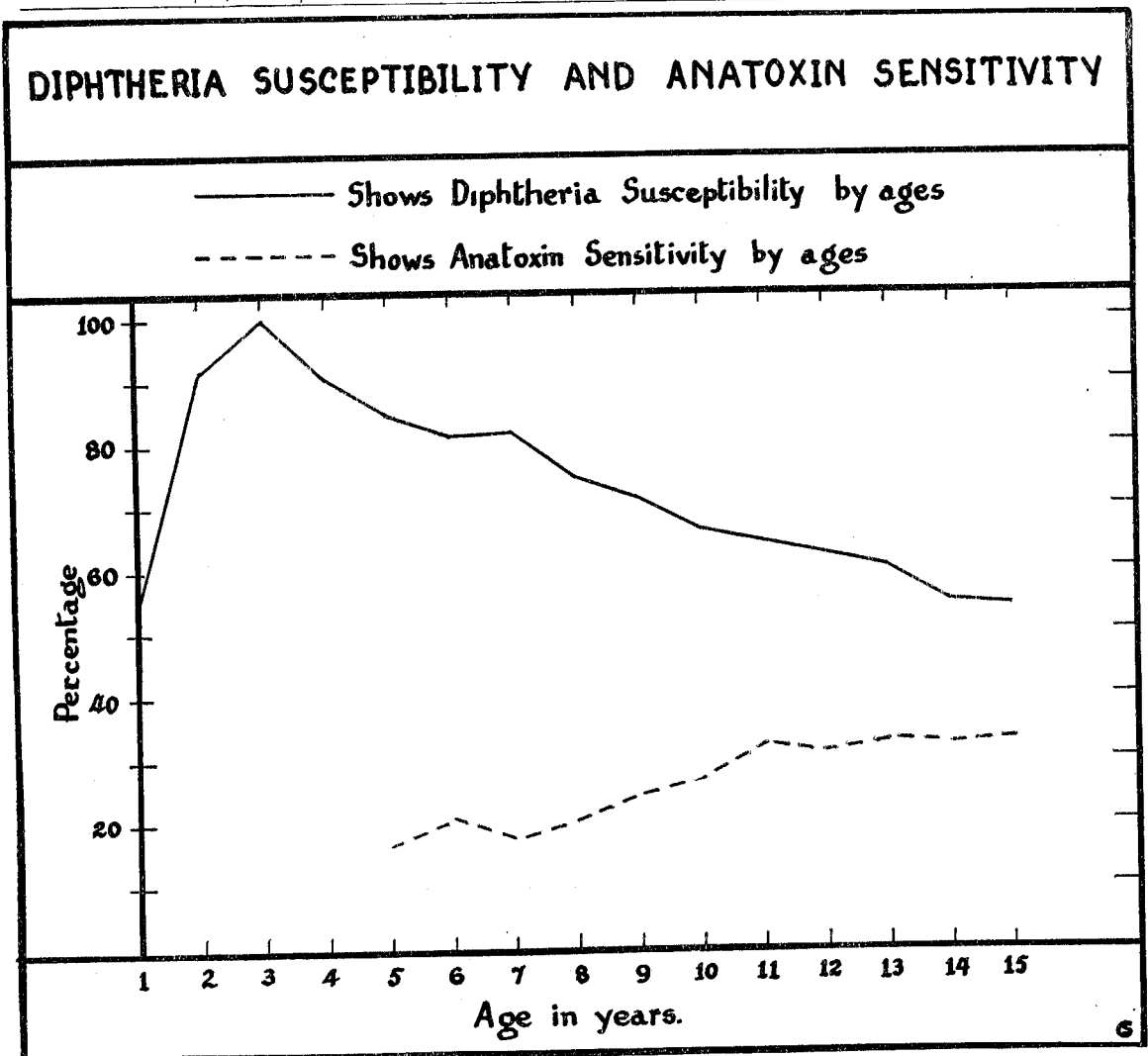
Eight thousand one hundred and forty-one children were Moloney tested. Reactions were graded as follows:—

- + = area of erythema up to 10 m.m. diameter with no induration.
 ++ = area of erythema more than 10 m.m. with slight central induration.
 +++ = area of erythema of 40 m.m. and more, with definite palpable induration.

All +++ reactors were not given anatoxin. ++ reactors received an initial dose of 0.25 c.c. anatoxin, unless they showed more than slight degree induration, when they were rejected. Induration seemed a more reliable guide than erythema as regards eliminating those liable to have reaction to anatoxin. In 1937, of 4,945 Moloney tested, 247, or 5 per cent., were rejected as +++ reactors. In 1938, of 3,196 children tested, 131, or 4 per cent., gave +++ reactions and were not immunized. The sensitivity to anatoxin increases steadily with age, the figures being given in the table, and demonstrated in the accompanying graph.

Anatoxin Sensitivity, 1938.

Age.	Number Tested.	Reactions.				+++	Percent- age.	Total.	Percent- age.
		+	Percent- age.	++	Percent- age.				
5	240	28	11.9	11	4.5	1	0.4	40	16.6
6	306	47	15.3	10	3.2	7	2.2	64	20.9
7	349	48	13.7	9	2.5	5	1.4	62	17.7
8	366	46	12.5	19	5.1	10	2.7	75	20.4
9	344	41	11.9	32	9.3	11	3.1	84	24.4
10	396	53	13.3	38	9.5	16	4.0	107	27.0
11	348	65	18.6	36	10.3	13	3.7	114	32.7
12	336	47	13.9	35	10.4	23	6.8	105	31.2
13	275	38	13.8	32	11.6	21	7.6	91	33.0
14	161	18	11.1	18	11.1	16	9.9	52	32.2
15	51	9	17.6	4	7.8	4	7.8	17	33.3
16	24	0	—	2	8.3	4	16.6	6	25.0
	3,196	440	13.7	246	7.6	131	4.0	817	25.5



A quarter of the children tested in 1938 showed sensitivity to anatoxin. The severe and immunization eliminating +++ reacting exists in less than 1 per cent. at age five years, rising steadily to over 16 per cent. at age sixteen years.

REACTIONS TO ANATOXIN INJECTIONS.

In considering anatoxin reactions immediate fainting from nervous strain is excluded. This happened every now and then, to a total of 0·4 per cent. in the series immunized.

Immediate general reactions occurred in thirty-four children in the 6,585 immunized, or 0·5 per cent. They may occur within a few minutes after first, second, or third injection of anatoxin. The child looks pale as though about to faint, but does not faint. The pulse is slow and weak, later irregular. The child is conscious throughout, complains of feeling cold, but of nothing else, except occasional nausea without vomiting. There may be muscular twitchings sometimes. The attack lasts anything up to thirty minutes, usually about fifteen minutes. Adrenalin was always given, and repeated if necessary, together with shock treatment. Recovery was universal.

Rashes originating from the injection site, with joint pains, and once with high temperature, occurred in 5 children, 0·07 per cent., usually about the seventh day following injection.

Local reactions, an area of erythema, swelling, and tenderness at injection-site (less than 3 in. in diameter), occurred in 12·1 per cent of those receiving injections. Local reactions more than 3 in. in diameter occurred in a further 5·1 per cent, the total reactions being 17·2 per cent.

General reactions up to twenty-four hours after anatoxin injections occurred in 9·4 per cent. of children immunized. They consisted of headache, nausea, or vomiting, anorexia, and sometimes pyrexia coming on a few hours after the injection was given. Compare this 9·4 per cent. general reactions in school-children with the 1·7 per cent. pre-school general reactions mentioned previously. The situation is difficult, as parents dislike having their pre-school children submitted to injection treatments, and yet this is the age when protective treatment is not only most needed, but also most easily sustained.

FOLLOW-UP OF DIPHTHERIA-IMMUNIZATION CAMPAIGN.

First Re-Schick Testing Results.

Towards the end of 1936 a small outbreak of diphtheria resulting in two deaths occurred in the country town of Pio Pio ; accordingly it was decided to offer immunization to the children attending the local school, and 149 children were immunized. These children received a three-injection course of treatment, whereas the children attending a neighbouring school received two injections only.

Six months later the children from both schools were Schick tested :—

—	No. Retested.	Secondary Schick +	Schick +ve. after.			Reduced Doses.
			Three Doses.	Two Doses.	One Dose.	
Pio Pio	89	5	1	1	1	2
Kohua Road	25	6	..	6	..	..

The results indicated the advisability of giving the three-injection course. Prior to the retesting of these country schools the children attending the Hamilton schools had been offered immunization, and the consents had been given the two-injection course as recommended by the Commonwealth Serum Laboratories. This group of children constitutes Series I in this paper. As a result of the retesting of the above small country schools it was decided to give the remaining schools in the South Auckland district a three-injection course of immunization. This group of children constitutes Series II.

Results of Secondary Schick Testing in 1937 and 1938 Campaign.

Three to six months after receiving their final injection 2,050 originally Schick positive children were re-Schicked, and the following results obtained :—

—	1937: Primary Schick Positives.	1938: Secondary Schick.		
		Tests.	Positives.	Percentage.
Series I: Two and less doses	847	568	186	32·7
Series II: Three and less doses	2,190	1,482	125	8·4

Series I were proceeded with on the strength of the Commonwealth Laboratories statement that 90 per cent. of persons receiving two doses of $\frac{1}{2}$ c.c. and 1 c.c. anatoxin at three-weekly intervals will be immunized. In our experience only 73·8 per cent. gained immunity with two doses ; the balance of the campaign was worked on a three-dose basis, and this achieved 98·1 per cent. immunity.

Comparison of Efficiency of Two and Three Doses Anatoxin.

—	Primary Schick Positive.	Secondary Schick.	
		Positive.	Percentage.
Series I: Two injections anatoxin $\frac{1}{2}$ c.c. and 1 c.c.	380	100	26·2
Series II: Three injections anatoxin $\frac{1}{2}$ c.c., 1 c.c., and 1 c.c.	941	18	1·9

In Series I, 380 originally Schick-positive children actually received two injections of $\frac{1}{2}$ c.c. and 1 c.c. of anatoxin and when retested, 100 (*i.e.*, 26·2 per cent.) were still Schick positive, whereas in Series II, 941 of the children actually received three injections of $\frac{1}{2}$ c.c., 1 c.c., 1 c.c. of anatoxin, and when retested 18 (*i.e.*, 1·9 per cent.) were still Schick positive.

These results indicate beyond doubt the advisability of giving the three-injection course of prophylactic treatment.

Another advantage of the three-injection course is that although a child misses one injection through absence he still has the opportunity of receiving a second injection, and thus has a much greater chance of developing immunity.

Reduced Doses of Anatoxin.

At the commencement of the campaign a number of children who showed a positive Moloney reaction were given reduced doses of anatoxin (*i.e.*, 0·1 c.c. to 0·2 c.c. as an initial dose). In Series I, 152 of the children who received the reduced doses of anatoxin, 60 (*i.e.*, 39·5 per cent.) were still Schick positive when retested. Many of these children gave no reaction whatsoever to anatoxin, so in Series II we decided that, provided there was no induration accompanying the positive Moloney test, we would give an initial dose of 0·25 c.c. Hence the fewer number of reduced doses in this series.

Moloney Retesting.

In Series II it was decided to Moloney test :—

- (a) Those children who showed an original +++ Moloney reaction ; and
- (b) Those children who developed what we considered to be definite reactions to anatoxin injections.

(a) *Original +++ Moloneys.*—Sixty-five original +++ Moloney reactors were retested, and the following results obtained :—

57 +++ Moloney reactions when retested remained +++
 7 +++ Moloney reactions were recorded ++
 1 +++ Moloney reactions was recorded +

These 65 Moloney reactors were Schick tested and it was found that 38 gave a negative Schick test, while 26 had such a pronounced protein reaction that it was impossible to tell at the forty-eight hours reading whether they were Schick positive or negative. However, 11 of these doubtful Schicks were re-read four to seven days after testing, and all were then found to be negative.

These results appear to indicate (a) that the strongly positive Moloney state remains permanent, and (b) that the strongly positive Moloney reactor has an accompanying immunity to diphtheria.

(b) *Reaction to Anatoxin Injections.*—Sixty-one children who from the teachers or parents reports were considered by us to have had definite reactions following anatoxin injections were Moloney tested, and the following results obtained :—

Number tested.	Moloney +++	Moloney ++	Moloney +	Moloney —
61	35	15	6	5

Of these 61 reactors 28 showed an initial ++ Moloney reaction, 14 showed an initial + Moloney reaction, 19 showed an initial — Moloney reaction, and of the original 19 Moloney negative reactors 8 when retested gave a +++ Moloney reaction, 6 when retested gave a ++ Moloney reaction, 3 when retested gave a + Moloney reaction, 2 when retested gave a — Moloney reaction.

The 61 children were all Schick tested, and it was found that 43 had become Schick negative, 10 gave doubtful readings owing to the protein sensitivity reaction mentioned above but were probably negative, and 8 were still positive.

The result indicate that the children who experienced reactions during the course of immunization were primarily sensitized or became sensitized to the anatoxin as demonstrated by their strongly positive reaction to the Moloney test.

SUMMARY OF POST-IMMUNIZATION AND MOLONEY TESTING.

(a) *Immunity to Diphtheria.*—A total of 2,050 originally Schick positive children were given injections of anatoxin and re-Schicked three to six months after receiving their final injection. 380 of these children received two full doses of $\frac{1}{2}$ c.c. and 1 c.c. of anatoxin, and when retested 100 (*i.e.* 26·2 per cent.) were still Schick positive.

Nine hundred and forty-one of the children received three full doses of $\frac{1}{2}$ c.c., 1 c.c., 1 c.c. of anatoxin and 18 (*i.e.*, 1·9 per cent.) remained Schick positive.

(b) *Sensitivity to Anatoxin.*—In Series II, 61 children who had reactions following injections, and 65 originally +++ Moloney reactors were Moloney tested, and the following conclusions reached :—

- (1) The strongly positive Moloney state appears to remain permanent.
- (2) The positive Moloney reactor is more likely to develop reactions following injections of toxoid than the negative reactor though there is no guarantee that the latter will not develop a sensitivity to anatoxin during the course of immunization.
- (3) The children who had reactions following injections developed in general a positive Moloney state and acquired an immunity to diphtheria.

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