Report of the Commissioner of Public Health / Western Australia.

1953

WESTERN AUSTRALIA

REPORT

of the

Commissioner of Public Health

for the year

1951

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Report of the Commissioner of Public Health.

To The Hon. Minister for Health.

I have the honour to submit the Report of the Department of Public Health for the Year 1951.

ADMINISTRATION.

On 10th December, 1951, Dr. D. J. R. Snow was appointed to the position of Epidemiologist to the Department. He had successfully completed the course for the Diploma in Public Health at the School of Public Health and Tropical Medicine in Sydney at the end of the year. It is expected that in 1952 he will be able to commence systematic work on the study and control of communicable diseases.

The work of the Department is being crystallised into branches, some of which will be dealt with later on in the Report. The different facets of public health require specialised treatment. The volume of the work of the Department is such that it is impossible for any Commissioner to give the personal attention which is necessary to these various specialities. There is an increasingly wide field in the demand for specialist services. These require the services of specialists to whom the Commissioner may delegate responsibility.

STATE HEALTH COUNCIL.

Two meetings of the State Health Council have been held during the year.

The value of this Council is becoming very apparent with the passage of time, and I would like to congratulate my predecessor, Dr. C. E. Cook, on his foresight in recommending its appointment.

It is pleasing to note that the State Government pays heed to its recommendations and that it appears to regard the Council as a body to be consulted and as one whose advice should be accepted wherever practicable.

1. At a meeting on 5th November, 1950, the Council recommended that the Government should give full support to a proposal that Professors Gye and Mann continue the cancer research which they were carrying out at the Imperial Cancer Research Institute in London. This recommendation was accepted and the Cancer Research Laboratory was established in March, 1951.

2. The Government approved of a recommendation to acquire a Hollerith Machine to facilitate and enlarge the scope of the tabulation of statistical data.

3. The Government approved of a recommendation for the appointment of an Insecticide Advisory Committee and to prepare the necessary legislation for an amendment of the Health Act to achieve this end.

4. A recommendation that the Department should advertise in Europe for suitable trained nurses to serve under bond for a period of two years, was approved. Efforts are being made to carry out this policy.

5. The Government throughout the year continued to mould its hospital policy on the recommendations made by the Hospital Requirements Committee which were approved by the State Health Council.

LOCAL AUTHORITIES.

Section 26 of the Health Act reads :—

> " Every local authority is hereby authorised and directed to carry out within its district the provisions of this Act and the regulations, by-laws, and orders made thereunder : . . . . ."

Section 27 of the Act provides for the appointment of a medical practitioner as medical officer of health, and it is obviously the intention of the Act that such medical officer of health shall accept the professional responsibility for the administration of the Act.

This Section, which was passed by Parliament in the year 1911, also provides that the medical officer of health " shall be paid by the local authority as remuneration for his services a salary of not less than fifteen pounds per annum."

In 1911 this salary was low enough, and in the year 1951 it is a manifest absurdity. It is apparent that local authorities are often denied professional advice from their medical officers of health and, indeed, many of them are unaware of the necessity to obtain it. If the local authorities were prepared to meet their obligations to their medical officers of health, they would doubtless obtain better service.

Section 27 also makes it obligatory for a local authority to appoint a Health Inspector. This is made difficult at present for all local authorities by the shortage of trained inspectors. It is proposed to enlarge the classes taking the course at the Perth Technical College in 1952 and so increase the numbers available in 1953.

Efforts have been made throughout the year to strengthen the local authorities' role in health administration. These efforts have in some cases been stultified by the tendency of some authorities to regard any increase in the health rate as a calamity, although the general rise in costs in all other directions makes obvious its necessity. This attitude is retrograde. There is a saying that " public health may be bought "—but one must be prepared to pay the price. Increasing costs generally must be reflected in an increase in the cost of health services, and in 1950 the Health Act was amended to provide for the levying of a higher maximum rate by local health authorities to meet the rising costs of health administration.

There are some local authorities which rate 1/16th of 1d. or even lower when the maximum permissible rate is 2d. (unless the Governor's approval is sought to levy a rate of 3d.) on Unimproved Capital Values. Many authorities have the tendency to think that if economy in administration or expenditure is to be effected, the first item to be sacrificed is the expenditure on health.

The difficulties of some local authorities with small populations in obtaining the services of a health inspector may be overcome by their joining with adjacent local authorities to form a Region and to appoint a common Regional Health Inspector. This practice has been successful in certain parts of the State and it is proposed to extend it.

SANITATION.

The struggle to raise the standards of hygiene and sanitation in the State continues unabated. The efforts of the local authorities have been handicapped by a shortage of health inspectors who not only police the Health Act but who also serve as educators of the public.

The control of environmental sanitation is the first essential of any public health authority.

This State has to overcome the disabilities inherent in its early settlement. One can still see prevalent the ideas of sanitation surviving from the pioneer days when the struggle to wrest a living from a hard and waterless country tended to relegate sanitary matters to the background as luxuries and refinements that could be dispensed with.

It is the policy of the Department to give every support to the local authorities in their endeavours to improve the sanitary conditions within their boundaries.

It is regretted that certain Government departments continue to offend against the Health Act in this respect. They set a poor example to the rest of the community.

HEALTH OF THE NATIVE POPULATION.

The health of the native population is inevitably bound up with the conditions under which they are housed.

Since the war ended in 1945, 20,190 houses have been constructed in this State, almost of all these in the southern part of the State.

It is estimated that the native population of the south-west part of the State is about 4,000, which is approximately 0·7 per cent. of the total population.

It is a fact that no native has been provided with a house since 1945. If natives were to have their share of housing accommodation in proportion to their population, they would have received 0·7 per cent. of the houses which have been erected in the State or 141 houses. It may be considered a national reproach that their housing needs have not been met in any way whatever.

Comments.

The following comments which were made in the Annual Report for 1950 are still appropriate :—

" Denied access to their former hunting grounds which are now devoted to the white man's agricultural and pastoral pursuits, they are compelled to work for the white man for their livelihood and yet denied a communal life with him. They are condemned to live in shack and shelter on the fringe of townships and only too frequently the only place where there is water and material from which they can build their shelters is the town's sanitary site.

Need one be surprised at the standard of hygiene and sanitary conscience of a community brought up on an area devoted to the deposition of the white man's rubbish and excreta.

The policy of the Department of Native Affairs is stated to be one of assimilation of the native into the white community. Many whites are, not unnaturally, averse to this when they see the conditions under which the natives are living now. A contrary policy has been proposed of placing them in large scale settlements. But the public health problems inseparately associated with them will not be solved by the creation of a new Mason-Dickson line behind which they might live their sub-standard life in partial oblivion.

There can be no doubt that the initial step to be taken in their habilitation is the provision of housing approximating in standard to that of the rest of the community, and the education of the young at any rate among them, in the ability to live therein. It is impossible to teach any man to use a tool unless he be given the tool with which to practice. It is not possible to learn the art of living on a sanitary site.

There can be no doubt that the majority of natives are at the present incapable of using properly, housing accommodation which is up to the white standard. Nevertheless unless efforts are made to educate them in its use they will never learn.

It is suggested that a beginning be made by providing them with camping conditions that conform to the Camps and Caravan Regulations of the Health Act. When a family has shown by its usage of the facilities so provided that it is capable of appreciating and not misusing these facilities, steps should then be taken to provide the family with a house of European standard.

' Dull would he be of soul who could pass by ' this pathetic heritage of the white man's irresponsibility. The state of this increasing racial minority is pregnant with dangerous social consequences and its risks to the public health must be recognised by this Department."

The North-West.

The local authorities in the North-West have shown in the year some increasing awareness of their responsibilities under the Health Act.

Regular visits of a Health Inspector of this Department has shown that a little improvement has occurred in the general sanitary conditions of this part of the State. Nevertheless, the lag in provision of new and adequate housing for our population in the North-West and the Kimberleys is severely handicapping the improvement in the conditions under which the people live.

The medical service is, on the whole, satisfactory. There is, however, no resident dentist in the State north of Carnarvon and arrangements are being made for some of the Dental Officers of the Northern Territory to cross the border into the Kimberleys when it is convenient for their route to take this course.

A Dental Officer of the State School Dental Service makes an occasional visit but is impossible for him to cater for the dental needs of the population.

There is an urgent necessity for the establishment of a dental service for the North-West on the lines of the mecical service, and for the various communities to have ready access to resident dentists.

One of the great difficulties is the shortage in this State of dental graduates. The position might be eased by the granting of bursaries for dental students taking the course at the University of Western Australia on condition that after graduation a period of service in the North-West is obligatory.

NORTH-WEST MEDICAL SERVICE.

As in former years, Medical Officers employed by the Department have been stationed at Roebourne, Port Hedland, Broome, Derby and Wyndham where they have carried on the Medical service given to the local inhabitants.

Particular attention is given to the health of the natives and of the effects produced by the close association of a comparatively large native population with the white residents. This aspect continued to receive careful study.

MEDICAL LABORATORIES BRANCH.

(Appendix I.)

In his report, the Director, Dr. W. A. Young, comments on the institution of a Cadet Trainee Scheme for the purpose of training laboratory technicians.

In order to aid this, courses of instruction given by the Western Australian Branch of the Australian Association of Laboratory Technicians were commenced in July. It is anticipated that these courses and the fact that the technicians will have to pass the necessary examinations of this Association will mean an improvement in the standard of the technical side of laboratory work in this State.

New equipment has been ordered or received by the Laboratory. Modern technical methods require equipment which is often costly, but the Laboratory has to keep pace with modern medical research and developments.

The laboratory at the King Edward Memorial Hospital is enlarging and in Appendix I is an account given by Dr. Kelsall and Dr. J. Watson on the valuable work they have done at this hospital.

It is significant to note in Dr. Young's report that the increase in the routine work of the laboratories at the Royal Perth Hospital shows that the total number of examinations for the year 122,474—an increase over the number for 1950 of approximately 22 per cent.

In the Report last year, mention was made of the need for the establishment of independent Public Health laboratories, as it is becoming more and more manifest that the premises available at the Royal Perth Hospital are quite inadequate to cope with the hospital requirements as well as those of this Department. This is a matter of great urgency.

Certain exploratory steps have been made by Dr. Young for the formation of small laboratories in country hospitals. These developments are handicapped by the shortage of available technicians and suitable premises.

Reference should be made to the branch of the Laboratory which has been established at the Perth Dental Hospital with the co-operation of Professor Radden. Valuable work is being carried on in this laboratory.

TUBERCULOSIS CONTROL BRANCH.

(Appendix V.)

Later in this Report are printed the annual reports of Dr. Alan King, the Director of the Tuberculosis Control Branch, and also those of Dr. F. E. Heymanson, Tuberculosis Physician, and Dr. D. D. Letham, Acting Medical Superintendent of the Wooroloo Sanatorium.

It is pleasing to note that, in the course of the year, the fall in the death rate from this disease was dramatic, reaching the record low level of 12·9 per 100,000 of the population. As will be seen from Dr. King's report, the course of the Death Rate since 1941 shows that the annual rates in ensuing years have been :—

Year.	Mean Population. 100,000.	No. of Deaths.	Rate per 100,000.
1941	4·74	185	39·00
1942	4·77	175	36·7
1943	4·77	144	30·2
1944	4·81	134	27·9
1945	4·88	149	30·4
1946	4·93	163	33·3
1947	5·03	128	25·4
1948	5·15	157	30·5
1949	5·33	123	23·1
1950	5·59	125	22·3
1951	5·90	76	12·9

This decline in the death rate may be attributed to the increasing efforts of the Branch in its case-finding programme, including the search for cases of disease among contacts, hospital patients and cases referred by private doctors, and also to the splendid results in treatment which are being achieved by the use of antibiotics and thoracic surgery.

The community has every reason to be grateful to the activities of Dr. King and the Staff of his Branch for their work throughout the year.

The co-operation of Dr. R. R. Anderson, the Medical Superintendent of the Royal Perth Hospital, continues in a highly satisfactory manner.

A 35 mm. Camera Tunnel Unit has been installed at the hospital for the routine X-ray examination of all patients. Dr. Anderson reads the films and arranges the follow-up of discharged patients and out-patients through the Chest Clinic. As a result of these activities, from 1st July, 1950, to 30th June, 1951, of 9,082 patients examined, 62 were proven to be suffering from active pulmonary tuberculosis—an incidence of 0·68 per cent.—and of 8,833 out-patients, 32 cases were detected—an incidence of 0·36 per cent.

X-ray examination of hospital patients is a fruitful field for work in tuberculosis control. Dr. Anderson pioneered this work in Australia.

Equipment has arrived at the Fremantle and the St. John of God's Hospital, Subiaco, and it is hoped that this will be installed in 1952.

Dr. King has continued the country X-ray service in association with selected country hospitals, and in the course of the year, 1,786 films of suspects were received and 21 cases of pulmonary tuberculosis were notified as a result of this work.

In Dr. King's remarks on mass radiography, he calls attention to the fact that since the Clinic was opened in Perth in 1948 a total of 127,796 people have been x-rayed.

It is anticipated that a new Mobile Unit will be available next year.

Concern continues to be expressed at the large number of migrants who were found to be suffering from tuberculosis in the course of the year. Of 507 notifications during the year, nearly 200 were migrants, of which 95 were foreign and 92 were British. Of the 249 patients in the Wooroloo Sanatorium at 31st December, 1951, 42, or nearly 17 per cent. were migrants.

It is pleasing to record the co-operation of the Director of Education, Dr. T. L. Robertson and the Teachers' Union in the arrangements made for the survey of school teachers during the year. They were gazetted as a class for compulsory X-ray examination under the Health Act on 6th April, 1951. Of the 2,000 teachers examined, only two active cases of pulmonary tuberculosis were detected. This small number is gratifying.

In the report submitted by Dr. Letham, a detailed analysis of the treatment given to the patients in the Sanatorium shows that of the 191 patients discharged in 1951, the percentage of controlled or stationary cases and of arrested cases is now over 80 per cent. This excellent result is due to the modern methods of treatment in use at the Sanatorium.

A tribute should be paid to the efforts of Dr. Elphick in this respect, and one must record sympathy to him in his absence from illness and good wishes for a speedy recovery.

The Thoracic Surgeon, Mr. F. J. Clark, and the Anaesthetist, Mr. G. F. R. Troup, continued to give first class service, and this is reflected in the results which have been obtained.

As in former years, the Sanatorium nursing staff has been continuing under great difficulties. It is impossible to over-emphasise the debt owed by the community to our nurses who have worked so tirelessly and often without regard for their personal comfort or even safety in the care of the sick.

The programme of development of the grounds of the Sanatorium has gone steadily on and a marked improvement has taken place within the past five years. These amenities are essential for the mental welfare of the patients.

In his report, the Tuberculosis Physician, Dr. F. E. Heymanson, stresses once more the important role played by medical men in private practice in the control of tuberculosis. Our medical colleagues have co-operated to the full and this is shown by the increase in the number of their private patients referred to the Chest Clinic from 1,965 in 1948 to 6,539 in 1951. Of the cases referred in 1951, 128 or two per cent. were found to be suffering from active tuberculosis. This proportion is 10 times as high as that obtained from a mass survey of the adult population.

The Branch is to continue its efforts of concentrating on that section of the population with the highest incidence of the disease, namely, contacts of known cases, general hospital patients and cases referred by private doctors because of suspicious symptoms.

It is pleasing to observe the use being made of the Chest Clinic by medical men in private practice as a consultative clinic. The professional relationship between medical officers of the Branch and their colleagues is most harmonious ; this is of extreme importance in this branch of preventive medicine.

As will be seen from Dr. Heymanson's report, many other abnormal conditions in the chest are discovered in cases examined in the course of the routine work of the Clinic and in the cases referred to by private doctors. This " by-product " is of great value and clearly establishes the Clinic as being one for thoracic diseases in general and not only tuberculosis.

The Department is continually resisting approaches to have X-ray examinations carried out on school children. The incidence of pulmonary tuberculosis in children of school age is almost negligible in this country. It is therefore not only uneconomic of the resources of the Tuberculosis Control Branch to examine many thousands of these children, but it is also practically useless as almost no cases of the disease are discovered.

Rehabilitation.

In the course of the year an amalgamation was made between the Wooroloo Colony and the Tuberculosis Association of W.A.

This has allowed of great developments, and on 14th October, Linley Valley Colony was officialy opened by the Premier, the Hon. Ross McLarty.

New workshops have been erected and equipped with machinery for sheet metal work ; houses are now available for workers as well as a hostel for single men.

In addition, the work at the Federal Cardboard Box Manufactory in Perth, which is also conducted by the Tuberculosis Association, has continued most successfully.

Dr. King reports that the partnership between the Department and the voluntary organization, the Tuberculosis Association, is efficient and is producing first-class results.

CANCER RESEARCH BRANCH.

(Appendix VI.)

Reference should be made to the report of Professor W. E. Gye and Professor Ida Mann, the Directors of the Cancer Research Laboratory of this Department.

As will be seen, considerable efforts were necessary in the establishment of the laboratory and the importation of stocks of mice. Great difficulties were caused by power breakdowns. However, at the end of the year they had been able to commence on a plan of research.

Reference must be made to certain clinical trials on treatment which were carried out. These have been referred to by them in their report. The conclusions reached were that the methods of treatment used produced no demonstrable effect on the growths from which the patients were suffering.

STAFF PUBLICATIONS.

(Appendix VII.)

During the year a number of articles written by members of the staff of the Department have appeared in various medical journals. In order to make these results of their work and observations more available to professional colleagues in this and other countries, it is desirable that these articles be published in journals of a wide circulation in professional circles.

It has been considered advisable to prepare a list of these articles and to publish in this Report summaries and abstracts of their contents. These are contained in Appendix VII.

COMMUNICABLE DISEASES.

(Appendix VIII.)

The most notable infectious disease of 1951 was viral hepatitis. As an epidemic disease it is new to us. Although sporadic cases are known to have occurred in the past, there is no previous record of a major epidemic in Western Australia. It appears to be spread in this State mainly through personal contact. No effective control measure is yet available, and it is fortunate that the disease carries a very low mortality.

Poliomyelitis accounted for 96 notifications (as opposed to 59 in 1950), and Diphtheria 271. The latter disease was more prevalent than it has been since 1948. There is need for even more extensive immunisation. An undue number of cases or rubella was also notified (137) and attention was specially directed to the problem of protecting pregnant women. None of the other notifiable diseases warrants special mention.

The handbook entitled " Notes on Communicable Disease," which was prepared last year and issued to medical practitioners, health inspectors and to teachers of the Education Department, has been revised in accordance with the recommendations made at the meeting of the National Health and Research Council held in November.

These modifications have been made in the light of increasing knowledge of epidemiology, and the booklet will now provide those interested and responsible with authoritative statements concerning all the notifiable diseases. It will be printed early in 1952 and distributed.

DEATHS FROM VIOLENCE.

In Appendix IX is a commentary by Dr. W. S. Davidson on " Traffic Accidents," in which is indicated the serious effects of road accidents on our hospital economy. Large numbers of hospital beds are immobilised for use for other cases of illness because of the need to admit so many accident cases to hospital. Dr. Davidson outlines the economic importance of this factor and, further, analyses certain road conditions leading to a high accident rate.

Also in Appendix IX will be seen an analysis made by Dr. D. J. R. Snow concerning the relative economic and social importance of the main causes of death in the community. The methods used in the determination of this are interesting and illuminating.

It is confirmed that, as in other countries, deaths from violence, including accidents and road deaths, occupy a prominent place in social and economic importance.

Estimated in terms of " useful years lost," accidental " deaths from violence " are the most important cause of wastage among all forms of death. Of these, " automobile accidents " and " other accidents " are of approximately equal importance.

The conclusions reached are of great importance to any Public Health Department, which should assume more responsibility than hitherto in this potent influence on the public health.

ARGENTINE ANTS.

In his report (Appendix X), the Deputy Chief Inspector, Mr. C. E. Flower, comments on the handicaps experienced in the Argentine Ant campaign by the shortage of D.D.T. early in the summer. This shortage delayed operations but, nevertheless, satisfactory work was carried out.

Experience has shown that it is doubtful if D.D.T. can eradicate this pest. It will certainly control it if used intelligently, conscientiously and with a relentless vigilance. More hope is held for the newer insecticide Chlordane, and some has been ordered for the 1952–53 season from the U.S.A.

Acknowledgments are due to the C.S.I.R.O. and the staff of the State Agricultural Department for their assistance and co-operation throughout the year.

INFANT HEALTH.

(Appendix XII.)

Report of the Acting Supervisor of Infant Health.

No marked developments have occurred in this branch in the course of the year. The usual high standard of work in the Infant Health Centres has been maintained.

Dr. Ward draws attention to an increase in the number of mothers who breast-feed their babies, but it is still depressing to read that only 40 per cent. of babies are fed from the breast for the first five months of life and that only 12 per cent. are partially breast-fed. Forty-eight per cent. of our children are, therefore, wholly artificially fed. It is impossible to believe that their mothers are incapable of feeding them themselves.

This is a fairly grave social question, the implications of which are fully realised by the medical and nursing staff of the Infant Health Branch of the Department. Every effort is being made to increase the proportion of mothers who breast-feed their children.

In the course of the year there has been an increase in the number of Infant Health Centres. It is gratifying to note that some local authorities realise their responsibilities in public health matters and that, with the assistance of the Lotteries Commission, are providing the capital for the erection of new Infant Health Centres.

New buildings have been opened at Cannington, Kalamunda, Quairading and Corrigin. The building at Corrigin was built with moneys provided by the local authority and the Lotteries Commission.

New buildings are being erected by the local authorities at Beverley and South Bunbury.

The precedent which was established by the farsighted Fremantle City Council in 1950 is being followed.

Acknowledgment must also be made to the ever-generous attitude of the Lotteries Commission.

In the course of the year, the Correspondence Sister has made regular visits to the Murchison and as far north as Wittenoom and Port Hedland. It will be appreciated that the provision of a service to the out-back areas of the State presents extreme difficulty.

The policy of giving mothercraft lectures throughout the year to girls at the various high schools has been continued. It is noted that the convent high schools do not appear as yet to be interested.

The infant mortality rate was 28·73 per thousand. This is rather higher than the over-all Australian figure of 25·24. Greater efforts are required to reduce this figure to a level which is more satisfactory.

SCHOOL MEDICAL SERVICE.

(Appendix XIII.)

Dr. Ward, the Acting Senior Medical Officer of Schools, reports that because of the increase in the School Medical Staff, it is now possible to arrange for a medical examination of every child in all high schools, State schools and convent schools throughout the State once every two years.

There appear to be misapprehensions concerning the function of the School Medical Service. Parents and Citizens' Associations repeatedly request that the inspection of the children be an annual one and even that the School Medical Staff be responsible for the treatment of some of the abnormal conditions which are discovered in the children. It must be clearly understood that the School Medical Officer's duties are to make periodic inspections of the children in order to detect any possible developing abnormality or tendency and to report this to the parent in order that correction or treatment may be made by the family's private doctor.

In the intervals between these periodic examinations it is expected that the parents will, if they have any suspicion of an abnormality, take the child to their private doctor. The School Medical Service is intended to supplement the care of the child by the family doctor and in no way attempts to supplant it.

After many years' experience in other countries and in our own, it is considered that a more frequent medical examination than once every two years is a wasted effort.

Dr. Ward comments on the fact that there are still some children whose nutrition is below standard. That this should occur in our country with its high standard of living and its vast resources of food is regrettable.

In previous reports comment has been made of the deficiencies in the dietary ideas of the population. The over-processing of food and the desire to " improve " the quality or the flavour of natural articles of food leads to a " cult of the palate " which cannot but have a harmful tendency on the health of the people.

Dr. Ward commenfs on the fact that Oslo lunches continue to gain in popularity. Their extension depends in great part on the co-operation of the teachers, and appreciation is to be given to the attitude of many of the teachers in our schools for their efforts.

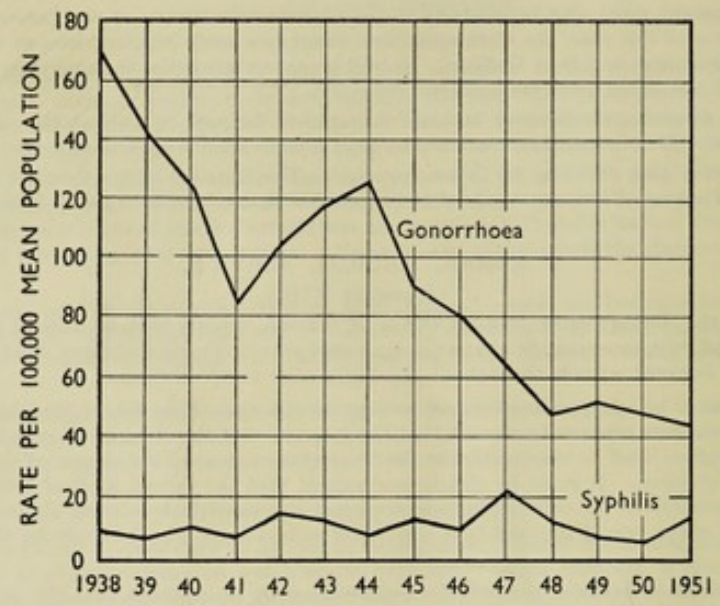
Dr. Ward's observations concerning Health Camps for children who are delicate but not definitely ill are worthy of serious attention.

VENEREAL DISEASES IN WESTERN AUSTRALIA, 1951.

(Appendix XXV.)

The two major venereal diseases in this State are gonorrhoea and syphilis. During the year under review, 261 cases of the former, and 66 of the latter were reported to the Department. The prevalence of gonorrhoea shows a decrease but that of syphilis an increase over the previous year. Notifications for the last fourteen years are set out in the accompanying table and are also shown as a rate per 100,000 of the population in the graph.

Year.	Mean Population (in 1,000's.)	Syphilis.		Gonorrhoea.	
		Cases.	Rate per 100,000 Mean Population.	Cases.	Rate per 100,000 Mean Population.
1938	464	34	7·32	791	170·4
1939	470	28	5·95	675	143·6
1940	473	40	8·45	590	124·7
1941	474	32	6·75	411	86·7
1942	477	78	16·32	500	104·8
1943	477	58	12·15	565	118·4
1944	481	36	7·48	588	122·2
1945	487	66	13·55	438	89·9
1946	493	46	9·33	397	80·5
1947	503	102	20·27	316	62·8
1948	515	63	12·23	246	47·7
1949	533	31	5·81	272	51·0
1950	559	29	5·18	272	48·6
1951	581	66	11·35	261	44·9



Reduction in the gonorrhoea rate over the years 1938–1941 is probably attributable to the introduction of the sulphonamide group of drugs. The reduction was interrupted for obvious reasons during the war years, but was resumed in 1945, and was almost certainly assisted by the introduction of penicillin. As newer antibiotics become available, this reduction should be maintained.

The prevalence of syphilis, despite minor fluctuations, has shown no remarkable variation. The increase during 1951 is partly attributable to an unusual number of cases (15) reported from a single North-West centre. The indications for 1952, however, are that a considerable reduction can be expected.

Clinics for the treatment of V.D. are conducted at the Royal Perth Hospital, Fremantle Hospital and Kalgoorlie Hospital. The treatment in these clinics is free and the cost of running the clinics is borne by the Department of Public Health. Of the grand total of 338 cases of V.D. (which includes one chancroid and ten granuloma) reported in 1951, 125, or more than one-third, were notified from the clinic of the Royal Perth Hospital where the patients attended for treatment.

CONCLUSIONS.

In conclusion, I would like to express satisfaction that the organisation and the work of the Department is evolving surely if slowly along the lines of a proper integration of the medical services of the State as a whole.

I would like to take this opportunity to thank you, Madam, for your sympathy and understanding of the many difficult problems associated with this and, also, to thank all members of the staff for their eager and willing co-operation.

LINLEY HENZELL,
M.D. (London), B.Sc., D.P.H.,
Commissioner of Public Health.

APPENDIX 1.

ANNUAL REPORT FOR THE YEAR 1951 BY THE DIRECTOR OF MEDICAL LABORATORIES.

To the Commissioner of Public Health.

I have the honour to submit a report on the work of the Public Health Laboratories and the Medical Laboratory Service of Western Australia for the year 1951.

In retrospect this year has produced noticeable improvements and extensions of laboratory services, such as the acquisition of senior experienced staff, the extension and re-orientation of laboratories, the taking over of the laboratory in the Dental Hospital, the reconstruction and remodelling of the museum and other items mentioned later, but the improvements were in most cases delayed until the end of the year so that their full benefit has not yet been felt.

There has been a continuous increase not only in the amount of work sent into the laboratories, but also in the elaboration of the methods employed in the investigation of each specimen. This improvement in method has not however been possible in every branch of work, as the amount of work coming into some sections has more than occupied the full time of an increasing staff ; there has been considerable change of staff in certain sections and every section of the laboratories has not yet acquired a sound nucleus of permanent trained staff to maintain the highest standard of routine work in their section and to train at the same time the cadets and laboratory assistants passing through their section.

In a new and rapidly growing organisation the proportion of trainees and junior laboratory assistants is still too high in comparison with highly trained staff to give the optimum results in most branches of our work.

The two branch laboratories at the King Edward Memorial Hospital and at the Dental Hospital have shown the most gratifying progress not only in their routine work, which is relatively smaller than in the central laboratories, but also in the investigations which it has been possible to carry out in the special branches of their work owing to the absence of the pressure of overwhelming routine which at present prevents investigational work on any scale in the central laboratories.

General Staffing.—The position of medical bacteriologist was filled in August by the appointment of Dr. N. Kovacs, who has taken charge of the department of bacteriology and haematology until a haematologist is appointed. The appointment of a medical or senior biochemist has remained vacant throughout the year. No candidate for this appointment with the requisite experience and qualifications has so far applied despite wide re-advertisement of the appointment. No attempt has so far been made to recruit a haematologist whose appointment was originally recommended late in 1950.

The recruitment of technical staff continued with the appointment of one science graduate to biochemistry, one technician to bacteriology, one technician to tuberculosis, one technician to the museum and one biochemistry technician to King Edward Memorial Hospital. Two science graduates held temporary positions and four science students were employed as temporary laboratory assistants during the long vacation.

Dr. A. Krievs underwent training for five months before taking up the appointment of Pathology Registrar at Fremantle Hospital. Dr. L. Szaloky continued his training for a pathology registrarship throughout the year. One science graduate was trained in the histopathology laboratory for some months with a view to taking up an appointment in the Cancer Research Laboratory.

The change-over of staff in the laboratory office was unusually large and regrettable. The senior typist's position was refilled on two occasions, and five junior typists were appointed. Five resignations were handed in for various reasons mostly associated with overwork and strain. The office staff was increased to four by the end of the year, but owing to the inexperience of most of the members in an office where the work is specialised and unusually hurried, overtime was still being worked to maintain reporting services.

The Cadet Trainee Scheme.—Two cadet trainees were appointed, after the previous year's establishment of two cadets was reduced to one when one cadet ceased duty. Two reconstruction trainees finished their training under the reconstruction scheme, but were retained as temporary laboratory assistants while completing their further training to qualify as technicians. The scheme of training continues to work well, their science training at the Technical College helping to produce a background to their practical training in the Laboratory.

An expansion of this scheme to provide an adequate supply of locally trained technicians to staff the extending medical laboratories of Western Australia is needed. Allowing for some wastage a minimum of three cadets is required each year to fill the junior positions in the present laboratories. This intake should be kept up until a sufficient number of young men interested in laboratory work and capable of holding junior appointments is obtained.

The courses of instruction given by the West Australian branch of the Australian Association of Laboratory Technicians commenced in July. Laboratory assistants from the Public Health Laboratory and other laboratories and some graduate technicians are attending these courses, which will be of considerable value in the further training of our cadet trainees when they become eligible to attend them.

The Staffing of Sectional Laboratories.—During Miss Silvester's absence on study leave, Miss Abbott has acted in her place and maintained routine services throughout the year with a relatively junior staff. The museum by the appointment of a second trained technician has completed its trained staff, but the pathology laboratory has lost its second technician by his appointment to the Dental Hospital Laboratory, and joins the sections of bacteriology and serology in having one senior technician only. The King Edward Memorial Hospital Laboratory has gained by the appointment of a senior biochemistry technician.

Laboratory Accommodation.—Two new rooms were taken over for the use of the biochemistry section, but remained unused until reconstruction work commenced in December. These rooms will be used as an " instrument room " and a washing-up room. General rehabilitation work in the biochemistry section was also commenced and a new store-room built in an unused passage-way. The old washing-up room is being converted into a B.M.R. room. With the completion of these alterations the biochemistry section may be expected to accommodate the work it is expected to do until the new laboratories are completed, when the old laboratories could be utilised as a central media preparation department and for other laboratory purposes.

The process of partitioning and dividing up the main laboratory was commenced but not completed by the end of the year. The additional bench space and improved working conditions are already apparent. The museum preparation room was divided into workroom and photographic darkroom.

Means of preventing recurrent damage to the museum ceiling from flooding were at last found, and the work of reconstructing the museum on a bay system with illustrative wall panelling, illuminated demonstration stands and an illuminated microscope bench was in progress at the end of the year.

As it is impossible owing to restriction of space to remove the telephone enquiry and the counter enquiry from the office and so to facilitate the smoother working of urgent reporting in the office, plans have been submitted for sectionalising and sound proofing the office to cut off the enquiry sections from the typist's section.

The original plans of the new biochemistry laboratories in the new wing have been re-considered in view of more recent advances in biochemistry technique, and revised plans are now under consideration.

The existing laboratories of the dental hospital have been taken over and some minor improvements to the King Edward Memorial Hospital laboratories have been carried out. Owing to the probable delays in the building of the new laboratories at King Edward Memorial Hospital, plans for the further utilisation of space for biochemistry and bacteriology there have been submitted.

New Laboratory Equipment.—The whole centrifuge equipment in the sections of bacteriology, tuberculosis and biochemistry was modernised by the purchase of three M.S.E. Major Centrifuges, the latter with high speed attachments. A M.S.E. Freezing Microtome and a Qualtex Floating Out Bath were supplied to the Dental Hospital laboratory. A M.S.E. Minor Centrifuge and three electrically operated water baths were supplied to the King Edward Memorial Hospital laboratory. Other items added to the equipment were a Casella Fortin barometer, a Muirhead pH meter and a Precision pipette shaker. A Hilger spectrophotometer arrived, but was not unpacked owing to the instrument room not being ready for its installation. The flame photometer attachment ordered in 1950 had not arrived at the end of 1951. A split-sampler, a vacuum freeze-dry apparatus, a spectrometer and a Van Slyke gas analysis apparatus were on order at the end of the year. A Perspex prothrombin estimation bath with controlled electrical heating and electrical stirring was made in the museum preparation room.

Animal House Accommodation.—Increased requirements for animal inoculation for diagnostic purposes continued throughout the year. The Animal Nutrition laboratories at Hollywood helped with the supply of guinea pigs, mice and rats, but mouse breeding was carried out for pregnancy tests and gonadotropin assays. Animals were obtained from various sources. The supply of rabbits improved, but the numbers available for all tests was frequently inadequate. No epizootics occurred among the housed animals, but occasional losses of groups of animals occur which are ascribed to heavy spraying of certain green vegetables with insecticides or fungicides, as these losses are always associated with the distribution of certain vegetables.

Pregnancy testing has been increased with the greater availability of rabbits and mice. Queensland toads have been added to the test animals for this purpose. Toads are flown in large batches from Innisfail, Queensland, and are housed in tanks in the biology department of the University of Western Australia by the courtesy of Professor Waring. Toads are removed in small batches to our animal houses as required.

With nearly half our animal house accommodation occupied by guinea pigs used in the diagnosis of tuberculosis and the other half reserved for stock animals and pregnancy tests, the amount of space required for other diagnostic procedure is inadequate. Extension of animal house accommodation for work on leptospiral, rickettsial and viral infections is an urgent necessity apart from the general need for increased space for general diagnostic inoculations.

One animal house cleaner still carries on the cleaning, feeding and breeding work of the animal houses and the general maintenance of the animal operating theatre. He is helped to a limited extent by cadets undergoing training in animal house work. But owing to the small number of cadets available, the maintenance of cage sterilisation and general cleaning does not reach the accepted standards of animal house hygiene in a hospital building, and a second cleaner will be needed shortly.

The planned breeding station for healthy stock animals is still in the planning stage, although progress has been made in the proposed design by reference to plans of animal houses built elsewhere or recommended by U.F.A.W. No site has yet been chosen.

The Medical Laboratory Service of Western Australia.—Detailed planning of new laboratories at King Edward Memorial Hospital continued and revised plans were submitted for the laboratories at the Tuberculosis Clinic and Chest Hospital. The partly built laboratory at Pinjarra Hospital was visited before plans for a rather similar laboratory at the Lake Grace Hospital were passed on. These two laboratories are of about the size of clinical siderooms, but they should allow, owing to their arrangement for diagnostic microscopy, simply haemotology, bacteriology and biochemistry, blood grouping, typing and cross-matching. They should also act as forwarding stations of specimens by correct methods.

There has been a general improvement in the standard of packing and forwarding of specimens from some outlying hospitals and practitioners. This most frequently occurs where practitioners use the laboratory service as a consultant service and not merely as a reporting service. More specimen containers have become available and more instructions on the taking, packing and despatch of specimens have been issued,

but the issue of sets of containers with complete lists of methods of collection has not yet become possible owing to the short supply of certain glassware. Complaints relating to the loss of specimens or the failure to receive reports still occur, but they are less numerous. Loss or destruction in transit appears to account for some of these. Failure to give particulars of their origin accounts for others. An express delivery service from the G.P.O. of all specimens arriving by post for the laboratories has cut down delivery delays. The sending of " warning telegrams " notifying the laboratories of the arrival of specimens by airlines has also cut down delivery delays especially at the week-ends. Delays at week-ends are inevitable until week-end delivery service is arranged and a seven-day-a-week laboratory service is instituted. Saturday morning staffs in the laboratories have been considerably increased and senior technicians attend for urgent examinations on Sunday when required.

A visit was made to the hospital and laboratory at Kalgoorlie to advise on improvements in laboratory services.

Serological investigations and other work for the Princess Margaret Hospital and the Fremantle Hospital have been continued and staff trained for the latter hospital. An interchange of some staff from the Princess Margaret Hospital for training purposes is being arranged.

Routine Work.—The table attached shows monthly totals of examinations in the main divisions of the laboratories with 89,945 for the central laboratory, 14,737 for the biochemistry section, 18,750 for the King Edward Memorial Hospital Laboratory and 1,912 for the Dental Hospital laboratory. The grand total of examinations for the year is 122,474, an overall increase over the number of 1950 of approximately 22 per cent. As these figures refer to anything from a simple examination taking one hour to one of multiple type spread over weeks, the figures as usual underestimate the actual increase of work carried out. The distribution of work showed that 27·5 per cent. only of examinations were carried out for the public health department, 56·3 per cent. for the Royal Perth Hospital and the remainder for the King Edward Memorial Hospital and Dental Hospitals.

Some detailed figures showed that 276 post mortem examinations were carried out by the Pathologist, Dr. T. R. Lubbe. Nine thousand three hundred and ninety sections, frozen, paraffin and special were cut in the Royal Perth Hospital and Dental Hospital. Five thousand nine hundred and sixty-four sera were examined for the Wassermann Reaction, 8,432 sera for the Kahn Test, 3,171 sera for gonorrheal, typhoid, typhus, Brucella and other anti-bodies and 3,835 sera for Rh. anti-bodies. Fourty-two thousand four hundred and one examinations were carried out by the haematology division including haemoglobin estimations, counts, sedimentation rates, coagulation and bleeding times and clot retraction, fragilities, haematocrits, prothrombins, grouping, typing, etc., 6,603 examinations were made for M. tuberculosis, 431 for M. leprae, 907 for N. Gonorrheae, 3,774 for C. diphtheriae. One thousand eight hundred and eighty-five samples of water and 148 of milk were examined bacteriologically. Fourteen thousand four hundred and eighty-five examinations in the biochemistry section covered a wider filed of routine examinations than in the previous year. The medico-legal section showed a marked increase of cases investigated throughout the last quarter of the year.

With such a large volume of routine work, however, carefully it is checked and cross-checked before the reports are issued, it is inevitable that in rushed periods occasional errors occur. As far as can be ascertained when repeat examinations are requested and carried out the rate of reporting error compares very favourably with that found in large laboratories where exact checks over a period of years have been made.

ROUTINE EXAMINATIONS, 1951.

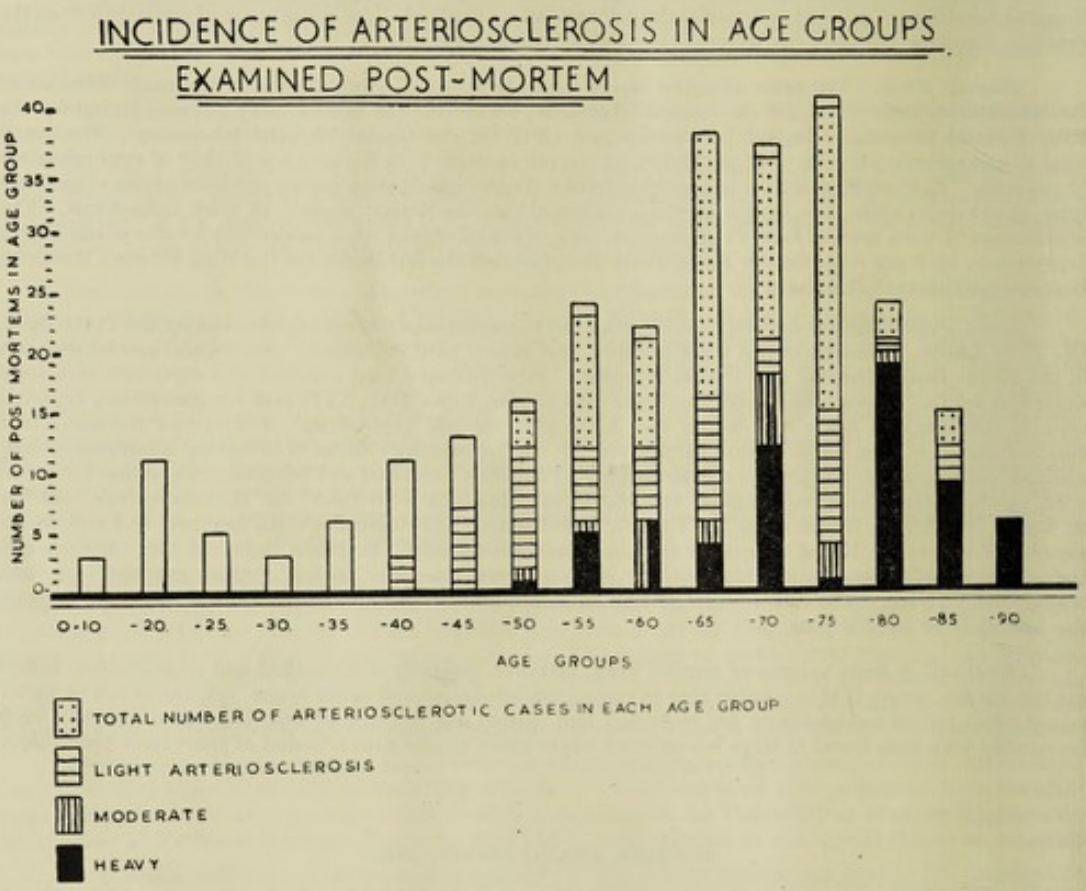
Laboratory.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Total.
Central Laboratory	7,374	7,666	6,310	7,239	7,763	6,890	8,541	8,138	7,241	7,340	7,034	6,229	87,945
Biochemistry Section	1,169	1,144	1,126	1,346	1,240	1,281	1,448	1,371	1,125	1,438	1,243	806	14,737
K.E.M.H. Section	1,402	1,721	1,600	1,721	1,786	1,443	1,502	1,570	1,517	1,670	1,610	1,238	18,780
Dental Hospital	....	....	....	....	....	....	....	....	147	319	350	196	1,012
Totals	9,945	10,531	9,036	10,306	10,789	9,614	11,491	11,259	10,030	10,767	10,237	8,469	122,474

Pathology.—Of the 8,384 examinations in the Royal Perth Hospital morbid anatomy section, 6,293 were carried out for the Royal Perth Hospital and 2,091 for the Department of Public Health. The number of examinations for the Royal Perth Hospital was 75·2 per cent. of the total figure. This large series covered biopsies, frozen sections for the operating theatres, sections of post-mortem material, special sections smears from friable tumours for malignant cells, sputa and pleural fluids for malignant cells, and frozen sections for fat emboli. Cervical smear diagnosis of early uterine cancer was not commenced owing to the failure of arrangements with the gynaecological department.

Routine demonstrations at weekly intervals were arranged by Dr. Lubbe to show surgical biopsy sections to the surgeons and their resident staffs to correlate clinical findings with histological appearances to the advantage of both surgeon and pathologist. One surgeon attended regularly, another at less frequent intervals and the others not at all.

Out of the 415 malignant tumours examined, 148 were squamous and basal celled carcinomata of the skin, 40 tumours of the breast, 33 uterine malignant tumours, 15 prostatic tumours and 17 bronchial tumours. Bronchial tumours showed only a slight increase from 14 in 1951, an increase which is not statistically significant. The remaining tumours occurred in various organs and tissues with 10 melanomata and nine lip carcinamata, nine stomach tumours, 11 colanic tumours and 10 bladder tumours as the most prevalent of the smaller groups.

An analysis of post-mortem material showing the incidence of arteriosclerosis in age groups was prepared by Dr. Lubbe. The accompanying histogram also shows the age of patients dying in the Royal Perth Hospital. This analysis of arteriosclerosis depicts a roughly similar pattern of incidence to those recorded in other countries except for the relatively late appearance in the 35 to 40 age group.



Clinico-pathological meetings in the lunch hour on Wednesdays were held regularly under the chairmanship of the Assistant Medical Superintendent of the Royal Perth Hospital. Pathological specimens, sections and photographs were shown at these meetings.

Dr. Lubbe was absent on study leave for six weeks and Dr. Ferguson-Stewart acted as part time pathologist in his absence.

Museum.—The work of remounting the old collection of 250 specimens, which were judged to be suitable for retention in the museum, was completed in August after they had been re-treated and re-investigated. Seventy-five specimens were sectioned and many more blocks were prepared. The compilation of the museum sectional catalogues was initiated to include case histories and macroscopical and microscopical descriptions of specimens, photomicrographs, etc. Over one hundred typed descriptions were completed and 90 more awaited typing. All museum specimens were re-labelled according to a classification based on the International Nomenclature of Diseases.

One hundred and sixteen new specimens, both biopsy and post-mortem, were treated for maintenance of true colour and future mounting, after cataloguing and indexing. A technician was appointed to the museum in September and work was commenced on the designing and preparation of perspex jars, which are constructed entirely by the staff of the museum. Perspex jars are now used for all mounting owing to the scarcity of glass jars and their prohibitive cost when obtained.

The photographic section has progressed despite the limitation of time for its development. The separation and completion of a dark room in the preparation room has facilitated work in the later months. Thirty-five clinical photographs were taken and 50 lantern slides were prepared for demonstration at the clinico-pathological meetings and 14 photomicrographs, 20 "reduced X-rays," and 20 specimen photographs and 14 chart reproductions were made for various purposes. A special Leica camera was purchased and has added to the scope and usefulness of the photographic equipment. A photostat apparatus was devised late in the year and 70 photostats were taken with it.

The museum staff has undertaken the construction of various articles of laboratory equipment made from perspex for the sections of bacteriology, haematology and biochemistry, and also the checking, repair and maintenance of microscopes.

With the completion of the alterations and additions to the museum and its lighting early in 1952, it is hoped that rapid progress will be made in the display of specimens under good conditions for study. An artist from the Government Printing Office has prepared a considerable number of charts, diagrams and paintings for the wall panels in the sections of haematology and protozoology. It is proposed to illustrate as many sections as possible and to use illuminated demonstration stands for radiological appearances as well as photomicrographs of groups of lesions.

Bacteriology.—With the appointment of Dr. N. Kovacs it has been possible to investigate and revise in rotation many, if not all, of the methods and techniques used in these laboratories in both clinical and public health bacteriology, and also the methods used in the collection of specimens. Although this work is still in progress, many striking improvements have already been made.

Quoting from Dr. Kovacs' report :—

> We keep two main aims in front of us, (1) close collaboration with the clinic, and (2) the investigation of the newest methods in laboratory diagnosis and the introduction into our standard methods of those which prove satisfactory.

He then stresses the necessity of co-operation of the doctor attending the patient with special reference to antibiotic therapy for with inadequate co-operation from the clinician it is not possible to use the specific inhibitor and so obtain a culture of the infecting organism. He quotes the frequency of sterile cultures in pneumonia.

The contamination of urine specimens has been fully investiaged, the methods of collection condemned and improved methods instituted. Means to differentiate the saprophytic from the pathogenic types of Proteus have been used and the coli-aerogenes group of bacteria have been divided according to their varying sensitivity to different antibiotics.

The periodicity in the frequency of occurrence of Ps. pyocyanea in specimens, which has been previously noted, was investigated again and traced to a ward infection due to Zephiran solution used for "disinfecting instruments." It was found that the same solution was used for "disinfecting" the rubber discs in the caps of blood bottles in the Blood Bank and several contaminations occurred. When the glucose citrate solution was sterilised with air-tight screw caps covered with cellophane and no Zephiran was used to "disinfect" the caps, contamination ceased.

A syringe and needle service was introduced and all syringes and blood taking needles used in the laboratory are packed in individual containers and sterilised. It is hoped that this service will be enlarged and will become the foundation for a syringe service for the Royal Perth Hospital.

Bacteriology-Tuberculosis.—The second technician appointed in 1950, resigned in May, 1952. He was replaced by a new technician in September. Despite changes of staff the work carried out in this section showed an increase of 10 per cent. over the work done in 1950 and an increase of 57 per cent. over the work in 1949. With the space and staff available work had to be confined almost entirely to routine examinations, which totalled 6,603 for the year. Of these 3,874 (58·6 per cent.) were carried out for the Royal Perth Hospital and 2,729 (41·4 per cent.) for the Department of Public Health. Out of the 308 "positive examinations," 157 were "positive sputa," 112 were "positive gastric contents" and 39 positive results were found in urines, C.S.Fs., etc. The examinations for leprosy bacilli (M. Leprae) were also carried out in this section.

Serology.—This separate section now deals not only with routine Wassermann and Kahn-testing, complement-fixation tests, agglutination tests, Paul Bunnell and cold agglutinin tests and heparin-protamine titrations but undertakes all the special examinations on blood and other stains associated with medico-legal work and tests for gonadotropins and pregnancy tests in general.

The Wassermann Reaction is still carried out in one batch per week, but daily batches of Kahn tests are done to expedite "positive reporting." Non-specific reactions are repeated and investigations of new antigens in their relation to "non-specific reactions" are under consideration. All routine antigens and agglutinable suspensions are now prepared and tested in this laboratory.

In addition to the Friedman Test and the qualitative and quantitive Ascheim-Zondek reaction, toad tests using the male Queensland toad, Bufo marinus, have been instituted. Toads after preliminary testing for sensitivity to urinary hormones, are then used in pairs after a rest period and the results are controlled against Freidman or Ascheim-Zondek tests. A high percentage of correlation has been shown with these more recognised methods after initial difficulties in technique were surmounted. When the number tested and controlled reaches a larger figure, it is considered likely that for a routine test for normal pregnancy the toad test is adequate. Being a rapid test and less expensive it will probably be the test of choice except in dealing with hormone excretion in pathological states.

Haematology.—The work of this section increased by 35·6 per cent. to a total number of examinations of 42,401. The increase has been more rapid in the King Edward Memorial Hospital branch than in the Royal Perth Hospital laboratory. Of the 31,540 examinations carried out in the Royal Perth Hospital laboratories 84 per cent. are done for " in " and " out " patients in the Royal Perth Hospital and only 16 per cent. for patients sent by other practitioners in Perth or on specimens sent from various hospitals in Western Australia.

The increase of work has already overtaken the increase of bench space given by reconstructing the laboratories, and overcrowding is as noticeable as in other sections.

Dr. Kovacs reports " the main aim of the haematology department is to introduce standard technique which gives results which do not vary under repeated controls. The routine blood grouping and typing is done under constant controls and is organised so that technical and clerical errors are practically eliminated." The estimation of prothrombin has been placed on an exact basis using the specially constructed water bath mentioned and a new technique.

Biochemistry.—Miss L. Silvester, biochemist to the Public Health Laboratories, was absent on study leave in Sydney throughout the year. Miss J. V. Abbott acted as biochemist during her absence. The work of the department increased by 33 per cent. This increase occurred in the work done for the Royal Perth Hospital, which constitutes 96 per cent. of the work done in this section.

King Edward Memorial Hospital Laboratory.—The work in this laboratory has shown a very rapid increase. The total number of examinations carried out in routine and investigational work is 16,245, an increase of 163 per cent. on the figures for 1950. The staff of technicians was increased to three in October by the appointment of a senior biochemistry technician. Dr. G. A. Kelsall was appointed part-time haematologist in May and Dr. J. Watson continued to act as a part-time honorary haematologist.

The following is a summary of Dr. J. Watson's report on the general working of the laboratory :—

" The established routine of Rh testing commenced in 1949 has been continued. All admissions to King Edward Memorial Hospital have been blood grouped and typed and where applicable antibody titrations by the Indirect Coombs technique have been done repeatedly throughout the latter months of pregnancy. This service has also been available to practitioners for their private cases and blood samples have been received from many parts of the State. Three thousand nine hundred and forty-four pregnant women have been investigated out of a total number of 14,794 giving birth in Western Australia to children in 1951, *i.e.*, 26·6 per cent. of all women giving birth to children. The number of King Edward Memorial Hospital admissions examined was 2,558 (2,535 in 1950), but the number of cases from outside practitioners increased from 130 in 1950 to 1,386 in 1951. Detailed examinations of infants' blood before, during and after exchange transfusions has become a routine and the haematology technician, Mr. G. H. Vos, has made himself available at all times for the 40 cases tested.

Anti-Rh typing serum has been obtained from suitable donors and is supplied regularly to Royal Perth Hospital, Fremantle Hospital and Red Cross Blood Transfusion Service. Previously, supplies were obtained from the Commonwealth Serum Laboratories. This has led to a more satisfactory control of Rh-typing as difficulties in the use of a particular serum can be readily referred back to the issuing laboratory.

Haemoglobin estimations have tripled in numbers. An M.R.C. grey wedge photometer was acquired for this purpose and has proved very satisfactory.

Bacteriological investigations showed a large increase, strains for further investigation being passed on to the central laboratory. Biochemistry equipment was built up and methods checked by the end of the year.

The hospital blood bank was maintained and a trained sister was appointed to assist at transfusions, maintain equipment, group, type and cross-match bloods.

Bench space was nearly doubled by the addition of new benches. Further space is required for biochemistry and bacteriology and office space is urgently needed. The services of a typist for reports, filing, record keeping, typing of notes, articles, etc., is also an urgent requirement."

Dr. G. A. Kelsall reports on the investigations which will be incorporated in two papers, one dealing with the study of maternal antibody titres during pregnancy, and the second a study of the relationship between maternal antibodies at delivery compared with the antibody titre of the infant's blood, indications for exchange transfusion, etc.

Owing to scarcity of cases, breakdown of apparatus and other causes, little progress has been made in the investigation of the toxaemias of pregnancy.

Two rare antibodies of undetermined nature at present are under investigation here and have been passed on to laboratories in England and America as well as to the Commonwealth Serum Laboratories, Melbourne.

Dr. and Mrs. R. L. Kirk, who have carried out since 1950 some of the bench investigations of a study of " iso-immunisation in the A.B O blood groups " in this laboratory, have completed their bench work and are incorporating it in a paper to be published shortly.

Perth Dental Hospital Laboratory.—The work of this laboratory consists of only a moderate amount of routine which is gradually increasing, and should be further stimulated, and the research work of the research department of the faculty of dental science of the University of Western Australia. Owing to the impossibility of obtaining suitable staff for a small isolated laboratory unit, the Public Health Department took over the laboratories with a view to staffing them and partly equipping them to carry out the routine work at present sent to the central laboratories, Royal Perth Hospital, and to help in the research programme.

As the technician acting as second pathology technician was a senior technician in age and experience and particularly qualified to help in Prof. Radden's research on the innervation of teeth, tooth buds and other oral structures he was seconded to the Dental Hospital in July. In Prof. Radden's absence routine histopathology and bacteriology was commenced, large numbers of sections were prepared for the teaching of histology and histopathology to dental and physic-therapy students, tissues left by Prof. Radden were prepared, cut and investigated and photomicrographic equipment was assembled and tested.

Prior to the transfer of this technician, Mr. T. E. Dockrill, to the Dental Hospital, we had commenced investigations in the Royal Perth Hospital histology laboratory into some aspects of dermal histology, including innervation. These were continued in the dental hospital alongside Prof. Radden's problems with which they were closely linked. A re-investigation of normal skin innervation has by improved methods led to new conceptions of the function of Langerhans dendritic cells and other structures. Structures resembling ganglia have been demonstrated in the pulp of molars and preparations for experiments on electrophoretic staining methods are progressing.

When the laboratory facilities of the Dental Hospital are fully organised, cadets and laboratory assistants will be able to undergo part of their training there as in other hospital laboratories.

The Laboratory Advisory Committee.—This committee was originally appointed to discuss difficulties and complaints arising from the laboratory service of the Royal Perth Hospital being carried out by a separate and distinct organisation, the Public Health Laboratories, working in the laboratories of the Royal Perth Hospital. The complaints might be of the service given by the laboratories to the Royal Perth Hospital. On the other hand they might come from the laboratories relating to the methods, timing, etc., of requests coming to the laboratories from members of the hospital staff.

No meeting of this committee was called by the staff or the laboratories during the year.

The inadequence of the services of pathology registrars to the laboratories with one notable exception continued, owing partly at least to the other duties carried out by the registrars. The lack of that full co-operation between all members of the hospital staff and the laboratory staff mentioned at previous meetings of this committee still continued despite the appointment of another senior member of the laboratory staff, who is always available and anxious to achieve that full co-operation.

The Future of the Public Health Laboratories in the Royal Perth Hospital Laboratories.—Despite the increase of bench space in the laboratories obtained by re-planning with the possible exception of the biochemistry section, the working capacity of all laboratories has been stretched to the limit and overcrowding is already apparent in every section. It is doubtful whether the working space in the wash-up rooms, media rooms and the haematology section conforms to public health requirements. The occupation of the new biochemistry laboratories in the fourth floor of the new west wing, if the old biochemistry laboratories can also be retained, would temporarily ease the congestion in some sections. But this is not expected to take place for another three years.

The work of the Public Health Department carried out in the Public Health Laboratories in the Royal Perth Hospital constitutes 32·7 per cent. of the total work of the laboratories and the work of the Royal Perth Hospital (62·3 per cent.) shows a constant increase. Within a few years the work required by the Royal Perth Hospital alone in its laboratories will fill them to the same state of congestion as the combined work of both Royal Perth Hospital and Public Health Department does at present.

In the meantime the laboratory work of the Public Health Laboratories cannot be expanded in any direction for lack of laboratory space or animal house accommodation. Essential investigations in tuberculosis, Brucella infections, rickettsial and virus diseases, water and sewerage bacteriology and river waters, are among the many problems held in abeyance owing to the swamping effects of ever increasing hospital routine work.

Additional space in the hospital buildings is now urgently required for many sections and might be made available if bleeding in the hospital blood bank is to cease.

The building of new laboratories for the Public Health Department in the form of a Hygiene Institute is now becoming an urgent problem. This institute should contain all sectional laboratories, with a public health museum and a lecture theatre, and, if built in close proximity to the Royal Perth Hospital should also contain a clinical research department with its own separate laboratories.

Investigations into the scope and type of laboratories required has been commenced, and some outline planning started which will be continued after visits to laboratories in the Eastern States and consultation with other laboratory directors in Australia and the United Kingdom.

Contact with Medical Laboratories in Australia.—During a period of six weeks study leave, the Pathologist visited medical schools and hospital laboratories in Adelaide, Melbourne, Sydney and Brisbane.

Staff Changes, 1951.—The following appointments and resignations have occurred :—

Appointments—

Miss H. Silberman, Technician, Biochemistry, 3rd January, 1951.
Mr. J. Hankey, Temporary Laboratory Assistant, 9th January, 1951.
Miss M. Thompson, Senior Typist, 25th January, 1951.
Mrs. A. C. Jitts, Technician, Biochemistry, 1st February, 1951.
Mr. B. Lang, Cadet Trainee, 12th February, 1951.
Mr. M. Mortimer, Cadet Trainee, 26th February, 1951.
Dr. A Krievs, Technician, 6th March, 1951.
Mr. F. J. Wright, Technician, Bacteriology, 14th March, 1951.
Miss M. Wykes, Typist, 3rd April, 1951.
Mrs. R. A. Caddy (*nee* Battye), Reappointment Technician, Biochemistry, 7th May, 1951.
Miss E. J. Babbington, Typist, 8th May, 1951.
Miss B. Wreathall, Trainee Technician for Cancer Research Laboratory, 28th May, 1951.
Mrs. A. Jitts, Technician part-time, 1st August, 1951.
Dr. N. Kovacs, Bacteriologist, 16th August, 1951.
Miss J. Holmsen, Junior Typist, 11th September, 1951.
Mr. E. Carroll, Technician, Bacteriology, 17th September, 1951.
Mr. B. Chandler, Technician, Museum, 17th September, 1951.
Mrs. M. Owens, Typist, 17th September, 1951.
Mr. J. Stuart, Technician, Biochemistry, King Edward Memorial Hospital, 15th October, 1951.
Miss M. B. Stewart, Typist, 22nd October, 1951.
Miss P. Faulkner, Temporary Laboratory Assistant, 5th November, 1951.
Mrs. I. W. Spaull, Senior Typist, 7th November, 1951.
Miss L. W. Byass, Temporary Laboratory Assistant, 13th November, 1951.
Miss G. P. Sloane, Temporary Laboratory Assistant, 19th November, 1951.
Mr. P. Finch, Temporary Laboratory Assistant, 20th November, 1951.

Resignations, etc.—

Mr. J. Hankey, Resigned, 27th January, 1951.
Miss Battye, Biochemistry Technician, Resigned, 9th February, 1951.
Mr. G. Cattermole, Cessation of duty, 23rd February, 1951.
Mrs. A. C. Jitts, Resigned, 14th March, 1951.
Miss M. Cook, Technician, Resigned, 4th May, 1951.
Miss G. Hancey, Typist, Resigned, 4th May, 1951.
Miss J. Lockyer, Typist, Resigned, 10th June, 1951.
Miss H. Barr, Technician, Resigned, 19th June, 1951.
Dr. A. Krievs, Transferred to Fremantle Hospital, 3rd August, 1951.
Miss M. Wykes, Typist, Resigned, 5th October, 1951.
Mrs. M. Owens, Typist, Resigned, 19th October, 1951.
Miss M. Thompson, Senior Typist, Resigned, 9th November, 1951.
Mrs. Caddy, Technician, Resigned, 28th December, 1951.

Acknowledgments.—I wish to express my appreciation of the work done and the help received from all members of the laboratory staff in their varying capacities. I wish to particularly mention the work of my Technical Assistant, Mr. A. Drummond, who has not only acted as senior technician in the serology section, but has carried out so much of the detailed work in connection with staff and stores, and various public health matters.

I desire also to place on record my appreciation of the advice and help of the Commissioner of Public Health, the Under Secretary, Assistant Under Secretaries and many other members of the staff of the Public Health Department in all the problems I have brought to them.

(Sgd.) W. A. YOUNG,
B.Sc., M.B., B.S., M.R.C.S., L.R.C.P., D.T.M & H.,
Director of Medical Laboratories,
Western Australia.

REPORT OF STUDIES AT THE KING EDWARD MEMORIAL HOSPITAL, by Dr. G. A. Kelsall, for the year ended 30th April, 1951.

During the past year my studies at the King Edward Memorial Hospital have been directed towards the lowering of the infant mortality rate in Haemolytic Disease of the Newborn.

Wiener (Wiener, A. S., Brit. Med. Journal, 1952, 12th Jan., p. 108), using the conglutination technique found a mortality rate of 12·2 per cent. where the titre was four or less, while with titres from 65 to 256 the total mortality rate was as high as 72·2 per cent. and (Wiener et. al. Am. J.D.Ch.) 63.1.1952.

Walker (Walker, W., Brit. Med. Journ. 1951, 10th Nov., p. 1142) reported that in 600 cases, approximately 15 per cent. were stillborn, and of those born alive approximately 15 per cent. died—making a 30 per cent. overall mortality rate. Furthermore, he found that of all the live-born infants with this disease, one in twelve shows evidence of brain damage.

Mollison and Walker (Mollison, P. L. and Walker, W., Lancet, 1, IX. Mar., 1952) have reported the results of the controlled trials of the treatment of haemolytic disease of the newborn, which was conducted in eight large British maternity hospitals over the last two years. Their main purpose was to determine whether exchange transfusion was superior to simple transfusion and whether premature induction of labour was preferable to allowing the pregnancy to proceed to term, with the idea of delivering the infant before too much damage had occurred. Their material consisted of 477 cases spread over two year's observation throughout the country. Of these 477 cases, 103 cases were either stillborn or died after delivery, giving them an *over-all* mortality rate of 21·6 per cent. However, it should be noted that they have excluded from their stillbirth figures all those which were stillborn before the 35th week of gestation. Their stillbirth figures and over-all mortality figures are therefore better than the true figure, as many affected infants die before the 35th week. Of the infants given exchange transfusion in Mollison's series, he had a 12·9 per cent. mortality rate, while of those given simple transfusion his mortality rate rose to as high as 37 per cent. He claims to show also that the premature induction of labour was possibly not as helpful as allowing the pregnancy to go to term. In this we would disagree with him.

The work at the King Edward Memorial Hospital has been divided into two phases. In the first phase, 43 consecutive experimental cases were studied and the results have been published in the Medical Journal of Australia (1st November, 1952, page 349). From these cases we have learned certain lessons which have been applied to the treatment of a further 60 cases in the second phase. We have endeavoured to adhere rigidly to the principles of treatment which we feel should be used ; and the principles may be enumerated briefly as follows :—

1. By employing standardised anti-globulin tests the optimum time of delivery for the infant is determined.
2. Where necessary, the infant is treated by *exchange* transfusion *as soon as conveniently possible* after delivery.
3. At least three times the infant's blood volume of blood is perfused.
4. The blood used must be (a) freshly collected, (b) while still warm, (c) into heparin, and on *no* account is citrated blood to be used. Either the umbilical vein—" cord cannula " method, or the saphenous-radial artery method could be employed.

When the second phase K.E.M.H. series is compared with the English series it is seen that our over-all mortality rate of 18·5 per cent. is less than Mollison's at 21·6 per cent. (But, as has already been pointed out, it must be remembered that Mollison did not include stillbirths in his series which occurred before the 35th week of gestation, and in our experience, a large proportion (probably half) of the stillbirths occurs before the 35th week). This exclusion affects both his over-all mortality rate as well as his stillbirth rate.

Of the infants born alive our " whole series " mortality rate at 14·4 per cent. compares favourably with Mollison's 17·4 per cent., whereas where we had applied the lessons learned from the first series " to our second series " patients, our mortality rate is reduced to 9·2 per cent.

When exchange transfusion was employed Mollison had a mortality rate of 12·9 per cent., while our " total series " had 12·7 per cent. Our second phase showed considerable improvement by being brought down to 7·9 per cent.

However, our second phase cases are as yet small in numbers. We feel that when it has reached at least a hundred cases we will be justified in drawing some conclusions.

Although Mollison's figures are the latest English figures available, our figures bear comparison with those of Walker and of Wiener, already quoted above.

In our mortality figures we have given the figures as being most unfavourable to ourselves ; for example, one affected infant was found at post-mortem to have had a severe broncho-pneumonia. We have attributed the death to haemolytic disease of the newborn. Another stillborn infant died of a prolapsed cord after artificial rupture of the membranes and has been included as stillborn due to haemolytic disease. The premature induction of labour had been intended to diminish the risk of damage to the baby, and was a hazard at least partly responsible for the loss of the infant.

Owing largely to the enthusiastic work of Mr. G. H. Vos, a standardised anti-globulin titration technique has been evolved in the laboratory, which has proved of inestimable value in the management of the mother and the treatment of the infant.

Contrary to the expressed views of many other workers, we have shown that the severity of the disease can be correlated to the maternal anti-body titre, that labour should be induced when the anti-body titre shows certain characteristic behaviour. By means of the knowledge of the titre we are able to allow some cases to go nearer to term than others ; in fact we can choose the optimum time for delivery. Since the anti-body is the responsible factor in the disease, it is reasonable to expect that the measurement of its potency should be related to the severity of the disease. Unless the greatest care is taken in *every* detail of the titrations, the results can be incorrect and the conclusions misleading. This applies particularly when performing the albumin titrations, which are easy and quick to do, whereas the indirect anti-globulin technique is long and tedious. However, as Wiener points out, " when done carefully it gives excellent results," and with this we heartily agree.

Other activities during the year have been the identification of an anti-serum which was found to be identical with that known as KELL. A quantity of this has been collected and samples have been exchanged with other workers in Australia and in England.

We have further established a panel of known cells for the antigens A_1, A_2, B, C, D, E, c, e, Kell, Lutheran, M, N, S, s, and P. D and D^u cells are also able to be identified.

Little work has been done upon the Toxaemias of Pregnancy owing to several factors : (1) The difficulty of organising the collection of blood and urine samples in the hospital, as at present staffed. (2) The absence of biochemical facilities which, when they became available in the summer months corresponded to the " off season " for the disease. (3) The difficulty of performing sodium potassium estimations without a flame photometer, and when uranium salts are not available for sodium estimations.

When these difficulties became apparent and as time was passing, I therefore devoted my time to the main matter for investigation—namely the Rh. factor and its relationship to infant mortality. However, I still hope to be able to continue the Toxaemia work which I had commenced with Professor Mayes in Sydney.

A search of the literature reveals the mortality rates of other workers.

Author.	No. of Cases.	Deaths.	% Mortality.	Journal.
Brancato	29	4	13·8	Trans. N. York, Acad. Sci. 13.220 1951.
Wiener and Wexler	106	18	17·0	Pediatrics 1951.
Diamond, Allen et al.	347	61	17·8	N. Eng. J. Med. 224.39. 1949.
Bartel & Van Loghem	141	21	18·5	Rev. Ist. Sie. Ital. 23.268. 1948.
Tzanck, Bessie et al.	34	12	35·3	Rev. Ist. Sie. Ital. 23.236. 1948.
Raske	22	4	18·2	Rev. Ist. Sie. Ital. 23.246. 1948.
Wallerstein	41	8	19·5	Proc. Am. Ass. Bl. Bk.
Mollison & Cutbush	30	7	23·3	Lancet 1948 2.522.
Fraser	24	3	12·5	Canad. M. A. J. 1948. 59.378.
Moloney	45	13	29·0	Pediatrics 1950 5.1008.
Ginsberg & Feldman	11	0	0	Am. J. Obst. & Gynae. 50.618.
Shapero	6	0	0	Sapic. M. Journ. 1949 23.576.

COMPARISON OF MOLLISON'S CASES WITH KEMP CASES (2 Series). (Lancet, 1-11-52

	MOLLISON.			103 K.E.M.H. Cases. (Whole Series).			60 KEMP Cases. (To May, 1952). 2nd Series only.			Remarks.
	Total.	Died.	%	Total.	Died.	%	Total.	Died.	%	
Stillbirths	477	24	5.03	103	13	12.8	60	6	10	Mollison only includes stillbirths after 35/52. K.E.M.H. series includes cases occurring at any time.
Overall Mortality	477	103	21·6	103	26	25.6	60	11	18.5	As above, Mollison's overall mortality is also higher than he has indicated.
Infants Born Alive	453	79	17.4	90	13	14.4	54	5	9.2	
Infants Given Exchange Transfusion	62	8	12.9	55	7	12.7	38	3	7.9	

Appendix II.

REPORT FROM THE DIRECTOR, TUBERCULOSIS CONTROL BRANCH.

To the Commissioner of Public Health.

Sir, I have the honour to submit my report on the activities of the Tuberculosis Control Branch for the year ended December 31, 1951.

It is gratifying to present a record of further progress in the reduction of the menace of tuberculosis to the community, and with pleasure to state that the teamwork of the staff of the Branch over the last few years is now beginning to show results.

In this report, in order to allow of a yearly comparison and to show the balance of effort required in the control programme, I am again classifying it under the main sub-divisions of :—

Prevention.
Case Finding.
Medical care and isolation.
Social and economic protection.
After-care and rehabilitation.
Records and statistics.

PREVENTION.

A close supervision of all patients living at home is maintained by the Visiting Nurses.

This year Dr. Edwards, the Assistant Tuberculosis Physician, has taken over the supervision of this work, and some domiciliary treatment with Streptomycin, P.A.S. and Conteben has been commenced on a few patients.

This has been in order to alleviate the bed position, but is, of course, considered a poor substitute for hospital treatment. No potentially infectious positive sputum case, however, is discharged from hospital unless the home conditions have been first approved.

Unfortunately, with the pressure on housing, it has not been possible to secure as much support as the previous year from the State Housing Commission in the provision of new accommodation for patients being discharged from the Sanatorium, when their available accommodation was unsuitable.

The Acting Secretary of the Commission, Mr. H. V. Telfer, reports that 26 houses were allotted under the Commonwealth /State Rental Scheme and an unspecified number under the War Service Homes Scheme.

This compares with an allotment of 60 houses under the Commonwealth /State Rental Scheme last year.

The effort of the Commission is, however, much appreciated, in particular that of their Liaison Welfare Officer, Mrs. M. Eichhorn.

One must look forward to the day when special homes with large living rooms and airy sleepouts will be provided for tuberculosis patients and ex-patients as is now done in Sweden.

B.C.G. Vaccine.

The use of this vaccine is being steadily increased, despite the fact that considerable planning and effort is required from an already extended staff.

Effort was concentrated on the school leaving age group and child contacts. Eleven of the greater schools in the metropolitan area were covered as well as University undergraduates.

It is hoped to cover the metropolitan schools every two years, and a proposal has been made by the National Tuberculosis Advisory Council that all National Service Trainees be vaccinated.

A total of over 5,400 Mantoux tests were performed by the Visiting Nurses, and 1,650 B.C.G. vaccinations by Staff Medical Officers.

" *Morriston.*"

"Morriston " preventorium continued to show the value of its establishment. Twenty-seven babies of tuberculosis parents were admitted for B.C.G. vaccination, generally at the age of 7 to 10 days. The average stay was 63 days.

Sister Marshall replaced Sister Hack as Sister-in-Charge in August, and has done excellent work, often under trying conditions due to the presence of workmen.

Unfortunately, it was not possible during the year to complete the alterations to enlarge the scope of the institution to include the admission of infants and toddlers, and these have had to be placed in other homes or institutions, often with difficulties.

Action under Section 293 *of the Health Act.*

During the year, eight persons suffering from pulmonary tuberculosis in an infectious state were " directed to enter Wooroloo Sanatorium for treatment." Thirteen persons were required " to submit to X-ray examination of the chest for tuberculosis."

CASE FINDING.

The policy of searching out tuberculosis in priority groups was continued to allow of the economic concentration of effort.

Metropolitan Practitioners.

The Tuberculosis Physician, Dr. Heymanson, reports an almost 100 per cent. increase of patients referred from private practitioners. The number reached was 6,539, which shows the appreciation of the medical profession of the facilities offered for the examination of their suspect patients. One hundred and twenty-eight, two per cent. of the number reporting, were proved to have active pulmonary tuberculosis.

The by-product of non-tuberculosis abnormalities (as enumerated in Dr. Heymanson's report) is, of course, here of equal importance to the practitioners, particularly where the early diagnosis of carcinoma of the lung can be made.

Hospital In-patient and Out-patient Group.

This group continues to receive attention.

At the Royal Perth Hospital a 35 mm. camera tunnel unit, for use with existing equipment, was supplied during the year. The films are read by Dr. Rowland Anderson, the Superintendent of the Hospital, in conjunction with the Clinic staff. He arranges follow-up of discharged patients and out-patients through the Clinic.

An extract from a paper prepared for publication by Dr. Anderson shows :—

For the twelve months 1st July, 1950, to the 30th June, 1951, 9,082 in-patients were examined ; 62 patients were proven to be suffering from active pulmonary tuberculosis, and incidence of 0·68 per cent. Eight thousand eight hundred and thirty-three out-patients were examined ; 32 were similarly proven positive, an incidence of 0·36 per cent.

Equipment has arrived for the Fremantle Hospital and the St. John of God Hospital, Subiaco, and it is hoped that this will be installed during 1952.

The economics of tuberculosis case finding are such that it is considered worthwhile installing a miniature film unit where there is a turnover of 4,000 or more in-patients per year.

Contacts.

Further progress was made with the X-ray examination of those on the contact register and 3,908 micro chest X-rays were taken (some in 1950). Thirty-one active cases were disclosed, an incidence of 0·79 per cent. Considering many of those examined had been "sieved" before this, this finding emphasizes the importance of a regular six monthly examination of this group.

The number covered exceeds 50 per cent. of those on the register and steps are being considered for compulsory X-ray examination of those contacts who do not report.

Country Practitioners.

Apart from part-time tuberculosis officers at Albany, Bunbury, Collie, Geraldton, Kalgoorlie and Northam (*i.e.*, Dr. A. E. Vivian, Dr. W. Lawson Smith, Dr. A. F. Walsh, Dr. A. J. Beaumont, Dr. A. B. Webster and Dr. A. McL. Robinson, respectively), films are received from the country doctors at Bridgetown, Broome, Busselton, Carnarvon, Derby, Harvey, Katanning, Kellerberrin, Merredin, Mullewa, Narrogin, Norseman, Port Hedland, Wagin, Wiluna, and Wyndham.

One might say now that an almost comparable service exists for country as for metropolitan areas in regard to the availability of X-ray examination for suspect patients.

A total of 1,786 17 in. x 14 in. films of suspect patients were received and 21 cases of pulmonary tuberculosis were notified as a result, apart from other abnormalities not enumerated.

In addition, 337 films of prospective National Service Trainees from the country were examined.

Mass Radiography.

Nearly 30,000 exposures were made at the Chest Clinic during the year, an increase of 7,000 on the previous year. Volunteers still attend at the rate of over 1,000 per month.

It is interesting to note the percentage of retakes on large films has dropped to the more reasonable figure of five per cent., probably due to the increased experience of the examiners.

Since the Clinic opened in 1948 a total of 127,796 people have been X-rayed, including 104,280 micro films and 23,516 large films.

Mobile Units.

The existing mobile unit was not used to the same extent this year, only 4,000 exposures being made, this being largely due to the diminished number of migrants examined ; 1,000 as against 7,000 in 1949.

This caravan needs almost complete rebuilding, but this will not be possible until the new unit at present under construction is completed.

The latter unit is the first of two planned for country work, which it is hoped to commence in 1952.

Result.

The incidence of proven tuberculosis in the mass radiography group (excluding migrants) remains at 0·26 per cent.—between two and three per 1,000—a steady finding now since the Clinic opened.

Special Groups.

Migrants.—With the co-operation of the Commonwealth Health Department, Migration and Customs Department, 4,218 X-ray films of Assistant Migrants and Landing Permit Holders were submitted for re-examination.

Although these had all been passed at the country of origin, 12 films showed evidence of pulmonary tuberculosis, of whom seven proved to be active.

Apart from this re-check of films, no large groups were surveyed this year, so we have no comparative percentage figures.

A most important aspect, however, is that of 507 notifications during the year, nearly 200 were migrants, as follows :—

	Foreign.	British.
Arrived prior to 1948	18	26
Arrived since 1948	53	25
Arrival not stated	24	41
Total	95	92

Of the 249 patients in the Wooroloo Sanatorium at 31st December, 1951, 42, or nearly 17 per cent., were migrants, as follows :—

Displaced persons	17
Assisted migrants	11
Seamen—	
Foreign	2
British	2
British Migrants	10

It is a well-known principle in the epidemiology of infectious diseases that one should not move infectious individuals from a high concentration area to a low concentration area.

Australia is fortunately a low concentration area in regard to the morbidity from tuberculosis and we should take care to see that the prevalence of this disease in migrants is well below that of our native-born population. (*See* figures of my 1950 report.)

In an attempt to tighten up this loophole, two types of migrants were gazetted under the Health Act as classes for compulsory x-ray examination within one month of arrival, *i.e.* :—

(1) British Migrants (gazetted 2nd March, 1951).

(2) Landing Permit Holders (gazetted 1st June, 1951).

This has not worked out in practice and only 50 individuals reported with the special forms provided (*i.e.*, from 27th June, 1951).

A closer liaison is to be worked out with the Commonwealth Departments concerned and a more instructive pamphlet is to be issued—with some of the information in six languages.

Special Surveys.

The only special survey of note during the year was that of school teachers, gazetted as a class for compulsory examination under the Health Act on the 6th April, 1951.

Over 2,000 State and Private teachers were x-rayed—only two active cases of pulmonary tuberculosis were detected and admitted to hospital ; although some others are being kept under out-patient observation.

The co-operation of the Director of Education, Dr. T. L. Robertson, and the Teachers' Union in this survey has been mentioned in the separate report already submitted.

MEDICAL CARE AND ISOLATION.

The present year has shown a continuation of the better results of treatment evidenced in recent years with the increasing use of Streptomycin and para-Aminosalicylic Acid—both for strictly medical cases, and for those patients when surgery is also indicated. Many patients are now saved by surgery where previously they would not have reached a fit state for operation.

A newer drug, a thiosemicarbazone (Conteben-Tibione) is also proving useful as an adjuvant in some instances—particularly in otherwise unresponsive bronchial tuberculosis.

The attached report of the Acting Superintendent of the Wooroloo Sanatorium, Dr. Letham, analyses treatment in detail and shows the impressive figure that, of the 191 patients discharged in 1951, the percentage of controlled or stationary cases and arrested cases is now over 80 per cent.—the highest percentage yet recorded.

It is notable, however, during the year that the problem of relapse is still with us, as there were 49 old patients admitted during the year, of whom 34 were first re-admissions, 9 were second re-admissions and 6 were third (or more) re-admissions.

Royal Perth Hospital.

During the year some 40 medical and 10 surgical beds at the Royal Perth Hospital were available for tuberculosis patients and the number of medical beds was a great help in the management of patients under investigation.

Notice was received at the end of the year, however, that the medical beds had to be drastically reduced as they were required for other urgent admissions.

This merely emphasises the need of the new Chest Hospital—for which now, fortunately, definite plans are being prepared.

It should be stressed here that the proximity of the Perth Chest Clinic to the Royal Perth Hospital, whereby it acts really as a separate out-patient department of the Hospital for tuberculosis cases, seems to have proved the ideal solution to the essential co-operation required between the Public Health Department and the Hospital.

Moreover, the fact that the Chest Physicians of the Clinic have access to beds in the Hospital for investigation and treatment of their patients ; and act as consultants for tuberculosis patients discovered in the other wards of the Hospital, does much to stimulate them in their work.

The ready co-operation of the Superintendent of the Hospital and the entire Honorary Medical and Surgical Staff is now accepted as a routine essential, but is much appreciated.

Apart from 80 patients transferred from the Wooroloo Sanatorium, 189 tuberculosis patients and suspect patients were admitted to the Hospital under the care of the Clinic Medical staff.

Of these patients, 22 underwent surgery, as follows :—

Modified thoracoplasty (apicolysis with leucite plombage)	19
Pneumonectomy	1
Lobectomy	2

The Thoracic Surgical Team, Mr. F. Clark, Surgeon, and Dr. Gilbert Troup, Anaesthetist, has this year been augmented by the appointment of Mr. J. A. Simpson, who commenced duties as full-time Assistant Thoracic Surgeon to the Branch on the 29th August. Mr. Simpson was specially chosen from amongst other applicants in England for his experience in chest surgery. His appointment will now allow of a steadier reduction of the surgical waiting list and relieve the pressure on the Senior Surgeon.

The special " Chest Team " Clinic is now held at the Royal Perth Hospital on a Friday morning and, in addition, Mr. Simpson visits Wooroloo regularly with clinic physicians to review prospective surgical cases with the Sanatorium staff.

There has been no new development of surgical manoeuvres during the year, but the modified thoracoplasty with apical leucite plombage has now become permanently established.

There has been no operative mortality from this procedure in a total of some 200 operations. The " follow-up " of patients, now some two and a half years since the first operation, has been completely satisfactory to date, but the final analysis of results must still wait a few years.

Out-Patient Treatment.

The report of the Tuberculosis Physician, Dr. Heymanson, shows that the Out-Patient Clinics continue to grow, the attendances at the Perth Chest Clinic increasing from four to six thousand.

Fortunately, the appointment of Dr. Keith Harris, who commenced duty on 2nd April, 1951, has helped to control the volume of work.

One hundred patients are receiving artificial pneumothorax refills at the Clinic, an increase of 20 on 1950, and the total number of refills during the year, over 2,000, was more than double the number performed at the Sanatorium.

The present methods of investigation of suspect patients and supervision of known out-patients require extensive bacteriological testing.

The following tests were arranged during the year at the Chest Clinic and forwarded to the Public Health Medical Laboratories :—

Sputum examinations (for 292 individuals)	584
Positive results for m. tuberculosis (for 67 individuals)	102
Gastric contents (cultured and /or guinea pig inoculations) (on 168 individuals)	504
Positive results (cultures and /or guinea pig inoculations) (for 60 individuals)	177

We are grateful indeed to the Director of the Medical Laboratories, Dr. W. A. Young, for his assistance, and particularly to the Senior Technician concerned, Mr. A. Guthrie, for his enthusiasm and co-operation.

Princess Margaret Hospital.

The Chest Clinic now functions on a Thursday afternoon.

In-Patients.

There were 15 admissions of pulmonary or suspect pulmonary tuberculosis during the year.

Of these, nine were discovered as a result of Mantoux testing of contacts. The average age of admission of this group was two years one month ; five showed definite evidence of pulmonary disease. One developed tuberculosis meningitis ; three under two years of age were given prophylactic chemo-therapy.

The other six admissions were as a result of illness ; three of these showed definite evidence of pulmonary tuberculosis. The average age of this group was three and a half years.

The results of treatment were most satisfactory—only one death is recorded from pulmonary tuberculosis at the age of 15 months.

Once again no tuberculosis of note was detected between the ages of three years and 14 years.

It is worthy of comment that only two patients suffering from tuberculosis cervical adenitis were admitted during the year.

SOCIAL AND ECONOMIC PROTECTION.

The Tuberculosis Allowance has now been in operation long enough to demonstrate its effectiveness in tuberculosis control.

Sufferers now are definitely able to accept treatment with a feeling of economic security.

The Allowance did not keep pace during the year with the rise in the cost of living, but the Commonwealth Authorities again showed their foresight and wisely increased the value of the Allowance at the end of the year.

The appointment of Miss M. Walters as Social Welfare Officer towards the end of 1950 has allowed of "almoner investigation" where necessary.

Miss Walters spends three days per week at Wooroloo and two in Perth at the Clinic, and is able to work in close liaison with medical and nursing staff, more particularly in regard to patients in hospital and their families.

AFTER-CARE AND REHABILITATION.

The after-care aspect has already been dealt with to some extent under Prevention, with the description of the work of the Assistant Tuberculosis Physician and the Visiting Nurses in their check on home conditions, contacts, etc.

The Tuberculosis Association of Western Australia is already responsible for the rehabilitation of many ex-patients in Perth by their employment in its Sheltered Workshop. An average of over twenty patients per day employed has been maintained now for over two years and over 60 have passed through the factory.

It was a great day for the Association when Linley Valley—the colony scheme for the long-term rehabilitees — was opened officially in its new form by the Hon. the Premier on the 14th October. This activity, which is dealt with more fully in Dr. Letham's report, should provide fully the necessary rehabilitation facilities in this State.

No praise is too great for the voluntary workers of the Association, who give so freely of their time, and to Mr. A. Barnes, the Secretary of Linley Valley, and Mr. A. R. Eadie, the Manager of the Sheltered Workshop.

Dr. W. F. Tomlinson, the Senior Medical Officer, Rehabilitation Branch of the Commonwealth Department of Social Services, also co-operates fully with the Tuberculosis Physician in the training of patients in whom the disease is considered completely stable or healed.

He reports 18 ex-patients undergoing this type of rehabilitation. In addition, a certain number were directed to suitable special employment.

RECORDS AND STATISTICS.

At 31st December, 1951, there were 2,477 notified cases of tuberculosis on the Register—2,402 pulmonary ; 75 non-pulmonary.

This is an increase of 377 on the previous year. One thousand three hundred were on the lists of the Visiting Nurses and it is estimated some 440 were in Hospital.

Four hundred and seventy-four were receiving the Tuberculosis Allowance, comprising :—

	Male.	Female.
Australians	254	147
New Australians	28	8
Anglo-Indian Migrants	8	2
English Migrants	7	5
European Migrants	10	2
Dutch Migrants	2	1
Total	309	165

Although not an accurate index as there are certain financial stipulations (income, but not assets) in assessing eligibility for the Tuberculosis Allowance ; as it is designed only for those individuals with active tuberculosis, it is pleasing to record a drop of over 40 in receipt of this pension.

The careful supervision of eligibility for this Allowance necessitates a regular careful check every month of between 30 and 40 patients and their case histories.

NOTIFICATIONS AND DEATHS.

Year.	Mean Population (100,000s)	Notifications.			Deaths.			Death Rate per 100,000.	
		Pulm.	Non-Pulm.	Total.	Pulm.	Non-Pulm.	Total.	Pulm.	All Forms.
1949	533	*499	20	519	123	5	128	23·1	24·0
1950	559	586	18	604	125	3	128	22·3	22·9
1951	‡590	467	37	504	†76	6	82	12·9	13·9

* Includes 86 notified from Claremont Mental Hospital as a result of special survey of inmates.

† Deaths abstracted from Registrar General's Monthly Returns and includes four notified from Mental Institutions.

‡ Estimate only.

PULMONARY TUBERCULOSIS.

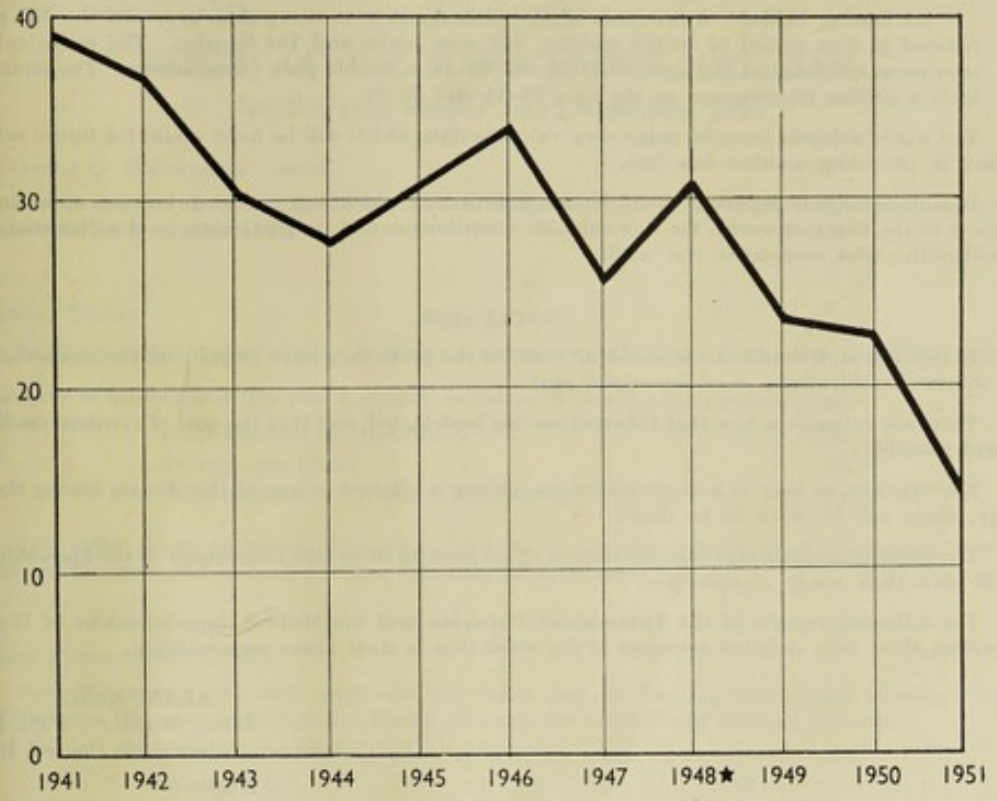
Year.	Mean Popn. 100,000.	No. of Deaths.	Rate per 100,000.
1941	4·74	185	39·0
1942	4·77	175	36·7
1943	4·77	144	30·2
1944	4·81	134	27·9
1945	4·88	149	30·4
1946	4·93	163	33·3
1947	5·03	128	25·4
1948	5·15	157	30·5
1949	5·33	123	23·1
1950	5·59	125	22·3
1951	5·90	76	12·9

(1) Figures for 1941–49 (inclusive) derived from Demography (Respiratory Tuberculosis).

(2) Population for 1950 calculated from quarterly estimates in accordance with usual formula.

(3) Population for 1951 is population estimated as at 31st December, 1951.

(4) Deaths for 1950 and 1951 taken out by Tuberculosis Branch from Registrar Genal's returns.



SHOWING THE DECLINE IN THE ANNUAL POST-WAR DEATH RATE FROM PULMONARY TUBERCULOSIS IN WESTERN AUSTRALIA. PERTH CHEST CLINIC ESTABLISHED ★

It was mentioned in the conclusion of the Annual Report for 1950 that, if the numbers of cases discovered in a year began to diminish, the goal of eradication of tuberculosis in this State would be in sight.

This conclusion may have been a little premature and must be qualified by the fact that case-finding measures in the metropolitan area will be further stepped up by the operation of the mass radiography units at Fremantle and St. John of God Hospitals. (The lag in installation of this equipment was not anticipated—if installed, the number of cases notified for the year would have been higher.)

Nevertheless, the fact that only 467 individuals were notified during the year as suffering from pulmonary tuberculosis, as against 586 of the previous year, is viewed as of considerable importance.

The figure of 12·9 deaths per 100,000 is a considerable improvement on the previous year and may be regarded as a most satisfactory figure—by any standard—at this stage of our control campaign.

The only lower published figure that I have seen is that of 12·8 deaths per 100,000 in 1950 for the Province of Ontario, Canada. (Up to the latest possible reference—Epidemiological and Vital Statistics Report W.H.O., August-September, 1951.)

I am sure, however, that the marked fall in this State will be paralleled in other centres, reflecting the recent great advances in treatment.

An analysis of the Western Australian case register as at 30th June, 1951, was made by a statistician on loan from the Commonwealth Department of Health.

This summarised, amongst other items :—

(1) Status of known cases.

(2) Cases notified during the year 1950–51.

(1) There were 2,245 sufferers on the case register at that time. Of these, 1,391 were males and 854 were females. 1·9 per cent. were non-pulmonary cases. Seventy-four per cent. of the pulmonary cases were resident in the Perth-Fremantle metropolitan area. The incidence of all types of tuberculosis was 408 per 100,000. For pulmonary tuberculosis, the incidence is 483 for males and 313 for females (based on 1950 population).

(2) During 1950–51, 5 per cent. of all notifications were non-pulmonary. Of the 527 persons notified in that period of twelve months, 343 were males and 184 females. The males exhibit a maximum incidence at the ages of 30–39 and 50–54, a double peak phenomenon. The females exhibit a similar phenomenon at the ages 24–34 and 50–54.

The whole analysis provides some very valuable data which will be most useful for future reference purposes in providing another base-line.

It is impossible to report in detail on the information which was provided, but our appreciation is expressed to the Commonwealth for this valuable contribution and, in particular, to the Statistician, Mr. L. Goldsmith, who completed the work.

CONCLUSION.

In conclusion, I would like to thank all staff for the parts they have played and the team-work they have shown in achieving a most successful year.

There are indications now that tuberculosis can be defeated, and that the goal of eventual eradication is a real possibility.

Nevertheless, as long as a single infectious sufferer is allowed to spread this disease among the community, there will be work to be done.

The existing problem still calls for further effort from all of us and I am happy in the knowledge that all will give their ready co-operation.

The following reports of the Tuberculosis Physician and the Medical Superintendent of Wooroloo Sanatorium show fully detailed accounts of the work that is their direct responsibility.

ALAN KING,
B.Sc., M.B.B.S., F.C.C.P.
Director Tuberculosis Control Branch.

APPENDIX III.

REPORT OF THE TUBERCULOSIS PHYSICIAN, for the year ended 31st December, 1951.

The Director of Tuberculosis Control.

I have the honour to submit a report on the activities of the Staff of the Perth Chest Clinic for the year ended 31st December, 1951.

Out-patient Clinics.

As in the past, these are conducted three times weekly on Monday, Wednesday and Friday mornings.

The number of attendances this year is greatly in excess of that for the previous year.

Total number of attendances	6,168
Average per Clinic	43
Total number of full-size X-rays taken	12,516

This latter figure represents films taken of patients attending Out-patient Clinics and referred by private practitioners and also all re-takes following micro X-ray.

Artificial Pneumothorax Clinics.

Four Clinics are held each week—the two main ones on Tuesday and Friday mornings, together with Clinics on Thursday mornings and Friday evenings for ex-Staff and working patients.

Total number of patients attending for refills		100
Bilateral A.P.	10	
Unilateral A.P.	87	
Pneumoperitoneum	3	
Total number of screenings		2,130
Total number of refills		2,003

Cases Referred by Private Practitioners.

The number of patients referred from private practitioners during 1951 was greatly in excess of that for any of the previous years. In contrast to this, the incidence of proven active tuberculosis in this group has declined substantially.

The figures for the last four years are here tabulated :—

	Number referred.	Number of proven cases.	Incidence. %
1948	1,965	102	5
1949	3,947	98	2·7
1950	3,699	122	3·3
1951	6,539	128	2·0

The incidence for 1948 has been swollen by the inclusion of a number of previously notified cases. It was not possible to accurately dissect these out from the newly discovered cases without an excessive amount of labour which was, at the time, not practicable. A rough approximation of the incidence of new cases for that year is a little over three per cent.

It was at first thought that the drop in the percentage of cases of active tuberculosis detected in 1951 might have been influenced by the progress of the anti-tuberculosis campaign ; and that that section of the community coming forward for their first examination in the later phases of the campaign could be expected to show a lesser proportionate number with tuberculosis.

It is not doubted that this will eventually occur, but the present findings cannot be accounted for on this basis. If the reduced percentage of patients with active tuberculosis amongst those referred by private practitioners were a reflection of a lessened incidence in the community as a whole, this would also be shown in the results of mass radiography over the same period. The fact is that the incidence of disease found by mass radiography during 1951 was very close to the figure for the previous year and higher than that for 1949.

There is no doubt that the reduced proportionate number of cases is due to the private practitioner relaxing his criterion for an X-ray of the chest. That this is the correct explanation is supported by the corresponding lowered incidence of abnormalities other than tuberculosis.

Quoting only for the last two years, the figures are :—

	Cases X-rayed.	Non-tuberculosis. Abnormalities.	Percentage.
1950	3,699	604	16
1951	6,539	643	9·8

The ratio of the two latter percentages (16 : 9·8) is 1·65. The ratio of the two percentage rates of tuberculosis for 1950 and 1951 (3·3 : 2·0) is 1·63. In other words, the incidence of non-tuberculosis abnormalities has decreased in almost exactly the same proportion as has the incidence of tuberculosis.

Despite this relaxed standard and looking at the situation purely from the point of view of tuberculosis case finding, the 1951 figures are still regarded as very satisfactory. It is worth mentioning that it is the experience of others (Trenchard, H. J. and Grenville-Mathers, R., Tubercle—Jan., 1952) that with increasing facilities for X-raying patients there is a diminishing return of tuberculosis discovered.

The results in detail are as follows :—

Total number	6,539
Normal X-rays	5,768
Total number of abnormalities of all sorts diagnosed	771
Cases of tuberculosis diagnosed and admitted to hospital	93
Cases of tuberculosis diagnosed and under out-patient observation	35
Suspect cases undergoing further observation	56

Other conditions diagnosed by X-ray and clinical findings.

Chronic bronchitis and emphysema	54
Cardiac abnormalities (including cardio-vascular abnormalities)	55
Bronchiectasis (diagnosis on plain X-ray)	27
Silicosis	23
Pulmonary fibrosis of unknown etiology	10
Pneumonic process (non-tuberculous)	233
Spontaneous pneumothorax	10
Marked bony abnormalities	11
Pleurisy with effusion	15
Pleural shadowing (recent)	21
Pleural shadowing and calcification of pleura (sequelae of pleurisy)	60
Carcinoma of lung (including secondary carcinoma)	16
Other tumours	3
Bronchial asthma	5
Lung abscess	1
Cystic disease of lung	9
Empyema (old)	7
Sarcoidosis	2
Atelectasis—Cause unexplained or requiring further investigation	10
Siderosis	1
Substernal thyroid	2
Diaphragmatic hernia	1
Diaphragmatic hemi-paresis	3
Eventration of diaphragm	1
Bronchial adenoma	1
Post-irradiation fibrosis	1
Middle lobe syndrome	1
Post pertussis	2
Gunshot wound (old)	2

MANTOUX TESTING AND B.C.G. VACCINATION.

Child Contacts.

Total Mantoux tests 1,358

Mantoux Postive.	Mantoux Negative.	Mantoux Not read.	B.C.G. Completed.	Vaccinated No second Mantoux.
582	738	38	297	27

All positive reactors were X-rayed.

Survey Groups—Adults and Children.

All those with a positive test and over fourteen years of age were X-rayed.

Schools—

Necessary X-rays by Mobile Unit.		Necessary X-rays at Perth Chest Clinic.	
Claremont High	Perth Boys'	Wesley	Christ Church
Girdlestone	Modern		
Fremantle Boys'	Princess Margaret		
Aquinas	Perth Girls'		
Kent Street			

Claremont Mental Hospital.
University of Perth.

The figures are as follows :—

Total Mantoux tests 4,046

Mantoux Positive.	Mantoux Negative.	Mantoux Not read.	B.C.G. Completed.	Vaccinated No second Mantoux.
2,320	1,611	115	1,234	92

B.C.G. Vaccine.

Vaccinations carried out this year were 1,650 as against 1,270 last year. School children and contacts have made up the bulk of those vaccinated.

MASS RADIOGRAPHY.

Perth Chest Clinic.

A total of 29,283 35 mm. films were taken this year ; of these 12,474 represented volunteers. Survey groups included the following, which totalled 16,809 exposures.

Services.	National Service Trainees.	Merchant Navy.	Police.	Routine X-rays Referred by Private Practitioners.
3,125	1,938	259	113	1,896

Commonwealth and State Public Service: Candidates.	Teachers.	Rehabilitation Patients.	Perth City Council Applicants for Employment.
1,001	2,196	27	113

Patients Referred from K.E.M.H.	Contacts.	Miscellaneous Groups.
1,402	2,463	* 2,276

* Including 53 School Children, 582 University students referred following Mantoux and an unknown number of migrants.

Retakes on large film were 1,443, which represents 4·9 per cent. of the total.

Mobile X-Ray Unit.

There were only 4,295 exposures made with this Unit, but this represents a coverage of scattered groups, many of which were x-rayed in conjunction with a Mantoux survey.

The number of re-takes was 265, representing 6 per cent. of the total.

The groups were as follows :—

Without associated Mantoux survey—	
Migrants	1,157
Teachers' Training College	231
Shell Oil Company	188
With associated Mantoux survey—	
Metropolitan schools	1,347
Claremont Mental Hospital :	
Staff	172
Patients	937
Total	4,032

The discrepancy between the total number of exposures and number of subjects x-rayed is due to repeat of defective films. Most of these were at Claremont Mental Hospital and were due to difficulties encountered in x-raying patients.

Two out of a total of eleven schools surveyed were x-rayed at the Chest Clinic. The figure for these x-rays is not included in the total of films for schools.

Mass Radiography Findings.

Number of 35 mm. exposures—

Perth Chest Clinic	*29,283
Mobile Unit	4,295
Total	33,578

* Includes 1,938 National Service Trainees.

Cases of pulmonary tuberculosis diagnosed (not including migrants)—

Admitted to Hospital	55
Undergoing Out-Patient observation	32
Total	87
Suspect cases undergoing further observation	109

Incidence of proven tuberculosis 0·26 per cent.

Other conditions diagnosed by x-ray and clinical findings.

Chronic bronchitis and emphysema	18
Silicosis	18
Cardiac abnormalities and cardio-vascular abnormalities	34
Bronchiectasis (diagnosis on plain X-ray)	21
Bony abnormalities	4
Pulmonary fibrosis of unknown etiology	4
Empyema (old)	4
Cystic disease of lung	6
Carcinoma of lung	6
Other tumours	5
Pneumonic process (non-tuberculous)	66
Pleural shadowing (recent)	9
Pleural shadowing and calcification of pleura (sequelae of pleurisy)	35
Diaphragmatic hernia	1
Substernal thyroid	4
Calcified cervical glands	1
Congenital atelectasis	1
Atelectasis of unknown origin or requiring further investigation	3
Anthracosis	1
Spontaneous pneumothorax	2
Old thoracotomy	3
Bronchial asthma	1
Hodgkin's disease	1

MIGRANTS.

The total number of migrants x-rayed this year is unfortunately not available. The mobile unit x-rayed 1,157 migrants, but an unknown number were x-rayed at the Clinic. Most of these were landing permit holders, nominated migrants, etc., who were required to have an x-ray of the chest within one month of landing.

During the year nearly 200 migrants of all types were notified as having tuberculosis.

ROYAL PERTH HOSPITAL.

All new patients attending the Royal Perth Hospital continue to have an x-ray of the chest, suspect cases being referred to this Clinic.

Total number referred to Clinic		158
Not yet attended Clinic		24
Cases of pulmonary tuberculosis diagnosed—		
Admitted to Hospital	28	
Under out-patient observation	19	
Total	47	
Suspect tuberculosis under out-patient observation		53

Other conditions diagnosed by x-ray and clinical findings.

Pneumonitis	3
Chronic bronchitis	6
Silicosis	4
Carcinoma	1
Lung cyst	1
Bronchiectasis	2
Pleural shadowing	1

In-Patients.

Beds available have been curtailed towards the end of the year and there is a real possibility that they will be reduced still further ; however, as yet this has not seriously interfered with treatment.

FREMANTLE HOSPITAL CLINIC.

This has been conducted during 1951 by the Assistant Tuberculosis Physician, Dr. F. G. B. Edwards.

Total attendance		1,646
Cases referred by private practitioners		523
Attendance of known cases of tuberculosis		255
Volunteer x-rays		334
Contact x-rays		233
New cases of tuberculosis discovered		6

Artificial Pneumothorax Clinic.

Number of cases receiving pneumothorax		12
Unilateral pneumothorax	10	
Bilateral pneumothorax	2	
Total number of refills given		301
Average number of refills per Clinic		7

In-Patients.

During the last twelve months our three beds have been used largely for cases requiring active treatment instead of as in the past for convalescents.

Total number of patients treated	10
Pre- and post-apicolysis	7
Chemotherapy only	2
Transit (awaiting transfer to Wooroloo)	1

VISITING NURSES.

The figures relative to the home supervision of patients by the Visiting nursing staff show little change from last year ; however, their other duties, including supervision of Out-Patient Clinics and Mantoux surveys, have greatly expanded.

Sister Cockerell, the Senior Visiting Nurse, reports :—

Number of patients visited in the metropolitan area	1,300
Number of visits	5,702
Number of patients with positive sputum under supervision at home	156

COMMENT.

The year has been a full one, although there have been no new departures, and it is felt that the continued upward trend in the volume of work carried out by the Clinic each year augurs well for the future.

ACKNOWLEDGMENTS.

My thanks are due to you, sir, for your continued help and friendly advice throughout the year.

I would like to acknowledge the valuable work of the Assistant Tuberculosis Physician, Dr. Edwards.

Dr. Keith Harris was appointed to the staff of the Clinic during 1951 and is playing his part in its activities.

The Nursing Staff have carried an increased burden in the past twelve months and I wish to place on record my appreciation of their continued good work.

The Clinic administrative staff, as in previous years, has maintained a high standard and my thanks are due to the Clerk-in-Charge, Mr. J. C. Morrison, and all those associated with him for the efficient service they have rendered.

F. E. HEYMANSON,
Tuberculosis Physician, Tuberculosis Control Branch.

APPENDIX IV.

ANNUAL REPORT FOR WOOROLOO SANATORIUM, 1951.

The Director,
Tuberculosis Control Branch,
Perth Chest Clinic,
17 Murray Street,
Perth.

In the absence of Dr. Elphick on sick leave, it is my privilege to present the annual report for Wooroloo Sanatorium for the year ended 31st December, 1951.

In formulating the report, it is my intention to follow as closely as possible the sequence which he used last year. This should facilitate the making of comparisons.

A. MEDICAL AND SURGICAL TREATMENT—CHEMOTHERAPY.

(a) *Parenchymal Disease of the Lung.*

1. *Chemotherapy.*

(i) *Treatment with Streptomycin and P.A.S.*—Guided by the findings of the Medical Research Council in Great Britain, nearly all patients who have been treated by chemotherapy have been given Streptomycin and P.A.S. concurrently. Dosages through the year varied, until in the last quarter, doses of Streptomycin ½ gm. four times weekly, and P.A.S. (Sodium Salt) 12 gm. daily, six days a week, were being administered.

Those treated will be considered in three main groups :—

Proliferative Disease.
Exudative Disease.
Mixed Disease.

as well as these can be assessed from radiological appearances.

For the purpose of interpretation, advanced disease refers to lesions which are listed as seven or over in the four digit code. In the majority of cases, results were assessed at the end of three months' treatment, and in a minority of cases, at the end of four to six months.

Fifty-three patients whose treatment commenced on or after 1st October, 1951, were not included in the series because less than three months' treatment had been completed at the end of the year. It is considered that three months is the minimum period at the end of which assessment can be made. This left 138 patients available for assessment. In five of these the lesions appeared to be caseous, and six were suffering from silicosis. These 11 cases were excluded from the series under consideration, leaving a total of 127. This number includes 28 patients who were given at least three months' treatment before active treatment, and who were, of course, assessed before active treatment commenced.

The following tables summarise the results :—

Table I.

——	Total.	Advanced.	Cavitation.
Proliferative	84	77 (92%)	59 (70%)
Exudative	27	18	12
Mixed	16	13	6
Total	127	108	77

Table II.

——	Total.	X-ray Improved.
Proliferative	84	57 (68%)
Exudative	27	26
Mixed	16	12
Total	127	95

Table III.

Sputum Results.

———	(1) Total.	(2) Negative before Treatment.	Col. (1) less Col. (2) Positive before Treatment.	Of those Positive before Treatment.		Total with Improvement.
				Converted.	Improved.	
Proliferative	84	15	69	24 (35%)	21 (30%)	45 (65%)
Exudative	27	3	24	18	1	19
Mixed	16	....	16	8	4	12
Total	127	18	109	50	26	76

Table IV.

X-ray and Sputum Results Considered together.

———	(1) Sputum Positive before Treatment.	(2) X-ray Improved and Sputum Converted.	(3) X-ray Improved and Sputum Improved.	(4) Total of (2) and (3).	(5) X-ray Unchanged or Worse Sputum Converted.	Total Improved (4) and (5).
Proliferative....	69	16 (23%)	14 (20%)	30 (43%)	8 (12%)	38 (55%)
Exudative	24	18	1	19	....	19
Mixed	16	6	4	10	2	2
Total	109	40	19	59	10	59

The effect of Streptomycin and P.A.S. on exudative disease, and hence by inference to a lesser extent on mixed disease, is well known. The effect on patients in this series with proliferative disease will now be discussed, and results assessed in terms of percentage.

Proliferative Disease.—Ninety-two per cent. of proliferative cases were advanced ; 70 per cent. showed evidence of cavitation (Table I). Notwithstanding this, in 68 per cent. radiological improvement was observed (Table II). In not a few cases this improvement was slight, and could have been due to resolution of small amounts of exudative disease, not obviously exudative in appearance. On the other hand, diminution in the size of cavities was also a notable feature. The sputum results are rather striking (Table III). Thirty-five per cent. of those positive before treatment converted their sputum, in most instances at the end of three months. In 30 per cent. of cases, sputum became less positive, *i.e.*, improved from positive on direct smear to positive on culture, so that in only 35 per cent. of cases was there no improvement in sputum results after treatment for three months. Considering sputum and X-ray results together (Table IV), 43 per cent. of patients with positive sputum showed radiological and bacteriological conversion or improvement. In addition, 12 per cent. converted sputum without radiological improvement (an overall improvement of 55 per cent).

No doubt some of the improvements listed above may be attributed to concurrent complete or modified rest in bed. However, past experience has made it clear that, apart from any other factor, such a high sputum conversion rate in cases of proliferative disease (particularly extensive disease with cavitation) is not to be expected from bed rest alone, in such a short period of time as three to six months. Whilst it is recognised that some of these cases of proliferative disease revert to positive sputum, it is felt that follow up treatment with Conteben and P.A.S. will diminish the incidence of relapse.

(ii) *Conteben.*—A small series of cases have been treated with Conteben. In most cases this treatment followed on that with Streptomycin and P.A.S., and so results are difficult to assess. This drug used alone has been found most useful in treating refractory bronchial disease.

(iii) *P.A.S. and Conteben.*—As a result of a visit from Dr. Hilary Roche, this combination has been used, over the last two or three months, following administration of streptomycin and P.A.S. It is as yet too early to assess results.

2. *Active Treatment.*

(i) *Artificial Pneumothorax.*—

Inductions or attempted inductions	20
Satisfactory A.P.	11
Effusions leading to abandoned A.P.	3
Thoracoscopies	12
Complete Pneumonolysis	9
Refills	932

(ii) *Major Surgery (at Royal Perth Hospital).—*

Apicolysis with Plombage	33
Second Stage Thoracoplasty	3
Removal of Lucite Spheres	1
Pneumonectomy	1
Upper Lobectomy	1
Lower Lobectomy	2

(iii) *Sundry.—*

Minor Operations	10
Phrenic Crushes, etc.	2
Inductions, A.P.	20
Inductions, P.P.	3
Pleural Aspirations	28
Bronchoscopies	91

(b) *Bronchial Disease Treated with P.A.S. and Streptomycin.*

Fifteen patients were treated with these drugs specifically for bronchial disease.

Seven had indolent, six acute and two granulomatous disease.

Thirteen of the 15 showed improvement at the end of three months.

In three cases sputum had already converted. Of the remaining 12, nine patients converted sputum and two improved.

In addition to this series it has been found over the last two years that two patients with bronchial disease responded to Conteben after response to P.A.S. and Streptomycin had been negligible. In one other the greatest improvement was observed with P.A.S. alone, after Streptomycin had effected little improvement.

(c) *Laryngeal Disease.*

Six cases of advanced exudative tuberculosis laryngitis all improved on three months' treatment with Streptomycin and P.A.S. In addition, quite a number of cases with less extensive involvement were observed to improved over the same period of time.

Medical Statistics.—

Admissions	237
Discharges	204
Deaths	30

Though the number of New Australians still being treated is considerable, fewer were admitted during the current year.

Analysis of Discharges.

Year.	Number of Discharges to own home excluding transfers and absconders.	Deaths.	Hopeless cases discharged to ideal home conditions.		Controlled or stationary cases.				Arrested Cases.				
					Sputum +ve.		Sputum —ve.		Active treatment with chemo-therapy when indicated.	Chemo-therapy alone.	Bed Rest alone.	Total.	
			No.	%	No.	%	No.	%				No.	%
1948	143	45	25	17·4	30	21	36	24	42	....	10	52	36
1949	105	39	17	16	11	10·5	26	25	35	2	14	51	49
1950	176	48	15	8·5	36	20	15	8·5	69	4	37	110	62·5
1951	191	30	7	4	17	9	68	35	35	35	29	99	52

B. STAFF AND ACTIVITIES.

1. *Medical Staff.*

During the year Dr. Langman joined the Resident Medical Staff and Dr. Porter returned from sick leave. Dr. Letham was appointed Assistant Medical Superintendent. These three, with Dr. Fisher, have worked as a willing team under the inspiring, able leadership of the Medical Superintendent, Dr. Elphick.

The Resident Medical Staff have been helped during the year by members of the Resident Medical Staff of the Royal Perth Hospital, who have been coming to the Sanatorium, each for a month.

The regular visits from the Director of Tuberculosis Control, the Tuberculosis Physician and the Assistant Tuberculosis Physician, all of the Perth Chest Clinic, have continued to be clinically stimulating.

Its notably high standard in surgical treatment has been maintained by the Thoracic Surgical Team. Mr. F. J. Clark, Surgeon, and Dr. G. R. Troup, Anaesthetist, were joined during the year by Mr. J. A. Simpson, Assistant Thoracic Surgeon. We particularly appreciate the visits of the latter with Dr. Heymanson, the Tuberculosis Physician. These visits, for Sanatorium staff, in a measure replace the Saturday surgical meetings, which used to be held at the Perth Chest Clinic. Mr. Simpson has also been most helpful in resolving our general surgical problems.

Dr. K. Barnden Brown, Hon. Ophthalmologist to the Sanatorium, has continued his Saturday visits. The sacrifice of these Saturdays has made the life of many patients, so dependent on efficient eye function, much more tolerable.

2. *Nursing Staff.*

Notwithstanding a persistent shortages of nurses, the Nursing Staff, under Matron E. S. Lochhead, have maintained a high standard of nursing. Particular credit is due to Assistant Matrons Mummery and Baker, who are each responsible for the maintenance of seventy to eighty male beds.

3. *Rehabilitation.*

A rehabilitation team has now been formed, and meets each Wednesday afternoon to discuss this aspect of patients' treatment. This team consists of the Medical Superintendent and Medical Staff, the Almoner, Miss Walters, the Occupational Therapist, Miss Perry, and the Education Officer, Mr. Skipworth. Unfortunately the latter during the year went off duty for a long period of sick leave.

Liaison has been made with the Commonwealth Rehabilitation Medical Officer, Dr. Tomlinson, and his team, who have commenced a series of visits to the Sanatorium. Steady progress is being made in this important field.

Miss Walters is an indefatigable worker in the cause of her patients, and her work is invaluable. One of the major problems which she is tackling is that of securing accommodation for patients on their discharges.

Miss Perry has been most helpful from the time of her arrival. In addition to her specified duties she produced the patients' Christmas concert for 1950. This year, with the co-operation of Mr. Grady, a talented patient, as editor, she commenced the production of " P.A.S.", a magazine " by the patients and for the patients."

Mr. Guy Grey-Smith has continued, as Art Therapist, to stimulate the creative efforts of patients. The good results of his work were demonstrated by the recent exhibition of paintings by his pupils.

All of us regret that the Red Cross Worker, Miss Spruhan, left us at the end of the year. She has worked untiringly and well with, and for, the patients.

4. *Laboratory.*

Dr. Krieves who, quietly competent, had worked in the Laboratory for one year, received his regional registration for Fremantle Hospital. He was replaced by Dr. Incze, a New Australian doctor from Adelaide. Dr. Incze has worked enthusiastically and well, and has been working towards establishing a pathology museum ; also his work on streptomycin resistance has been valuable and he is preparing for the use of fluorescent microscopy.

Miss Bothwell's reliable work in the preparation of bacteriological culture media and work on cultures continues to be one of the mainstays of the Laboratory work. Dr. Briedis, another New Australian doctor, has been working in the Laboratory the major part of this year and his work has been of a constantly high standard.

Details of Laboratory examinations are as follows :—

	1951.	1950.
Sputum examinations for T.B.—Direct Smear	1,456 (55% pos.)	1,043 (55% pos.)
Sputum examinations for T.B.—Concentration	232 (24% pos.)	251 (14% pos.)
Sputum examinations for T.B.—Culture	2,148 (22% pos.)	1,735 (24% pos.)
Gastric contents examined to T.B.—Culture	281 (8% pos.)	471 (10% pos.)
Pleural fluid examinations for T.B.—Direct Smear	32 (6% pos.)	60 (3% pos.)
Pleural fluid examinations for T.B.—Culture	30 (10% pos.)	47 (13% pos.)
Urine examinations for T.B.—Culture	31 (25% pos.)	26 (12% pos.)
Urine examinations—General	341	221
Faeces examinations	4	21
Blood counts	682	365
M.S.R.'s.	6	18
General bacteriological investigations	81	38
Smears for lepra bacilli	27	12
C.S.F. examinations	98	41
Guinea Pigs for T.B.	77	72
Streptomycin resistance examinations in three dilutions	33	....

A total of 326 dozen tubes of Lowenstein's Medium were made in 1951, compared with 260 dozen in 1950, and approximately 300 sections were cut and 17 post mortems conducted during the year.

The increased volume of work in the Laboratory was handled only because of the high standard of the work of the three workers mentioned. Also, it was facilitated by the acquisition during the year of a large incubator, and because the plumbing system and benches were installed in the culture room.

5. *X-ray.*

The work in the X-ray Department is steadily increasing in volume. More tomograms and more X-rays other than chest X-rays are being taken.

The acquisition of a portable X-ray plant (complete with converter) has been of considerable diagnostic aid in the treatment of the acutely ill.

In addition, Mr. Jones, the radiological assistant, has been making many electrocardiographs in the wards.

Statistics are :—

Chest X-rays	2,171
Tomograms	41
Films other than chest	282
Intravenous pyelograms	3
Barium meals	3
Total No. of Screenings	2,888
Electrocardiographs	330

The facilities of the developing room were augmented during the year by the installation of a thermostatically controlled water tank, and of a more efficient plumbing system and sink.

6. *Administration.*

Following the tragic death of Mr. C. J. G. Stansfield, the position of Secretary was, for several months, filled by Mr. S. Macleod. His quiet efficiency and co-operation were much appreciated at this difficult period. Mr. J. L. Cross took over from Mr. Macleod and he has quickly assimilated a knowledge of his duties. He has vigorously pursued a policy of keeping maintenance and repair work in all parts of the institution as up to date as limitations of staff allow him. In addition he has taken a very active interest in affairs outside the scope of his duties.

After many years of cheerful, efficient service, Mrs. Mitchell resigned from the office of Postmistress, and was replaced by Mrs. Skipworth, who has competently carried out the rather exacting duties of this office.

7. *Engineering and Workshops.*

Following the death of Mr. H. S. Leys in tragic circumstances, Mr. Kleiman acted as Engineer for several months, then Mr. McGowan was appointed to the position.

Early in the year the third " Southern Cross " 40 h.p. engine was installed, and the Engineer has planned for the installation of a new " Crossley " engine.

An extension to the carpenters' shop has approximately doubled the floor space, and much improved the lighting. Adjoining this extension, the plumbers' shop was also enlarged. At the back of the carpenters' shop a service " run-in " for vehicles, complete with pit, has been constructed. Rock steps set in cement have been built as a convenient pathway to this. A major job undertaken during the year was the cleaning and painting of the water storage tank behind the workshops.

8. *Grounds and Gardens.*

Mr. Dowell has continued to maintain the grounds in good condition. During the year he and his staff, together with Mr. Thorpe, an expert in cement work, installed a number of large storm water drains. Fire boxes, painted bright red, containing lengths of fire hosing, were installed in key positions around the Sanatorium.

Contractors commenced work on the paving of the roadways between the ward blocks. This has yet to be completed.

9. *Kitchen and Dining Rooms.*

Mr. Cornford and his staff have continued to work without complaint in conditions which are far from ideal. When these are improved and the " Esse " cookers are installed, the standard of cuisine will no doubt be considerably higher.

The meals will never be satisfactory from all aspects until a Dietician is appointed, and facilities are provided in the ward pantries for the preparation of special diets.

The installation of a Kelvinator by Peters and Western Ice Company has made it possible for ice cream to be served to patients and staff.

10. *Laundry.*

Improvements this year were on a major scale. Two presses, two tumblers (for drying), and three large washing machines, all power driven, were installed. In addition to facilitating the handling of material in bulk, these improvements have made more congenial the working conditions.

C. BUILDINGS AND ACCOMMODATION.

The Medical Officers' houses were completed and occupied during the year by Doctors Porter and Langman.

The Occupational Therapy Centre was occupied early in the year by the Almoner, the Occupational Therapist and the Red Cross Worker. In addition, this building provides a long overdue men patients' sitting room and library.

Extra cubicles are about to be built in the top block. The completion of these will slightly ease the pressure on accommodation for staff.

Work on the staff sick quarters has been disappointingly slow. At present the painting remains to be done before interior fittings and furnishings can be installed.

Towards the end of the year the building of the extension to the Theatre block was commenced.

The housing of staff constitutes a major problem. The building of cubicles on the top block means only that staff members at present sleeping on verandahs will move into comfortable quarters. There is still a paramount need for the building of further houses, for married staff awaiting suitable accommodation, and to attract stable married workmen. For a considerable time now this institution has had to put up with a constant percentage of poorly efficient single males, many of whom drift from job to job.

Steady progress is being made with the erection, near the engine room of a building, equipped with showers and change room, for members of the staff of the engine room and carpenters' shop.

D. WARDS.

The following additions to equipment were made. Two large electric toasters, one in each of the two female blocks ; six water coolers, distributed at intervals ; an Electrolux in each block, and an electric polisher for duty rooms and administration block.

E. STATE FARM AND POULTRY FARM.

State Farm.

Improvements during the year involved a major plumbing undertaking in which the water pipes in and around the milking sheds were completely replaced according to a new plan. Pipe lines in adjoining and outlying paddocks were repaired.

The boiler house was renovated.

A new shed was built to house the tractor which was bought during the year. The acquisition of the latter greatly facilitated the harvesting for, in addition to its ordinary function, a drive from the tractor operates the reaper and binder. Despite some damage by unseasonal rain, the crop was a good one.

The Farm continued to supply the Sanatorium with milk during the year.

Including that of the Champion Bull, " Moss Trooper," nineteen prizes were won at the Royal Show.

To the thoughtful and tireless efforts of the Farm Manager, Mr. Wallace, are to be attributed these fruitful results.

Poultry Farm.

Because the Manager, Mr. S. Roberts, works consistently long hours, the flock has been maintained in a healthy condition, and hundreds of day old chicks have been reared. As a result of this, the Sanatorium has been adequately supplied with eggs and a handsome profit for the year was shown.

The electric wiring for the fowl houses has been completely overhauled and virtually replaced.

The projected guinea pig house has not yet been built, but its erection early in 1952 is anticipated.

F. LINLEY VALLEY COLONY.

This activity of the Tuberculosis Association of Western Australia, by reason of the close liaison effected with Sanatorium patients, is regarded as an integral part of our activities.

Three " Nissen Huts " were completed and a power plant installed in one of them. Water has been laid on to the huts and new lines will be put down to the houses at an early date. It is anticipated that power will be distributed to the houses at a later date.

On the 14th October Linley Valley Colony was officially opened by the Premier, the Hon. Ross McLarty. All who attended were pleased and proud to see present Dr. Linley Henzell, Commissioner of Public Health, who founded the Colony. The opening marked the culmination of many months of intelligently directed and tireless effort on the part of the Secretary of the Colony, Mr. Aubrey Barnes, O.B.E. In this major achievement he was consistently assisted by the committee of the Colony and by many willing workers on the Sanatorium staff.

The house " Woodcote " was furnished in tasteful tones, for which grateful appreciation is expressed to Mrs. Barnes. By the end of the year the first six colonists had moved and settled in and work had commenced in the Tinsmith's Shop. Production will be restricted until new power machines are available.

An A40 " Countryman " has been purchased and is expected to be of considerable use in the transport of personnel and light articles.

Towards the end of the year the Lotteries Commission, headed by the Chairman, Mr. Kenneally, visited the Colony. The latter is indebted to the Commission for a grant of £2,500, the more especially as it came at the end of a long term of capital expenditure.

Liaison with the Tuberculosis Association has been close, and considerable help, financial and otherwise, has been forthcoming from this body during the year. The Linley Valley Colony Committee is now a sub-committee of the Tuberculosis Association.

G. FLIES.

The fly menace continued. " Gammexane " bombs, placed and set off in the early hours of one morning, were tried out. Conditions were not ideal and the results were difficult to assess. It is proposed to repeat the experiment when weather conditions are more suitable.

H. ENTERTAINMENTS.

There were two major features. The first was the series of Adult Education recitals. These, during the winter months, were consistently enjoyed by both patients and staff. It is appreciated that generosity of the Red Cross Society and volunteer drivers made these visits possible.

The second feature was the Christmas Concert by the staff for the patients. This was the third of the series and was an outstanding success ; in fact a second performance was demanded and given. That this was so, was primarily due to the artistic sense and capacity for work of Miss Margaret Parker, and to the efficient organisation of the stage manager, Mr. Cross. It was heartening to witness the cheerful enthusiasm of all who took part in the show and in the preparation for the supper which followed. The spontaneous, happy response of the patients to the performance was a fitting culmination to 1951.

D. D. LETHAM, M.B., B.S.,
Acting Medical Superintendent.

APPENDIX V.

WESTERN AUSTRALIA.

PULMONARY TUBERCULOSIS.

Year.	Population in 1,000's.	Notifications Received.	Incidence Rate per 100,000 Population.	Deaths Registered.	Mortality Rate per 100,000 Population.
1911	287	259	90·2	190	66·2
1912	301	429	142·5	220	73·1
1913	313	424	135·5	206	65·8
1914	323	353	109·3	229	70·9
1915	321	336	104·7	233	72·6
1916	313	511	163·5	225	71·9
1917	306	464	151·6	217	70·9
1918	308	432	140·5	245	79·5
1919	320	467	145·9	289	91·6
1920	330	442	133·9	259	78·4
1921	334	424	126·9	277	82·9
1922	341	387	113·8	256	75·1
1923	351	361	102·8	216	61·5
1924	363	381	104·6	228	62·8
1925	373	403	108·4	259	69·4
1926	381	415	108·2	252	66·1
1927	392	409	104·3	231	56·4
1928	408	395	96·8	282	69·1
1929	421	400	95·0	245	53·4
1930	429	569	132·6	218	50·8
1931	432	372	86·1	223	51·6
1932	435	339	77·9	203	46·7
1933	439	295	67·2	207	47·2
1934	442	287	64·9	218	49·3
1935	447	270	60·4	210	47·0
1936	452	338	74·8	193	42·7
1937	457	239	53·0	172	37·6
1938	464	247	53·2	177	38·1
1939	470	202	43·0	179	38·1
1940	473	231	48·8	181	38·3
1941	474	154	32·5	185	39·0
1942	477	113	23·7	175	36·7
1943	477	273	57·3	144	30·2
1944	481	219	45·4	134	27·9
1945	488	271	55·5	149	30·5
1946	493	343	69·6	163	33·1
1947	503	372	74·0	128	25·5
1948	515	325	63·1	157	30·5
1949	533	499	93·6	123	23·1
1950	559	586	104·8	125	22·3
1951	*590	467	79·2	76	12·9

* Estimate only.

APPENDIX VI.

FIRST ANNUAL REPORT OF THE CANCER RESEARCH UNIT OF THE DEPARTMENT OF PUBLIC HEALTH.

The unit was inaugurated at the beginning of March, 1951, by the appointment of Professor W. E. Gye, F.R.S., and Professor Ida Mann, C.B.E., F.R.C.S., to initiate a small research laboratory to be housed in the Animal Health and Nutrition Laboratory of the Department of Agriculture, but administered and financed by the Department of Public Health.

The work carried out during the year falls under five headings :—

1. Organisation of the equipment of the laboratory and establishment of stocks of pure line strains of experimental animals.
2. Experimental investigation on animals of certain "cancer treatments."
3. Experimental treatment of patients in collaboration with the staffs of the Royal Perth Hospital and the Princess Margaret Hospital for Children.
4. Continuation of lines of work previously carried out at the Imperial Cancer Research Fund Laboratories in London, principally investigation of the thermal properties of the "Bittner milk factor" and of certain sporadic and chemically induced tumours of mice. Production of tumours with chemical carcinogens for experimental purposes.
5. Publications and lectures.

1. ORGANISATION AND ESTABLISHMENT OF THE LABORATORY.

(a) *Stocks of Mice.*

On 7th March, 1951, 26 live mice of pedigree strains (C3H, R3, and C57) were received by air from England, including mice bearing the standard tumour C48. The mice were established under quarantine precautions in the laboratory and breeding started. Various setbacks were encountered, such as :—

1. *Diet.*—Some time was required to work out the optimum diet for breeding purposes. This appears to be mouse cubes, lucerne, raw carrot and a small quantity of sprouted corn.
2. *Lead poisoning* occurred from the lead lids of the food containers. This was overcome by interposing wood between the copper and lead of the lid.
3. *Temperature.*—In May the temperature began to fall and the breeding to go off. A method of heating the laboratory to 70°F. was worked out. The thermostatic control of the radiators is shortly to be installed. In October the temperature began to rise and when it reached 82°F. young mice began to die. A "Weathermaker" Air Conditioner was therefore installed and is working well (apart from power cuts).

   The present breeding stock of mice stands at 200. Approximately 100 more are, or have been, under experiment. The C57 and R3 are now breeding well. The C3H not so well. No grave difficulties in breeding are anticipated.

   Apart from the auxiliary power plant about to be installed, it is not anticipated that further apparatus will be required in the near future and the laboratory can now be considered a "going concern."

(b) *Technicians.*

On 11th July, 1951, Miss Betty Wreathall was appointed as technician but resigned on account of ill health in August. Miss Joan Cox was then appointed as part time technician and is still working very satisfactorily.

2. INVESTIGATION OF CERTAIN "CANCER TREATMENTS" ON MICE.

(a) *Mycetine de Angelis.*

Swiss and French pathological literature had contained for some time references to the work of Professor de Angelis who claimed to have cured cancer in mice (mammary adenocarcinoma) by means of an extract of a streptothrix, which presumably destroyed the Bittner virus. In March a proprietary preparation, Mycetine, purporting to contain an extract of this streptothrix, came on the market and the Perth agent approached us. It was agreed that the distributing agent (Mr. Lindquist of Western Chemical Agency) should not advertise this widely and that we should know to whom it was supplied. A committee (the Mycetine Committee) was formed :—

Dr. H. S. Lucraft—nominated by the Royal Australasian College of Physicians.
Dr. M. E. Minchin—nominated by the Royal Australasian College of Surgeons.
Dr. A. J. Nelson—nominated by the Radiotherapeutists of the Royal Perth Hospital.
Professor Ida Mann—nominated by the Cancer Research Department of the Public Health Department.
Dr. L. Henzell—Commissioner of Public Health.

to investigate the action on human patients, and animal experiments were started in the laboratory. The action of commercial mycetine was uncertain and variable. It was discovered that a dose approximately 100 times that recommended by de Angelis was required to affect a mouse at all and that then certain batches

only of ampoules produced some necrosis of the C48 tumour, prolonging the life of the mouse but not curing the tumour. Later batches of the material had no effect. A long and at times acid correspondence began between us and the Anglo-Swiss Drug Co. (the Australian importers), Neotherapie of Geneva (the manufacturers) and Medicina S.A. of Geneva who had bought the distributing rights from Neotherapie. All attempts to contact de Angelis personally have so far failed. Finally the commercial formula was obtained from Neotherapie and was found to be approximately that of " Fichera 365 " (a preparation tested and found to be useless by Professor Gye in 1934) to which was added an understandardised quantity of a rough extract of de Angelis' organism. It was thus apparent that confirmation of de Angelis' results on mice could not be obtained with commercial mycetine. Efforts are being made to obtain a live culture of the streptothrix from Switzerland but so far the two tubes received have grown nothing. This line of work will be continued if and when a live culture is obtained. Meanwhile the distributing agents have agreed not to recommend or advertise the preparation, so that the public have been spared the false hopes which would have resulted from wholesale distribution.

(b) *Hormones plus Antibiotics.*

In August, 1951, we received a verbal report via Mr. E. J. L. Hallstrom that Dr. Emerson of Mercks' Laboratories, New Jersey, had succeeded in curing mice of lymphosarcoma with a combination of cortisone and aureomycin or other antiviral antobiotic. Mr. Hallstrom donated £1,500 for the purchase of the necessary drugs for human and animal trials. Tests have been carried out on C3H and R3 mice with sporadic mammary adenocarcinoma. Treatment has been by cortisone and aureomycin. There may be a temporary inhibiting effect on the rate of enlargement of the tumours, but the mice die inevitably, often with relatively small tumours. It is obvious that this treatment does not cure the cancer. The experiments will be repeated with the C48 tumour as this allows of the use of controls and should give a clear cut picture of the nature of the effect, if any. Since experimental tumours in mice can be made under aseptic conditions and in healthy animals, all treatments intended for trial on human patients must be checked by animal experiment to exclude errors due to the presence of sepsis and other complications, and to the action of psychological suggestion. This will be done with all future treatments investigated and will provide a useful brake on clinical enthusiasms.

3. EXPERIMENTAL TREATMENT OF PATIENTS.

(a) *Mycetine.*

The staffs of the Royal Perth Hospital and Princess Margaret Hospital for Children together with certain private practitioners collaborated with us on clinical trials of commercial mycetine. Twenty patients were treated under controlled conditions, and the results embodied in a Report to the Mycetine Committee. The Committee adopted the report unanimously and agreed that Mycetine in its present form has no action on cancer in man other than the promotion of a slight feeling of being well.

(b) *Hormones and Antibiotics.*

On 29th August, Drs. Maguire and Mc Elhone from Sydney visited the laboratory and were interviewed by Dr. Henzell and later by Dame Florence Cardell Oliver, Mr. Brand and Dr. Lucraft among others. A joint scheme for clinical trials of ACTH and aureomycin in Sydney and Perth was drawn up. The method of treatment and the type of case were discussed and agreed to and Drs. Maguire and Mc Elhone returned to Sydney. On 20th September, in consequence of unrestrainedly enthusiastic messages from Sydney, Dr. Henzell and Professor Mann visited Sydney (at Mr. Hallstrom's expense) and investigated the cases under treatment. A report was prepared. The conclusions reached were that the results attained were due to the control of sepsis, the treatment of complications and the psychological action of ACTH. No evidence was obtained that the cancer cells themselves were affected. These findings were not accepted by the Sydney team and, consequently, connection with this team was terminated by Dame Florence Cardell Oliver. Clinical trials under strict conditions on uncomplicated cases were continued in Perth. Fourteen patients were treated of whom eight are already dead and most of the others relapsing. No evidence was obtained of any action on cancer itself. In those patients whose main symptoms were due to secondary sepsis great improvement occurred and their condition could be maintained up to the point of involvment of vital organs. This is to be expected from the known properties of ACTH, cortisone and the antibiotics and is no new discovery. The findings of American workers that acute lymphatic leukaemia can be controlled up to a point by cortisone but subsequently relapses with fatal results in spite of treatment, was confirmed.

4. EXPERIMENTAL WORK ON THE THERMAL PROPERTIES OF MOUSE TUMOURS.

The main controversy over cancer in the pathological world today centres on the nature of the " continuing cause." It is now known that a large number of physical and chemical agents can initiate cancer but the reason for the continued cell division, which continues ad infinitum after removal of the initiating cause, is still controversial. Since the discovery of the Rous virus of chicken tumours and the Bittner virus of mouse mammary cancer it is apparent that viruses play a large part in this cell division. Very little work has however been done on viruses in mammalian cancer, partly because techniques for demonstrating them are still imperfect and partly because of a fixed belief or doctrine existing among large groups of pathologists that the unit of transmission of cancer cell itself and not something smaller within it. This belief obviously goes back to the era before the electron microscope and the demonstration of the complicated life history and properties of the many virus families now known in other fields.

The criteria of a virus disease are generally accepted to be :—

1. Transmissibility by long frozen material (*e.g.*, at —79°C. as for the typhus virus).
2. Transmission by dried material (taken as proof of the Rous virus).
3. Transmission by cell free filtrate (often not possible if the virus is thermolabile, *e.g.*, typhus).

Before leaving the Imperial Cancer Research Fund we had succeeded in demonstrating the transmissibility of mouse tumours (both sarcoma and carcinoma, chemically induced and sporadic) by means of material frozen at —79°C. and by material dried in vacuo at —20°C. The problem of filtration is obviously bound up with sensitivity to temperature and in order to find out whether filtration is possible it is necessary to study the behaviour of tumour material in the higher ranges of cold (*e.g.*, from —30 to 0°C.). This is the work we are now engaged on. The laboratory has been presented (by Major A. Pam of Pressed Steel, Oxford) with a refrigerator capable of maintaining constant temperatures from —29° to +10°C. The experiments which are considered crucial, consist in subjecting batches of tumour mice to known temperatures and testing their potency at stated intervals. Since we know already that alternately raising and lowering the temperature destroys the activity of the material, it is obvious that it is essential for the temperature to remain constant. This depends on a constant supply of electricity. At present we are entirely frustrated by the apparently unavoidable power cuts which occur frequently and without warning. There have been power cuts to our knowledge fourteen times within the last seven months and each time the complete carrying through of an experiment has been prevented. Repeated negotiations with the Electricity Commission and with the Public Works Department have at last resulted in a promise of an auxiliary power supply and this is apparently about to be installed. The experiments as far as they have gone seem promising of important results on the virus question, but nothing can be said until several sets have been carried through to completion, which will take several months. Experiments on the composition of biologically appropriate salt solutions to overcome the difficulties of filtration at temperatures below freezing are also in progress and look promising, but it is to be remembered that the material it is desired to filter lies inside the nuclear membrane, so that the problem is one of extraction as well as filtration.

5. PUBLICATIONS AND LECTURES.

At the beginning of the work Professor Gye addressed the British Medical Association in Perth on Recent Advances in Cancer Research. In June, 1951, Professor Mann lectured to the Royal Australasian College of Surgeons in Sydney on Recent Cancer Research and its Relation to Ophthalmic and other Clinical Problems.

In August, she also addressed the Society of Laboratory Technicians of Australasia on the pathology of cancer. At Sydney in August, she spoke on cancer at a dinner including some of the staff of the Royal Prince Alfred Hospital and the Public Health Department of New South Wales.

(Sgd.) W. E. GYE,
I. MANN.

APPENDIX VII.

ABSTRACTS OF CONTRIBUTIONS TO THE LITERATURE BY AUTHORS ASSOCIATED WITH THE DEPARTMENT.

by D. J. R. Snow.

In this new feature of the Annual Report, which is introduced at the request of the Commissioner, resumes of material published in technical journals under the names of individuals employed either whole time or part-time by the Department, will be presented. It will provide one measure of the activities of the Department, and give some indication of work being undertaken, which is complementary to health administration. In the main these abstracts deal with reports of investigations which are of interest to a wider circle of readers than those who receive the Annual Departmental Report. Further, they deal with technical subjects intended for perusal essentially by qualified medical men. For these reasons they have been submitted in the first instance to professional journals for publication "in extenso." It is felt, however, that the inclusion of summaries of these publications, within the Annual Report, will serve a useful purpose. During 1951, six articles were published, and these are summarised below :—

1. GYE, W. E., and MANN, I. (1951).

The Medical Journal of Australia, i., 209–212, 8 references :

"Recent Advances in Cancer Research."

This paper was read at a meeting of the West Australian Branch of the British Medical Association. It includes a brief historical survey of the discovery of the apparent causes of cancer, and gives an outline of some of the experimental aspects of the disease in laboratory animals and birds. The lines of research suggested are :—

(1) Search for "a substance which will kill the virus in its latest phase and so prevent the development of cancer even when the secondary causes are present."

(2) Search for "an antobiotic which will circulate in the bloodstream and kill the active virus particles whether they are in the cells of the primary growth or in the metastases."

2. EDWARDS, J. C. (1951).

The Medical Journal of Australia, i., 853–856, 4 references :

"The Nature of the Decline in the Loss of Infant and Foetal Life : A Study in Western Australian Vital Statistics."

"The decrease in infant mortality is shown to be due to the elimination of infantile gastro-enteritis. This leaves, as a hard core, the problem of reducing infant mortality from obstetrical and pre-natal causes. These deaths tend to share their aetiology with that of stillbirth. It is suggested that the loss of infant life could be further reduced if a general policy were adopted of (i) correcting all breech presentations at the thirty-fourth week of gestation, and (ii) treating all patients showing the early signs of toxaemia of pregnancy by bed rest."

(Author's summary).

3. SNOW, D. J. R., and PEARSON, A. T. (1951).

The Medical Journal of Australia, i., 856–859.

"Stillbirths, Neo-natal Deaths, and Premature Births in Western Australia."

This was a preliminary report of the Stillbirth Inquiry based on the first 457 consecutive stillbirths notified to the Department during the period 1st August, 1949 (when autopsies became compulsory by law in certain proclaimed areas) to 31st December, 1950.

The findings suggest that the causes of stillbirth in Western Australia are similar to those operating elsewhere, *i.e.* :—

(1) Pre-natal factors such as toxaemia of pregnancy, breech presentations, ante-partum haemorrhage, and rhesus incompatability.

(2) Obstetrical difficulties such as occipito-posterior positions, breech presentation, multiple pregnancy, and ante-partum haemorrhage.

(3) Unknown factors.

Post-mortem examination has been of assistance in elucidating the cause of death in obscure cases. Where autopsy was not performed the cause of death was unknown in 37 per cent. of cases ; where autopsy was performed the cause was unknown in only 14 per cent.

This investigation is proceeding and it is hoped that by early 1953, over 1,000 analysable cases will have accumulated.

4. KING, A., EDWARDS, G., and GIBSON, P. (1951).

The Medical Journal of Australia, i., 934–935 :

"A Survey of Australian Aborigines for Pulmonary Tuberculosis."

This is a report of a survey conducted during August-November, 1950, among 3,200 natives in the Kimberley and Port Hedland areas, by staff from the Tuberculosis Control Branch. The survey was based on Mantoux Tests, and Radiological Examination. B.C.G. Vaccine was administered to non-reactors. The over-all incidence of pulmonary tuberculosis was slightly less than five per thousand (a lower incidence than in the white population). The Mantoux-positive rates in all the various age groups were lower than those of the white population during the Perth Metropolitan Area Survey of 1949.

5. EDWARDS, J. C. (1951).

The Medical Journal of Australia, ii., 559–564, 17 references :

"The Osmotic Theory of Eclampsia and The Mechanism of Water Retention."

"Clinical and experimental work bearing on the pathological mechanisms giving rise to eclamptic convulsions is correlated. The chorionic hormone of the placenta stimulates the activity of the steroid hormones of the adrenal gland and corpus lutem, which together with the placental hormones cause an increase in the intracellular sodium-potassium ratio. This increases the osmotic pressure of both intracellular and extracellular fluids. Verney has shown that an increase in the osmotic pressure of the extracellular fluid stimulates the antidiuretic action of the posterior pituitary body. The antidiuretic hormone increases the tone of the juxta-glomerular body, which acts both as a sphincter to the renal tubules and as a clamp to the afferent glomerular artery. This hypothesis thus accounts for the hypertension, albuminuria (through ischaemic impairment of the glomerulus) and oedema of preeclampsia.

Reasons are given for believing that the neuro-muscular system becomes highly irritable during the stage of withdrawal of the placental hormones, and the excitatory state of this system may become sufficiently great to culminate in convulsions.

The hypothesis is correlated also with the pathology of acute cortical necrosis and acute nephritis."

(Author's summary).

6. GYE, W. E. (1951).

The Medical Journal of Australia, ii., 869–871 :

"The Criteria of a Cancer Cure."

It is not possible to summarise this article satisfactorily, and those interested are advised to read the original. It is intended mainly for the guidance of persons who wish to conduct clinical trials. The author concludes with these words : "The pressure of public and medical opinion is, however, upon the whole profession, and the exercise of a rigidly scientific approach and an insistence on the slow and meticulous investigations necessary for success demand the utmost strength of mind. Without it, nothing of value will be learned from human experiment, and the 'diet of hope deferred' to which we have so long been subjected will be indefinitely prolonged."

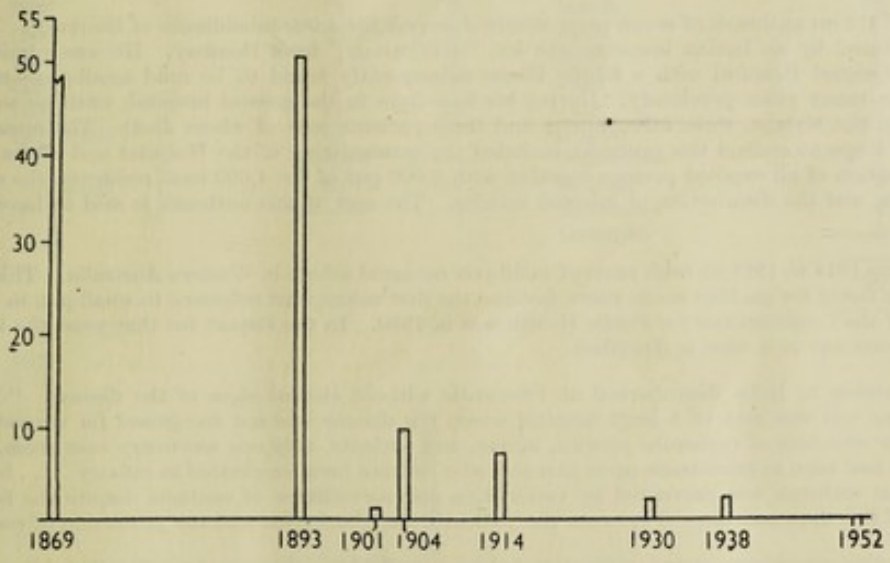
APPENDIX VIII.

THE HISTORY OF SOME COMMUNICABLE DISEASES IN WESTERN AUSTRALIA (1828-1951). PART I.

It is the intention in this and subsequent reports on the same subject to assemble any data previously recorded elsewhere, to fill in any gaps that exist, and to bring the record of communicable diseases in Western Australia up to date. By so doing, it is hoped to present a complete and convenient previous history of each communicable disease, which may be of future assistance to anyone interested in these matters. Much of the information included has been or will be reproduced or abstracted from various Commonwealth Service Publications, and from previous Annual Reports. These will be duly acknowledged. Other data has been prepared "*de novo*" within the Department, while the latest record of Smallpox (1938–51) is based on data very kindly provided by the Commonwealth Deputy Director-General of Health for Western Australia. The basis of the record will, of course, be notifications received and deaths registered. Wherever possible, data will be presented, in addition, as rates. Tabulations by age and sex, and other features such as seasonal prevalence, will be shown wherever these are considered likely to be of value for future study of that particular disease.

I. SMALL-POX (1828–1951).

Small-pox has always been of special concern to Western Australia. Because of its geographical situation, this State is perhaps the most vulnerable in the Commonwealth ; while the increasing speed of modern travel augments the risk. It is significant that all but one of the outbreaks or occurrences of small-pox in this State were the result of infection imported by sea from Asian countries. Apart from its implications in Western Australia, however, it is a disease of more than ordinary public health interest, for small-pox outbreaks in New South Wales during the latter half of the last century provided the impetus for the establishment of sound Public Health organisation, and later, led to the first Australian Public Health Conference of State representatives in 1884 (Metcalfe, 1951).



Year.	Cases.	Deaths.
1869	? 50 +	? 17 +
1893	52	9
1901	1	?
1904	10	?
1914	7	?
1930	2	2
1938	2	1
1939–51	....	....

No record of small-pox is available for years other than those shown.

The History of Small-pox in Western Australia (1828–1951).

The first oubreak of small-pox to which reference is made in early records appears to have occurred among the natives of the North-West and of the Geraldton district during the early months of 1869. A large number of them died and, in one instance, the disease is said to have annihilated an entire camp of 17 people. The origin of the infection is not recorded but it has been presumed that it was introduced from the East Indies.

A second epidemic of small-pox in Western Australia occurred in 1893 and involved 52 persons with nine deaths (47 of these cases were diagnosed in Perth, three in Fremantle, one in Albany). The outbreak originated with the arrival of a Cingalese fireman from Singapore on board the s.s. " Saladin." He was admitted to the Perth Hospital on 19th March, and Cumpston remarks : " It is noteworthy that until 16th May, the majority of cases occurred in the immediate vicinity of the hospital." During this epidemic there was evidence of person-to-person spread, of an incubation period of approximately 12 days, and of the efficacy of vaccination in controlling the epidemic. The outbreak is said to have cost the State £20,000.

Reference is made to a state of unpreparedness in that the Perth supply of vaccine lymph was quickly exhausted and there was considerable delay in obtaining fresh supplies.

The following newspaper notice inserted by the Fremantle Board of Health at the time is of some interest :—

> " SMALL-POX PUBLIC NOTICE.—Mr. Carroll, in charge of the Quarantine station at Woodman's Point, has been authorised to convey all persons infected with small-pox or other contagious disease to the Quarantine Station. He will carry a yellow flag on a pole and will not be permitted to enter any dwelling except for the purpose of removing a patient. The public are asked in all cases to keep on the *weather* side when they are passing the conveyance."

In 1901 a West Australian policeman who, during the course of his duties, came in contact with a case or pre-eruptive small-pox on board the " Ormuz," developed the disease 12 days after the vessel's departure, while in 1904 an outbreak involving nine or 10 cases occurred among Asian pearlers off Broome. Only one case developed among the permanent residents of Broome. He was an aboriginal police boy. The origin of the epidemic is obscure, but the epidemic itself was suppressed by Thomas Lovegrove and his energetic team of assistants who carried out careful medical inspections, extensive vaccination, and the disinfection and fumigation of clothing, bedding, ships and the like.

In accordance with the Vaccination Act of 1878, vaccination had become compulsory in Western Australia. In 1909 an attempt to remove the compulsory clause was defeated in the legislature, but the item providing for the salary of the compulsory officer was deleted, and the services of this officer were terminated. In 1911 a conscientious objection clause was inserted into the Act, and a marked reduction in the number of vaccinations followed.

In 1914 an outbreak of seven cases occurred among the 4,000 inhabitants of Bunbury. The disease was introduced by an Indian lascar on the s.s. " Kilchattan " from Bombay. He was admitted to the Bunbury General Hospital with a febrile illness subsequently found to be mild small-pox—modified by vaccination many years previously. During his four days in the general hospital, until he was isolated, he infected the Matron, three other nurses and three patients (one of whom died). The measures taken by James Hope to control this outbreak included the quarantining of the Hospital and all its occupants, the vaccination of all exposed persons together with 3,000 out of the 4,000 local residents, the surveillance of contacts, and the disinfection of infected articles. The cost of this outbreak is said to have been over £2,000.

From 1914 to 1923 no fresh cases of small-pox occurred ashore in Western Australia. This immunity apparently lasted for another seven years, because the first subsequent reference to small-pox in the Annual Reports of the Commissioner for Public Health was in 1930. In the Report for that year, the background to the occurrence of a case is described.

A visitor to India disembarked at Fremantle without clinical signs of the disease. " He became ill next day and was sent to a large hospital where the disease was not recognised for several days. In spite of the exposure of numerous persons, nurses, and patients, only one secondary case arose, namely, a nurse who had been in attendance upon him and who had not been vaccinated in infancy . . . . both proved fatal." An outbreak was prevented by vaccination and surveillance of contacts despite the fact that an interval of five days had elapsed between the patient's disembarkation and the protection of contacts.

Another seven year period of freedom followed until 1938, when the s.s. " Strathaird " arrived from England on 22nd March (Bombay, 11th March ; Colombo, 13th March). A female passenger from Bombay disembarked and proceeded to a private house in Nedlands. Two days after her arrival she developed Haemorrhagic Smallpox and eventually died. On 2nd April a woman at the same address developed symptoms and a rash appeared on 5th April ; she had a severe attack but recovered. No further cases occurred ashore or on the ship.

Since 1938 no cases of small-pox have occurred in West Australians, although no less than 11 ships have reached Fremantle and been placed in quarantine because of small-pox aboard during the period 1939–1950 :—

1939	" Riley "	Shanghai
1942	" St. Essylt "	Suez and Bombay
1942	" Clan MacDonald "	Bombay and Colombo
1943	" Suva "	Bombay and Cochin
1943	" Wanganui "	Suez and Colombo
1944	" Empire Mist "	Bombay and Karachi
1944	" Nellore "	Bombay
1944	" Tanda "	Bombay
1946	" Wrangell "	Shanghai and Hong Kong
1949	" Mooltan "	Port Said and Colombo
1950	" Blairclova "	Bombay

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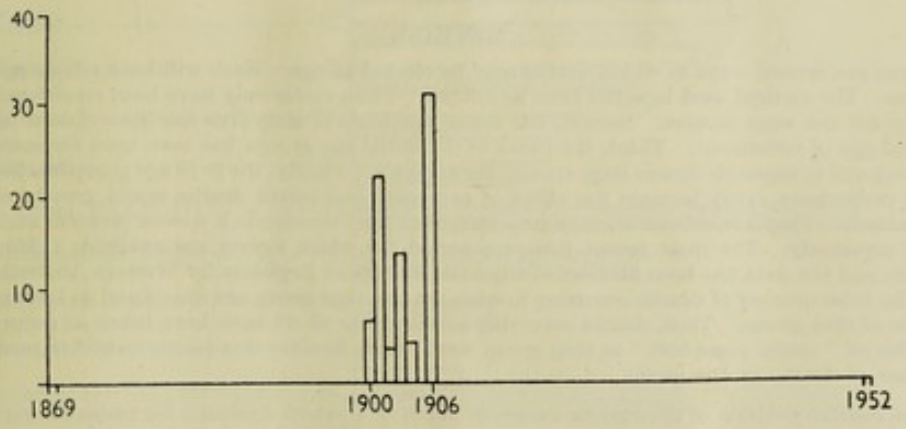
II. PLAGUE (1828–1951).

The first known case of plague in Western Australia was a wharfside railway shunter, aged 19, who " had recently been engaged in handling cargo from Sydney," and who died at the Fremantle Hospital on 8th April, 1900. It is most probable that the infection was introduced from Sydney, which had had the dubious distinction of recording the first case in Australia on 19th January, 1900. An Australian epidemic, in which Western Australia participated, lasted from 1900 to 1909. In 1921–22 a second outbreak occurred in Brisbane and Sydney, but Western Australia and the other States escaped.

Cases and deaths during the only period of former prevalence in Western Australia (1900–1906) are shown in the accompanying table and figure, while the monthly distribution of cases indicates highest prevalence during the months of February and March, which, together, contributed more than half of the total of 80 cases which are known to have occurred in the State. During the last 45 years no case of plague has been authenticated.

Year.	Cases.	Deaths.
1900	6	3
1901	23	5
1902	3	3
1903	13	8
1904	4	1
1905	....	....
1906	31	14
1907–1951	....	....
Total	80	34

Monthly Incidence.	
January	6
February	23
March	22
April	9
May	8
June	5
July	2
August	1
September	0
October	3
November	1
December	0
	80



PLAGUE—WESTERN AUSTRALIA—1828-1951.

REFERENCE.

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APPENDIX IX.

ACCIDENTS: THE GREATEST CAUSE OF MORTALITY IN TERMS OF WORKING YEARS LOST,

by D. J. R. Snow.

For over a century the main yardstick for the measurement of the public health has been mortality. At first the number of deaths over a given calendar period (usually a year) was used as a guide. Then the effect of varying population size was appreciated and mortality was expressed as a rate—or deaths per given number of the population (usually a thousand or a hundred thousand). This rate later came to be referred to as the Crude Death Rate. Next, the influence of the varying age structure of a population was recognised and the concept of a standardised death rate was introduced. Other refinements have been suggested in order to remove fallacies in the interpretation of mortality ; and, today, death rates are still widely used by public health organizations all over the world. It has always been appreciated, however, that such indices in the study of public health have limitations.

Nevertheless, some sort of yardstick is very necessary for the formulation of public health policy, for the demonstration of trends, and for assessing the effect of administrative measures. Mortality statistics are therefore inescapable. They are, when cautiously handled, the least unreliable of several yardsticks. William Farr once said " The death rate is a fact, all else is inference," and there can be no doubt that it is a very instructive fact when interpreted intelligently.

PROPOSAL.

It is the intention of this presentation to offer an unusal concept in the interpretation of mortality from the public health standpoint, and to suggest the use of an expanded measure in examining the wastage due to disease. Instead of measuring the loss by numbers of deaths or by death rates alone, the age at death is taken into account, so that the loss can be measured in terms of " years of useful life lost," and, in effect, by productive man-hours wasted. The precise technique used in assembling the data may be open to criticism, but the principle of presenting deaths in terms of economic loss will surely be appreciated.

One of the main problems which confronts health administrators, is to decide where emphasis should be placed, where major effort must be expended, and where the weight of preventive or control measures must be pressed. Man-power, materials, time, and money are all limited. It is therefore necessary to devise some system of priorities. In commercial parlance, available resources must be invested where they will repay the highest dividends. A useful basis for the construction of such a list of priorities would be the amount of economic loss resulting from individual factors causing death or injury.

Thus, the number of deaths attributed to some particular condition would be less important than the aggregate years of life lost. Clearly, a single preventable death at age twenty is no less important than forty-five deaths at age sixty-five. The loss of a man in the prime of life is more important than a dozen who die of senility. This may be a brutal outlook, but it is a practicable one. We must all die sometime, but it is preventable premature death which is of the greatest importance.

METHOD.

There are several ways in which deaths may be related to age. Each will have advantages and disadvantages. The method used here has been as follows. First, males only have been considered as, in the main, they are the wage-earners. Second, the upper age limit of sixty-five has been chosen because this is the usual age of retirement. Third, the mean of decennial age groups has been used for convenience in computation and to assemble figures large enough for analysis. Finally, the 0–10 age group has been omitted from this preliminary study because the effect of neo-natal and infant deaths would greatly obscure the general pattern. They are, of course, very important but they constitute a special problem and should be examined separately. The most recent five-year period for which figures are available (1945–1949) has been taken, and the data has been abstracted from the Statistical Registers for Western Australia for those years. The total number of deaths occurring in each ten-year age group are considered to have occurred at the middle of that group. Thus, deaths occurring in the group 40–49 have been taken as occurring at 45. The number of " useful years lost " in that group would then be sixty-five minus forty-five, multiplied by the number of deaths in the group.

The relative position of the various causes of death in Western Australia for males during the period 1945–1949, is set out in Table I. It shows both the actual numbers of deaths in the various groups together with the years of useful life lost. For ease and speed in interpretation, the same data is represented graphically in Figure II.

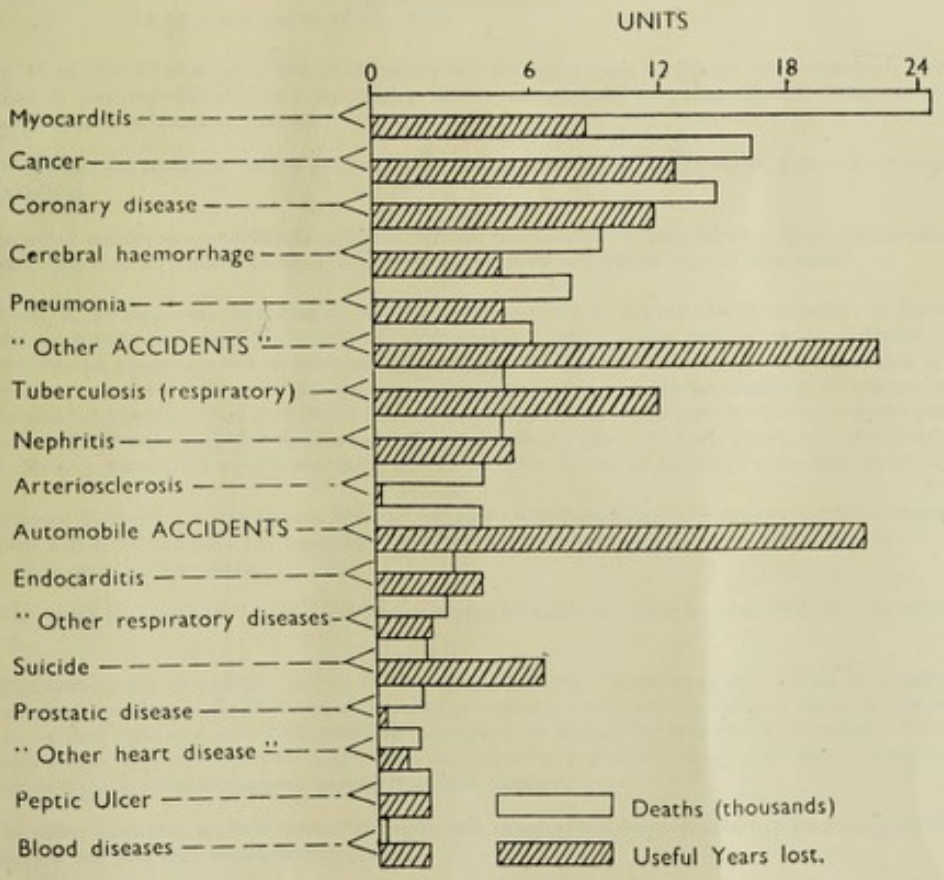
FINDINGS.

When the numerical sequence of actual numbers of deaths is examined, it will be seen that heart disease and cancer occupy the most prominent positions. When considered in terms of " useful years lost," however, the importance of these two causes of death is much reduced. A striking transformation takes place. The lead is assumed by " automobile accidents " and by " other accidents " ; cancer and coronary disease being relegated to third and fifth places respectively. The importance of tuberculosis is enhanced by being moved up from seventh to fourth rank, while another notable change relates to suicide which is transferred from thirteenth to seventh position.

Accidents, when viewed in this light, assume overwhelming significance as a cause of premature death, and acquire an importance which is even greater than authorities already realise. Accidents clearly merit the attention of a department which is charged with the task of preserving and promoting public health. Just how it can be of assistance is a matter for examination but if it is to fulfil its purpose it must give greater attention to the problem of accident prevention.

TABLE I.

Cause of Death.	Number of deaths at all ages (in thousands).	Useful years lost (in units of 500 years).
Myocarditis	2·42	9·30
Cancer	1·65	13·12
Coronary disease	1·50	12·60
Cerebral haemorrhage	·98	5·54
Pneumonia	·85	5·42
" Other accidents "	·65	22·18
Tuberculosis (respiratory)	·54	12·62
Nephritis	·53	5·66
Arteriosclerosis	·49	·58
Automobile accidents	·43	21·40
Endocarditis	·31	4·30
" Other respiratory diseases "	·26	2·08
Suicide	·21	7·16
Prostatic disease	·20	·14
" Other heart disease "	·15	1·28
Peptic ulcer	·13	1·94
Blood diseases	·10	1·92



SUMMARY.

A new measure of mortality is described, in which deaths are related to the ages at which they occur. The result is expressed as "years of useful life lost." It is suggested that this is a more profitable way of examining the effect of individual causes of death, than methods in current use. The overwhelming importance of accidents as a cause of economic loss in Western Australia is demonstrated; and it is suggested that the Department should take a more active part in accident-prevention on the grounds that it is a matter which affects the public health.

ACKNOWLEDGMENT.

I am very grateful to Mr. J. F. Woolcott for abstracting the data for me from the Statistical Registers, and for the major part of the computations involved.

Appendix IX.

TRAFFIC ACCIDENTS,

Report by W. S. Davidson, Deputy Commissioner of Public Health.

In the year ended June, 1951, 12,022 bed-days were occupied by traffic accident cases in the Royal Perth Hospital. With a 10 per cent. wastage of beds in turnover of cases this represents 37 beds of the hospital's total of 514 beds permanently occupied by traffic accident patients.

At 72/– per bed-day, the annual cost of their hospital care is over £43,000.

Royal Perth Hospital represents only 15 per cent. of the total acute general beds in public and private hospitals throughout the State and, even after allowing for a smaller proportion of accident cases in other hospitals and lower average costs, the total cost of hospital care of these cases in Western Australia must be in the region of £200,000 per annum. This figure is but a fraction of the economic loss to the community in lives, limbs and working days, but nevertheless it represents an expenditure of hospital accommodation and hospital funds which must greatly concern any authority responsible for the provision and finance of hospitals.

However irrelevant it may at first appear for a Health Authority to enquire into and make recommendations regarding traffic facilities, being a matter normally beyond their jurisdiction, this apparent irrelevancy disappears when it is borne in mind that this authority carries the burden of looking after the end results of circumstances productive of road accidents.

The end of petrol rationing and the availability of generous supplies of new vehicles has thrust upon responsible authorities the unenviable task of reorganising traffic control. We are not concerned here with bus stops and level crossings ; such things are presumably receiving expert attention in the proper place. We are, however, concerned with the design of our highways and cities insofar as that design will facilitate traffic management calculated to reduce accidents and the demand on our hospital beds.

In an endeavour to ascertain if the traditional pattern or Grid System of streets has any influence on the accident rate, some figures were obtained from the Police Department. These figures refer only to accidents between vehicles. Accidents involving a vehicle and a pedestrian are not included as it was considered that the latter introduced factors too complicated to be considered only in the light of street planning.

In 4½ years from the beginning of 1948, there have been 112 fatal accidents in the Metropolitan Area involving more than one vehicle. Of these :—

53 occurred at intersections,

14 at T junctions, and

45 at other parts of the road.

In 41 of the 67 that occurred at intersections and junctions no blame was attached. That is, in 61 per cent. it was impossible to say that either driver was at fault and that the accident rate could have been the result of a natural hazard.

Of the 45 that occurred on the road other than at a junction or intersection, 24 or 53 per cent. had no blame attached.

In other words, more accidents occur at corners than elsewhere and there is more likelihood of corner accidents being due to a natural hazard than if they occur anywhere else on the road.

There is nothing very startling in this as we have come to regard the intersection or junction as a place where vehicles are most frequently in close approximation while proceeding in different directions and therefore the place where accidents may reasonably be expected to take place. But this is very far from correct ; a vehicle passes far more other vehicles going in a different direction at places other than junctions and intersections but because of the left hand rule of the road the vehicles proceed in parallel and not in intersecting lines and therefore accidents are relatively few. If Hay Street was suddenly superimposed on Murray Street, we would have a picture of what traffic would be like if there was no left hand rule.

Viewed in this light our figures become far more significant and to improve them we must attempt to produce a rule of the road for junctions and intersections comparable in its adequacy to the left hand rule for the rest of the road.

The point is, does the " Grid " pattern attempt to facilitate such a circumstance. In actual fact it does not.

The traditional planning of towns in the State is on the " Grid System." That is, parallel rows of streets are laid down with another set of parrallel streets superimposed on them at right angles, with little regard to natural contours, and with complete disregard for the safety of modern transport. Every corner is an intersection and intersections come with monotonous regularity every few yards along any street. The intersections are made without room for traffic circuses.

In other countries a great deal of thought and expense has been devoted to removing existing intersections, yet we are still constructing them.

The " Grid " or " Colonial " system was adequate for the " horse and buggy " days when avoiding accidents was largely a matter of ordinary horse sense and did not require a meticulous regard for the Highway Code. It is not suitable for modern traffic.

The simplest solution is to limit the number of through roads in the grid and to stagger the intercommunicating roads so that the vast majority or intersections are replaced by T junctions. Where the through roads cross at intersections, a traffic circus is installed. At T junctions all traffic halts before coming out of the communicating road into the other road, *i.e.*, traffic halts before coming out of the road represented by the vertical part of the T.

This simple adjustment is but a modification of the Grid system and if it is considered desirable to retain that system the modification can be introduced with great benefit to traffic safety and with little interference in traditional planning.

ACKNOWLEDGMENT.

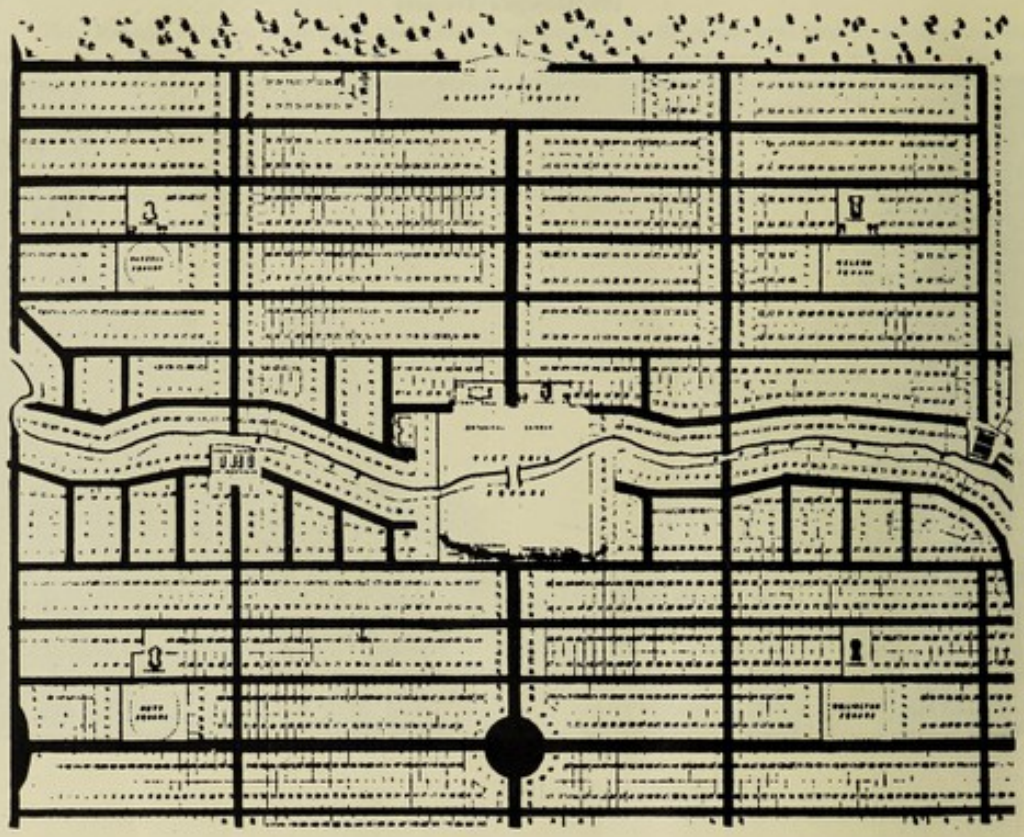
I have to thank the Commissioner of Police for supplying data regarding fatal accidents, and the Government Archivist and Government Printer for the photographs.

FIFTY YEARS PROGRESS IN ROAD TRANSPORT.

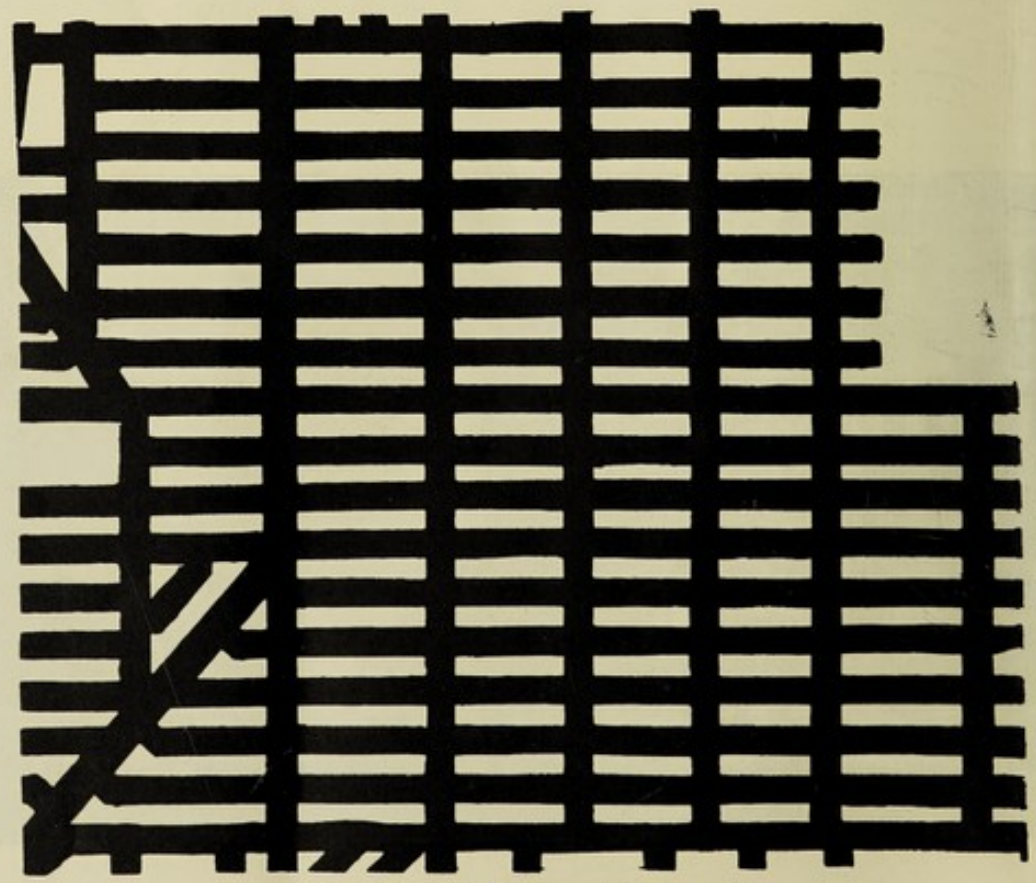
(St. George's Terrace)

1906.

1952.



1841—Portion of Phantom City of Australind.



1951—Portion of Developing Scarborough.

Appendix X.

ARGENTINE ANT CONTROL.

The Commissioner of Public Health.

I submit herewith a report of the Argentine Ant Control activities for 1951.

A world-wide shortage of D.D.T., which occurred towards the end of last year was still apparent when this season's work was being planned. Efforts by this Department to stock-pile insecticide met with little success and it was not until 10 tons of D.D.T. were obtained from overseas, nearly two months after the proposed opening date of the campaign, that sufficient stocks were on hand to commence spraying. Therefore, this report deals with three months' spraying operations only.

Street Spraying.

As in the previous year, D.D.T., and power sprays were made available free of charge to local authorities for the treatment of public property, and the cost of spray labour (three men per machine) was recouped by the Government.

It is disappointing to record that despite these arrangements, there were still some local authorities controlling infested areas who did not avail themselves of these facilities for the treatment of property under their control. However, those that did, covered a very wide area in the time and a larger acreage was treated than in 1950.

Higher labour and insecticide costs, as well as the increased acreage covered, accounted for a much higher expenditure in this field and is clearly shown by the comparative figures hereunder.

As it was impossible actually to measure the sprayed areas, the acreage figure has been based on the rate of application of spray and, although this is not strictly accurate, it does in practice, provide a very close approximation of the ground covered.

Street Spraying by Local Authorities.

	1950. (6 months.)	1951. (3 months.)
20 per cent. D.D.T. emulsion used	5,953 galls.	6,490 galls.
Cost per gallon	18s.	28s.
Total cost of D.D.T.	£5,358	£9,086
Wages recoups	£2,580	£3,700
Miscellaneous	£386	£1,000
Total cost of street spraying	£8,324	£13,786
Estimated acreage—		
80 gallons 1 per cent. per acre, or 4 gallons 20 per cent. per acre	1,488 acres	1,622 acres
Cost of street spraying per gallon (20% D.D.T. and Wages)	£1·40	£2·12
Cost per acre	£5·6	£8·48

Sales to the Public.

A total of 6,476 ¼-gallon tins of 20% D.D.T., 12,837 bottles of ant bait and 1,224 bait containers were purchased by the public.

These materials were prepared to Government specification and supplied, at cost, to all Local Health Authorities in infested areas.

Extent of Infestation.

Further surveys were made of both old and new areas during the year. Several new infestations were reported in the outer metropolitan area and one in the country at Manjimup.

In co-operation with the Entomological Branch of the Agricultural Department, the Manjimup area of 1½ acres was thoroughly sprayed with D.D.T. twice during the season and there is every reason to hope that the ants have been eradicated from this district.

In this outbreak and in two which occurred in the metropolitan area there was a suggestion that the infestation in each case could have commenced in a greengrocer's shop. This led to an extensive survey being made of market gardens, particularly at Wanneroo, as Argentine ants had been picked up on vegetables coming from that district.

The presence of Argentine ants in market gardens as far out as the 29 mile peg on the Yanchep Road has been established and presents a serious problem in control :—

(a) Because of the limitations placed on the use of insecticides on fresh vegetables, and

(b) because the distribution of vegetables from these areas is State-wide.

This investigation is proceeding.

It is now estimated that the area of infestation in this State has increased to approximately 30 square miles and, in view of the disconnected nature of many of the new infestations, it seems evident that much of this increase has been due to the artificial transfer of ants in manure, soil, potplants, wood or other merchandise.

General.

Continued assistance has been given to the experimental work being done by the C.S.I.R.O. and Department of Agriculture and the treatment of ants on Government institutions and hospitals has been undertaken.

Some success was achieved by using the T.I.F.A. (Todd Insecticidal Fog Apparatus) on infested paper bark swamps, which would be difficult to treat by normal spray methods. A mixture of D.D.T. and benzene-hexachloride was applied to the area with very promising results. This work was carried out just prior to the onset of winter ; the results, therefore, were inconclusive and further trials will be made next year.

There is no doubt that the success achieved during this year's necessarily curtailed campaign has been due to the whole-hearted co-operation of the Departmental and Local Authority officers who participated, as well as to the continued support of the press and the public.

Our future campaign against the Argentine ant will depend to a large extent on the results of the experimental work now being done by the C.S.I.R.O. and State Department of Agriculture. Their work so far indicates that the use of the new insecticide Chlordane may make the total eradication of this pest a practical and economic possibility.

C. E. FLOWER,
Deputy Chief Inspector.

Appendix XI.

INFANT HEALTH.

The Commissioner of Public Health.

I have the honour to submit a report on Infant Health activities throughout Western Australia for the year ending 31st December, 1951.

The number of individual babies who attended Infant Health Centres throughout the State for the period under consideration was 21,879, as against 20,075 in 1950 and 18,063 for 1949. I think the increased numbers are attributable to both an increased birth-rate and an increased number of migrant babies coming into the State, not so much to an increased interest in the service available, because it is estimated that the vast majority of mothers with babies in the State already take full advantage of the service and attend more or less regularly.

Births reported to the Department for 1951 were 12,790 as against 12,290 for the previous year, showing an increase of 500 births for the period.

The total attendance at the Centres was 186,679 and this figure shows a slight decrease from the previous year when it was 188,322. The slightly decreased attendance is rather unusual as one new Centre and five new Sub-Centres have been opened during the year making easier access to the Centres for the mothers concerned.

In addition to these figures must be added the figures of the Correspondence Nurse, who had on her roll 936 individual mothers and 240 expectant mothers in constant communication with her. These mothers, in addition, paid 554 individual visits to the Sister and wrote in 2,524 letters.

Home Visits.

The visits paid by the Infant Health Sisters to the homes where babies are being reared is considered of the utmost importance, because in this way the Sister can see at first-hand the conditions under which the child is being brought up, and it is of great importance for the Sister to know this when giving advice and directions to the mother. Except in cases where there is a special need, only one visit is paid to the home as soon as possible after the mother comes from the Hospital with the new baby. The total number of such visits paid to infant homes was 19,795 for the year compared with 20,301 for the previous year.

Telephones.

During 1951 a number of the Infant Health Centres, both in the country as well as the metropolitan area, have had the telephone installed. This has improved the service that we have been able to give to the mothers, as on very wet days the mothers can get advice from the Sister by telephone. Also it is of great advantage in the case of any infectious disease in the house. In such circumstances the mother, of course, does not go to the Centre because of the risk of infection, but at the same time she can get the necessary help from the Sister by telephone for her baby. The telephone is of particular value in the country districts.

Advices given either by telephone or letter (not counting the Correspondence Scheme) total 4,146 as against 3,872 for the previous 12 months.

Breast Feeding Returns.

A question that is disturbing those in charge of Infant Health work throughout Australia and throughout the English speaking world, is the fact that there is a marked decrease in breast feeding—which is the natural feeding for the baby. In many cases it is because the mother does not wish to breast feed for social reasons. In other cases she simply cannot do so because she is over-worked and over-tired with a consequent loss of milk supply ; in other words, she is not leading the type of normal life that was intended by nature for a woman bringing up her baby. Quietness, relaxation and freedom from worry is most essential to produce the placidity which is the necessary accompaniment of the normal and natural mother—many of these factors are non-existent today.

A determined effort is being made by the Infant Health Service to increase the amount of breast feeding amongst mothers, and accurate returns are now being required from the Sisters to give an idea as to the amount of breast feeding being carried out in their particular districts. From the figures submitted it will be seen that some districts are outstandingly in advance of others with regard to breast feeding and in many cases this is due to the enthusiasm and patience of the Sisters, because the mothers are encouraged, educated and helped to continue with breast feeding.

I am happy to state that following this policy the returns for the year 1951 showed that throughout the State 40·14 per cent. of mothers are now fully breast feeding their babies for the first five months of life, and 12·29 per cent. are partially breast feeding for the same period, making a total of 52·39 per cent. of babies who receive a certain proportion of breast milk during the first five months of life. It is indeed heartening to see at last an increasing number of mothers breast feeding their babies for there is nothing to take the place of breast feeding in its value to the child, both from the nourishment standpoint and the protection which the child receives through this medium against infectious diseases.

Expansion.

The Infant Health work has continued to extend, some Sub-Centres having developed into main Centres, and boundaries have been re-allocated in such a way that in several cases two Centres have become three full-time Centres with an extra Sister operating in the areas concerned. This gave increased service to the districts and was much needed.

New Centre buildings with residential quarters for Sisters, which is of great importance in the country districts, are being erected at Beverley and South Bunbury.

There are now 44 full-time Centres and 240 Sub-Centres.

Centres—		
Metropolitan, including Correspondence Scheme	24	
Country	20	
		44
Sub-Centres—		
Metropolitan	93	
Country	147	
		240
Total Centres and Sub-Centres for whole State		284

When any of the Centres are closed through the prevalent shortage of nurses, which happens occasionally, mothers can obtain assistance from the Correspondence Infant Health Sister until their own Centre re-opens.

New Infant Health Buildings.

Work in connection with new Infant Health buildings throughout the State has progressed steadily and markedly. New Centre buildings have been erected and opened at Cannington, Kalamunda, Quairading and Corrigin. Many other districts are formulating their plans and making arrangements for the erection of Infant Health buildings and it is expected that there will be a great deal of activity in this direction during the ensuing 12 months.

Correspondence Section.

The Correspondence Sister, as well as carrying out the work already specified in her office, has paid regular visits to the North-West as far north as Port Hedland, including the rapidly growing settlement of Wittenoom Gorge. This Sister has also made regular visits to the Murchison district extending along the line as far as Meekatharra. Owing to transport difficulties and the time available in order to keep to a schedule, Wiluna was not visited this year, but arrangements have now been made to include Wiluna in the next visit to the North-West. Most of the travel on these visits has to be done by air.

Three trips were made during the year, in May, August and October-November. The trips to the North-West usually take about 1½ weeks and to the Murchison one week.

During these visits Sister examines as many pre-school children as possible, as well as all babies in the area.

The Correspondence Sister, in addition to giving service to all mothers in the districts mentioned, keeps in contact with all mothers in isolated and scattered areas throughout the State. In addition, when a Centre shuts down the mothers in the district affected are contacted and invited to keep in touch with this Sister until a new Sister is supplied. By this means a complete coverage can be given in Infant Health work throughout the State.

North-West.

The Infant Health Sister who was stationed in the North-West and whose duty it was to give Infant Health service to the babies at Wyndham, Derby and Broome has resigned, and it is felt that the continuation of such an appointment is no longer justified. Experience has now shown that there are not sufficient babies in the area to justify a full-time Sister and that the work can be carried out equally satisfactorily by the visits from the Correspondence Sister and by the Correspondence section, which has previously done so for many years. In fact the Correspondence section has certain advantages in as much as continuity of the work can always be guaranteed, whereas the Sister who was stationed in the North-West, owing to the fact that there was not sufficient Infant Health work to occupy her, was used for other purposes and consequently the continuity and reliability of the Infant Health work was interfered with.

Mothercraft Lectures.

These lectures were continued throughout the year and were organised in such a manner that the various Infant Health Sisters in the country gave lectures to the students at the High Schools in their own particular area.

In the metropolitan area a Sister has been appointed whose duty it is to deliver all Mothercraft Lectures in this area.

The service has been offered to Convent Schools but they do not as yet appear interested in the lectures.

Number of children lectured	718
Number of children taking examinations	707
Results—	
Honours	139
Credit	158
Pass	267
Failures	143

All classes instructed attended either an Infant Health Centre to see it in working order or the Mothercraft Corner.

Lectures were also given to St. John Ambulance Junior Cadets and Girl Guides.

Radio Talks.

Radio talks were organised to be put on a network throughout the whole State. Our thanks are due to 6AM, PM for this free service. Special discs have been cut of the talks given by the Infant Health Sisters. These talks are put over on a regular session every week. In Geraldton and Kalgoorlie the local Sister gives the talks direct at the station at the time specified. These radio talks receive very favourable comments, giving a regular and good service to the mothers, but in no way taking the place of visits to the Centre, merely adding to the service already given to mothers.

Infant Mortality.

The infant mortality rate was 28·73 per thousand live births for the year 1951, which is regrettably high in comparison with the Australian figure of 25·23.

	Per thousand live births.
New South Wales	26·29
Victoria	22·61
Queensland	25·63
South Australia	24·51
Tasmania	26·64
Northern Territory	44·23
Australian Capital Territory	11·96

Pre-School Section.

A determined effort is being made by the Infant Health service to interest the mothers in the care of their pre-school children. The Sisters are taking an increasing interest in this section and are endeavouring to work up a pre-school section on certain specified days per month in order to encourage the mothers to bring their pre-school children in for regular supervision.

It is recognised that the pre-school age is a vitally important period in the life of a child and is the one which is often most frequently neglected. The children are given care during infancy by the Infant Health movement and then at six years of age are taken on again and supervised regularly by the School Medical Service, but the intervening pre-school period is, and has been up to the present, a " no man's land."

There is a great necessity for the development of Kindergarten Schools, Nursery Schools and Nursery Classes which could most conveniently be attached to the present infant schools. There are throughout the State 64 Kindergarten Schools, 53 of which are in the metropolitan area, and which are under the administrative control of the Kindergarten Union. It is perhaps to be regretted that such control is not administered either by the Public Health Department or the Education Department, who, up to the present, are not producing any standardised curriculum.

Medical inspection of children in the pre-school ages is scanty and not organised. The School Medical Service is responsible for the supervision of children at a few of the existing Kindergarten schools but in most instances these schools operated by the Kindergarten Union have, at present, their own honorary medical advisers.

Scales.

The position is and has been very difficult in regard to Baby Scales but we have been fortunate in being at least able to import a number of scales from abroad. Steps are now being taken to see whether suitable scales can be imported at a reasonable rate from abroad in future.

Refresher Course.

A Refresher Course was held at the end of the year and it proved a great success and of great benefit to the work and to all those who took part in the meeting. Many compliments have been paid, particularly from outside Doctors and mothers, admiring the uniformity and high standard of the work throughout the whole State.

The Doctors and specialists co-operated valiantly and a fine syllabus was presented. After the course a copy of each lecture was typed and given to the Sisters so that they would have the subject matter for reference.

It is hoped to hold further Refresher Courses during the coming years to enable the Sisters and staff to acquire a knowledge of the modern trends of thought concerning various branches of infant and child health work.

Sisters.

The Infant Health service is fortunate in having an excellent group of Sisters who have worked very well and consistently over a great number of years, also the new Sisters coming in appear to take a great interest in the work and show a desire to stay with us as part of our permanent team, the only exceptions to this are those Sisters who marry. The Sisters in the Infant Health Service are chosen carefully as it is essential that they should have very pleasant personalities, so that the mothers will wish to come to see them. Apparently they are too well chosen and that is why so many are lost by us to matrimony. Nevertheless, some of these Sisters still stay and carry on the work, and the majority of them will, at all events, stay until such time as a substitute has been obtained for their Centres. This is appreciated.

Practically all the Infant Health Centres were open throughout the whole of the year, and where any Centres had to be shut for any reason, various of our ex-Infant Health Sisters, being married and living in the district, came forward to keep the Centre open until a permanent Sister could be obtained. Sisters have now been appointed to the staff for relief work for holidays, sickness, etc. These are not employed permanently but are Sisters who are agreeable to doing work whenever they are needed. Such Sisters are a very great help to the organisation.

Holiday Leave.

All Centres throughout the State will now close down for three weeks after Christmas and New Year, re-opening about the third Monday in January. This will have the advantage of giving the Sisters their holidays at a good time of the year, and the majority of mothers will not be inconvenienced so much as this is the time, particularly in the country districts, that so many go away on their own holidays.

Fremantle, Subiaco, Perth and the Correspondence section will remain open and any mother who has a young baby or who is extremely worried about her child will be able to get in touch with the Sister at one of these Centres and receive help or advice, either by personal visit or telephone.

Lotteries Commission.

The Lotteries Commission have made their special contributions to the Sisters' salaries and to the other expenses involved in the establishment of Centres.

The Commission has also given money towards the cost of the erection of new buildings, and in other cases where they have not assisted with the building they have given money towards the furnishing of the rooms provided. All this help has been most acceptable and the Commission had also been most generous in the provision of new scales, when available, for various Centres.

It is felt and appreciated that the Lotteries Commission carry out their responsibility to the public in a very fair and just way as far as the Infant Health Services are concerned.

Local Infant Health Committees.

Local Infant Health Committees are to be found in many towns or suburbs where there is an Infant Health building. These Committees are responsible for the building, furnishing and cleaning and maintenance of the Centre and also for the purchase of a motor car where one is necessary for the work and that Centre. These Committees are purely honorary and do a great deal of hard work on behalf of the Infant Health activities in their own towns and districts. The grateful thanks of the Department are due for their continued co-operation.

Many people, however, have been on the various Committees for a long time and they say they are finding it increasingly difficult to recruit new members, because the attitude of the public seems to be that as the Federal Government takes a Social Service tax the Infant Health Service should be the financial responsibility of the Government. As a result of this feeling there is a marked tendency for local Committees to disband and hand over the whole of their duties to the Department, and in view of this situation it is hoped that the Local Authorities concerned will see their way to take an increasing interest in the Infant Health Services of their own particular districts. Where there is already a furnished building in existence it is a comparatively easy matter for us to accept this responsibility and carry on, but where a building has to be erected it will be appreciated that the position becomes most difficult.

Local Authorities.

As mentioned previously, Local Authorities are being encouraged to take an increased interest in Infant Health activities and they are now becoming much more sympathetic and in a great number of instances are prepared to accept a definite responsibility towards the work. In some instances they are assuming the role of the Infant Health Committee. This interest is shown more particularly in certain places, for example, Quairading, Beverley, Corrigin, etc., where the Local Authority has raised a loan to find money that the Committee needed for the erection of a building. In other cases Local Authorities have assumed the full responsibility for the planning and erection of the building, and this has happened already at Fremantle, Bunbury, South Bunbury and Kalgoorlie.

Government.

The Government has been very generous to this section of preventive public health work and recognised the value it is to the public. It has granted the requested money for any extra staff necessary for the further expansion of the work and accepts responsibility for the payment of the Sisters' salaries, together with mileage rates, general travelling allowance and petty expenses of the Centres, literature and stationery requirements.

Conclusion.

To sum up, the past year has seen a development in the Infant Health work throughout the whole State and it has been possible to keep practically all Centres open throughout the year, and to keep them operating fully and efficiently.

In addition, the drive for properly built and equipped Infant Health Centres throughout the State has continued with the results as shown in this report on that particular section. It is hoped that this drive will continue and become even more intensive, and that next year and all further years will show even greater results.

G. W. WARD,
Acting Medical Supervisor of Infant Health.

31541—5

Appendix XII.

INFANT HEALTH CENTRES—ATTENDANCES.

Summary of Infant Health Report for year ending 31st December, 1951.	COUNTRY CENTRES.																			
	Albany.	Beverley.*	Boulder.	Bridgetown.*	Bunbury.*	Busselton.*	Corrigin*	Geraldton.	Kalgoorlie.	Katanning.	Kellerberrin.	Manjimup.	Moora.	Narrogin.	Norseman.	Northam.	Three Springs.	Wagin.	Waroona.	Broome-Derby.*	Wyalkatchem.
Births Reported	370	179	271	153	249	371	151	313	483	267	52	249	114	220	80	349	223	390	335	73	179
Total No. of Individual Babes who attended	597	327	320	522	392	491	408	426	566	284	129	422	222	440	80	424	409	476	666	707	1,112
Total Attendance	5,118	3,176	3,566	1,440	2,092	3,285	2,633	3,369	6,231	2,457	1,450	3,781	1,252	3,365	1,586	3,424	3,583	4,954	4,988	2,104	2,452
No. of Individual Expectant Mothers advised	15	17	10	....	2	15	10	10	35	2	1	12	7	8	8	3	60	5	23	102	13
Total No. of Home Visits	538	346	456	31	308	3	77	573	780	237	217	270	....	484	543	1,176	324	18	280	873	165
No. referred to Doctor or Hospital— (a) Babes	109	31	33	7	9	22	212	51	148	14	7	40	18	37	....	27	59	25	44	105	23
(b) Mothers	24	6	4	1	2	4	166	12	53	....	....	5	4	7	12	....	27	1	9	29	61
No. of Letters and Telephone Calls re Advice	141	75	34	37	30	38	186	94	197	92	....	23	4	51	6	35	264	32	1	90	10
Feeding under 9 months— Breast	70	46	71	92	61	123	58	48	92	99	12	67	64	87	29	89	54	71	82	83	161
Complementary	23	15	9	27	13	23	15	25	44	5	2	23	12	17	2	24	14	28	38	16	56
Artificially Fed— Cows Milk	74	12	2	41	9	60	12	6	2	21	5	27	12	44	....	16	4	55	21	3	73
Cows Milk Dried	60	21	50	53	....	62	27	71	109	46	13	21	26	64	35	71	41	80	67	42	89
Cows Milk Condensed	2	2	....	2	1	8	....	3	5	....	....	3	....	....	....	7	....	10	6	....	4
Patent Foods	....	2	....	12	44	....	2	....	2	....	....	2	....	3	....	....	3	2	....	....	....
Educational Diets	....	60	11	114	....	51	52	....	....	....	25	....	....	100	....	....	....	46	....	56	256
Total	229	158	143	341	128	327	166	153	254	171	57	143	114	315	66	207	116	292	214	200	639
Percentage of Breast Fed Babies born between 1st January, 1951, and 31st December, 1951— (a) Fully Breast Fed	31·69	37·70	31·93	39·9	†	43·92	49·74	9·62	36·07	33·04	38·52	41·41	58·50	38·07	†	40·00	45·80	29·79	30·83	†	41·53
(b) Breast Fed and Complementary— 5 months period	12·67	10·29	7·83	7·77	†	8·79	10·05	13·90	14·28	3·43	13·11	20·71	8·00	9·68	†	8·63	13·80	11·70	13·91	†	4·24

* Centre Temporarily Closed.

† Not available.

Busselton 4 months, Moora 6 months, Bunbury 4 months, Corrigin 4 months, Bridgetown 1 month, Beverley 1 month, Broome and Derby 1 month, carried on by correspondence.

Appendix XII.—*continued.*

Summary of Infant Health Report for year ended 31st December, 1951.	Metropolitan Centres.																								
	Armadale.	Bicton.	Claremont.	Cottesloe.	East Fremantle.	East Victoria Park.	Fremantle.	Hollywood.	Inglewood.	Kalamunda.	Kensington.	Maylands.	Midland Jct.	Mt. Hawthorn.	Mundaring.	Nedlands.	North Perth.	Osborne Park.	Perth.	South Perth.	Subiaco.	Victoria Park.	Wembley.	Total.	Total for Previous Year.
Births Reported	304	350	173	335	227	321	638	191	288	314	255	422	372	317	187	117	544	447	603	221	275	505	313	12,790	12,290
Total No. of Individual Babes who attended	406	597	468	575	426	450	1,084	285	631	582	531	599	530	631	421	251	634	555	590	442	714	619	441	21,879	20,075
Total Attendance	3,927	5,058	4,856	5,354	3,387	4,501	8,868	4,216	6,079	5,432	5,369	5,711	4,527	5,728	5,037	3,232	6,905	5,043	5,070	5,569	5,143	6,150	5,211	186,679	188,322
No. of Individual Expectant Mothers advised	7	23	28	....	6	....	52	2	16	5	26	29	7	21	54	12	25	3	30	31	31	45	2	813	879
Total No. of Home Visits	547	310	942	565	571	216	562	572	568	311	207	408	155	691	1,415	247	694	904	550	298	719	264	380	19,795	20,301
No. referred to Doctor or Hospital—(a) Babes	28	46	45	34	74	25	262	37	67	30	24	75	112	27	43	18	90	73	59	67	194	94	21	2,566	2,550
(b) Mothers	3	16	22	13	19	1	29	9	6	4	5	10	4	27	11	4	9	4	5	3	98	23	1	753	670
No. of Letters and Telephone Calls re Advice	17	37	524	117	9	23	113	....	289	45	16	8	9	2	29	254	224	13	298	294	15	317	53	4,146	3,872
Feeding under 9 months—Breast	76	110	128	89	115	132	201	136	178	62	346	174	100	114	74	62	122	136	234	73	127	116	70	4,534	3,987
Complementary	24	30	14	14	15	23	39	10	30	27	38	19	28	9	18	8	43	25	33	12	4	14	12	920	931
Artificially Fed—Cows Milk	55	9	30	21	21	66	30	29	70	32	143	84	29	58	22	23	50	32	60	43	27	46	34	1,513	1,319
Cows Milk Dried	56	12	77	24	60	82	130	49	70	70	141	78	70	59	49	13	68	65	102	27	38	70	36	2,494	2,429
Cows Milk Condensed	1	1	1	....	....	5	4	1	5	5	9	19	2	13	3	5	3	....	9	1	3	5	7	155	177
Patent Foods	5	6	....	3	9	....	3	....	....	....	12	....	1	8	6	....	....	....	5	6	....	6	1	143	53
Educational Diets	120	62	....	....	145	....	1	85	....	....	329	....	....	141	....	....	....	....	68	68	....	....	....	1,790	1,238
Total	337	230	250	151	365	308	408	310	353	196	1,018	374	230	402	172	111	286	258	511	230	199	257	160	11,549	10,134
Percentage of Breast Fed Babies born between 1st January, 1951, and 31st December, 1951—(a) Fully Breast Fed	36·36	50·54	67·47	43·35	49·54	35·75	37·29	31·90	19·43	31·71	53·16	41·07	43·54	52·80	30·17	50·00	39·39	45·69	30·67	10·73	58·31	50·00	38·57	‡40·14	‡28·31
(b) Breast Fed and Complementary—5 months period	13·63	14·54	4·82	13·69	10·65	13·04	14·49	22·41	6·07	8·54	3·37	14·29	51·23	9·87	13·90	15·24	6·89	9·93	18·42	7·39	12·39	8·47	18·22	‡12·25	‡20·82

‡ Average.

APPENDIX XIII.

SCHOOL MEDICAL SERVICE.

To the Commissioner of Public Health.

I have the honour to submit a report on the School Medical Service in Western Australia for the year 1951.

The year 1951 has seen a further expansion in the School Medical Service. The total staff is now six full-time Doctors and eight full-time Nurses. With this staff it is now possible to give a thorough medical examination to every child in all the High Schools, State Schools and Convent Schools throughout the country and metropolitan area once every two years. The schools where fees are paid have not been examined in the past but a comprehensive examination of all children attending schools where fees are paid is now being considered and may be instituted in the near future.

At present children in Kindergartens are only given a medical examination by the School Medical Officers on request.

For the year under consideration 46,171 school children were examined, of which 13,477 were in the country districts and 32,694 were in the metropolitan area. The number of children of school age throughout Western Australia in Convents, Primary and High Schools was 94,617.

The number examined reflects very creditably on the School Medical Staff, all of whom worked wholeheartedly throughout the year.

Of the total number of children examined 19,480 were notified as having some defect, the majority of the defects being of a slight nature and requiring home attention or observation. By observation is meant that the parents were told to watch a certain condition and if it got worse then to obtain medical attention.

Out of the total figure examined only 4,752 were referred for medical attention. This is very satisfactory and suggests that the previous years of School Medical Service are beginning to show definite results.

Nine thousand nine hundred and four children were referred for dental attention. This high proportion means that more than 20 per cent. of the children were suffering from dental defects.

It is interesting to note that a comparatively small number of children were referred for throat and nose defects, 510 being in the country districts and 639 in the metropolitan area. One thousand six hundred and fourteen children were referred for eye defects ; a great number, in contrast to the previous year, were found to be in the metropolitan area, 1,107, as against 507 in the country districts, though it must be remembered that more than twice as many children were examined in the metropolitan area as compared with the country area.

The remainder of the children who were referred for medical attention were suffering from a variety of troubles, such as heart defects, rheumatism, skin complaints, etc.

Nutrition.

Of the total number of children examined it was found that 39,209 were of normal nutrition, 4,457 were above normal standard and 2,508, that is 6·5 per cent., were below standard nutrition. This figure is a great improvement on the figure for 1950 but it is a pity that there are still understandard children in this country of good food and high wages. This does not, of course, mean that the children were grossly below standard, nor do I think it means that they are not getting enough to eat, but it means possibly that they are not getting the right type of food. There is still room for more education in the teaching of parents regarding the proper food to give the children. In this connection it is interesting to note that the Oslo Lunch project continued to gain ground, though more slowly than perhaps we would like, but each year more schools are incorporating it as part of their normal school activities.

The extent to which the project spreads still further will depend largely on the teachers in charge of the schools. It is they, as a general rule, who are the deciding factor. If the Head Teacher is keen, the scheme gets under way and then the Oslo Lunch Committee take it over and do the necessary work involved. As a result of their activities the Oslo Lunch Committees are usually able to provide the children with a very satisfactory lunch for 9d. to 1s. per day and I venture to say that it is a better lunch than most adults can provide for the same figure.

During the winter time the children are, in addition, given a large bowl of hot vegetable soup and this is usually included in the above price. Some Committees are also anticipating that, instead of giving the milk as milk, they may be able to heat it up with cocoa in order to give the children the increased fat and warmth during the cold weather.

North-West.

In the majority of the schools in the North-West the children were examined by the local Doctors. This work will be continued.

School Nurses.

There were no additions to the School Nursing staff during the year but all the staff is now fully trained and is available for work with the School Doctors, for home visiting, hygiene examinations in the schools and for some office duties.

Home Visiting.

The home visiting, or followup section, is considered of vital importance in the School Medical Service, because as a result of these home visits a great deal of the recommended attention is obtained. Many of the parents do not understand what is the matter with their children, but when explained kindly, intelligently, and sympathetically, by the School Nurse, it puts a completely different aspect on the problem and willing and active co-operation can then be obtained.

A great number of these home visits are paid during the school holidays when the full staff of School Nurses is available for this purpose. Admittedly, this is not a very good time for these visits, as the mothers are frequently away with the children on holiday trips, but there remains a great percentage of mothers still available to be seen.

One thousand seven hundred and seventy home visits were paid, of which 1,747 were in connection with children who required medical attention. Of this number it is pleasing to note that 704 of the children had already had the medical attention and 481 promised to obtain it. Thirty-five were, unfortunately, quite disinterested, but they will be persevered with. Also the others who promised medical attention will be followed up to see that it is obtained. Of the visits paid 527 parents were either out or had left the district. At the moment there appears to be a large number of " floating " families about, particularly amongst the migrant section of the population.

Child Hygiene.

Very close supervision is kept by the School Nurses on the cleanliness of the schools, particularly with regard to pediculosis or head infections. Through consistent action in this matter, the percentage of dirty heads in the State Schools has been brought down from 14·8 per cent. in 1925, to ·69 per cent. in 1951, and in the Convents from 28·5 per cent. to ·82 per-cent. for 1951.

This great improvement has only come about through the persistent efforts of the nurses, together with full co-operation from the teachers in the schools. It would be pleasing to be able to report that the pediculosis percentage for the State was nil, but it is doubtful whether this will ever occur until the millenium.

It is most noticeable that, as the " head cleanliness " of a family improves, so does the whole general cleanliness, *e.g.*, body, clothes, etc., and their attitude to life is improved, and self-respect is born or revived.

Correspondence Classes.

Close co-operation between the School Medical Service and the Correspondence Classes is now existing, as the Education Department is notified by us concerning the different country districts that the School Medical Officers will visit, and approximately the time that they are expected to be there. The Correspondence section in turn notifies those of its pupils who are living in proximity to any one school, and requests them to keep in touch with the Head Teacher of that school in order to ascertain when the medical examination is to take place, and in due course to present themselves at that time, so that they can participate in the general medical examination.

CONCLUSION.

During the past year it has been repeatedly suggested by the various bodies, and in particular the Parents' and Citizens' Association, that all school children should be given a yearly medical examination. This I think, even if the necessary staff was available, would be unnecessary, because the average school child is a healthy creature and once any of the common defects which may have been present have been detected and treated, then generally speaking, the child should progress normally and healthily through to adult life. A yearly examination would be very largely a waste of time, but a thorough general medical examination every two years has proved, and will prove more so in the future, most beneficial, as it enables a close check to be kept on all children. It is the function of the family Doctor to be the guide and protector of the children of his patients, and in the majority of cases this means the children of his district.

The function of the School Medical Service is to keep a general check on the children's physical condition, and draw the attention of the parents to any particular defect of which they were apparently not aware. Any unexpected condition of a serious nature arising between the two school medical examinations should be within the direct province of the local or family Doctor, and the School Medical Service is always most appreciative of the co-operation which they receive from these Doctors.

The School Nurses go to all the schools established in the metropolitan and sub-metropolitan areas at least once, if not more often, during the year, and any cases which might be worrying the teacher can then be brought to the nurse's attention, who in turn can bring them to the notice of the Department, and arrangements made for a special examination of the children concerned. In this way one can claim that a yearly supervision is given, making it unnecessary to do a full medical examination of the whole school more frequently than at the previously stated two yearly interval.

Furthermore, the teachers know that in the event of any epidemic arising, they only have to notify the Department and one of the Medical Officers will immediately go out and make a complete check of those children about whom they might be worried. Such calls are made to us from time to time throughout the year. Thus it can be seen that there is in existence a close liaison between the Education Department and the Department of Public Health.

Health Camps.

For many years I have been stressing the need for permanent Health Camps to be established in this State where the delicate, but not sick, children can go for varying periods, up to six months, although two months might perhaps be taken as the average, in order to have their health built up. At such camps the children would be kept under close medical supervision. They would have a certain amount of schooling, but the main emphasis is on health rehabilitation. Once their health has been brought up to required standard, then the children could be returned to their homes and to their ordinary schools. We have not, at present, got even one such health camp in this State, and I think at least one, and probably more, is a real necessity for any large organised community.

The School Medical Service is a very specialised one, and is also one that is of the utmost value to the community because its particular function is the early recognition of disease, in other words, recognition of disease before either the parents or the child himself realises that anything abnormal is present. As a consequence of this early recognition and early treatment, a great deal of sickness can be spared both the individual and the community. The School Medical Service, since its recent enlargement, and re-organisation, is now one that can take its place as an equal with similar services elsewhere. But one thing which we are still lacking and which we badly need, is, as has been already mentioned, a health camp for the health rehabilitation of the sub-standard child.

G. W. WARD,
Acting Senior Medical Officer of Schools.

Appendix XIV.

SCHOOL MEDICAL SERVICE.

Examination of Metropolitan and Country Schools, 1951.

——	No. Examined.	No. Notified.	No. referred for Medical Attention.	No. referred for Home Attention and Observation.	No. requiring Dental Attention.	Recalls.	Skin Complaints.		Nutrition.			Eyes Medical Attention.	Tonsils Medical Attention.
							No.	%	3.	Under 3.	Over 3.		
Metropolitan Schools.													
Boys	16,234	7,252	1,604	3,728	3,394	24	....	....	13,929	1,301	1,004	....	....
Girls	16,460	7,209	1,686	3,591	3,556	27	....	....	14,187	774	1,499	....	....
Total	32,694	14,461	3,290	7,319	6,950	51	1,573	4·8	28,116	2,075	2,503	1,107	639
Country Schools.													
Boys	6,878	2,487	681	789	1,479	....	....	....	5,943	311	624	....	....
Girls	6,599	2,532	781	1,002	1,511	....	....	....	5,147	122	1,330	....	....
Total	13,477	5,019	1,462	1,791	2,990	....	444	3·2	11,090	433	1,954	507	510
State Totals.													
Boys	23,112	9,739	2,285	4,517	4,873	24	....	....	19,872	1,612	1,628	....	....
Girls	23,059	9,741	2,467	4,593	5,067	27	....	....	19,334	896	2,829	....	....
Total	46,171	19,480	4,752	9,110	9,940	51	2,017	4·3	39,207	2,508	4,457	1,614	1,149

APPENDIX XV.

SCHOOL DENTAL STAFF

The Commissioner of Public Health.

Following is my report on the activities of the School Dental Staff for the year 1951.

STAFF.

During the course of the year the establishment of School Dental Officers was raised to 14 and at one period it seemed likely that we would go very close to filling all positions ; however at the end of the year the situation deteriorated because of two resignations and the certainty of two more early in 1952. It seems that it is too easy nowadays for men to make a very good living in comfortable circumstances by practising privately in contrast to the travelling which our men have to undertake.

EQUIPMENT.

Delivery was taken of four Trailer surgeries making the total nine whilst three more have been ordered ; these are proving particularly valuable now, since our older method of setting up a temporary surgery in a school room is becoming more difficult with the large increase of children attending school ; Head Teachers can now seldom spare us a room in which to work.

COUNTRY WORK.

In addition to normal country itineraries it has been possible to treat a large number of outback children who attended the Summer Camp Schools at Pt. Peron, Esperance and Albany. Our dentists worked at these camps for their duration.

Another tour of North-West towns was also undertaken—the third since 1945 ; on these occasions adults as well as children were given the opportunity of receiving treatment.

It might not be out of place to repeat an article which I have written for the Teachers' Journal since the information provided may be of general interest ; it is as follows :—

> " It is quite likely that within the next year or two most members of the teaching staff will be coming into close contact with the work of the Dental Officers. Consequently a short account of the methods and scope of the School Dental Service may be appreciated by teachers.

STAFF.

Nine dentists are, or will be, based on country towns such as Geraldton, Kalgoorlie, Bunbury, Manjimup, Albany, Wagin, Narrogin, Merredin and Northam and each man will visit from 25 to 30 schools within a radius of from 100 to 200 miles from his headquarters. The towns mentioned will not necessarily be those finally chosen because a lot will depend upon the availability of living accommodation.

Four dentists are based on Perth ; these spend approximately six months each year on country itineraries which may be in any part of the State according to factors such as length of time since the previous visit and isolation from private dental facilities. They spend the other six months of each year in Metropolitan and suburban schools.

One dentist is engaged on Institutional work in addition to the administration of the total Dental Service.

Frequency of Visits.—An endeavour is being made to have each man visit each school in his district at least once every two years.

Children to be Seen.—As it would be impossible to obtain a staff large enough to attend all children in the State, it was found imperative to make an age limit at the larger schools, as follows :—

Classes 1, 2 and 3 schools—Children who are under 8 years are attended.

Class 4 and 5 schools—Under 10 years.

Class 6 and 7 schools—All children are attended.

The dentists, however, have discretion to alter the age groups at some of the medium sized places according to the local circumstances then prevailing.

Procedure.

(a) On arrival at a school a Dental Officer examines all the children concerned ; to those in need of dental attention notices are given to take home to their parents. These notices are worded as follows :—

> " I have to advise you that your child....., is in need of dental attention. The work may done by your private dentist if you so wish it. If not, and you would like me to do the necessary work (which may include extractions and fillings), free of charge, will you please sign your name in the space provided below and return this form to the school."

When these notices are returned to the school the Dental Officer begins operative work on the children.

(b) Quite often in the case of small schools, notices are forwarded to the Head Teachers before the arrival of the Dentist. These are worded as follows :—

"I shall be visiting your child's school some time in the near future. If I find that your child is in need of dental attention would you like me to do the necessary work, which may include fillings and extractions, free of charge ? If so, please sign your name below and return this form to the school.

If you feel that you would like to discuss the matter with me, will you please indicate it on this form and on my arrival I shall make an appointment for you'"

Then when the Dentist arrives at the school he is able to commence work immediately upon those children who need it and whose parents have consented.

Although dental attention is not compulsory, the examination IS.

Type of Work Done.

Every attempt is made to put each mouth into a healthy condition by discriminate extraction of badly decayed teeth, by the filling of saveable teeth and by prophylaxis ; and it should be noted particularly that as a child at first entry to school normally has a number of deciduous teeth which are not replaced by permanents for 5 or 6 years later, an endeavour is usually made to fill any such deciduous teeth which are decayed and which warrant such procedure.

Surgeries.

The majority of the staff use trailers which they take from school to school by means of a car or utility fitted for towing purposes. These trailers are fitted up as dental surgeries and they contain practically all the necessary apparatus which can be used in such mobile units.

On the other hand several dental officers are not provided with trailers. These men are dependant upon a room at the school or in a nearby building being placed at their disposal ; the equipment is packed into boxes and on arrival at a school it is unpacked and set up in the room provided ; and a collapsable wooden chair is carried instead of the orthodox one. Owing of course to lack of suitable working accommodation at small schools, these "box" men generally confine their activities to large schools and the particular notices which are sent to the Head Teachers concerned are worded approximately as follows :—

"School Dental Officer, Mr....., will be vistiing your school some time in the near future for the purpose of examining children in some of the lower age groups and treating them free of charge if the parents so desire ; it is necessary, therefore, that he should have the use of a room of some sort for perhaps a few weeks.

A room at the school itself would be preferable, but failing that it may be possible to borrow or hire a room in a nearby building. Will you please do what you can for him in that respect ?

You will be notified of the definite date of arrival as soon as that information becomes available."

Assistance.—It has been found impracticable to provide trained assistance for the dental officers ; consequently they work mainly alone. However they are glad to have the assistance of one or two of the older children occasionally for preliminary clerical work and for cleaning up after work each afternoon. Any help which Head Teachers may be able to render in this respect would be greatly appreciated ; it facilitates the work of the itinerants and makes their arduous duties a little more bearable.

School Vacations.—During these periods the dental officers take their annual two weeks leave and for the remainder of the time work in orphanages and Native Settlements."

During the year some research work on fluorine was carried out ; a copy of the report made at its conclusion will be appended.

Facts in regard to the activities of the School Dental Staff for 1951 are as follows :—

Number of country schools visited	124
Number of metropolitan schools visited	29
Number of children examined	8,405
Number of children treated (with parents consent)	5,731
Number of children who needed no attention	1,574
Number who were to be done privately	502
Number whose parents desired no treatment to be done	598

Operations Performed.

Silver Amalgam. Fillings	6,726
Copper Amalgam. Fillings	1,564
Cement fillings	1,147
Porcelain fillings	618
Silver Nitrate treatments	2,109
Other conservative treatments	4,557
Extractions	12,921
Prophylaxis	765
Talks and personal interviews	505

At certain Government Institutions work was done by the Senior Dental Officer as follows :—

Wooroloo Sanatorium.

Number of visits by patients to surgery	356
Extractions	121
Fillings and other conservative work	34
Prophylaxis	16
New Dentures	25
Repairs to dentures	12
Other treatments	148

Mental Hospitals.

Patients visits	323
Extractions	178
Prophylaxis	9
New Dentures	16
Repairs to dentures	36
Other treatments	84

Prisons.

Patients visits	223
Extractions	92
Fillings	20
Prophylaxis	3
New dentures	9
Repairs to dentures	13
Other treatments	86

Inmates of prisons paid fees for any work done and even then it had to be considered necessary by the medical officer.

FLUORINE REPORT.

On 5th October, 1950, an investigation of the relationship, if any, between dental caries and the fluorine content of water in this State was initiated. Accordingly the gathering of samples of drinking water from many parts of the State was begun for the purpose of analysis and at the same time figures in connection with the incidence of tooth decay at the same centres were abstracted from the records of examinations conducted in past years ; the work in connection with the water samples having been completed in October, 1951, I now submit a number of facts together with a table of figures.

General Notes.

It has been stated on several occasions by research workers in America, Australia and elsewhere that :—

(1) A concentration of about 1 part per million of fluorine in drinking water is likely to have a beneficial influence on the production of teeth which will be resistant to decay.

(2) That more than 1 part per million is likely to produce " mottling " of the teeth but these teeth are likely to be more resistant to decay than teeth from fluorine free areas.

Dr. Arnold of the United States Health Service stated in July, 1943, that experimenters are convinced that if 1 part per million of fluorine were added to fluorine free public drinking water, it would do much to inhibit dental caries in large centres of population ; and experiments to this end are being carried out in several cities.

On the other hand, an extract from " Food and Nutrition Notes and Reviews," Vol. 8, No. 304, states :—

Teeth.—An inadequate intake of fluorine during the first six years of life does not appear to predispose to caries.

In Queensland a definite belt of fluorine country has been proved where the drinking water from bores has been shown by analysis to contain from 1 to 3 parts per million of fluorine and where the children have been shown by examination to have much better teeth than in the remainder of Queensland ; and during a visit to that State in 1950, I was shown by a Dental Officer who had been working in that belt, figures which he had gathered in his own examination of the children.

The number of children with perfect sets of teeth was remarkable, ranging from 19 per cent. to 26 per cent. at various schools. In our State, as will be demonstrated later, the only places which can show comparable figures are those where native children have influenced the calculations.

In our Departmental Report for 1948, Dr. E. G. Saint of Port Hedland showed :—

(1) That the drinking water on two pastoral properties about 150 miles South-East of Port Hedland contained fluorine in quantities of 10 P.P.M. and 2 P.P.M. respectively.

(2) That the children of families who have lived on these stations for many years showed signs of fluorosis in their teeth.

With the foregoing facts in mind I proceed now to our own investigation.

TABLES.

These are graded according to the amount of fluorine found, the highest concentration (at Marble Bar) coming first and the lowest (at Pingelly) being last.

An explanation of the headings of different columns is as follows :—

Column A. Name of Town.
B. Source of drinking water.
C. Parts per million of fluorine found in the water (P.P.M.).
D. Percentage of children with sound teeth (no signs of decay, no premature loss of teeth and no teeth filled).
E. Average number of decayed, prematurely missing or filled teeth per child (D.M.F.).

A.	B.	C.	D.	E.
Town.	Source of water.	P.P.M. Fluorine.	Per cent. of Sound Mouths.	Average D.M.F. per child.
Cue	Bore	1·25	8·9	4·89
Marble Bar	Well	1·0	35·0	3·21
Leonora	Well	0·5	14·3	5·77
Gingin	Well or Bore	0·45	4·4	7·88
Roebourne	Bore	0·4	26·7	4·29
Big Bell	Bore	0·4	....	4·45
Broome	Bore	0·35	14·0	3·58
Busselton	Bore	0·35	3·2	6·91
Brookton	Dam (rain)	0·3	5·0	8·8
Katanning	Catchment (rain)	0·3	3·0	7·66
Derby	Bore	0·3	13·1	4·71
Bunbury	Bore	0·25	7·6	7·96
Meekatharra	Bore	0·25	12·7	4·78
Wiluna	Bore	0·25	13·3	5·58
Morawa	Tank	0·2	6·0	7·35
Mt. Magnet	Bore	0·2	4·1	5·78
Narembeen	Dam (rain)	0·2	6·7	9·43
Wittenoom Gorge	Bore	0·18	....	2·0
Mullewa	Bore	0·15	....	6·41
Port Hedland	Well	0·14	16·1	5·9
Moora	Bore	0·12	*Nil*	7·94
Esperance	Well and Tank	0·1	1·5	9·68
Pemberton	River	0·1	3·5	7·38
Gnowangerup	Tank	0·1	4·8	8·4
Kalgoorlie	Pipe Line	0·1	5·7	8·8
Laverton	Tank	0·1	4·1	4·76
Dalwallinu	Tank	0·1	1·9	7·98
Balingup	Tank	0·1	4·3	6·78
Salmon Gums	Dam	0·1	....	9·2
Northampton	Tank	0·1	4·0	8·65
Wyalkatchem	Tank	0·1	2·1	10·12
Ballidu	Tank	0·1	....	5·0
Bridgetown	Tank	0·1	6·0	7·95
Beverley	Tank	0·08	7·0	6·49
Harvey	River	0·08	2·1	8·22
Cowaramup	Tank	0·08	0·8	7·51
Wagin	Tank	0·08	7·1	....
Waroona	River	0·08	2·4	7·07
Tambellup	Tank	0·08	7·6	8·76
Margaret River	Tank	0·07	2·1	7·06
Corrigin	Tank	0·07	9·1	6·33
Dowerin	Tank	0·07	5·0	9·36
Brunswick	Tank	0·06	5·4	7·32
Mornington	Catchment (rain)	0·06	*Nil*	9·1
Yarloop	River	0·06	2·1	9·42
Coolgardie	Pipe Line	0·06	....	9·87
Kulin	Tank	0·06	2·8	7·4

A.	B.	C.	D.	E.
Town.	Source of water.	P.P.M. Fluorine.	Per cent. of Sound Mouths.	Average D.M.F. per child.
Pinjarra	River	0·06	1·1	9·22
Donnybrook	Tank	0·06	1·9	8·41
Narrogin	Tank	0·06	4·5	7·46
Sandstone	Tank	0·06	....	2·8
Mt. Barker	Tank	0·06	4·4	9·68
Nannup	Tank	0·05	3·6	8·46
Mandurah	Tank	0·05	....	8·54
Kojonup	Tank	0·05	7·5	8·16
Yornup	Tank	0·05	....	9·8
Albany	River	0·05	1·6	10·03
Holyoak	Tank	0·05	4·1	9·6
Greenbushes	Tank	0·05	1·5	8·0
Boyup	Dam	0·05	8·0	7·17
Mukinbudin	Tank	0·04	7·9	9·73
Menzies	Dam	0·04	2·8	8·16
Boyanup	Tank	0·04	8·0	5·37
Pithara	Tank	0·04	....	6·0
Koorda	Tank	0·04	5·5	6·84
Geraldton	Tank	0·04	5·0	8·49
Brookton	Tank	0·04	1·0	8·8
Toodyay	Pipe Line	0·02	5·0	8·38
Rockingham	Tank	0·02	6·5	6·0
Capel	Tank	0·02	6·0	7·4
Denmark	Tank	0·02	3·6	8·69
Jarrahdale	Tank	0·02	8·6	8·5
Quairading	Tank and Pipe Line	0·02	....	6·88
Three Springs	Tank	0·02	3·4	7·86
Williams	Tank	0·02	9·6	5·82
Norseman	Pipe Line	0·02	3·8	7·76
Ravensthorpe	Tank	0·02	11·1	7·05
Perenjori	Tank	0·02	5·6	4·5
Newdegate	Tank	0·02	2·1	6·6
Dumbleyung	Tank	0·02	4·0	7·57
Collie	River and Tank	0·02	2·4	8·99
Kondinin	Dam	0·02	10·0	6·44
Roelands	Tank	0·02	*Nil*	3·6
Boulder	Pipe Line	0·02	2·9	9·78
Jardee	River	*Nil*	9·0	6·98
Manjimup	Tank	*Nil*	3·1	6·62
Deanmill	Tank	*Nil*	....	11·6
Southern Cross	Pipe Line	*Nil*	3·5	7·77
Bullfinch	Pipe Line	*Nil*	....	....
Bruce Rock	Pipe Line	*Nil*	6·7	7·84
Pingelly	Tank	*Nil*	....	8·14

As a comparison with the rest of the State in general, following are some figures from the Metropolitan Area.

A.	B.	C.	D.	E.
School.	Source of supply.	P.P.M. Fluorine.	Per cent. of Sound Mouths.	Average D.M.F. per child.
Fremantle	Reservoirs on hill streams plus artesian water in the summer	Less than 1 part per million	0·9	9·5
East Perth			4·0	7·8
Inglewood			3·5	7·7
Victoria Park			2·9	8·6
Mt. Hawthorn			3·5	7·7
South Perth			5·0	8·4
Claremont			4·7	9·2
Applecross			6·0	7·6
Guildford			3·5	7·9
Maylands			4·8	7·7

Not many towns drawing their supply from the Mundaring Weir-Goldfields Pipe Line were sampled but as seen in the table below there is a variation in the amount of fluorine which seems to have been influenced by the mains themselves or the local piping, after leaving Southern Cross.

A.	B.	C.	D.	E.
Town.	Source of Water.	P.P.M. Fluorine.	Per cent. of Mouths.	Average D.M.F. per Child.
Kalgoorlie	Pipe Line	0·1	5·7	8·8
Coolgardie		0·06	....	9·87
Norseman		0·02	3·8	7·76
Boulder		0·02	2·9	9·78
Southern Cross		Nil	3·5	7·77
Bruce Rock		Nil	6·7	7·84

Points to be noted when studying the tables are as follows :

Only places which had settled communities for many years were selected for investigation.

Water samples were obtained during 1951.

The figures in columns D. and E. were obtained from examinations conducted at odd intervals during the past 20 years.

The number of children involved were not very great except at large towns.

Ages of children examined were mainly, five, six and seven. However the average D.M.F. figure for these groups was 8·5, while the D.M.F. figures for children of all ages in this State (derived from very small schools where all ages are examined and treated) is 7·9. Therefore the fact of having dealt mainly with lower age groups in our tables can be disregarded in reaching any conclusion.

Examination of children was by probe and mirror only and by a number of different men.

Facts obtained after a study of the Tables.

Most of the higher concentrations of fluorine occur (as would be expected) in water taken from bores or wells.

In only two places has there been a concentration of one part or more per million—Marble Bar and Cue. At these places and at two more where a fair amount of fluorine was proved, the D.M.F. figures are low, as shown below :—

—	P.P.M.	D.M.F.
Cue	1·25	4·89
Marble Bar	1·0	3·21
Broome	0·4	3·58
Derby	0·3	4·71

But, D.M.F. figures just as low appear at towns where the concentration of fluorine in not high, for instance :—

—	P.P.M.	D.M.F.
Roelands	0·02	3·6
Boyanup	0·04	5·3
Laverton	0·1	4·7
Ballidu	0·1	5·0

On the other hand at some of the places which had a comparatively large amount of fluorine in the water, no beneficial result was shown in the teeth—the D.M.F. figures were comparatively high :—

—	P.P.M.	D.M.F.
Gingin	0·45	7·88
Busselton	0·35	6·91
Brookton	0·3	8·8
Katanning	0·3	7·66
Bunbury	0·25	7·96

I am sure that the low D.M.F. figures at some towns such as Marble Bar, Laverton and Roelands are influenced, not by the amount of fluorine present, but by the fact that a number of children with native blood attended those schools.

Now let us examine schools at which the percentage of mouths with all sound teeth was higher than nine and compare the concentrations of fluorine.

—	Percentage of Sound Mouths.	P.P.M. Fluorine.
Marble Bar	35·0	1·0
Roebourne	26·0	0·4
Leonora	14·0	0·5
Broome	14·0	0·35
Wiluna	14·0	0·25
Derby	13·3	0·3
Meekatharra	12·7	0·25
Ravensthorpe	11·1	0·02
Kondinin	10·0	0·02

Although there is a slight significance in this table which attaches the higher P.P.M. fluorine to the higher percentages of sound mouths, it could again be explained by the influence of native children. The fact remains that high percentages of sound mouths come from places with low amounts of fluorine as well as from places with high amounts.

We can also show that some towns with the higher concentrations of fluorine had very small percentages of sound mouths :—

—	Percentage of Sound Mouths.	P.P.M. Fluorine.
Gingin	4·4	0·45
Busselton	3·2	0·35
Brookton	5·0	0·3
Katanning	3·0	0·3
Mt. Magnet	4·1	0·2

Tank Water.

Figures taken from towns where the drinking water is mainly from tanks vary quite a lot as will be seen from the following two examples :—

Wyalkatchem—had a very low number of sound mouths (2·1%) and a very high D.M.F. figure (10·12).

On the other hand :—

Corrigin—had a high number of sound mouths (9·1%) and a correspondingly low D.M.F. (6·33).

Conclusions.

(1) Except for two or three very small and isolated places there is no significant concentration of fluorine in any settled areas in this State.

(2) There is little variation in the incidence of tooth decay except what is probably due to the effect of children with native blood having been included in the survey.

A. G. McKENNA,
Senior Dental Officer.

APPENDIX XVI.

FOOD AND INSPECTORIAL STAFF.

The shortage of qualified Inspectors was responsible for the Department being unable to meet all its commitments with local authorities, with whom it had contracted to provide health supervision. A Departmental Inspector made the usual yearly visit to the North and North-West.

The Annual Conference of Health Inspectors employed by local health authorities was held in Perth on the 12th and 13th July, 1951. The conference was opened by the Hon. Minister for Health, Dame Florence Cardell-Oliver. The following lectures and addresses were delivered to a large and appreciative audience.

"The Inspector's Role in Health Administration" by Dr. Linley Henzell, Commissioner of Public Health.

"Architecture and Buildings" by A. C. Douglas, A.R.A.I.A.

"Modern Trends in Insecticides" by S. Davies, Industrial Chemist of the I.C.I.

"Insect Pests in relation to Public Health" by C. F. H. Jenkins, M.A.—Government Entomologist.

"Some Causes and Aspects of River Pollution" by E. A. Rogerson, B.Sc., A.M.I.E. (Aust.).

Two meetings of the Food and Drugs Standards Advisory Committee were held during 1951. On the advice of the Committee the following amendments were made to the Food and Drug Regulations.

Regulation 4 was amended by adding a paragraph prohibiting the sale of refrigerators with inferior plating of cadmium.

Regulations 36 and 37 relating to butter and cheese were amended to conform with the standards provided for these commodities in regulations made under the Dairy Industry Act.

Regulation 4 was amended to regulate the addition of preservative to mixed food stuffs.

Regulation 6 was amended to prohibit food bottles and receptacles being used to contain kerosene or other contaminating matter.

Regulations 32 and 57 were amended to provide for the plate count method to be used in bacteriological analyses of milk.

Regulation 53 was amended to permit a maximum of 21 grains of sulphur dioxide preservative in dried fruits.

Information relating to meat inspection carried out by Departmental Inspectors is included in Appendix XXX.

Food Samples submitted during 1951.

——	Number of Samples.	Number Failing to Comply with Regulations.
Chemical and bacteriological Analyses—		
Milk	96	26
Chemical Analysis—		
Tomato Soup	14	....
Sausages	2	1
Liquid Jelly Crystal	1	....
Water	28	11
Mynex	1	....
Milk and Chocolate	1	1
Mince Meat	10	4
Celery	1	1
Split Peas	4	....
Haricot Beans	1	....
Syrup of Coffee and Chicory	1	....
Tinned Cherries	1	....
Total	65	18
GRAND TOTAL of all samples	161	44

Prosecutions.

No prosecutions relating to food were initiated by the Department during 1951.

Imported Fish.

Fish of a total weight of 1,417,200 lb. was imported. The inspection fees amounted to £506 8s. 7d.

Condemnations.

Appended hereunder are details of food condemned at the Fremantle wharf by the Department's Inspector.

15 sacks Oatmeal.
27 cases Dates.
74 bags Onions.
180 lb. Sultanas.
911 chests Tea.
37 cases Coconut.
80 bags Coco-meat.
1,562 boxes Confectionery.

Septic Tanks.

Five thousand two hundred and eighty-seven permits were issued for septic tanks at £1 and 155 permits were issued for septic tanks at £2. Total revenue being £5,597.

A. C. STEVENS,
Chief Inspector.

Appendix XVII.

NURSES' REGISTRATION BOARD.

Eleven meetings were held during the year.

In April an interstate conference of representatives of Nurses' Registration Boards was held in Canberra, this State being represented by the Chairman (Dr. Linley Henzell), and two members of the Board, namely, Mrs. A. M. Walsh and Miss G. A. Siegele. An important recommendation of the conference was that Commonwealth appoint an Advisory Committee on Nursing on the lines of the National Health and Medical Research Council.

On 19th December an amendment of the Nurses Registration Act was assented to by Parliament giving the Board power to increase the training periods of midwifery nurses from eighteen months to two years in the case of untrained persons, and from nine months to one year in the case of registered general nurses. This increase in the training periods will bring Western Australia into line with the United Kingdom, New Zealand, and certain of the Eastern States.

The number of nurses registered in the various divisions of the register whose registration was in force at the end of the year was :—

	1951.	1950.
General	1,879	(1,858)
Children's	25	(20)
Infant Health	175	(179)
Mental	40	(51)
Midwifery	985	(964)
Tuberculosis	34	(29)
Mothercraft	15	....

Figures in parenthesis are those of 1950 for comparison.

Applications for restoration of name to the midwifery division of the register were approved in eight cases.

Eighteen examinations were conducted during the year, as follows :—

General and Children's	3
Mental	1
Midwifery	3
Tuberculosis	3
Mothercraft	2
First Year Professional	3
Educational	3

31st December, 1951.

APPENDIX XVIII.

REPORT ON THE TRAINING OF STUDENT NURSES IN COUNTRY HOSPITALS, FROM JUNE, 1951, TO JUNE, 1952.

To the Commissioner of Public Health.

Miss D. H. Bailey resigned in June, 1951, to study for the Sister Tutor Certificate at the College of Nursing, Edinburgh.

It is desired to place on record the fine work Miss Bailey has done for the training of student nurses in country hospitals, the pioneering of the block system of training and the organising of the Central Training School.

Appointments.

Miss E. E. Harler, Triple Certificate Nursing Administration Certificate, College of Nursing, London, F.C.N.A., was appointed Organiser of Nursing Training.

Miss V. Steel, Triple Certificate Sister Tutor Certificate, College of Nursing, London, F.C.N.A., was appointed Senior Tutor.

Sister Beard, part-time Tutor to Kalgoorlie District Hospital.

Sister McLean is appointed Clinical Supervisor at Geraldton District Hospital.

Sister Abud has resigned from Northam District Hospital after 15 years' service to this Hospital.

Sister M. Morrisby is tutoring the Preliminary School and gives Hygiene lectures.

In many instances during the latter half of 1951, hospitals have maintained a service to the community mainly through the staffing by supervised student nurses. Therefore, expenditure on the training of these students is their just dessert as well as being the minimum requirements of the Nurses' Registration Board.

When hospitals are short staffed, the taking of students for their blocks has meant difficulties for the Matrons with their administration, but they have always managed and the school is grateful for this co-operation.

Provisional blocks for a year ahead are circularised to Matrons to allow for the arrangement of staff and allocation of Annual Leave to students. This young age group need to have leave within their twelve months' service.

The school has taken through the Preliminary Training School, General Nurses, Tuberculosis Nurses, and commencing in August, 1951, students from Heathcote Reception Hospital. This should help these nurses to reach the standard of the First Professional Examination.

The Registration Board within six months have made two changes to the training in hospitals with a daily occupied bed average below 70. This is to the advantage of the student. But these changes during a period when insecurity is prevalent in the community are disconcerting to this teenage group and are the cause for various reactions and resignations. Training needs to offer assurance, a feeling of confidence and security.

Situation of the School.

It is a disadvantage that two institutions must be housed under one roof. Although the school is over-crowded, it is managing to function satisfactorily. Class-rooms and living quarters need to be in close proximity because lecturers find 8·0 a.m. to 9·0 a.m., 5·0 p.m. to 6·0 p.m., and 6·0 p.m. to 7·0 p.m., and even 8·0 p.m. to 9·0 p.m. suitable times to lecture. Transporting students varying distances is a waste of time and most awkward when arranging catering. Doctors still get delayed and lecture times have to be changed. During the last six months it has not been so difficult to get lecturers.

Grounds.

Since the appointment of a full-time gardener (Mr. J. White), there has been a great improvement and he has done much clearing up on the vacant allotment. This allotment has been a dumping ground and an excellent breeding ground for flies and mosquitoes. This block having been cleared is to be covered with grass and would make a tennis court for students.

Vegetables have been grown and used for the table. Repairs to the fences and gravel roadway for tradesmen have not been undertaken as requested.

Visual Aids.

The 16 mm. Bell and Howell film projector has been installed and is appreciated by students and tutors.

The strip film projector has been a great help during Anatomy, Hygiene and Gynaecology lectures.

The Trunk Anatomical Model has been housed in a wooden cabinet ; this should protect the model from damage. The cupboard for the skeleton has not been completed to date.

Uniforms.

The new style uniform is appreciated by the students and the appearance of these students has greatly improved.

The made uniforms, aprons, caps and capes are delivered to the school. Students are fitted and replaced from the school with the exception of Kalgoorlie District Hospital, where replacements are made in Kalgoorlie. This means storing 300 to 400 pieces of uniform. A seamstress is hired by the hour to alter and fit these uniforms.

General Nurses entered the Preliminary Training School from June, 1951, to June, 1952 :—

Nurses from Metropolitan area	25
Nurses from Country districts	38
Total	63

Resignations from the Preliminary Training School, 17. Five of these students were below educational standard, and have taken up Assistant Nursing.

Completed final examinations during June, 1951, to June, 1952, 40. Eight nurses gained credit passes.

Resignations from 2nd and 3rd year nurses, 31, as follows :—

7 due to marriage.
2 failed resit Hygiene in First Professional Examination.
1 resigned because of ill health.
18 continued failure in examinations.
3 resignations requested as not suitable for training.

Visits to Hospitals, 23. These visits are always of at least two days' duration.

Interviews.

There have been at least 80 prospective student nurses interviewed, and many of these have made application to train at the Central Training School. Many have decided to apply for positions in Metropolitan Hospitals.

Twelve visits have been made to schools and clubs in the Country and Metropolitan areas, with a view to keeping before the students' and teachers' minds the opportunities training as a nurse offers, also the educational standard required for nursing training.

The staff of the Central Training School desire to record appreciation for the help and consideration extended to them by the clerical staff of the Under Secretary's Department.

E. E. HARLER,
Organiser of Nursing Training.

11th July, 1952.

APPENDIX XIX.

MATERNITY HOSPITALS.

To the Commissioner of Public Health.

During the year, 1950, San Hedrin Hospital, East Fremantle, was leased to accommodate the overflow patients from Bundi Kudja Midwifery Hospital.

Hawthorn Hospital.

Purchased by this department and leased to Matron Wake. May, 1951.

Albany Maternity Hospital.

Since April, 1951, this hospital has been under departmental control.

Katanning Hospital.

Owing to Matron Ross's intention of closing her hospital, a section of the general hospital was converted to accommodate the midwifery patients who were unable to be nursed at Coleraine Hospital.

Domiciliary Nursing.

Only one midwifery case was reported for the year.

D. K. RAILTON,
Acting Principal Matron.

7th August, 1952

Appendix XX.

Western Australia.

DERBY LEPROSARIUM.

Admissions and Discharges for the Year 1951, *compiled from Monthly Returns of the Superintendent.*

Months of Year 1951.	Admissions.							Discharges.											Inmates Remaining in Leprosarium.		
	Male.			Female.			Total Admitted.	Male.					Female.								
	Admitted.	Re-admitted.	Total Males.	Admitted.	Re-admitted.	Total Females.		Discharged Cured.	Deceased.	Absconded.	Discharged Non-infectious.	Total. Males Discharged.	Discharged Cured.	Deceased.	Absconded.	Discharged Non-infectious.	Total. Females Discharged.	Total Discharged.	Male.	Female.	Total Remaining.
January	1	—	1	—	—	—	1	—	—	—	—	—	—	—	—	—	—	—	184	122	306
February	—	—	—	—	—	—	—	—	1	—	—	1	—	—	—	—	—	1	183	122	305
March	1	2	3	1	2	3	6	—	1	—	—	1	—	—	—	—	—	1	185	125	310
April	5	1	6	3	—	3	9	—	—	—	—	—	—	—	—	—	—	—	191	128	319
May	—	—	—	1	—	1	1	—	—	2	—	2	—	—	—	—	—	2	189	129	318
June	1	—	1	—	—	—	1	—	1	3	—	4	—	1	—	—	1	5	186	128	314
July	3	1	4	2	—	2	6	—	—	1	—	1	—	1	—	—	1	2	189	129	318
August	1	—	1	4	—	4	5	—	—	2	—	2	—	2	—	—	2	4	188	131	319
September	—	4	4	—	—	—	4	—	1	—	—	1	—	—	—	—	—	1	191	131	322
October	—	1	1	2	1	3	4	—	1	—	—	1	—	—	—	—	—	1	191	134	325
November	7	3	10	2	—	2	12	—	1	1	—	2	—	—	—	—	—	2	199	136	335
December	3	1	4	1	—	1	5	6	—	1	—	7	—	—	—	—	—	7	196	137	333
Total	22	13	35	16	3	19	54	6	6	10	—	22	—	4	—	—	4	26	—	—	—

Analysis of Admissions and Discharges during Year 1951.

Inmates as at 31st December, 1950	305
Admissions for period ended 31st December, 1951	54
Discharges for period ended 31st December, 1951	6
Deaths for period ended 31st December, 1951	10
Absconded for period ended 31st December, 1951	10
Total Remaining in Leprosarium as at 31st December, 1951	333

Appendix XXI.

VITAL STATISTICS.

Western Australia.

	1949.	1950.	1951.
Mean Population—			
Males	273,888	287,152	299,024
Females	259,195	271,557	282,435
Total	533,083	558,709	581,459
Births—			
Males	6,826	7,293	7,684
Females	6,685	6,935	7,110
Total	13,511	14,228	14,794
Birth Rate per 1,000 of Mean Population	25.35	25.47	25.44
Deaths—			
Males	2,893	3,022	3,086
Females	1,897	2,036	2,202
Total	4,790	5,058	5,288
Death Rate—Rate per 1,000 of Mean Population	8.99	9.05	9.09
Natural Increase Rate per 1,000 of Mean Population	16.36	16.42	16.35
Infant Mortality per 1,000 *Births—			
Metropolitan Area	21.53	25.41	26.38
Rest of State	31.56	28.83	30.84
Whole State	26.42	27.13	28.73
Stillbirths—			
Metropolitan Area	119	121	144
Whole State	268	240	297

* Excluding Stillbirths.

COMPARISON OF INFANT MORTALITY AND GENERAL DEATH RATE.

Place.	Infant Mortality.			General Death Rate.		
	1949.	1950.	1951.	1949.	1950.	1951.
New Zealand (a)	23.66	22.78	22.77	9.09	9.31	9.56
Western Australia	26.42	27.13	28.73	8.99	9.05	9.09
New South Wales	27.29	27.04	26.29	9.43	9.60	9.62
Victoria	21.89	20.09	22.61	10.28	10.14	10.33
Queensland	24.72	24.77	25.63	8.85	8.82	9.20
Tasmania	23.91	23.75	26.64	8.76	8.74	8.76
South Australia	27.68	24.04	24.51	9.45	9.63	9.98

(a) Non Maori.

Appendix XXII.

NOTIFICATION OF EACH TYPE OF INFECTIOUS DISEASE RECEIVED BY THE COMMISSIONER OF PUBLIC HEALTH FOR EACH WEEK OF YEAR ENDED 31st DECEMBER, 1951.

Week of Year.	Acute Rheumatism.	Amoebiasis.	Ankylostomiasis.	Brucellosis.	Diphtheria.	Dysentery (Amoebic).	Dysentery (Bacillary).	Hydatid.	Infantile Diarrhoea.	Infective Hepatitis or Ep. Catt. Jaundice.	Leprosy.	Malaria.	Meningococcal Infection.	Paratyphoid.	Poliomyelitis.	Puerperal Fever.	Purulent Ophthalmia.	Rubella	Salmonella Infection.	Scarlet Fever.	Tetanus.	P.T.B.	Other T.B.	Typhoid Fever.	Typhus Fever.
1							1			1					1			4							
2										1			1					1				3			
3										1								4				11	1		
4							1			1						1		1				9			
5										4												16			
6										4	1							1				13			1
7			1		1		4		6	1	1				6					6		3			
8							1						1		1	1				3		14		1	1
9															1					7		11			
10							6			1	1						1		1	6		12			
11										11								1		10		3	8		
12							3			3	5									4	1	6	1		
13	1				11	1				4							4	3	4	4		4			
14	1				3		1			8					1		1	1	1	1		7			1
15					6		2			9								4		3		6		2	
16	1				6		1			13					1			1		6		10	1		
17	1				3		1			4		1					1			8		7			
18					11					4				1	1			1		3	1	5	1		
19					7		1			4							1		1	2	1	6			
20		1	1		13				2	19	9			1						3		8	1		
21					5		1		1	13					1					5		14	1	1	1
22					3		5			6	1				1			6		5		8	3	1	1
23					8					15					1			4		5	1	5			1
24	2				3		1			18					2			4		4		13			2
25					8		16			9		1			1			6		1		14	1		
26					5		2			17	2				2			1		5	1	7	4		
27			1		3					13					4					4		10	5		1
28				1	5					4			1		5			4		4		6		2	
29				1	6					10	1	1			5					2		10	6		2
30					2					13					3					10		13	2		2
31		2	2		3					9	6		2		6					2	3	9	2		1
32					2					9	4				4				1	2		3	3		
33					2					13			1		3					2		4	2		1
34					6		1			19	1				2			6		2		14		1	1
35					6					16					2			2		2		11	2	1	
36					7					18		1	1		2			8		5		4	1		
37					8		1			9					2			14				13		1	
38				1	4		2			9					2			3		1	1	7			
39					2					12			1		2			3		4		11			
40					3					7					2			2		4		11	1	1	
41				1	5					6					5			2		2		8			
42					2					12			3		2	1		2		2	1	18			
43	1		1		2	1				2			1		1			2	1	2		15			
44					3		1		1	20			1		2			2	1	2		9			
45				1	3					10	1				4			2		1		3	1		
46					2					6	3				2		10			1		6	1		
47					3			1		16					3			2		2		8	3		
48					3				1	10		1			1			2		2		6	2		
49					2					12					3							15	4		
50					2				1	15	12		1		1			6		2	2	11	1		1
51					7					7			1			1		6	1	3		6			
52	1				3		1			5			1		1			4							
Total	8	5	13	8	271	2	56	1	46	467	48	7	20	3	96	4	23	137	16	179	12	448	66	11	24

APPENDIX XXIII.

INCIDENCE AND MORTALITY OF NOTIFIABLE INFECTIOUS DISEASES.

1948–1951

Diseases Notifiable.	Cases Reported.			
	1948.	1949.	1950.	1951.
Acute Rheumatism	....	....	....	8
Amoebiasis	25	13	14	5
Ankylostomiasis	101	52	132	13
Brucellosis	5	9	7	8
Dengue Fever	....	1	1	....
Diphtheria	255 (7)	170 (4)	172 (7)	271 (11)
Dysentery (Amoebic)	9	5	5	2
Dysentery (Bacillary)	17	22 (2)	45 (1)	56 (1)
Encephalitis Lethargic	....	....	1	....
Encephalitis Virus	4 (1)	....	5 (2)	....
Hydatid	....	....	....	1
Infantile Diarrhoea	....	6 (21*)	4 (26*)	46 (30*)
Infective Hepatitis	7	8	36 (4)	467 (3)
Leprosy	49 (1)	51 (1)	60	48 (3)
Malaria	118	13	15 (1)	7
Meningococcal Infection	16 (4)	13 (4)	24 (5)	20 (3)
Paratyphoid	....	....	....	3
Poliomyelitis	311 (24)	61 (6)	59 (5)	96 (4)
Peurperal Fever	5 (6)	7 (2)	2	4
Purulent Ophthalmia	4	3	14	23
Rubella	50	101	45	137
Salmonella Infection	....	11	6	16
Scarlet Fever	268	199	198	179
Tetanus	7 (5)	9 (7)	11 (6)	12 (4)
Tetanus Neonatorum	1	1	....	....
P.T.B.	325 (157)	499 (123)	586 (125)	467 (73)
Other T.B.	28 (9)	20 (5)	18 (3)	37 (10)
Typhoid	24 (1)	15	7 (1)	11
Typhus	87 (4)	61 (2)	32	24 (1)

Deaths, excluding full blood aboriginals, shown in brackets.

* Under two years of age.

TABLE SHOWING THE INCIDENCE OF INFECTIOUS DISEASE IN EACH STATISTICAL DISTRICT FOR THE YEAR ENDED 31st DECEMBER, 1951.

Statistical Districts.	Acute Rheumatism.	Amoebiasis.	Ankylostomiasis.	Brucellosis.	Diphtheria.	Dysentery (Amoebic).	Dysentery (Bacillary).	Hydatid.	Infantile Diarrhoea.	Infective Hepatitis or Ep.Catt. Jaundice.	Leprosy.	Malaria.	Meningococcal Infection.	Paratyphoid.	Poliomyelitis.	Puerperal Fever.	Purulent Ophthalmia.	Rubella.	Salmonella Infection.	Scarlet Fever.	Tetanus.	P.T.B.*	Other T.B.	Typhoid Fever.	Typhus Fever.
Albany Municipality					6															2		4			1
Albany Road Board					1																	3			1
Armadale-Kelmscott				1	2		1			1												2	1		
Ashburton											1									3					
Augusta-Margaret River					4								4		2					1	1				
Bassendean					5		1			1					2					2		6	1		
Bayswater					14		1		2	15		1			3			2	1	4		9	2		1
Belmont Park					18				1	4				1	7			1		8		12			
Beverley					2					11								2							
Bridgetown					1					7			1							3					
Boulder													1									10	1		
Brookton									1	9					1										
Broome											4											1			
Broomehill			*															1							
Bruce Rock							4		3	4							4			7					
Bunbury Road Board				1	7								1									4			
Bunbury Municipality					11																	1			
Busselton Municipality					1																				
Busselton Road Board					3		1																		
Canning				1	3		1		1	11			1					1		7		3			
Carnarvon																						1			
Chittering					1																				
Claremont					2					7								2	1	4		10	1		3
Collie Coalfields Rd. Bd.										12			1		2	1		3		1		2		1	
Coolgardie	4									5					1							1	1	1	
Corrigin															1					1		1			
Cottesloe					9		2			5					2			1		3		6	1	1	2
Cranbrook																		3							
Cue-Day Dawn										1													1		
Cunderdin										1					1							1			
Dalwallinu															2										
Dardanup					2										3							1	1		
Darling Range					4				2			1			1			2		1		2			
Denmark										6								5							
Drakesbrook										1										1					
Dumbleyung										2										1					
Dundas										5								14		4		3			
Esperance					1																				

APPENDIX XXIV.—*continued.*

Statistical Districts.	Acute Rheumatism.	Amœbiasis.	Ankylostomiasis.	Brucellosis.	Diphtheria.	Dysentery (Amœbic).	Dysentery (Bacillary).	Hydatid.	Infantile Diarrhœa.	Infective Hepatitis or Bp.Catt. Jaundice.	Leprosy.	Malaria.	Meningococcal Infection.	Paratyphoid.	Poliomyelitis.	Puerperal Fever.	Purulent Ophthalmia.	Rubella.	Salmonella Infection.	Scarlet Fever.	Tetanus.	P.T.B.	Other T.B.	Typhoid Fever.	Typhus Fever.
Fremantle Municipality	...	...	...	...	25	...	3	...	2	39	...	...	...	...	2	...	...	3	...	6	...	9	7	...	...
Fremantle Road Board	...	...	...	...	2	...	...	...	...	6	...	...	1	...	...	...	...	2	...	1	...	4	1	...	1
Fremantle, East	...	...	...	...	2	...	...	...	...	5	...	...	...	...	1	...	...	...	...	3	...	1	1	...	...
Fremantle, North	...	...	...	...	3	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	7	...	...	...
Geraldton Municipality	...	...	...	...	...	...	...	...	...	...	...	...	1	...	1	...	...	...	...	...	...	3	...	...	...
Geraldton Road Board	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	4	...	...	...
Gnowangerup	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	1	...	...	...
Gosnells	...	...	...	...	1	...	2	...	...	...	...	...	...	...	...	1	...	...	...	...	...	6	1	...	1
Goomalling	...	...	...	...	...	...	...	...	...	...	...	...	...	1	1	...	...	...	...	...	...	1	...	...	...
Greenbushes	...	...	...	...	...	...	...	...	...	3	...	...	1	...	...	...	...	...	...	3	...	2	...	...	...
Greenough	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	2
Guildford	...	...	...	...	2	...	...	...	2	1	...	...	...	...	...	...	...	...	...	...	...	2	...	...	...
Halls Creek	...	...	...	...	1	...	...	...	1	8	9	...	...	1	...	...	1	...	...	...	...	...	...	...	...
Harvey	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Kalgoorlie Municipality	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	1	...	1	...	2	1	...	...
Kalgoorlie Road Board	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2	...	3	...	...	...
Katanning	...	2	...	...	3	...	...	...	...	2	...	...	...	...	1	...	...	34	...	2	1	4	...	...	...
Kojonup	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Kondinin	...	...	...	...	...	...	...	...	...	1	...	...	...	...	1	...	...	1	...	...	...	1	...	...	...
Koorda	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Kulin	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	1	...	...	1
Lake Grace	...	...	...	...	1	...	...	...	...	6	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Leonora	...	...	...	...	...	...	...	...	...	16	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...
Mandurah	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Manjimup	...	...	...	...	...	...	...	...	...	5	...	...	...	...	3	1	...	...	...	...	...	5	...	...	...
Marble Bar	...	...	...	...	...	...	1	...	2	6	...	...	...	...	2	...	...	2	...	5	...	1	1	...	...
Melville	...	...	...	...	3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	3	...	...	...
Menzies	...	...	...	...	...	...	...	...	...	14	...	...	...	...	...	...	...	4	...	1	...	...	...	...	...
Merredin	...	...	...	1	5	...	...	...	2	4	...	...	...	...	2	...	...	1	1	3	...	7	1	...	...
Midland Junction	...	...	...	...	...	...	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1
Mingenew	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Moora	...	...	...	...	1	...	2	...	2	...	...	...	...	...	...	1	...	4	...	1	...	3	...	...	...
Morawa	...	...	...	...	...	...	2	...	1	8	...	...	...	...	...	...	...	...	...	2	...	...	...	...	...
Mosman Park	...	...	...	1	4	...	...	...	...	2	...	...	...	...	1	...	...	1	...	2	...	6	...	...	...
Mt. Marshall	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Mukinbudin	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...
Mullewa	...	...	...	...	12	...	1	...	2	...	...	...	...	...	...	...	...	...	...	...	...	2	1	...	...
Mundaring	...	...	...	...	6	...	5	...	...	5	...	...	1	...	1	...	...	1	...	...	...	7	2	...	...
Murray	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	8	...	1	...	...	1
Nannup	...	...	...	...	...	...	...	...	...	...	...	...	...	...	6	...	...	...	...	...	...	...	...	...	...
Narembeen	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...
Narrogin Road Board	...	...	...	...	...	...	1	...	...	10	...	...	...	...	...	...	...	...	...	...	...	2	...	2	...
Nedlands	...	...	...	1	7	...	5	...	...	7	...	...	...	...	2	...	...	...	...	10	...	19	3	...	1
Northam Municipality	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	11	...	...	...

Northam Road Board	....	....	....	....	....	1	....	....	....	2	....	....	....	....	....	1	....	....	1	....	4	....	9	....	....	1
Northampton	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	2	....	....	....
Nullagine	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	....	....
Nungarin	....	....	....	....	....	....	....	....	....	....	2	....	....	1	....	....	....	....	....	....	....	....	1	....	....	....
Peppermint Grove	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	....	....	....	....	....	....
Perenjori	....	....	....	....	....	....	....	....	....	....	2	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Perth Municipality	....	....	....	....	....	46	....	11	....	11	54	....	1	3	....	15	1	....	22	9	32	5	129	22	3	....
Perth Road Board	....	....	....	....	....	8	....	9	....	5	28	....	....	1	....	7	....	....	11	....	9	1	31	3	....	
Phillips River	....	....	....	....	....	....	....	....	....	....	4	....	....	....	....	....	....	....	....	1	0	....	....	....	....	....
Pingelly	....	....	....	....	....	....	....	1	....	....	15	....	....	....	....	1	....	....	....	....	1	1	....	....	....	....
Plantagenet	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Port Hedland	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	3	....	....	....
Preston	....	....	....	....	....	....	....	....	....	....	2	....	....	....	....	2	....	....	....	....	....	....	1	....	....	....
Quairading	....	....	....	....	....	....	....	....	....	....	14	....	....	....	....	....	....	....	....	....	2	1	1	....	....	....
Roebourne	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	2	1	....	....
Rockingham	....	....	....	....	....	1	....	....	....	....	1	....	....	....	....	....	....	....	1	....	....	....	2	....	....	....
Rottnest (Dept. Public Health)	....	....	....	....	....	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Serpentine-Jarrahdale	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	....	....	....	....	....	4	1	....	....
Shark Bay	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	....	....
South Perth	....	....	....	....	....	12	....	....	....	....	11	....	....	2	....	2	....	....	....	1	14	....	10	1	....	....
Subiaco Municipality	....	....	....	....	....	6	....	....	....	2	34	....	....	....	....	7	....	....	9	....	5	1	19	3	....	1
Sussex	....	....	....	....	....	2	....	....	....	1	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Swan	....	....	....	....	1	7	....	1	....	....	6	....	....	....	....	1	....	....	....	1	2	....	4	2	1	....
Tableland	....	....	....	....	....	....	....	....	....	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Tambellup	....	....	....	....	....	....	....	....	....	....	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Three Springs	....	....	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	3	....	....	....
Tammin	....	....	....	....	....	....	....	....	....	2	....	....	....	....	....	....	....	3	....	....	1	....	....	....	....	....
Toodyay	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	....	....	....	1	....	....
Upper Blackwood	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	....	....
Victoria Plains	....	....	....	....	....	....	....	....	....	2	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Wagin Municipality	....	....	....	....	....	....	....	1	....	....	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Wagin Road Board	....	....	....	....	....	....	....	....	....	....	1	....	....	....	....	....	....	....	....	....	1	....	1	1	....	....
Wanneroo	....	....	....	....	....	3	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	....	....
West Kimberley	....	....	....	7	....	....	....	....	....	....	....	4	1	....	....	....	....	....	....	....	....	....	1	....	....	....
Westonia	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	1	....	....	....	....	....
Wickepin	....	....	....	....	....	....	....	....	....	....	3	....	....	....	....	....	....	....	....	....	1	....	....	....	....	....
Wongan-Ballidu	....	....	....	....	....	....	....	....	....	....	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Woodanilling	....	....	....	....	....	....	....	....	....	1	1	....	....	....	....	....	....	....	....	....	....	....	1	....	....	....
Wyndham	....	....	....	....	....	....	....	....	....	....	2	26	....	....	....	....	....	9	....	....	....	....	1	....	....	....
Wyalkatchem	....	....	....	....	....	2	....	....	....	....	2	....	....	....	....	....	....	1	....	....	....	....	1	....	....	....
Yalgoo	....	....	....	....	....	2	....	....	1	....	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
York Municipality	....	....	....	....	....	....	....	....	....	....	6	....	....	....	....	....	....	....	....	....	....	....	1	....	....	....
York Road Board	....	....	....	....	....	....	....	....	....	....	12	....	....	....	....	....	....	....	....	....	....	....	1	....	....	....
Contracted outside State	....	1	....	....	1	....	....	....	....	....	....	4	3	....	....	1	....	....	....	....	....	....	13	....	2	....
Service Personnel	....	3	6	1	....	2	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1
Total	8	5	13	8	271	2	56	1	46	467	48	7	20	3	96	4	23	137	16	179	12	448	66	11	24

The above table shows notifications received and not amended diagnosis.

APPENDIX XXV.

VENEREAL DISEASE IN WESTERN AUSTRALIA, 1950-1951.

Disease.	Male.		Female.		Total.	
	1950.	1951.	1950.	1951.	1950.	1951.
Syphilis—						
Primary	8	26	2	11	10	37
Secondary	1	5	2	7	3	12
Tertiary	7	6	4	5	11	11
Congenital	2	1	3	5	5	6
Total Syphilis	18	38	11	28	29	66
Gonorrhoea	237	228	35	33	272	261
Chancroid	1	1	....	....	1	1
Granuloma	*7	*3	*13	*7	*20	*10
Total	263	270	59	68	322	338

* Native.

Appendix XXVI.

MATERNAL MORTALITY.

Year.	Live Births.	Deaths from									
		Puerperal Septicaemia.		Other Puerperal Infections.		Abortion.		All Other Causes of the Puerperal State.		All Causes of the Puerperal State.	
		No.	Rate.	No.	Rate.	No.	Rate.	No.	Rate.	No.	Rate.
1943	10,481	2	0.19	1	0.10	3	0.29	17	1.62	23	2.19
1944	10,870	2	0.18	2	0.18	5	0.46	18	1.66	27	2.48
1945	10,672	....	....	2	0.19	5	0.47	13	1.22	20	1.87
1946	12,105	....	....	3	0.25	5	0.41	18	1.49	26	2.15
1947	12,874	1	0.08	1	0.08	8	0.62	22	1.71	32	2.49
1948	12,981	2	0.15	4	0.31	1	0.08	13	1.00	20	1.55
1949	13,511	....	....	2	0.15	3	0.22	11	0.81	16	1.18
1950	14,228	....	....	2	0.14	1	0.07	12	0.84	13	0.91
1951	14,794	....	....	2	0.14	3	0.20	11	0.74	16	1.08

All rates per thousand live births.

APPENDIX XXVII.

STILLBIRTH AND INFANT MORTALITY RATES.

Year.	Total Births including Stillbirths.	Stillbirth Rates.	Neo-Natal Rates.		Total Mortality Rates under One Year.	Other Post Natal Rates Over One Month and under One Year.
			Under One Week.	Under One Month.		
1926	8,534	27.4	....	27.6	48.0	20.4
1927	8,708	26.0	....	23.0	44.7	21.7
1928	8,981	30.9	....	23.1	35.5	12.4
1929	9,316	28.4	18.8	25.8	54.6	28.8
1930	9,456	27.0	18.0	23.5	46.5	23.0
1931	8,777	26.0	20.1	26.6	40.5	13.9
1932	8,175	25.7	21.02	25.2	43.5	18.3
1933	8,105	29.4	18.1	22.5	35.8	13.3
1934	8,029	29.2	19.3	24.8	38.8	14.0
1935	8,377	30.8	20.6	24.8	39.0	14.2
1936	8,730	28.9	19.6	24.8	41.0	16.2
1937	8,850	27.2	16.8	21.2	36.5	15.3
1938	9,325	23.9	16.6	19.1	33.1	14.0
1939	9,249	23.0	16.5	19.7	40.0	20.3
1940	9,363	25.9	20.5	24.9	43.0	18.1
1941	10,375	24.8	15.1	18.1	34.4	15.7
1942	10,109	20.6	17.1	20.3	36.2	15.9
1943	10,759	25.8	17.1	21.0	31.8	10.8
1944	11,144	24.8	18.6	21.0	32.0	11.0
1945	10,896	20.6	18.0	20.0	28.9	8.9
1946	12,398	23.6	17.1	20.6	30.3	9.6
1947	13,178	23.0	16.9	19.4	30.2	13.2
1948	13,197	20.1	16.9	18.7	25.0	8.4
1949	13,779	19.4	16.2	19.0	25.9	6.8
1950	14,468	16.6	16.2	18.0	26.7	8.6
1951	15,091	19.7	16.2	19.7	28.2	8.5

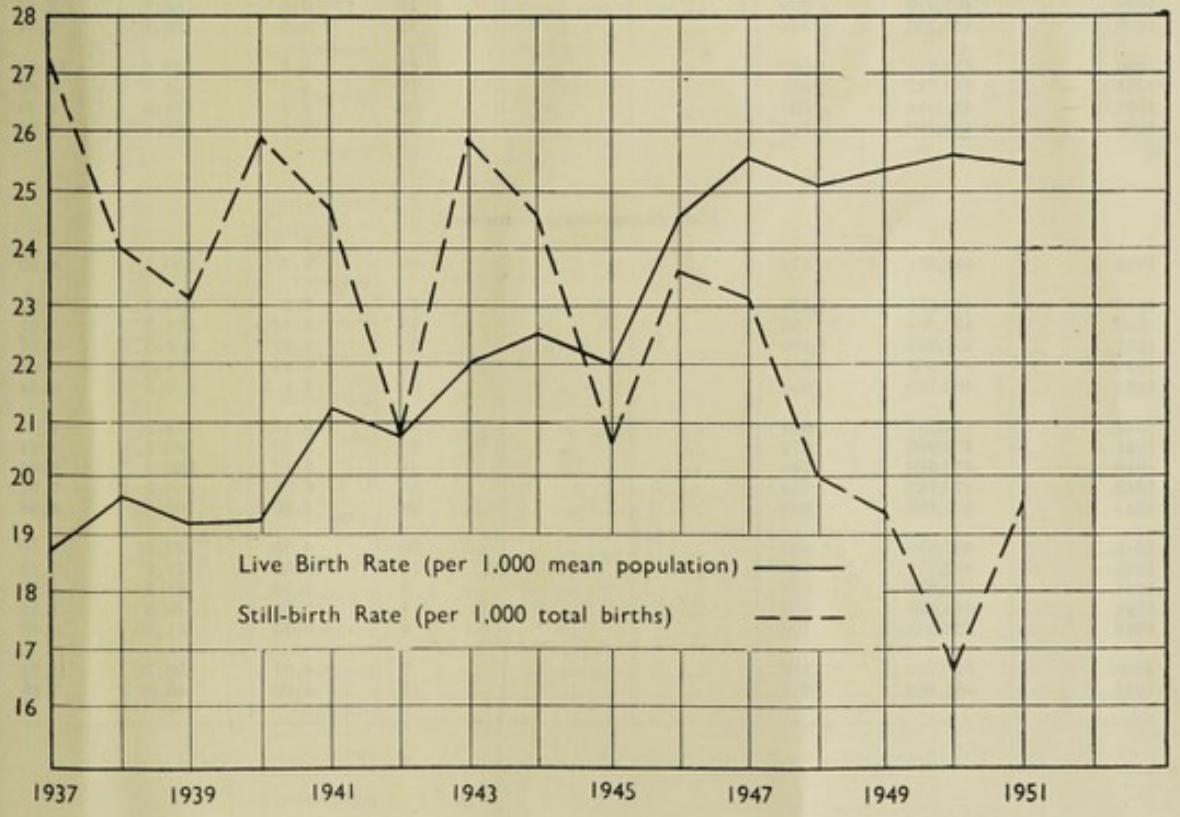
In above table all rates are calculated in deaths per 1,000 of total births, including stillbirths.

APPENDIX XXVIII.

STILLBIRTH AND BIRTH RATES.

Year.	Mean Population.	Live Births.		Still Births.	
		Number.	Rate per 1,000 Mean Population.	Number.	Rate per 1,000 Total Births.
1937	457,328	8,609	18.82	241	27.23
1938	463,808	9,141	19.71	224	23.92
1939	469,780	9,036	19.23	213	23.03
1940	473,397	9,121	19.27	242	25.85
1941	473,988	10,118	21.35	257	24.77
1942	476,619	9,901	20.77	208	20.57
1943	476,745	10,481	21.98	278	25.84
1944	481,498	10,870	22.58	274	24.59
1945	487,510	10,672	21.89	224	20.56
1946	492,771	12,105	24.57	293	23.63
1947	502,978	12,874	25.60	304	23.07
1948	514,843	12,931	25.12	266	20.16
1949	533,083	13,511	25.35	268	19.45
1950	558,709	14,228	25.47	240	16.59
1951	581,459	14,794	25.44	297	19.68

WESTERN AUSTRALIA—LIVE BIRTH AND STILL BIRTH RATES.



APPENDIX XXIX.

DIPTHTHERIA MORTALITY AND MORBIDITY, 1902-1951.

Year.	Mean Calendar Population.	Notifications Received.	Deaths.			Case Mortality.	Incidence Rate per 100,000 Population.	Mortality Rate per 100,000 Population.
			Diphtheria.	"Croup."	Total.			
						%		
1902	204,705	73	8	1	9	12.33	35.6	4.39
1903	219,643	81	18	4	22	27.16	36.8	10.01
1904	233,963	216	35	5	40	18.52	92.3	17.09
1905	246,681	228	35	5	40	17.54	92.4	16.21
1906	254,362	347	59	6	65	18.73	136.4	25.55
1907	255,510	821	64	5	69	8.40	321.3	27.00
1908	257,822	1,719	106	5	111	6.45	666.7	43.05
1909	263,279	1,221	75	6	81	6.63	463.8	30.76
1910	271,019	1,066	62	7	69	6·47	393.3	25.46
1911	286,712	764	36	1	37	4.71	266.4	12.55
1912	301,040	634	28	7	35	5.52	210.6	11.62
1913	313,383	957	44	2	46	4.80	305.3	14.67
1914	322,668	785	37	3	40	4.72	243.2	11.46
1915	321,247	1,045	38	2	40	3.63	325.2	11.82
1916	313,066	757	25	8	33	3.30	241.8	7.99
1917	306,339	800	31	1	32	3.87	261.1	10.11
1918	308,198	1,277	26	1	27	2.11	414.3	8.95
1919	319,955	971	32	1	33	3.39	303.4	10.31
1920	330,023	1,080	46	4	50	4.62	327.2	15.15
1921	334,084	958	....	....	44	4.59	286.7	13.17
1922	341,375	377	17	4	21	3.6	169.0	6.12
1923	350,772	504	18	2	20	3.97	143.6	5.70
1924	363,152	511	....	....	14	2.7	140.7	3.85
1925	372,970	334	....	....	6	1.7	94.9	1.60
1926	380,930	256	....	....	11	4.3	67.2	2.88
1927	392,071	273	....	....	6	2.9	69.6	1.53
1928	407,576	639	....	....	13	2.0	156.7	3.19
1929	420,756	539	....	....	33	6.0	128.1	7.84
1930	429,079	1,045	....	....	43	4.1	243.5	10.02
1931	432,347	452	....	....	19	4.2	104.5	4.39
1932	435,041	664	....	....	20	3.0	152.6	4.59
1933	438,780	848	....	....	20	2.4	193.2	4.55
Mass Immunisation Commenced.								
1934	442,354	974	....	....	36	3.7	220.1	8.13
1935	446,874	1,308	....	....	35	2.6	292.7	7.83
1936	452,294	792	....	....	36	4.54	175.2	7.95
1937	457,328	1,166	....	....	39	3.34	259.3	8.52
1938	463,808	921	....	....	41	4.44	198.5	8.83
1939	469,780	610	....	....	27	4.4	129.9	5.74
1940	473,397	583	....	....	22	3.75	123.1	4.64
1941	473,988	674	....	....	20	3.00	142.1	4.21
1942	476,619	748	....	....	41	5.48	156.9	8.60
1943	476,745	755	....	....	38	5.03	158.3	7.97
1944	481,498	528	....	....	24	4.80	109.6	4.98
1945	487,510	425	....	....	20	4.70	87.1	4.10
1946	492,771	380	....	....	11	2.89	77.1	2.23
1947	502,978	339	....	....	8	2.36	67.3	1.59
1948	514,843	255	....	....	7	2.74	49.5	1.35
1949	533,083	170	....	....	4	2.35	31.88	0.75
1950	558,709	172	....	....	7	4.07	30.78	1.25
1951	581,462	271	....	....	11	4.06	46.60	1.89

Appendix XXX.

MEAT INSPECTION FOR THE YEAR ENDED 31st DECEMBER, 1951.

No. of Animals Slaughtered.		Carcases Condemned.																Part Carcases Condemned.							Organs Condemned.													
		Emaciation.	Icterus.	Immaturity.	Moribund.	Piroplasmosis.	Unmarketable.	Pyrexia.	Gangrene.	Pleuro-Pneumonia.	Sepsis.	Traumatism.	Tuberculosis.	Actinomycosis.	Peritonitis.	Caseous-Lymphadenitis.	Parasyphoid.	Totals.	Abscess.	Actinomycosis.	Caseous-Lymphadenitis.	Tuberculosis.	Arthritis.	Unmarketable.	Traumatism.	Totals.	Abscess.	Actinomycosis.	Angiomatosis.	Cirrhosis.	Fatty Infiltration.	Hydro-Nephrosis.	Hydatids.	Melanosis.	Necrosis.	Pericarditis.	Pleuro-Pneumonia.	Tuberculosis.	Unmarketable.	Parasitic.	Totals.
Fremantle District (Including Watson's Bacon Factory).																																							
Cattle	19,462	9	....	....	....	14	1	3	8	4	7	15	48	....	....	....	....	109	1	233	....	44	....	1	44	323	264	....	222	4	89	....	56	....	....	19	....	2	1	....	657
Calves	574	....	....	1	....	....	....	....	....	....	....	....	4	....	....	....	....	2	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Sheep	162,931	357	1	....	7	....	2	11	1	....	6	6	....	....	....	10	....	401	....	....	51	....	10	....	4	65	....	....	....	56	....	....	2,053	....	....	....	....	....	....	....	2,109
Pigs	65,394	15	6	....	7	....	13	28	8	....	62	1	237	....	32	....	25	434	1,067	....	....	643	....	....	17	1,727	11	....	....	....	2	....	3	....	34	....	....	....	....	....	50
		....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	946	....	....	....	....	....	....	....	2,115	....	....	....	....	....	....	....	....	....	....	....	....	....	....	2,816
Midland Junction Abattoirs (Including Foggitt Jones, Ltd., Bacon Factory).																																							
Cattle	42,400	17	....	....	4	11	2	3	8	1	11	13	197	....	1	....	....	268	37	597	....	318	3	13	55	1,023	421	....	490	160	214	87	163	....	15	38	....	200	....	....	1,788
Calves	3,004	....	1	3	....	....	....	....	....	....	....	....	1	....	....	....	....	5	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	706	....	2,005
Sheep	342,449	721	46	....	87	....	10	32	1	....	3	4	....	....	5	3	....	912	1	....	51	....	102	....	4	158	....	....	....	68	54	....	1,177	....	....	....	....	....	....	....	12,737
Pigs	43,890	....	9	....	....	....	....	1	1	....	4	....	125	....	1	....	9	150	20	....	....	131	3	1	25	180	....	....	....	74	....	8,703	132	....	3800	....	....	....	28	....
		....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1,335	....	....	....	....	....	....	....	1,361	....	....	....	....	....	....	....	....	....	....	....	....	....	....	16,530
Kalgoorlie District.																																							
Cattle	5,895	....	....	....	....	....	....	....	....	....	1	....	16	....	1	....	....	18	3	65	....	66	....	....	6	140	41	10	11	16	18	3	9	....	....	6	1	173	6	....	334
Calves	8	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Sheep	2,467	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	....	1	....	....	5	....	....	....	....	5	44	....	....	....	....	....	45	....	....	1	....	....	3	....	93
Pigs	346	....	....	....	....	....	....	....	1	....	....	....	....	....	....	....	....	1	....	....	....	4	....	....	....	4	4	....	....	2	2	12	....	....	76	....	....	3	....	99
		....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	20	....	....	....	....	....	....	....	149	....	....	....	....	....	....	....	....	....	....	....	....	....	....	526
Perth City Markets.																																							
Cattle	296	....	....	....	....	....	3	....	....	....	....	....	....	....	....	....	....	3	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Calves	16,446	....	....	79	....	....	79	....	....	....	....	....	....	....	....	....	....	158	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Sheep	36	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	1
Pigs	414	....	....	....	....	....	....	....	....	....	....	....	5	....	....	....	....	5	....	....	....	6	....	....	....	6	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
		....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	166	....	....	....	....	....	....	....	6	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1
Fremantle Meat Markets.																																							
Cattle	59	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Calves	813	....	....	....	....	....	4	....	....	....	....	....	....	....	....	....	....	4	....	....	....	....	....	2	....	2	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Sheep	2	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Pigs	13	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
		....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	4	....	....	....	....	....	....	....	2	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Country Districts.																																							
Cattle	12,798	....	....	....	1	....	....	1	....	....	1	2	13	....	....	....	....	18	6	25	....	20	....	1	14	66	84	62	119	14	23	....	....	2	7	....	....	25	59	80	475
Calves	2,041	....	....	54	....	....	....	....	....	....	....	....	....	....	....	....	....	54	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Sheep	105,965	822	....	....	30	....	8	5	....	....	7	8	....	....	....	17	....	897	5	....	54	....	68	3	20	150	242	....	14	45	66	....	....	99	14	....	....	269	2,112	2,861
Pigs	5,914	....	1	....	....	....	1	4	....	....	1	....	9	....	....	....	....	16	5	....	....	37	....	3	4	49	21	....	....	61	3	4	....	11	494	....	....	6	92	710	1,402
		....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	985	....	....	....	....	....	....	....	265	....	....	....	....	....	....	....	....	....	....	....	....	....	....	4,738

Totals of Animals Slaughtered—Cattle, 81,000; Calves, 22,886; Sheep, 613,850; Pigs, 115,971.

TOTAL NUMBER OF ANIMALS SLAUGHTERED AND INSPECTED IN COUNTRY DISTRICTS WHERE MEAT INSPECTION IS CARRIED OUT.

District.	Cattle.	Sheep.	Calves.	Pigs.	Total.
Albany	2,121	39,402	735	1,852	44,110
Bunbury	2,350	11,340	769	845	15,304
Busselton	1,000	3,820	38	181	5,039
Collie	1,841	8,012	58	422	10,333
Geraldton	1,274	18,449	153	787	20,663
Katanning	592	3,931	36	66	4,625
Narrogin	931	4,900	64	243	6,138
Northam	1,843	10,842	147	1,283	14,115
Wagin	324	2,083	12	84	2,503
York	522	3,186	29	151	3,888
	12,798	105,965	2,041	5,914	126,718

Appendix XXXI.

REVENUE AND EXPENDITURE FOR YEAR 1951.

Revenue.

	£	s.	d.
License Fees	34	11	0
Meat Inspection Fees	7,721	7	5
Fish Inspection Fees	428	8	5
Patho. Laboratory	948	2	0
Sanitation Refunds	165	15	6
Inspection of Plans (Septic Tanks)	2,490	10	6
Miscellaneous	3,981	8	10
Nurses and Midwives Registration and Examination Fees	915	14	1
Local Health Authority Recoups	3	3	4
T.B. Diagnosis (Generally)	137,130	14	11
T.B. Diagnosis (Wooroloo)	16,845	12	11
Total Revenue	£170,665	8	11

Expenditure.

	£	s.	d.
Salaries	198,366	16	6
Payments Local Health Authorities	12,376	4	8
School Hygiene	5,673	11	5
Travelling and Transport	2,401	0	2
Postage and Telephones	1,130	19	0
Laboratory	7,140	0	4
Venereal Diseases	2,957	6	6
Miscellaneous	12,905	12	3
Infant Welfare Centres	21,327	14	0
Maintenance and Transport of Lepers	18,946	19	10
Medical Officer and School Dentists Travelling	5,442	17	7
Diphtheria Immunisation	53	17	11
T.B. Clinics	118,903	4	3
Argentine Ants	12,478	8	8
Cancer Research	1,384	17	2
Sanitation Government Buildings	12,650	17	7
Total Expenditure	£434,140	7	10

By Authority: William H. Wyatt, Government Printer, Perth.