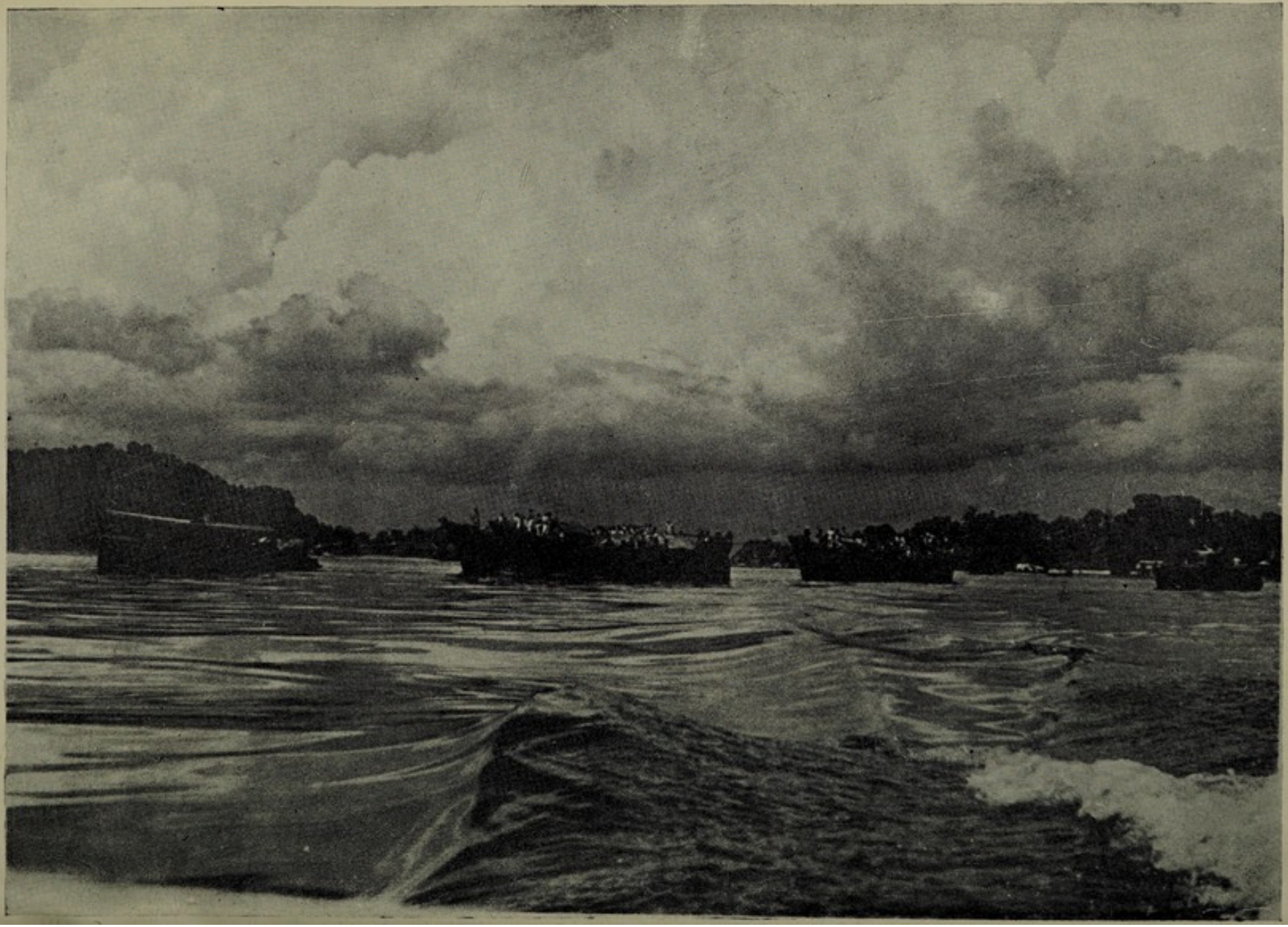
Annual report of the Medical Department / Colony of Singapore.

1949

The Annual Report of the Medical Department of the Colony of Singapore



COLONY OF SINGAPORE

MEDICAL DEPARTMENT ANNUAL REPORT, 1949

BY

W. J. VICKERS,

C.M.G., M.R.C.S., L.R.C.P., D.P.H., D.T.M. & H.,

of the Inner Temple, Barrister-at-Law,

Director of Medical Services,

Singapore

PRINTED AT THE GOVERNMENT PRINTING OFFICE, SINGAPORE,
BY F. R. VINE, ACTING GOVERNMENT PRINTER.

—

To be purchased from GOVERNMENT PUBLICATIONS BUREAU,
GENERAL POST OFFICE, FULLERTON BUILDING, SINGAPORE

—

1950

Price: $3

CONTENTS

PART I—GENERAL

PART II—THE HEALTH DIVISION

PART III—THE HOSPITALS DIVISION

APPENDICES

ILLUSTRATIONS

MAP

PART I

GENERAL

CHAPTER ONE

INTRODUCTORY

STUDIES and discussions since the liberation in 1945 culminated in the acceptance of a ten-year Medical Plan by the Legislative Council of the Colony towards the end of 1948 based on a capital expenditure of some $33½ millions and an increase in the annually recurrent expenditure by some $4 millions. Thus 1949 has been a period of preparation for the future and an attempt to keep in being the existing standards so hardly won under present conditions. This fourth Annual Report of the Medical Department of the Colony of Singapore will indicate how the latter goal has been gained.

The health figures detailed in 1948 were records of achievement in all directions. Not only have these been maintained in 1949, but they have been surpassed in many directions in spite of the continuing serious staff shortages: in spite of the lack of accommodation which has been amply stressed in previous reports. Thus the infantile mortality rate—generally considered to be one of the most important criteria in assessing the state of the public health—reached the low record of 72.04 per 1,000 live births returned: the death rate to the new low of 11.85 per 1,000 of the population: and maternal mortality 2.2 per 1,000 live births. For the first time in local history the death rate now approximates that of England and Wales. On the other hand the birth rate is now up to the pre-war peak. These facts are very clearly demonstrated in the graphs within.

A steady yearly improvement in the staff position is to be expected now that the local Medical School is in more or less full operation, but in 1949 the Department was still working on a total of doctors and nurses far below that required for even present operations. As the estimates give a minimum staff for present operations a truly remarkable picture is presented in the increase in the work done over the post-war period. There can however be no true comparison with pre-war statistics. The majority of the population is no longer prepared to suffer illness or even ill-health with that unquestioning calm that has been a byword in the East. It now expects modern attention of the most up to date kind. Since the end of the war the people have become health conscious to an extraordinary degree. New drugs together with the radio, the cinema, and the newspaper have played a notable part in this respect. This is sufficiently evidenced by the tremendous increase in our out-patient services which have had to continue to operate in totally inadequate and outmoded hospital and welfare clinics with attendance returns far in advance of anything anticipated before the war: by a hospital maternity service which is now attempting to deal with 11,000 deliveries every year as compared with some 6,500 prior to the occupation, in buildings which were considered even then to be inadequate when the population was a good deal less than it is to-day.

This hospital has had to reduce its institutional care-period from eight to three days per case and patients will soon have to be turned away if the demand increases without a corresponding increase in accommodation and staff.

Clearly the immediate solution cannot be ignored if the achievements of the post-war years are to be consolidated. A long range medical policy is imperative if such an international centre as this is to retain its place in the traffic and commerce of the world. One really serious epidemic might well cost the community untold millions of dollars and serious difficulties in present and future relationships. A steady implementation of the Medical Plan which seeks to lay the foundations of what is merely an adequate health service is called for. This is anticipated from the small beginning made in 1949.

The remarkable increase in the local population over the past decade has been stressed in many quarters recently. The population has been more or less doubled over the last twenty years: it will certainly repeat this process at least during the next twenty whatever is done in connection with family planning in view of the far more favourable sex balance which exists to-day. The situation exists, and the public health cannot be ignored in the meantime.

The Port of Singapore is fast becoming one of the most important air and sea connections in the Commonwealth. The future of the Colony depends largely on this fact, and we can congratulate ourselves that epidemics have been conspicuous by their absence in 1949: and that the Port continues to be one of the healthiest in the East in consequence. There is however no margin for complacency when note is taken of the fact that we have less fortunate neighbours, and when communications are spreading directly to regions hitherto too far away to matter. To carry on with a qualified health staff which is clearly inadequate for the purpose is surely tempting providence.

Thus port and air quarantine procedure is under constant and anxious scrutiny. So far demands for a relaxation in existing control procedure have been resisted in view of the small staff available in this respect and the proved efficiency of the present arrangements. Action taken by the local authority was fully endorsed by the Public Health Conferences which have become such an important feature of our advisory organisation. By this means co-operation between Service branches and civil health authorities is enhanced for the mutual good of all.

Inadequacy of accommodation until the accepted Plan is sufficiently operative led to consideration of other methods of approach. Thus increased mobility in the rural services has been sought and should be effective in the not too distant future through an increase in the scope of travelling dispensaries, and in additional transport facilities for such staff as midwives and nurses. Health visitors and almoners are being steadily increased in number: domiciliary services are being extended. All these approaches are an essential to modern practice: when they have to take the place of institutional care no limit can be placed on them. A good deal more will be heard of operations of

this nature during the months to come if present planning in other directions cannot be speeded up.

Action was taken during the year to consolidate that part of the Plan which is to be covered by the development and welfare grants available. Most of the improvements in the rural services come under this head.

Preliminary planning under expert architectural advice was undertaken in regard to the hospital services during the year. Building was actually commenced at the Leper Settlement and tenders had been called for the new Base Medical Store and Manufactory. These two deficiencies have become an urgent priority in view of the annual and increasing demand for expensive drugs of all kinds and the unforeseen increase in the number of lepers which are being found. Hospital rehabilitation advanced considerably. The new Ophthalmic Clinic and Surgical Unit came into action.

In spite of the serious shortage of trained staff which continued to plague all medical activity the total bed strength in our hospitals now equals the pre-war. It has now been brought to a maximum figure compatible with practical efficiency in consequence. That the bed strength has reached this level, and is being maintained, is a feat in view of the difficulties which have been encountered.

Tuberculosis continued to attract increasing attention throughout 1949 and a scrutiny of the appropriate sections within will show that reliance has still to be placed primarily on deaths and death rates in assessing the ravages of the disease although a beginning was made in that study of incidence which must eventually be our aim. There is some satisfaction in noting the steady drop in the mortality indices of tuberculosis over the post-war years as compared with the pre-war, the 1939–41 average being taken at one hundred. The index fell from eighty-six in 1947 to fifty-seven in 1949. Observations by the School Medical Service appear to indicate some increase of incidence in the lower age groups—a serious trend indeed if true. The studies suggest an activity rate of 1.6 per cent in school children and 0.74 in adults. That ten per cent show some form of X-ray lesion is not unexpected as many cases cure themselves in all communities and races.

B.C.G. vaccine is the best-known means of conferring a specific protection against this disease, but it can only be used after adequate testing of an individual and only on those who are free from all infection in this respect. Negotiations have been in progress with U.N.I.C.E.F., and also with W.H.O., in regard to its introduction to Singapore in the coming year.

The year 1949 marked a milestone in our tuberculosis history. For the first time over one million dollars was set aside for this purpose alone. In April the Rotary Clinic at Tan Tock Seng Hospital was opened. This event can be said to be the first "brick" in the new Medical Plan although half the money came from non-Government sources—the Rotary Club of Singapore. This munificent gift covered the erection of an up-to-date tuberculosis clinic on the most modern lines.

While it was found impossible appreciably to extend tuberculosis bed strength during the year an average of 500 beds was maintained for this disease and domiciliary schemes and almoners services were started for the first time in this connection. These marked yet another important step along that long and expensive road towards tuberculosis control which we must tread. The Singapore Anti-Tuberculosis Association also found it possible to extend its diagnostic clinic into a treatment centre.

The N.A.P.T. has noted recently that the world is still waiting for a drug which will do for tuberculosis what penicillin has done for some other diseases: that so far in streptomycin recent research has opened up a vast field of promise. In pulmonary tuberculosis the value of this drug appears to be limited as yet, and this must be realised in view of the publicity which it has been received. Para-aminosalicylic acid is another which is now being used with success, but here again more work is essential before one can say whether a major or minor aid to the chest physician and his patient has been found. "The world still awaits the really effective medicine for tuberculosis. Too often in the past the correct treatment of tuberculosis has suffered a set-back through enthusiastic but premature claims." (N.A.P.T.).

Malaria continues to exhibit the remarkably low incidence it has shown since the serious peak it reached during the Japanese occupation, and the anti-malarial measures and control so carefully exercised must have played their not unimportant part in this result. This does not complete the picture however. It has been pointed out by the Malaria Advisory Board of the Federation and elsewhere that this disease exhibits cycles of eight to ten years, and that this country has probably been in the happy position of being in the trough of one of these since the end of the war. This may well mean an increased incidence later on. In consequence an added and increasing vigilance is called for. Here is an instance where complacency may be prepared to rest on its oars at a serious future cost.

Poliomyelitis has always and unfortunately will always be with us. Fortunately no epidemic manifestation occurred during 1949, but an increased endemicity which is to be expected after the epidemic manifestations of 1945–46 and 1948 was fully apparent. Outbreaks have occurred in other countries during the period.

Three particularly successful campaigns may well be noted. The Venereal Disease control scheme inaugurated in 1945 has steadily expanded on the basis then designed: it showed a further satisfactory advance during the year under review. Within the limits of a small service the scheme has been exceptionally satisfactory. It now deals with well over the pre-war number of patients. Only lack of staff and accommodation has placed a limit on a considerable further advance. Real future control appears to lie largely in the social welfare direction with Girls and Boys Clubs, and homes and institutions for those who have taken the wrong turning early in their lives. The

proper care of the adolescent is one of the most important factors in the control of Venereal Disease.

Success can be claimed in the Blood Transfusion field also. Here again there is no comparison with pre-war figures; the service is now dealing with four times the 1947 total of donors and twelve times that of 1946. Yet even this increase is insufficient as the demand is always on the up-grade. This is in the main a voluntary effort and the staff and committee dealing with it are to be commended for their zeal and enthusiasm.

Leprosy has become a problem indeed. The increase in cases demanding admission has been phenomenal. Thus the accommodation for 250 has proved quite inadequate for over 700. Fortunately the Federation Government came to our aid and now accommodates over 300 lepers from Singapore. All new treatments are under trial and excellent results have been obtained, but it has not been possible to release many as sufficiently cured as yet. Plans to deal with this situation are well in hand.

Mental disease, institutional feeding and nutrition are three problems which continue to demand the most anxious attention. While the Mental Hospital will eventually be able to accommodate its pre-war total of 2,000 fortunately up to date we have only been called on to take in a thousand, but the number is steadily increasing. The tragedy is that the pre-war staff is not adequate to deal with the present number under modern conditions, and the type available—a superior sort of hospital servant—is not really suitable for this work. In consequence a scheme for a special kind of mental aide is under consideration. Previously most inmates in mental institutions received little specialised treatment: such treatment is the rule for a majority now and this requires not only a considerably increased staff but a far better trained one than formerly.

The modern approach to institutional feeding is one which has outmoded present possibilities. While the food supplied to our hospitals is adequate and nutritionally sound (as it is based on the deliberations of a Committee headed by Dr. Lucius Nicholls, the tropical diet expert, in 1946) the distribution and cooking leave much in the way of improvement. Kitchens have not been sufficiently modernised as yet. The employment of better cooks is imperative. Better distribution is a matter of more supervisory staff and specialised equipment—a change which will come in due course.

Nutrition is a subject which has given rise to much discussion in view of the feeling in many quarters that the present child feeding programme is not serving a useful purpose. There is no question of not continuing the domiciliary relief and infant welfare feeding schemes which are such an essential part of the anti-tuberculosis service. The difficulty arises with the pre-school child dealt with as a part of the town's Social Centres. The Singapore Nutrition Council has recently expressed its perturbation at any reduction in the child feeding scheme which has served such a useful purpose in post-war Singapore. Apart from the nutritional angle is the necessity for an

experimental organisation and a nucleus for rapid expansion in times of depression and social unrest.

Certain recommendations have been made for the development of a rural accident ambulance service for the Colony. Otherwise the accident and hospital ambulance organisation has now been modernised. That for the country districts has been held up by lack of accommodation: in the meantime this section of the population is covered by the existing services.

Voluntary aid by various societies and groups of citizens has been an increasingly satisfactory feature of the medical services of the Colony during the year under review. The thanks of the community must be extended to the excellent—indeed essential—services provided by the Ladies Diversional Therapy Unit, the Leper Welfare Committee, the Blood Transfusion Committee, the St. John Ambulance Association and Brigade, the Singapore Branch of the British Red Cross, the ladies of the feeding centres, the Singapore Anti-Tuberculosis Association and last but not least to Rotary for its gift of a tuberculosis clinic. The same remarks apply to those ladies and gentlemen who have so willingly and generously given up their time for the many committees and boards connected with the medical services. As these expand more and more assistance of all kinds from the public spirited will be called for. No large and expanding public service can do without aid of this kind.

The Faculty of Medicine of the University of Malaya took the place of the College of Medicine in October 1949. The College has always been intimately associated with the medical services of Malaya as a whole, and the latter will have the same relationship to the University. Nevertheless the change of status presents many problems to the Medical Departments of the two territories, and puts into a prominent place the serious teaching problem which exists. A large and expanding Medical School means added teaching staff, and expensive facilities in other directions if public and students are to be adequately served at one and the same time.

A special scheme for Housemen and for a new type of nurse were introduced during the year. These will be discussed in the next chapter which deals with administration and staff as a whole.

Staff and patient welfare received special attention during the year, and will be discussed in detail within. An Interim Joint Council on the lines of a Whitley Council which was forecast in 1948 was set up with the valuable assistance of the Assistant Trade Union Adviser early in 1949. Undoubtedly this organisation will take an increasingly important place in the medical field.

The Government Medical Services cover the entire hospital organisation of the Colony except the Infectious Diseases Hospital which is under a form of joint Municipal and Government administration; all air and sea quarantine arrangements; the rural health division of some 300,000 persons; and the school medical and dental services. These are controlled by a Director of Medical Services, with a Deputy Director, a Chief Health Officer and a Chief Medical Officer.

The Director was an *ex-officio* President of the Council of the College of Medicine until this was merged with the new University in October; President of the Medical Council of the Colony of Singapore and the Federation of Malaya; Registrar of the Medical Council; Chairman and Registrar of the Dental Board, Singapore; Chairman of the Hospitals Board; Chairman of the Pharmacy Board; Chairman of the Public Health Conference; Chairman of the St. John Ambulance Association; and Chairman of the Singapore Branch of the British Red Cross Society. He was a member of the Legislative Council throughout the year and Chairman of the following special Committees which were formed to deal with special problems:— Venereal Disease, Blood Transfusion, Tuberculosis and U.N.I.C.E.F. Some 250 meetings and conferences of various sorts were attended by the Director during the year.

The Colony of Singapore consists of Singapore Island with a number of small adjacent islands, including Christmas Island and the Cocos-Keeling Group in the Indian Ocean. It came into being under the constitutional proposals instituted in 1946.

Christmas Island is situated in the Indian Ocean and is a densely wooded area of some sixty square miles, with a small population consisting of a few hundred Chinese and Malays working in exporting the deposits of phosphate of lime found on the Island. There is a medical officer and a well equipped hospital.

The Cocos-Keeling Islands consist of twenty-seven coral reefs, only two of which have any practical significance. They lie some 700 miles south-west of Batavia and about 550 miles distant from Christmas Island. One is used by the Cable and Wireless Company as a station and the other by Malay labourers and their families working the large coconut plantations on the Islands. There is a resident medical officer.

The climate of Singapore is relatively good in spite of a close proximity to the equator. It is characterised by a uniform temperature varying from eighty degrees to ninety degrees Fahrenheit and a high average humidity of some eighty-four per cent. The island is flat without hills of any consequence. While there is no dry season the rainfall is considerably increased during the north east winter monsoon. The average annual rainfall is within the hundred inch range, January being a particularly wet month.

The Island is some twenty-seven miles in length and fourteen miles in breadth, and about 217 square miles in area with a population of just under the million mark.

An acknowledgement is due for the assistance given to the Director in the preparation of this report by various members of the staff of the Medical Department and of the Faculty of Medicine of the University of Malaya. Particular thanks are due to the Government Printer and to the Public Relations Secretary (photographs) in this connection.

CHAPTER TWO

ADMINISTRATION

THE difficulty in administration has been to meet the ever increasing demands of the public with a seriously understaffed organisation housed in buildings designed to cater for a population of half the present size. An excellent service has been built up within these very serious limitations. It must be clear, however, that there is a limit to advance under these conditions: that a stage is reached when not only is an ever imminent danger to the public health enhanced, but the risk of institutional disease is created.

Reference has been made in the previous chapter to the lack of trained personnel. This continued to be the most difficult feature in the administrative field: while the 1949 estimates were based on a minimum qualified medical requirement without adequate leave and sickness reserves, the present available qualified staff falls so far short of this supply, that it is proving increasingly difficult to create a satisfactory structure for staff or public. Yet that is the present position. The Singapore Medical School cannot possibly turn out sufficient graduates for some time to come to fill the many vacancies that exist today in a country-wide Government service excluding the demands of an expanding teaching institution and non-Government needs. The result of a complete stoppage in training during the Japanese occupation is still having its serious repercussions. For a growing population which is fast becoming health-minded—particularly in Singapore—the present numbers in the estimates can well be doubled from a long range point of view. The Medical School has been admitting a far greater number of students than the facilities available permit, thus throwing an intolerable burden on both hospital and teaching staffs. So far only fifty-four men and twelve women have qualified over the post-war period. The position in this respect was foreseen when some thirty-five local medical officers in Singapore and the Federation of Malaya resigned in 1946 owing to salary and other conditions then in operation. What has been unexpected is the virtual cessation of expatriate recruitment. Only forty-four (only eight in the last two years) time-scale officers have joined the service from overseas since 1945 and of these fourteen have since left. Another difficulty has been the insistence on specialisation after qualification. It is the lack of the ordinary general-duty officer which is most severely felt and no national medical organisation can operate without these.

A uniform basis of salary with an enhanced cost of living allowance came into being in 1948 for both Asian and European officers retrospective to 1st August, 1947. The creation of a Unified Health Service dealing with promotion and other conditions for the whole country is in the process of being finalised. A White Paper was tabled

in the Legislative Councils of both the Federation of Malaya and Singapore in this connection in November, 1949.

The Dental situation is even more parlous as the number qualifying from the Singapore Dental School over the last four years only totalled thirty-one. As, however, the Government Dental Service was little more than a token one before the war, and a School Dental Division was only created in the latter part of 1948 for the first time in Singapore, lack of sufficient qualified dental surgeons has been felt mostly by the general public outside the Government field so far. This and the remarkable registration procedure in relation to the unqualified by the Japanese during the enemy occupation led to special legislation in this connection in 1948–49. A special examining board has had to be created to deal with this problem alone. It will be a long time before sufficient qualified and experienced dentists are available, but the totally inadequate Government service in this respect must be steadily expanded as more and more men and women graduate from the local school.

A "houseman" scheme designed to give the necessary experience to newly qualified doctors and dentists was inaugurated during the year whereby selected new graduates are required to complete one year in the main hospitals of the city. Following the practice whereby all expatriate recruits to the Government service must have one year's post-graduate experience all local entrants will be similarly treated.

In the nursing field the estimates have been calculated until very recently on pre-war requirements which were based on conditions no longer acceptable to the present time.

Only towards the end of 1949 was the estimated figure in sight of attainment following increased salaries and allowances towards the latter part of 1948. In consequence 1951 should see an appreciable increase in the figure to be aimed at provided sufficient accommodation is forthcoming. Improved conditions of service are the subject of present consideration, and improved quarters await the implementation of the Medical Plan. One of the chief difficulties in the recruiting of nurses here as elsewhere is the lack of sufficiently educated girls to tackle the prescribed course satisfactorily—a condition accentuated in Singapore by the Japanese occupation. This and the return of girls to their families either on marriage or for other domestic reason have tended to keep the numbers finally available to a disappointing total. In consequence an Auxiliary or Assistant Nurses Scheme and a section under the auspices of the Franciscan Missionaire are being inaugurated. The former should give a satisfactory career to the girl interested in nursing who is unable to deal with the prescribed course. She will nurse the more chronic sick and will be given an opportunity to become a probationer in the senior scheme. The latter will deal with tuberculosis.

The Nurses Registration Bill became law in the early part of the year. By its provisions our nurses will reach proper professional status for the first time in the history of Singapore. Regulations under the Bill were under discussion throughout the year. Acceptance of

these is necessary before reciprocity with the United Kingdom can be achieved. This means definite obligations by our local nurses and a comparable training standard. The Singapore Training School has reached the stage for negotiations in this respect, but a higher standard of examinations will be attained and retained. There can be no lowering of standards in any respect from now on. It was only in 1948 that an adequate start was possible in modern training procedure. Our first Sister Tutor got into action and trained Ward Sisters became sufficiently available only then.

Nurses were promoted to the Nursing Sister grade for the first time in local history in December, 1947, and there are now twenty-nine out of a total sixty-four sisters on the strength who are local girls. All our Health Sisters are now local ladies. It is particularly in the rank of Sister that nursing standards must be retained at the highest level, and any local nurse of sufficient merit can now reach this rank and proceed in due course to the Matron stage. A Promotions Board is held every December in this connection.

One qualified Sister Tutor obviously is inadequate in such a nursing service as this, but it has not been possible to fill our second vacancy so far. This is a problem which must meet with an immediate solution.

The Midwifery Service has come in for a good deal of study during the period under review as Professor English who initiated the present organisation was of the opinion that much of the work in the Maternity Hospital should be performed by Staff Midwives in place of nurses, thus releasing the latter for other duties. In consequence pay and other conditions of service for this grade have been the subject of special consideration as well as the best type of training to be given. The importance of the hospital midwife can be realised when it is noted that 10,928 births were dealt with in the 200 bedded maternity section of the Government Hospital concerned during 1949 as compared with 6,034 in 1939. The present figure is an all time record. The Government Rural Maternity Service covered 7,849 births out of 13,045 recorded. This is also a record return. There is a Central Midwives Board which keeps in close touch with the Director of Medical Services and the Municipal Health Officer.

An important part of the local nursing staff has always been composed of male nurses or hospital assistants as they are called. Their future training is being incorporated into the new scheme and will also be a part of the proposed legislation. Male nurses are a more expensive proposition than female because of family and additional housing commitments. Thus this section must be a comparatively small but well trained corps.

Sanitary Inspectors have to attend a local course and pass the examinations of the Royal Sanitary Institute, London. Thus these and Laboratory Assistants must also comprise a small but well trained division.

The question of study leave to all sections of the department has become a serious one but there must be a strict limit to the numbers

which can be spared at any one time. The desire for post-graduate study must be met on an increasing scale for all qualified staff both medical and nursing. This problem has obviously an intimate bearing on sufficiency of staff.

Hospital food and dieting is a subject which has led to criticism and discussion in the United Kingdom and elsewhere both at present and in the past. Thus the question was not forgotten in Singapore. In 1946 all our hospital diets and matters connected with them were extensively reviewed by a Committee under the chairmanship of Dr. Lucius Nicholls, C.M.G., then the Nutrition Adviser to the Special Commissioner for South East Asia. The recommendations of this Committee were adopted in full. Since then the diet for the Leper and T.B. patients has been further improved. An appointment for a dietetic expert and adviser to each main hospital was approved in the 1948 estimates. The suggestion has been made that a local housewife might well prove more satisfactory in such a post than a trained expert from elsewhere. Until selected local girls can be given the long training required this suggestion will receive little support. A properly trained dietitian can soon acquire all the local knowledge required; a patient's food is as important as medicine; training is as essential in this branch of our hospital work as in any other today. Lack of sufficient experienced staff in the hospitals has led, and will continue to lead, for some time to come, to lack of proper supervision in cooking and distribution of food. These are difficulties which are being gradually overcome, but outmoded kitchens must await the implementation of the Medical Plan. A majority of the cooks available are of a poor type. The question of a separate scheme for these outside the hospital servants scheme is at present under consideration.

Rehabilitation of the last of the hospitals requiring to be dealt with was commenced towards the end of the year and this progress will certainly put our existing medical institutions out of the danger the accumulation of dirt of the war and post-war years has created. Action was finally commenced on the Medical Plan in respect of the Leper Settlement and the Base Medical Stores and Manufactory. There has been a remarkable increase in the demands on the institution in view of new treatment procedures and drugs. The existing temporary arrangements were jeopardising essential hospital supplies. With regard to the Leper Settlement suffice it to say an institution built for 250 cannot indefinitely house some 450 inmates with an average added increase of twelve per month. In this country leprosy is an acute public health matter. The fear and reaction against this disease will never be removed from the present generation. The real problem in this connection is the rehabilitation of the non-infectious or cured case who still shows the ravages of the disease. This is a question which will be discussed in a further chapter.

The implementation of the full Medical Plan particularly in regard to its hospital side cannot be long delayed. There is no means of stopping the steadily growing pressure on the existing hospital services until more accommodation is available, but there is a danger

both to the patient and to the public health in the progressive overcrowding of the existing institutions. Take the Women Diseases Hospital for example. Kandang Kerbau Hospital is now dealing with over four times the number of patients it was designed for and 1949 is an all time record in that this 240 bedded institution dealt with 14,779 in-patients during the year. In consequence the danger of septic infiltration and spread must be ever present. The lack of in-patient accommodation has resulted in an enormous increase in out-patient attendances, and out-patient accommodation was barely sufficient before the war: to expect to deal with several times the numbers then forthcoming in the same buildings must lead to complaint and inefficiency.

Tuberculosis is almost a new post-war problem in this and other respects in that it has attracted a very considerable and increasing attention over the last four years although it is clear that the disease was equally present to the serious danger of the public health before the war. The new Rotary Clinic at Tan Tock Seng Hospital plus the Singapore Anti-Tuberculosis Association has helped to ease the situation, but these efforts have also attracted increasing numbers of patients. A lack of in-patient accommodation means more and more out-patient treatment and domiciliary relief. That these practically new services have made such strides in the last two years is naturally no consolation to the unfortunate who still cannot get the attention he requires.

Quarters for staff is an immediate and urgent problem. This is as important a factor in recruitment as any other. As much of the available accommodation was designed and built on a system which is obsolete according to present day standards the demand for rehabilitation which really means rebuilding is not surprising. A contented public service is not to be expected until our housing difficulties have been overcome.

A number of Committees work as a part of the Medical Department. These did much to assist the administration in its difficult task. The work of these is discussed in a separate chapter.

The Medical Department deals with an essential public service. It cannot stand still. The population is growing daily: the public is becoming more and more health-minded. Within the Medical Plan lies the immediate answer.

CHAPTER THREE

LEGISLATION

LEGISLATION considered during the year under review in relation to new law pertaining to medical matters or to an extension of existing enactments, comprised the following:—

Registration of Nurses.
Dangerous Drugs.
Therapeutic Substances.
Poisons.
Lepers.
Mental Deficiency.
Medical Registration.
Dental Registration.
Pharmacy Registration.
Hospital Board.
University of Malaya.
Tan Tock Seng Hospital (Amendment).

Most of the legislation in regard to medicine and the public health in this country has received little attention for some decades. The present policy is to review all the existing law in consequence. Dental Registration dealt with detailed and complicated regulations in regard to Japanese licensed unqualified dentists and better control of existing registration, while Medical Registration was considered from the point of view of a Medical Council with a wider control by registered practitioners themselves. The University of Malaya came into being on 8th October, 1949, and this has necessitated a review of various matters in connection with the Government Hospitals and the Medical School. An attempt is being made to bring all legislation relating to dangerous drugs and therapeutic substances into line with that of the United Kingdom. Mental deficiency has never received attention locally so far: the new law in this respect seeks to introduce some reasonable control. In regard to leprosy the late Mr. E. R. Koek, an enthusiastic social worker, a legislative Councillor, and a lawyer, wished to introduce a more benevolent and less medieval attitude towards this disease. The new law is based on his ideas accordingly.

TOTAL NUMBER OF OFFICERS AUTHORISED AND AVAILABLE ON 1ST JANUARY, 1950

———	Estimates	Permanent	Temporary	Gone or going on long leave including study	Total to be available
(*A*)—ADMINISTRAVITE					
Director	1	1	..	..	1
Deputy Director ..	1	1	..	..	1
Chief Health Officer ..	1	1	..	..	1
Chief Medical Officer ..	1	1	..	..	1

TOTAL NUMBER OF OFFICERS AUTHORISED AND AVAILABLE ON 1ST JANUARY, 1950—*continued*

———	Estimates	Permanent	Temporary	Gone or going on long leave including study	Total to be available
(*B*)—HOSPITALS DIVISION					
Specialists (including clinical University posts) ..	17	12	5 (acting)	..	17
Medical and Health Officers (including Housemen and University junior clinicians)	95	53	16 { 4 on contract	7	62
Matrons	9	6	2 (acting)	1 vacant	8
Specialists	17	10	1	6 vacant	11
Sisters—expatriate ..	64	24			
Sisters—locally appointed ..		14	5	..	33
Nursing Nuns	10	..	..	..	..
Senior Staff Nurses ..	16	8	..	..	8
Trained Nurses	120	87	33	..	120
Qualified Midwives ..	41	41	..	..	41
Probationer Nurses ..	254	145	9	..	154
Hospital Assistants ..	169	150	4	..	154
Probationer Hospital Assistants	44	30	..	..	30
Dental Staff (including University):—					
(*a*) Qualified ..	14	7	1	..	8
(*b*) Rest	13	10	..	..	10
Pharmacists	8	2	..	..	2
Laboratory Assistants ..	9	9	..	..	9
(*C*)—HEALTH DIVISION					
Health Officers	4	2	2	2 (1 retiring)	2
Chief Sanitary Inspector ..	1	1	..	..	1
Sanitary Inspectors ..	12	9	..	..	9
Matron	1	1 (acting)	..	..	1
Sisters (all local) ..	4	3	..	..	3
Health Nurses and Nurses ..	20	9	9	..	18

CHAPTER FOUR

STAFF WELFARE SCHEMES

THE inaugural meeting of the Medical Department's Interim Joint Council on the lines of a Whitley Council was held in April 1949. The Medical Services Union was largely instrumental in getting the Council started—the second departmental Council instituted by a Government Department in the Colony at that time. The Council has felt its way slowly a necessity in getting under way a feature of this nature.

During the latter part of the year it was discovered that the Japanese cinema in which the Hospital Assistants Club had been housed was unsafe and had to be vacated. This was most unfortunate as this building in many ways served as an excellent centre for the club's activities and many improvements had been made to it by the hospital assistants themselves. Temporary accommodation for the club has been provided.

The Hospital Assistants Union was registered officially in August 1947 to represent the hospital assistants of Singapore, but now includes nurses, laboratory assistants and sanitary inspectors. It recently changed its name to the Medical Services Union. The Union during the year put up for Government consideration its considered views on salaries revision, housing, opportunities for special training and on proposed regulations under the new Registration of Nurses Ordinance.

The second annual sports meeting of the Medical Services Union was held in September and again proved to be a most successful and popular affair.

Another venture of the Union was the publication of the first volume of a magazine; a most commendable effort and a production of the highest standard.

During the year meetings took place from time to time between representatives of the hospital servants and the Deputy Director of Medical Services and the Chief Medical Officer to discuss problems concerning their work and general welfare. This periodic form of meeting continues to prove useful in maintaining direct contact with the hospital servants.

The hospital shops and canteens continued to function and are now a regular feature of the hospitals.

The Co-operative Society run for and managed by the labourers of the Health Division still maintains its membership which stood at 416 at the end of December. The total investments of this Society were $21,536.50. The credit balance as at 31st December, 1949, was as follows:—

	$	c.
P.O. Savings Bank	16,987	64
Chartered Bank	496	38
Cash in transit (December subscriptions) ..	1,406	82

CHAPTER FIVE

KING EDWARD VII COLLEGE OF MEDICINE

(*Submitted by the Principal, Dr. D. W. G. Faris,* C.B.E.)

THIS is the last Report of King Edward VII College of Medicine as such, the Governments of Singapore and the Federation of Malaya having enacted the University of Malaya Ordinance, fusing this College with Raffles College into a University. The King Edward VII College of Medicine Ordinance was repealed on 8th October, 1949, and the College then became the Medical Faculty of the University. So these remarks are concerned primarily with the period January to October, 1949.

Seventy-nine new students were admitted to the College, at the beginning of the academic year in October, 1949, 53 as first-year Medicals and 26 as first-year Dentals. These admissions raised the number of medical and dental students on the Register to 390, of whom 112 were Singapore medical and 29 dental students, a total of 141 Singapore students, the remainder being from the Federation, Borneo and Sarawak. The admission of a considerably larger number yearly than in pre-war days has raised many problems concerned with hostel accommodation, teaching staff and facilities. At present there are 270 students housed in hostels which were designed to hold 183. This is most unsatisfactory and is now receiving the earnest attention of the new University.

There has been considerable rehabilitation and reconstruction in departments responsible for the teaching in the pre-clinical years, especially in those of Biochemistry, Physiology and Bacteriology. The necessity for increased accommodation for the Department of Anatomy realised in 1939 but on which action was postponed owing to the war, has been the immediate concern of the Council, and during the year it was decided to hand over the buildings which housed the Public Health Museum as a partial solution to the problem. The Public Health Department, now known as the Department of Social Medicine and Public Health, is occupying the old Sepoy Lines Club as a temporary measure until such time as a decision is made as to the permanent headquarters of the Medical Faculty.

In admitting a greatly increased number of students to the College over the pre-war, it was agreed that this depended an increased provision of not only hostel accommodation and laboratory facilities but of increased staff. Unfortunately these pre-requisites have not been fulfilled, especially in the departments concerned with the clinical years. The expansion of the teaching hospitals has not taken place as yet, and the recruitment of qualified staff both locally

and from overseas has so far quite failed to meet demands. The following shows the number of students in the different years:—

	Medical	*Dental*
First year	67	31
Second year	53	20
Third year	66	16
Fourth year	50	8
Fifth year	27	13
Sixth year	39	—
	302	88

Two vacant Chairs were filled, that of Bacteriology by Professor N. K. Sen, M.B., DIP.BACT., promoted from amongst the Tutorial Staff, and that of Clinical Medicine by Professor E. S. Monteiro, L.M.S., M.R.C.P., F.R.F.P.S. (Glas.), D.C.H., Professor G. A. Ransome, F.R.C.P., M.R.C.S., now occupying the Chair of Medicine. The Chairs of Parasitology, Pathology, Midwifery and Gynæcology and Dental Prosthetics, together with a large number of junior teaching posts, still remain vacant.

The second post-war Graduation Ceremony was held as a combined ceremony of the College of Medicine and Raffles College in Oei Tiong Ham Hall, Raffles College, on 29th June. His Excellency the Commissioner-General, the Right Honourable Malcolm Macdonald, presented the diplomas to the medical and dental graduates.

Final Professional Examinations were held in June and December. Sixteen students were awarded the Licentiate in Medicine and Surgery and five the Licentiate in Dental Surgery at the former examination and twelve and six respectively at the latter. These examinations were held under the auspices of the old Senate and Council of the King Edward VII College of Medicine.

The financial aid system to old students was continued. With regard to new students the Government awarded bursaries in the case of Singapore to four students (three medical and one dental) and in the case of the Federation of Malaya to ten students (eight medical and two dental) of whom five were Malays and five non-Malays.

The work of the Nutrition Unit continued during the year. The investigation into the dietary intake of pregnant and lactating women was continued and a health survey of a small community of Chinese vegetable gardeners was commenced. At the request of the Social Welfare Department the Unit assisted in an investigation into the home conditions of families whose children attended the Feeding Centres. The Unit also co-operated with the Almoner of the General Hospital in the follow-up of cases of malnutrition after discharge. Advice was given to industrial concerns regarding dietary scales for their employees.

Research

In the Department of Bacteriology research was continued on antibiotics from local strains of moulds and actinomyces; antigenic analysis of some salmonella; and with a tuberculin survey in schools.

In the Department of Physiology the estimation of the basal metabolic rate of naval ratings was started towards the end of last year in collaboration with the Naval Tropical Research Unit and continued throughout the year under review. A comparative study is being made on sweat formation and response to high temperatures of European naval ratings in varying states of acclimatisation, and of locally born Malays, Chinese, Indians and Eurasians. This work was begun in June this year in collaboration with the Medical Research Council Climate and Working Efficiency Unit, Oxford University and Tropical Research Unit, Singapore. The results that are being obtained locally will be compared with those obtained at Oxford on artificially acclimatised European naval ratings and students living in a temperate environment.

Experiments have been carried out on experimental animals to estimate the factors determining the flow of blood through the small intestine. Continuous measurements have been made of arterial inflow and pressure, and venous outflow and pressure, using optically recording manometers and differential flow-meters. The investigation has included:—

(1) An analysis of the phasic action of graded doses of adrenalin; and

(2) A measure of relation between pressure and flow over a wide range of pressures.

The experiments are proceeding.

CHAPTER SIX

VITAL STATISTICS

POPULATION

SINGAPORE ISLAND

(Excluding Cocos and Keeling Islands)

THE present population figure for mid year 1949 is based on the actual 1947 census figure plus migrational surplus plus excess of births over deaths since then. On this calculation the estimate is 980,818.

Details by race since 1911 are as follows:—

Year	Chinese	Malays	Indians	Europeans	Eurasians	Others	Total
1911 (Census) ..	219,577	41,806	27,755	not available		..	303,321
1921 (Census) ..	315,151	53,595	32,314	6,145	5,436	5,717	418,358
1931 (Census) ..	418,640	65,014	50,811	8,082	6,903	8,295	557,745
1947 (Census) ..	729,473	113,803	68,967	9,279	9,110	7,512	938,144
1948 (Mid year) ..	749,591	116,364	69,474	9,660	9,354	7,599	962,042
1949 (Mid year) ..	761,962	119,623	70,749	10,923	9,716	7,845	980,818

Thus there has been a remarkable increase in Singapore's population over the last eighteen years. In the twenty year period from 1911 to 1931 the increase was some eighty-three per cent when the cause was mainly due to immigration from India and China on a large scale. Since 1931 the overall increase is about seventy-six per cent due to a steady increase by natural (births over deaths) means. Since the last war in fact the increase has been vitiated by the balance of emigration over immigration. In 1931 the number of females to males was 584 to 1,000. It is now 950 to 1,000. This is the factor of real significance in present and future local population trends.

NOTES ON COCOS KEELING ISLANDS, 1949 POPULATION

1949 (Mid year)	
Chinese	10
Malays	1,736
Indians	1
Europeans	16
Eurasians	..
Others	..
Total ..	1,763

CHRISTMAS ISLAND

1949 (Mid year)	
Chinese	924
Malays	213
Indians	17
Europeans	62
Eurasians	..
Others	..
Total ..	1,216

Births and Deaths 1949

Cocos-Keeling Islands	Males	Females	Christmas Island	Males	Females
Births	73	45	Births	34	24
Deaths	18	5	Deaths	6	2

Births and Birth Rates

	1931		1947		1949	
	Number	Rate	Number	Rate	Number	Rate
Chinese	15,993	37.85	33,629	46.20	36,322	47.67
Malays	2,862	43.69	5,473	47.73	5,709	47.72
Indians	1,020	19.64	3,087	43.30	3,041	42.98
Europeans	169	20.55	312	35.79	357	32.68
Eurasians	199	28.53	359	39.84	368	37.88
Others	227	29.09	185	28.27	372	47.41
Total ..	20,470	36.37	43,045	45.89	46,169	47.07
Male	10,753	..	22,152	..	23,681	..
Female	9,717	..	20,893	..	22,488	..
Total ..	20,470	..	43,045	..	46,169	..
Male births per 100 births ..	..	52.04	..	51.23	..	51.29

Births by Sex and Race

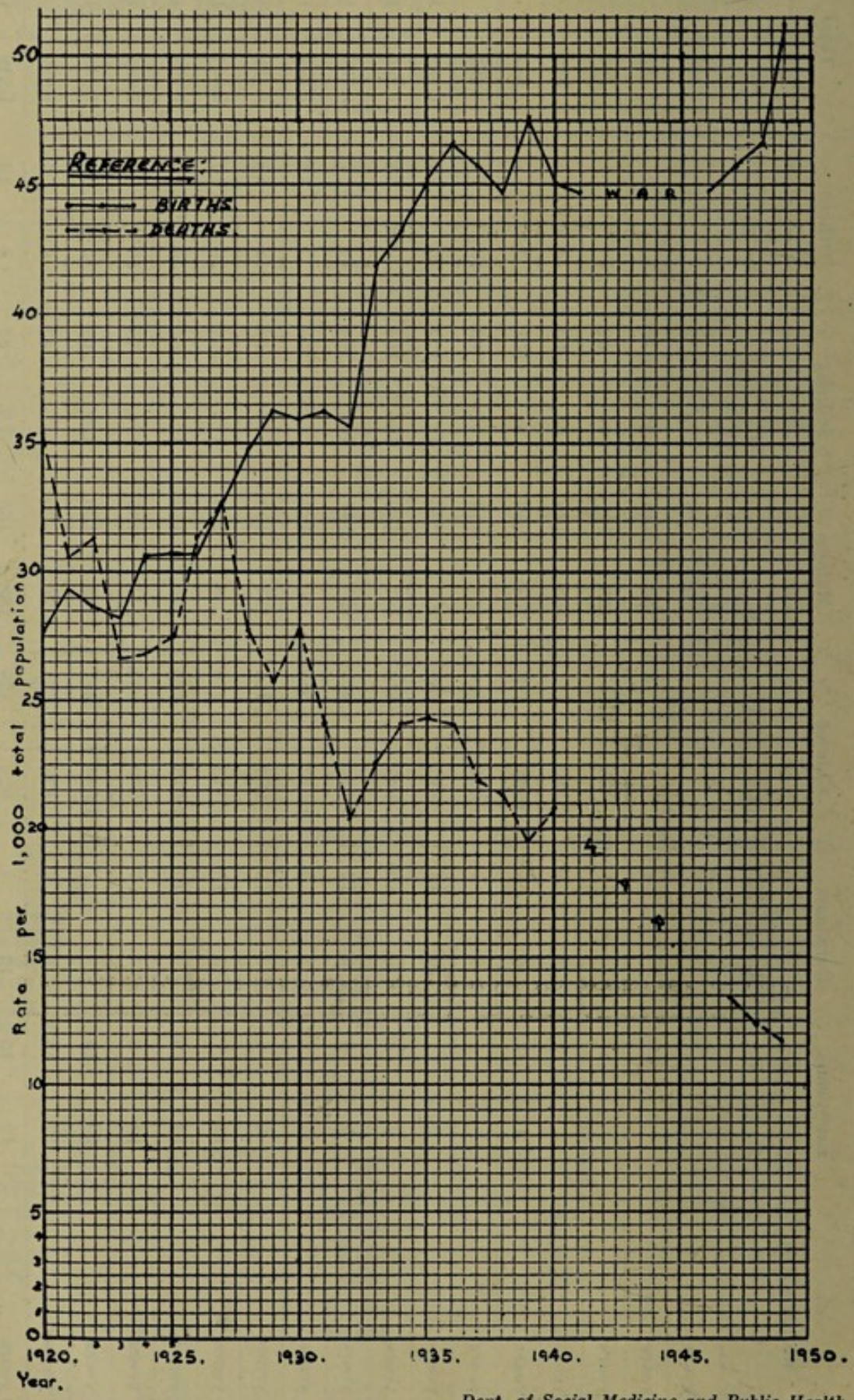
	Urban Area	Rural Area	Singapore Total
Males			
Europeans	100	78	178
Eurasians	173	17	190
Chinese	13,665	5,006	18,671
Malays	1,710	1,215	2,925
Indians	1,175	357	1,532
Others	167	18	185
Total ..	16,990	6,691	23,681
Females			
Europeans	109	70	179
Eurasians	161	17	178
Chinese	12,962	4,689	17,651
Malays	1,589	1,195	2,784
Indians	1,143	366	1,509
Others	170	17	187
Total ..	16,134	6,354	22,488
Grand Total ..	33,124	13,045	46,169

Births by Sex, Race and Mother's Ages Registered in Singapore—1949

Mother's Age	Europeans		Eurasians		Chinese		Malays		Indians		Others		Total	
	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.
14 years	..	..	..	..	..	..	5	8	5	2	..	..	10	10
15 years	..	..	..	2	2	4	56	46	25	16	..	..	83	68
16 years	..	..	..	1	35	41	105	101	46	52	..	1	186	196
17 years	..	1	1	5	130	127	138	125	68	65	3	5	340	328
18 years	1	1	6	5	334	326	204	206	94	101	5	8	644	647
19 years	..	1	7	8	595	600	157	144	92	93	10	3	861	849
20 years	2	1	10	13	877	859	273	266	111	124	9	14	1,282	1,277
21 years	4	4	9	10	991	976	187	169	100	101	8	14	1,299	1,274
22 years	5	6	9	12	1,118	1,032	185	191	106	104	12	7	1,435	1,352
23 years	7	7	8	9	1,012	1,008	150	124	74	108	7	12	1,258	1,268
24 years	5	6	15	13	904	915	127	109	76	88	12	10	1,139	1,141
25 years	11	7	13	15	1,113	970	229	236	115	94	20	10	1,501	1,332
26 years	14	19	9	13	1,013	875	149	153	105	96	8	8	1,298	1,164
27 years	18	8	14	7	950	863	111	109	76	79	13	15	1,182	1,081
28 years	20	13	15	7	1,044	911	149	130	100	68	15	17	1,343	1,146
29 years	17	15	9	8	878	778	76	70	41	47	8	6	1,029	924
30 years	12	15	13	8	925	839	188	165	75	67	6	12	1,219	1,106
Total ..	116	104	138	136	11,921	11,124	2,489	2,352	1,309	1,305	136	142	16,109	15,163

TREND OF CRUDE BIRTH AND DEATH RATES IN SINGAPORE
(1920 onwards)

(Rates are the number of births reported per 1,000 total population)
(Rates are the number of deaths reported per 1,000 total population)



Dept. of Social Medicine and Public Health

Fig. 1

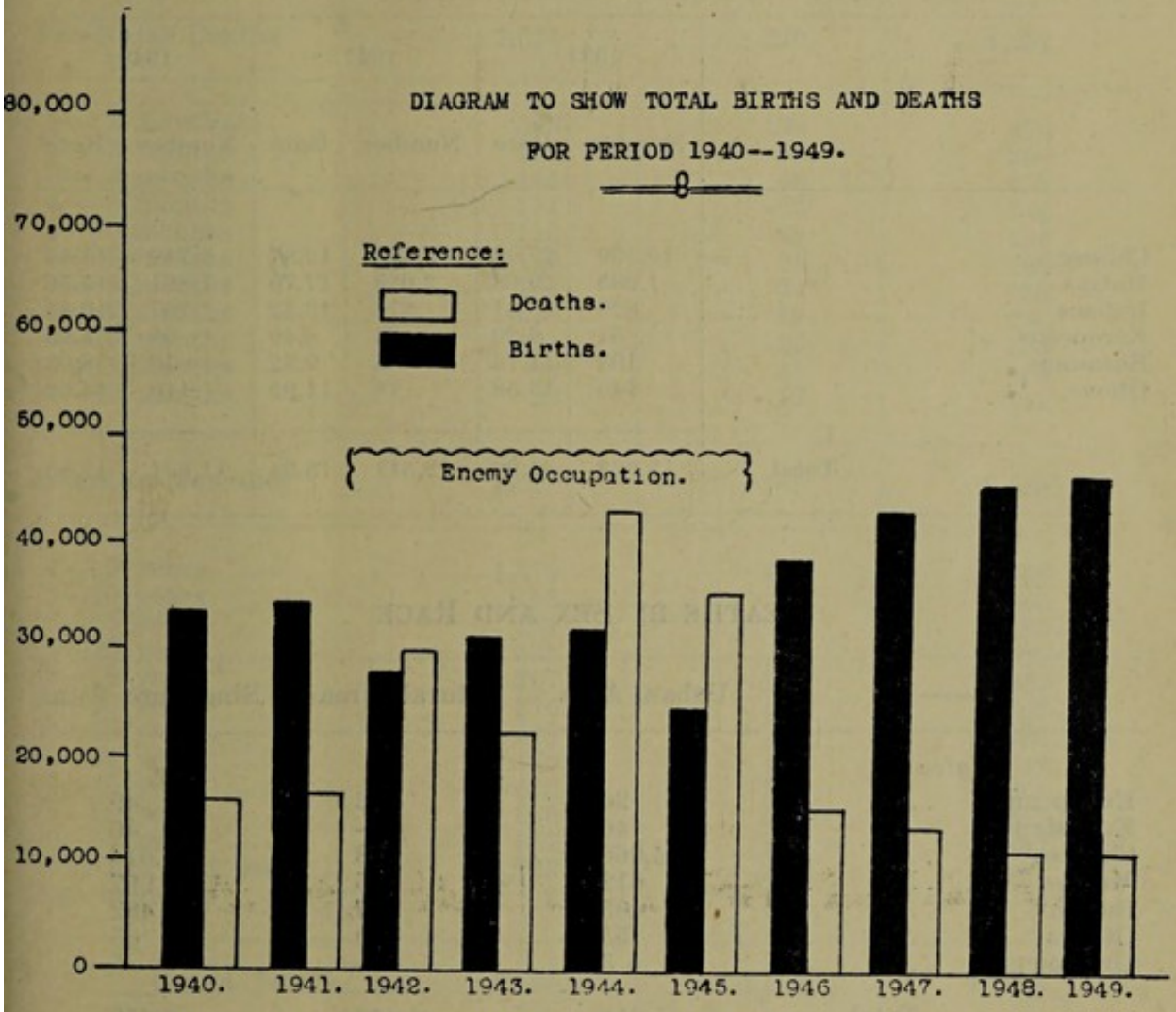


DIAGRAM TO SHOW TOTAL BIRTHS AND DEATHS
FOR PERIOD 1940--1949.
Reference:
Deaths.
Births.
Enemy Occupation.
80,000
70,000
60,000
50,000
40,000
30,000
20,000
10,000
0
1940.
1941.
1942.
1943.
1944.
1945.
1946
1947.
1948.
1949.

Fig. 2

The steady increase in the number of births continues and the 1949 rate of 47.07 per 1,000 of the population is now almost up to the estimated pre-war peak of 47.57 in 1939. This compares with 20.5 in 1947 and 35.4 in 1871–1880 in England and Wales where the rate has been as low as 13.9 in 1941. The United Kingdom 1947 and 1941 figures are based on total population including Armed Forces at home and abroad however.

Deaths and Death Rates

	1931		1947		1949	
	Number	Rate	Number	Rate	Number	Rate
Chinese	10,599	25.09	9,368	12.87	8,740	11.47
Malays	1,905	29.08	2,029	17.70	1,861	15.56
Indians	820	15.81	878	12.32	767	10.84
Europeans	51	6.20	74	8.49	65	5.95
Eurasians	103	14.76	84	9.32	78	8.03
Others	145	18.58	78	11.92	110	14.02
Total ..	13,623	24.20	12,511	13.34	11,621	11.85

Deaths by Sex and Race

	Urban Area	Rural Area	Singapore Total
Males			
Europeans	26	23	49
Eurasians	46	—	46
Chinese	4,066	948	5,014
Malays	612	385	997
Indians	405	77	482
Others	55	10	65
Unknown	5	—	5
Total ..	5,215	1,443	6,658
Females			
Europeans	10	6	16
Eurasians	29	3	32
Chinese	3,108	618	3,726
Malays	510	354	864
Indians	232	53	285
Others	31	5	36
Unknown	3	—	3
Total ..	3,923	1,039	4,962
Unknown Sex	1	—	1
Grand Total ..	9,139	2,482	11,621

Deaths by Age Groups

Ages	Urban Area	Rural Area	Singapore Total
0— 1 day	328	94	422
1— 7 days	298	89	387
8—14 days	168	35	203
15—21 days	153	35	188
22—28 days	74	17	91
Neo-Natal Deaths ..	1,021	270	1,291
1— 2 months ..	356	120	476
2— 3 months ..	229	66	295
3— 4 months ..	144	48	192
4— 5 months ..	114	32	146
5— 6 months ..	110	20	130
6— 7 months ..	119	36	155
7— 8 months ..	108	24	132
8— 9 months ..	126	29	155
9—10 months ..	109	26	135
10—11 months ..	86	22	108
11—12 months ..	99	12	111
Infantile Mortality ..	2,621	705	3,326
1— 5 years	1,374	424	1,798
5—10 years	186	64	250
10—15 years	151	38	189
15—20 years	131	46	177
20—25 years	267	72	339
25—30 years	274	83	357
30—35 years	319	82	401
35—40 years	435	77	512
40—45 years	545	128	673
45—50 years	550	109	659
50—55 years	551	116	667
55 years and over ..	1,733	538	2,271
Age unknown	2	—	2
Grand Total ..	9,139	2,482	11,621

Deaths Grouped According to Age, Sex and Nationality Registered in Singapore for the Year 1949

Age Groups	Sex	Europeans	Eurasians	Chinese	Malays	Indians	Others	Unknown	Total
0— 1 day	M.	1	1	163	42	27	1	2*	237*
	F.	2	1	120	26	33	1	1	184
1— 7 days	M.	..	1	138	34	13	4	1	191
	F.	2	..	143	32	15	2	2	196
8—14 days	M.	..	2	73	15	7	..	..	97
	F.	..	..	82	17	7	..	..	106
15—21 days	M.	..	..	50	17	2	..	..	69
	F.	..	..	97	15	6	1	..	119
22—28 days	M.	..	..	22	13	4	..	..	39
	F.	..	..	43	6	2	1	..	52
Neo-Natal Deaths	M.&F.	5	5	931	217	116	10	7	1,291
28 days— 2 months	M.	1	1	156	65	25	..	..	248
	F.	..	1	163	48	13	3	..	228
2— 3 months	M.	1	1	105	42	16	1	..	166
	F.	..	..	92	31	5	1	..	129
3— 4 months	M.	..	1	62	39	3	1	..	106
	F.	..	2	54	20	9	1	..	86
4— 5 months	M.	..	..	39	21	9	..	..	69
	F.	..	..	55	15	7	..	..	77
5— 6 months	M.	..	..	57	9	1	1	..	68
	F.	..	..	41	13	5	3	..	62
6— 7 months	M.	..	..	56	16	4	1	..	77
	F.	..	..	61	13	4	..	..	78
7— 8 months	M.	..	..	45	19	7	..	..	71
	F.	..	..	39	18	4	..	..	61
8— 9 months	M.	..	..	67	16	4	2	..	89
	F.	..	..	55	8	3	..	..	66
9—10 months	M.	..	..	46	19	..	..	..	65
	F.	..	..	51	14	5	..	..	70
10—11 months	M.	..	2	50	8	2	1	..	63
	F.	..	..	32	11	2	..	..	45
11—12 months	M.	..	..	41	9	1	..	..	51
	F.	..	..	45*	14	1	..	..	60
Infantile Mortality	M.	3	9	1,170	384	125	12	3*	1,706*
	F.	4	4	1,173	301	121	13	3	1,619
Carried forward ..		7	13	2,343	685	246	25	7	3,326

*One unknown sex.

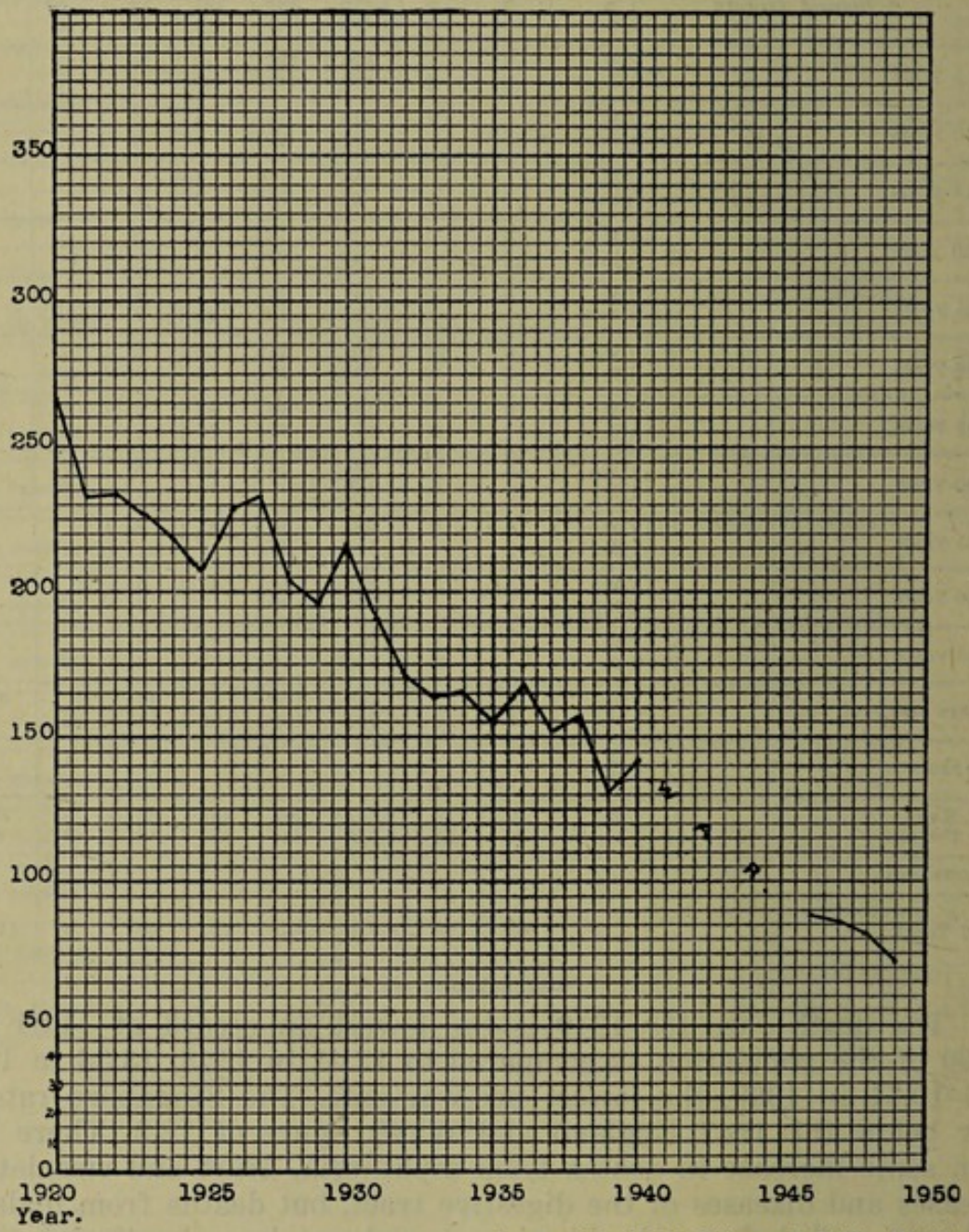
DEATHS GROUPED ACCORDING TO AGE, SEX AND NATIONALITY REGISTERED IN SINGAPORE FOR THE YEAR 1949—*continued*

Age Groups	Sex	Europeans	Eurasians	Chinese	Malays	Indians	Others	Unknown	Total
Brought forward ..	M.	3	9	1,170	384	125	12	3*	1,706*
	F.	4	4	1,173	301	121	13	3	1,619
1— 5 years	M.	1	1	693	187	46	10	..	938
	F.	2	2	635	174	43	4	..	860
5—10 years	M.	..	2	112	10	4	2	..	130
	F.	..	..	89	22	8	1	..	120
10—15 years	M.	..	..	85	17	7	..	..	109
	F.	..	1	61	15	3	..	..	80
15—20 years	M.	4	..	71	13	5	2	..	95
	F.	..	..	53	20	9	..	..	82
20—25 years	M.	6	3	127	30	15	4	..	185
	F.	..	1	93	39	20	1	..	154
25—30 years	M.	8	2	121	35	30	3	..	199
	F.	5	3	106	30	13	1	..	158
30—35 years	M.	3	1	164	40	24	3	1	236
	F.	..	2	117	33	13	..	..	165
35—40 years	M.	5	3	261	25	33	3	..	330
	F.	..	3	130	37	12	..	..	182
40—45 years	M.	1	2	353	36	45	3	..	440
	F.	1	1	186	38	7	..	..	233
45—50 years	M.	5	3	363	44	47	3	..	465
	F.	1	..	155	30	7	1	..	194
50—55 years	M.	4	7	392	48	32	6	..	489
	F.	..	2	146	19	7	4	..	178
55 years and over	M.	9	13	1,102	128	69	14	..	1,335
	F.	3	13	781	106	22	11	..	936
Age Unknown	M.	..	..	..	..	..	..	1	1
	F.	..	..	1	..	..	..	..	1
Total Males	M.	49	46	5,014	997	482	65	5	6,658
Total Females	F.	16	32	3,726	864	285	36	3	4,962
Unknown Sex		..	..	..	..	..	..	1	1
Grand Total		65	78	8,740	1,861	767	91	9	11,621

*One unknown sex.

The death rate for 1949 is the lowest on record at 11.84 per 1,000 of the population as compared to 12.41 in 1948, 13.34 in 1947 and 19.51 in 1939, the lowest pre-war rate. The Singapore rate is now below the 1947 England and Wales figure of 12.3. There has been some increase in deaths from diphtheria, heart and circulatory diseases and diseases of the digestive tract, but deaths from malaria and unspecified fever, beri-beri and violence have continued their marked decline over the post-war period. The position in regard to infantile convulsions is about the same as that recorded in 1948. 1,306 deaths were recorded as from this cause as compared to a 1,743 pre-war average. This is a matter for satisfaction while certification of deaths must still be open to serious inaccuracy in the rural districts under the present system of report without medical inspection in a large proportion of cases.

TREND OF INFANT MORTALITY RATES IN SINGAPORE
(1920 onwards)
(Rates are the number of deaths reported under 1 year of age per 1,000 live births)



Dept. of Social Medicine and Public Health

Fig. 3

A very satisfactory reduction in deaths from diseases of pregnancy and infancy is to be recorded—a further mark of credit to the expanding maternity and child welfare services of the Colony.

A further marked drop in the deaths from pulmonary tuberculosis is to be noted—1,290 as compared to 1,449 in 1948 and 1,976 in 1946.

There is no doubt that the population of the Colony is now generally healthier than it has ever been.

Infant Mortality

Race	1931		1947		1949	
	Number	Rate	Number	Rate	Number	Rate
Chinese	3,041	183.83	2,671	79.43	2,343	64.51
Malays	722	261.35	784	143.25	685	119.99
Indians	171	163.73	236	76.45	246	80.89
Europeans	5	29.59	18	57.69	7	19.61
Eurasians	23	110.55	28	77.99	13	35.33
Others	34	149.78	91	113.51	32	86.02
Total ..	3,996	191.30	3,828	87.33	3,326	72.04

Infant Mortality Deaths

	Urban Area		Rural Area		Singapore		Rate per mille of births
	Births	Deaths under 1 year	Births	Deaths under 1 year	Births	Deaths under 1 year	
First Quarter:—							
January	7,714	619	3,101	183	10,815	802	74.15
February ..							
March							
Second Quarter:—							
April	7,956	707	3,152	187	11,108	894	80.48
May							
June							
Third Quarter:—							
July	8,444	697	3,358	177	11,802	874	74.06
August							
September ..							
Fourth Quarter:—							
October	9,010	598	3,434	158	12,444	756	60.75
November ..							
December ..							
Total ..	33,124	2,621	13,045	705	46,169	3,326	72.04

Rate per mille for 1949—72·04.

TOTAL NUMBER OF DEATHS, RATE PER MILLION OF POPULATION AND COMPARISON WITH THE AVERAGE RATE FOR 1939/1941 BY PRINCIPAL CAUSES OF DEATHS

Causes	Average 1939/1941		1946			1947			1948			1949		
	No. of deaths	Rate per million	No. of deaths	Rate per million	Index	No. of deaths	Rate per million	Index	No. of deaths	Rate per million	Index	No. of deaths	Rate per million	Index
Malaria and Unspecified Fever	1,159	1,547	1,929		..	1,207	1,274	82	971	999	65	838	854	55
Violence (all forms) ..	477	637	773		..	573	605	95	457	470	74	443	452	71
Beri-beri	654	873	786		..	398	420	48	312	321	37	235	240	27
Senility	927	1,237	1,101		..	955	1,008	81	920	946	76	897	915	74
Bronchitis, Pneumonia and T.B. of Respiratory System	3,513	4,689	3,868		..	3,013	3,180	68	2,902	2,985	64	2,851	2,907	62
Heart Diseases ..	491	655	516		..	403	425	65	433	445	68	452	461	70
Diseases of the Circulatory System	168	224	145		..	112	118	53	173	178	79	197	201	90
Diseases of the Digestive System	409	546	371		..	253	267	49	340	350	64	364	371	68
Diseases of early Pregnancy and early Childhood ..	994	1,327	982		..	978	1,032	78	1,004	1,033	78	825	841	63
Infantile Convulsions ..	1,793	2,393	1,571		..	1,519	1,603	67	1,257	1,293	54	1,306	1,332	56
Diseases of the Respiratory System	416	555	367		..	333	351	63	322	331	60	318	324	58
T.B. other than Respiratory System ..	186	248	163		..	167	176	71	233	240	97	270	275	111
Diseases of the Genito-Urinary System ..	548	731	394		..	277	292	40	285	293	40	279	284	39
Diseases of the Nervous System	438	585	310		..	263	278	48	303	312	53	349	356	61
Influenza, Acute Rheumatism	279	372	195		..	208	220	59	101	104	28	103	105	28
Typhoid, Dysentery, Diarrhoea and Enteritis	1,350	1,802	908		..	954	1,007	56	1,064	1,094	61	1,039	1,059	59
Cancer	353	471	217		..	306	323	69	334	344	73	296	302	64
Others	1,147	1,531	691		..	592	625	41	522	537	35	559	570	37
Total ..	15,302	20,425	15,287		..	12,511	13,206	65	11,933	12,275	60	11,621	11,848	58
Pulmonary Tuberculosis ..	1,714	2,288	1,976		..	1,468	1,550	68	1,449	1,491	65	1,290	1,315	57

No accurate figure

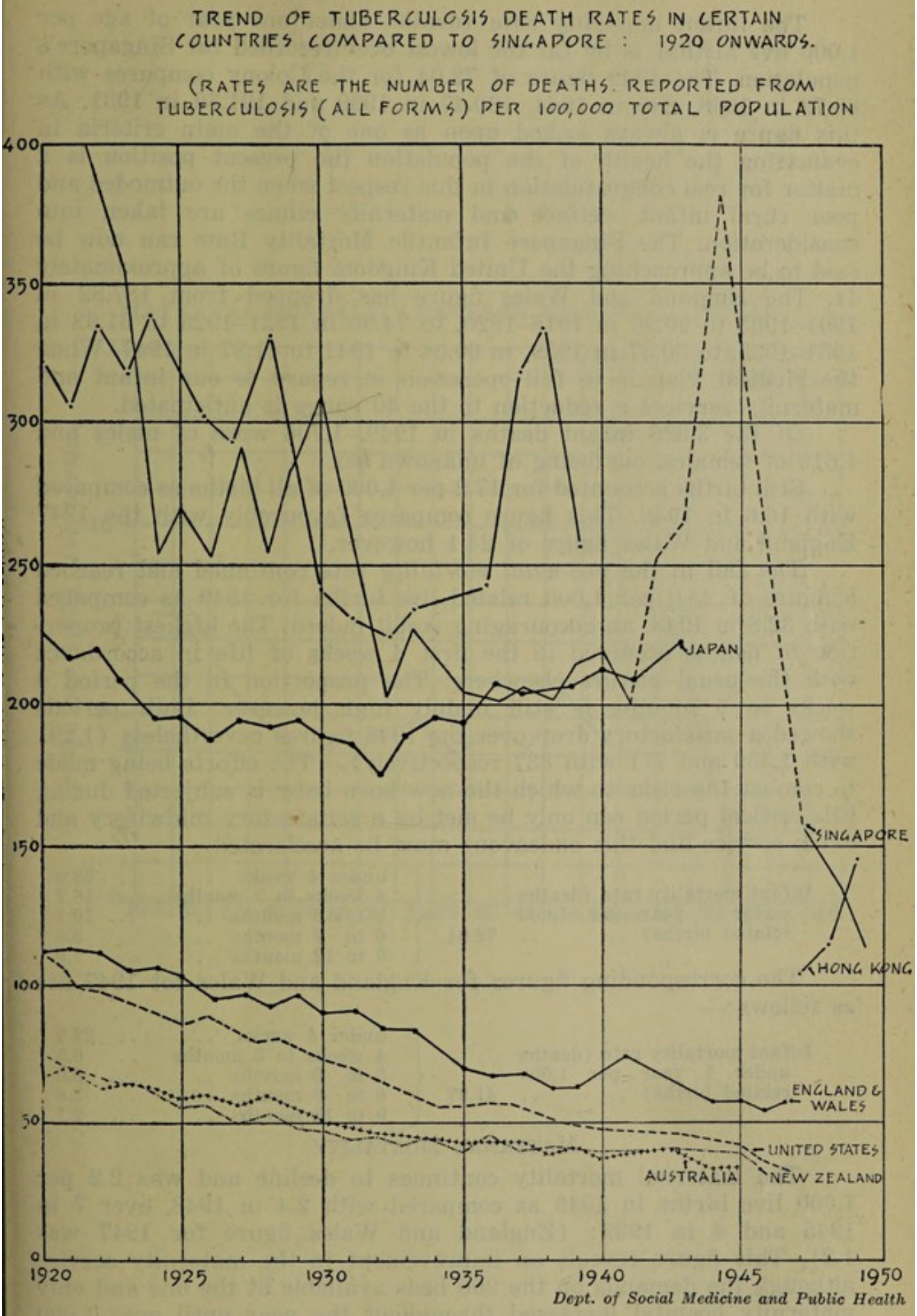

TREND OF TUBERCULOSIS DEATH RATES IN CERTAIN COUNTRIES COMPARED TO SINGAPORE : 1920 ONWARDS.
(RATES ARE THE NUMBER OF DEATHS REPORTED FROM TUBERCULOSIS (ALL FORMS) PER 100,000 TOTAL POPULATION
400
350
300
250
200
150
100
50
0
1920
1925
1930
1935
1940
1945
1950
JAPAN
SINGAPORE
HONG KONG
ENGLAND & WALES
UNITED STATES
AUSTRALIA
NEW ZEALAND
Dept. of Social Medicine and Public Health

Fig. 4

The infant mortality rate (deaths under one year of age per 1,000 live births) is by far the lowest ever recorded for Singapore's population. The 1949 figure of 72.04 for the Colony compares with 80.79 in 1948, 285 in 1944, 130.47 in 1939 and 191.30 in 1931. As this figure is always looked upon as one of the main criteria in evaluating the health of the population the present position is a matter for real congratulation in this respect when the outmoded and poor rural infant welfare and maternity clinics are taken into consideration. The Singapore Infantile Mortality Rate can now be said to be approaching the United Kingdom figure of approximately 41. The England and Wales figure has dropped from 137.82 in 1901–1905 to 90.90 in 1916–1920, to 74.90 in 1921–1925 to 61.92 in 1931–1935, to 50.57 in 1939, to 60.04 in 1941 to 41.37 in 1947. When the Medical Plan is in full operation in regard to our infant and maternity services a reduction to the 40 range is anticipated.

Of the 3,326 infant deaths in 1949, 1,706 were of males and 1,619 of females, one being of unknown sex.

Still births accounted for 17.2 per 1,000 of all births as compared with 16.6 in 1948. This figure compares favourably with the 1947 England and Wales figure of 24.1 however.

The fall in the *neo-natal mortality rate* continued and reached a figure of 28.0 per 1,000 related live births for 1949 as compared with 32.8 in 1948, an encouraging result indeed. The highest proportion of deaths occurred in the first 4 weeks of life in accordance with the usual picture elsewhere. The proportion in the period 4 weeks to 3 months is still unduly high however. Both periods showed a satisfactory drop over the 1948 figures nevertheless (1,291 with 1,459 and 771 with 837 respectively). The efforts being made to combat the risks to which the new born baby is subjected during this critical period can only be met by a satisfactory midwifery and clinic service and this endeavour must be accelerated.

Infant mortality rate (deaths under 1 year per 1,000 related births)	72.04	under 4 weeks	28.0
		4 weeks to 3 months ..	16.7
		3 to 6 months	10.1
		6 to 9 months	9.6
		9 to 12 months	7.5

The corresponding figures for England and Wales for 1947 are as follows:—

Infant mortality rate (deaths under 1 year per 1,000 related births)	41.37	under 4 weeks	22.7
		4 weeks to 3 months ..	6.9
		3 to 6 months	6.0
		6 to 9 months	3.6
		9 to 12 months	2.1

Maternal Mortality

The maternal mortality continues to decline and was 2.2 per 1,000 live births in 1949 as compared with 2.4 in 1948, over 7 in 1945 and 4 in 1939: (England and Wales figure for 1947 was 1.2). This figure reveals an improvement in the maternity service although the demands on the 200 beds available at the one and only maternity hospital increased throughout the year until over 1,000 deliveries were being dealt with by this unit per month.

MATERNAL MORTALITY RATES IN SINGAPORE 1931–1949

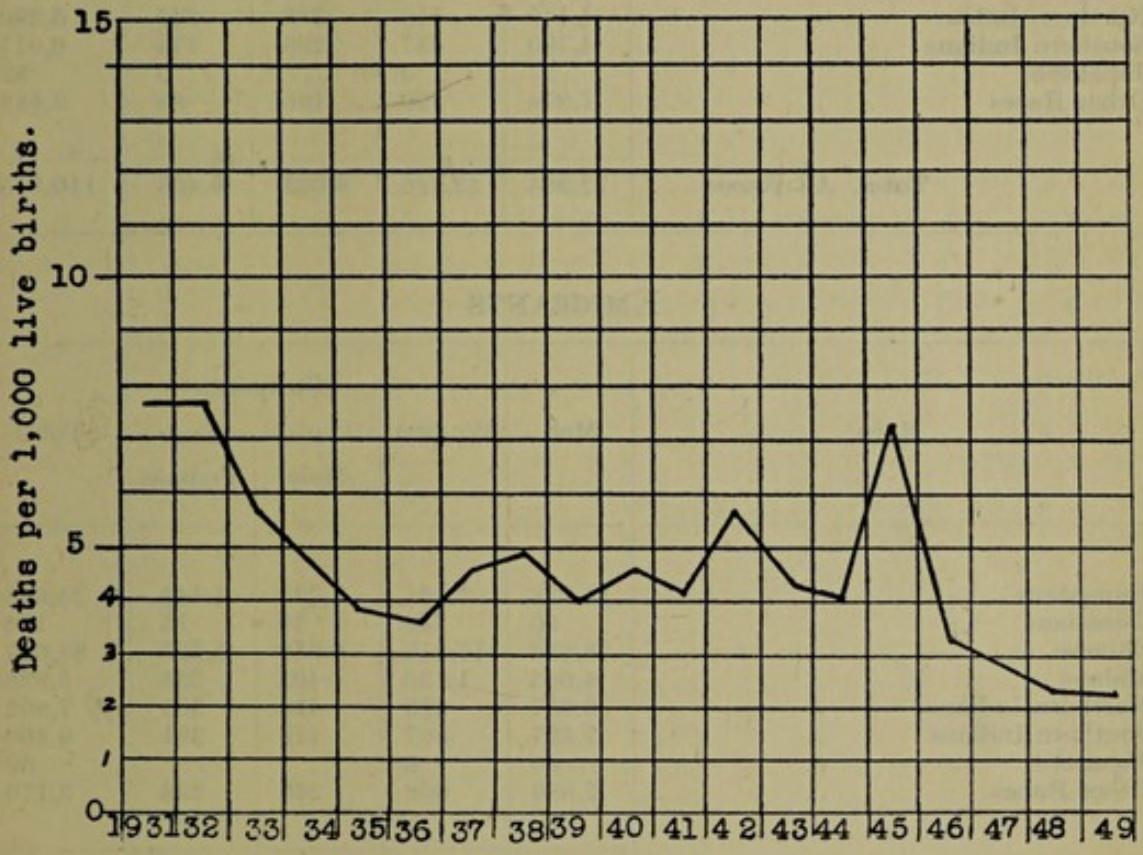


Fig. 5

Migration Statistics by Sea and Air during 1949

Immigrants

Race	Men	Women	Children		Total
			Male	Female	
Europeans	14,517	7,988	1,982	1,771	26,258
Eurasians	140	100	38	30	308
Chinese	43,409	12,302	5,532	3,727	64,970
Malays	3,487	1,331	363	271	5,452
Northern Indians	4,140	619	286	245	5,290
Southern Indians	4,790	657	296	274	6,017
Japanese	27	3	..	2	32
Other Races	1,874	420	106	88	2,488
Total, All Races ..	72,384	23,420	8,603	6,408	110,815

Emigrants

Race	Men	Women	Children		Total
			Male	Female	
Europeans	14,338	7,121	1,728	1,443	24,630
Eurasians	90	46	19	15	170
Chinese	58,536	17,816	6,952	5,323	88,627
Malays	4,063	1,135	402	335	5,935
Northern Indians	6,257	820	420	305	7,802
Southern Indians	7,527	827	415	391	9,160
Japanese	60	9	..	..	69
Other Races	2,089	608	240	233	3,170
Total, All Races ..	92,960	28,382	10,176	8,045	139,563

Chinese Deck Passengers from and to China including Hongkong 1949

Country	Immigrants					Emigrants				
	Men	Women	Children		Total	Men	Women	Children		Total
			Male	Female				Male	Female	
China ..	19,165	3,808	2,929	1,831	27,733	15,811	5,652	3,216	2,421	27,100
Hong Kong ..	6,656	4,658	1,383	1,030	13,727	10,915	6,108	2,514	2,030	21,567
Total ..	25,821	8,466	4,312	2,861	41,460	26,726	11,760	5,730	4,451	48,667

PART II

THE HEALTH DIVISION

CHAPTER SEVEN

INTRODUCTORY

THE Government Health Division covers Rural Singapore, Port and Air Quarantine, prevention and control, and the school medical and dental services.

It is a matter for congratulation that despite having to carry on with a minimum of qualified staff the progress made in getting back to pre-war standards was maintained during 1949. No case of major infectious disease occurred in the Colony although anterior poliomyelitis continued to appear throughout the year in an endemic form. The malaria position continued to be satisfactory.

The rural area of Singapore contains some 186 square miles of territory in which live approximately 270,000 persons. However a very large area in the centre of the island is occupied by a water catchment area, other large areas are occupied by the Services, including three large aerodromes, and a not inconsiderable portion of the rest is swamp, burial ground, and rubber estate, so that the population is concentrated in a very much smaller area than the nominal 186 square miles.

The most densely populated areas are Holland Road, Bukit Timah and Bukit Panjang, following the main road to Johore, Nee Soon and Sembawang, the heavily populated Serangoon and Paya Lebar districts and the coastal strips at Pasir Panjang and Siglap, to the West and East of the Municipal area.

The Government Health Department provides the officers to perform those duties which are laid upon the Health Officer in the Municipal Ordinance, which embodies the sanitary laws applicable in the rural area. During 1949 advantage was taken of the two natural divisions into which the rural area falls (divided by the Bukit Timah ridge) to apportion the work of the Rural Health Officers to two divisions, East and West, with a Health Officer with full powers in each. These officers are empowered to deal direct with the Chairman of the Rural Board on health matters affecting their districts.

The Chief Health Officer, Singapore, is a member of the Rural Board and advises the Board on matters of general policy. He supervises the work of the Rural Health Officers and co-ordinates their activities. The Health Department does all the anti-malarial work in the area and is in control of the scavenging and conservancy services. All building plans are scrutinised by the Health Officers and the Health Department employs the labour engaged in Rural Board duties. The Infant Welfare staff of the Health Department does all its work in the rural area, and the Schools Medical Branch

in addition to its work in the Municipal schools looks after the health of the rural school children, and advises on school buildings. The Travelling Dispensaries in the rural area are run by the Health Department.

The staff engaged directly on Rural Board duties is as follows:—

Health Officers			2
Sanitary Inspectors			7
Technical Subordinates			23
Labourers (*a*) Anti-Malarial	380	}	660
(*b*) Scavenging	280	}	
Drivers			5

The Health Department Infant Welfare services is staffed as follows:—

Lady Health Officer (a new appointment in 1949) ..	1
Public Health Matron	1
Health Sisters	3
Health Nurses	14
Health Midwives	18
Health Servants	21

In addition four School Health Officers, six School Health Nurses, one Hospital Assistant of the Schools branch and the Schools Sanitary Inspector do much of the work in Rural Board area. Three Hospital Assistants and three drivers run the Travelling Dispensaries. There is a public dispensary with a Hospital Assistant in charge at Bukit Timah and another public dispensary at Paya Lebar. Although this latter dispensary is actually in the Municipal area it draws a large number of its patients from the rural districts around. The School Dental Service although a Singapore service is as yet too small to reach the rural districts.

Public Health Conference

Two meetings were held during the year under the chairmanship of the Director of Medical Services. One was specially convened for a talk and demonstration on the working of the Naval Tropical Research Unit by Surgeon Commander Ellis, Director, Royal Naval Tropical Research Laboratory.

The main subjects under discussion at the ordinary meeting were sanitary aerodromes, B.C.G., streptomycin, pest destruction in food stores, charging of fees for inoculation and vaccination.

These Conferences are a post-war development arising from the period of the British Military Administration when all the health services of the Island of Singapore were fully co-ordinated both civil and military. Now all interested parties meet together in an effort to keep full co-ordination in being with complete success.

The following are regular members or observers:—

The Hon. Dr. W. J. Vickers, Director of Medical Services, Singapore (*Chairman*).
The Hon. Dr. R. B. MacGregor, C.M.G., Director of Medical Services, Federation of Malaya.
Air Commodore C. T. O'Neill, P.M.O., A.C.S.E.A.
Colonel R. S. Dickie, A.D.M.S., Singapore District.
Colonel L. R. H. Keating, D. H. Hygiene, G.H.Q., S.E.A.L.F.
Dr. N. A. Canton, Municipal Health Officer, Singapore.
Dr. G. H. Lowe, Chief Health Officer, Singapore.
Wing Commander R. C. O'Grady, D.P.M.O. (H), R.A.F.
Major T. A. Pace, D.A.D.H., Singapore District.
Major G. M. Curtois, D.D.A.H., G.H.Q., S.E.A.L.F.
Surgeon Lieut.-Commander A. Robinson, N.M.O.H., Naval Base, Singapore.
Dr. H. R. Morrison, Assistant Health Officer, Municipality, Singapore.
Dr. W. A. Nicholas, Health Officer (Rural) Singapore (*Secretary*).

Observers

Dr. J. Coutts Milne, Deputy Director of Medical Services, Singapore.
Dr. W. W. Yung, Director of the World Health Organisation Epidemiological Intelligence Station.
Professor J. H. Strahan, Professor of Social Medicine and Public Health, University of Malaya, Singapore.
Captain J. Shearman, R.A.M.C.
Dr. J. C. Burns, Health Officer, Singapore.

Malaria

During the year eighty-eight cases of malaria were traced to the rural area and of these twenty-two occurred in the controlled areas. At first sight this might be thought to be a reflection on the efficiency of the work done, but the controlled areas are naturally those with the greatest density of population, and the efficiency of the control falls rapidly as the boundary of the controlled area is approached, until the dwellers on the boundary are only fifty per cent protected. At the moment with the present control malaria hardly seems to be a serious disease in Singapore, but the condition is subject to epidemic periodicity and it is thought that the trough of such a wave may be one of the reasons for this. In consequence any complacency is to be deprecated in such a serious matter.

CHAPTER EIGHT

INFECTIOUS DISEASE

No case of cholera, plague or small-pox occurred in the year under review.

Acute Anterior Poliomyelitis

The comment in the 1948 Report that this infection appeared to be assuming a more endemic form than previously following the 1945–1946 and 1948 epidemics has been borne out by the experience of this disease in 1949. Table I shows the monthly incidence over the year in the Colony as a whole.

Table I

Month	*Number of Cases*
January	9
February	3
March	10
April	3
May	5
June	6
July	11
August	7
September	4
October	8
November	5
December	3
Total	74

Cases continued to occur sporadically. In all seventy-four cases were notified; fifty-four in the municipal and twenty in the rural area; the highest number notified being eleven in July and ten in March. Table II shows the age, sex and race incidence. Fifty cases were Chinese and fourteen Europeans; but in proportion to the population at risk by race Europeans showed the highest incidence and then Indians. Fifty-seven cases (seventy-seven per cent) were aged five years and under. By sex males were almost twice as heavily attacked as females (1.9 to 1.) : a higher ratio than is usually found in epidemics—usually 1.3 to 1. In 1948 in Singapore the ratio was 1.4 to 1. There were only two deaths—giving a very much lower case mortality rate (2.7 per cent) as against fifteen per cent in 1948.

In view of the constant contact between Singapore and Western Australia it is of interest to note that Western Australia experienced a very severe anterior poliomyelitis epidemic in 1948, having 311 cases and 25 deaths—an attack rate of 62 per 100,000 of the population compared with Singapore's rate of 18 per 100,000 and 23 deaths. An interesting feature was the influence of school holidays in disseminating infection and raising the notification rate.

TABLE II

Race, Sex and Age Incidence, 1949

Age Group	European		Chinese		Indian		Malay		Eurasian		Cases
	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	
Under 1 year ..	..	..	6	8	1	..	..	..	..	..	15
1— 5 years ..	2	3	22	9	1	2	1	1	1	..	42
6—15 years ..	1	..	1	..	..	..	..	..	..	..	2
16—20 years ..	3	..	..	..	1	..	..	..	..	..	4
21—30 years ..	3	1	1	1	1	..	..	..	..	..	7
Over 30 years ..	..	1	2	..	1	..	..	..	..	..	4
Total ..	9	5	32	18	5	2	1	1	1	..	74

TROPICAL TYPHUS

Ten cases of tropical typhus were reported in the rural districts from a total of thirty-four in the Colony during 1949. Compared with many States in the Federation of Malaya where a considerable increase in cases of tropical typhus has been noted in recent years, the incidence is extremely low in Singapore. However recent advances in methods of treatment have robbed this disease of its terrors. The preventive inoculations so popular a few years ago are not now considered to be of value. Out of the ten cases six were scrub typhus and one urban typhus (civilian). One case of scrub typhus came from a Military Camp and the other two were infected from outside Singapore.

DIPHTHERIA

Out of 288 cases notified forty-seven came from the country districts during the year, but it is probable that this does not convey a correct impression of the incidence of this disease. In general, milder cases are not seen and many of those admitted to hospital are *inextremis* and aid from Western medicine has been a last resource. That common expression *Sakit Sawan* (convulsions) probably includes cases of diphtheria. The appointment of a Lady Health

Officer to the Rural Infant Welfare branch has enabled a start to be made with preventive inoculations. Since October 1949 some 800 children have been immunised in the rural area. If this rate can be maintained the incidence of diphtheria should be greatly reduced in a few years' time. The good response on the part of the mothers of children may indicate that there is more diphtheria about than we know of. Preventive inoculation has been a feature in the urban centres for a considerable period.

Chicken Pox

Sixty-four rural cases of chicken pox were reported out of a Colony total of 466. This disease is more of a nuisance than a danger, but it is very necessary that all cases should be seen in order that no cases of small-pox should be missed.

Enteric Fever

While seventy-two cases were reported in 1949 only eleven were seen in rural Singapore. Although the incidence is small these follow the usual monthly distribution in Malaya and occur during the seasons of heavier rainfall. This is what would be expected with a water-borne disease. Also flies tend to be more numerous when the soil is damp and the surface collections of refuse are moist. The commonly accepted theory that all typhoid fever is caused by food hawkers may not always be correct and leads to the ignoring of the much more important questions of general sanitation and distribution of water supplies. A sudden increase in cases in a definite area or among one section of the population should cause attention to be directed to the discovery of a hawker carrier, or other food source. The low incidence of typhoid fever in the rural area is an indication that general sanitation is reasonably good.

CHAPTER NINE

HYGIENE AND SANITATION IN THE RURAL AREAS

Mosquito Control

EACH sanitary district now has a technical assistant who is responsible for all oiling and maintenance work in the district. Under him are employed oiling gangs and maintenance gangs. The district sanitary inspector still remains the over-all local authority to whom the technical assistant and his gangs are responsible however, and in addition he also exercises direct authority on all construction and rehabilitation going on in his district.

Checking is done constantly by the Rural Health Officer, the Chief Sanitary Inspector and the Central Laboratory Staff.

Anti-malarial works are permanent and temporary.

Permanent

New subsoil drains measuring 870 yards were constructed and 6,142 yards were relaid. 7,715 yards of open cement drains were repaired. Much of this work was made necessary by the neglect or damage during the years of enemy occupation. Three new sluices were erected.

Temporary

Earth drains measuring 498,681 yards (283 miles) had work done on them during the year. The keeping of earth drains free from grass and weeds in a tropical climate is never-ending labour. 13,203 yards of earth drains were dug (7½ miles). These earth drains were kept free of mosquito breeding by brush oiling and by using this method a considerable saving in oil was effected with no loss in efficiency. 35,962 gallons of oil were used as against 70,904 gallons in 1948.

In addition to the work done by the Health Department the Services control large areas in and around their property and a considerable amount of permanent drainage has been done by them. The Health Department advises the Services on these matters. This anti-malarial work has a very beneficial effect on those districts bordering on the lands occupied by the Armed Forces.

Recent investigation of outside areas have shown that dangerous mosquitoes are breeding in large numbers, but there is at present very little malaria—one case per 3,000 of the population in Rural Singapore in 1949. This peculiar phenomenon has been noticed throughout Malaya during the last three years. In Singapore there has been an increase in the number of cases of malaria in 1949 so perhaps the trough has been passed and a return to a more normal state of affairs is to be expected. However the population of the rural area is rapidly increasing and urbanisation is proceeding apace, so that an increase in both permanent and temporary constructional measures may have to be contemplated in the not too distant future.

There have been the usual numbers of complaints of nuisance mosquitoes, and investigations have frequently shown that the nuisance has an extremely local origin. The erection of good residential property in areas largely occupied by vegetable gardens and fish ponds gives rise to a clash of interests between the householders and the gardeners which has no easy solution. Spraying of houses with D.D.T. has been resorted to in some cases, and if householders would pay for this service it could be offered more freely.

Sewage and Refuse Disposal

Scavenging

Refuse is collected from the household and public dust bins, and from the drains and roads and back lanes by the scavenging labourers every morning. It is then carried in hand carts, either direct to the disposal site, or to various collecting stations. At the collecting stations, of which there are nineteen, it is deposited into large bins with lids. From here a contractor carries it in his lorry to the disposal site. There are in use several methods of final disposal. At Bukit Timah and sixth mile Dunearn Road the refuse is composted and this method is used to a limited extent at Changi. The difficulty is to dispose of the compost; the main demand comes from Europeans with gardens. At Changi, Serangoon, Bukit Panjang and Bukit Timah incinerators are used and in smaller villages the oil drum. For many months of the year disposal by tipping was in use, but it was discovered that large numbers of flies were breeding in the tips. So this practice has been abandoned in all areas where incineration is possible; where it still continues a liberal application of D.D.T. powder is added to control flies. Refuse collection was started in the Holland Road new residential areas this year, and in five other small villages. The incinerator at Bedok is in the process of being repaired.

The contract system for the removal of refuse has definite disadvantages and the rapid urbanisation and suburbanisation of the rural area will probably necessitate a change to more modern methods of refuse carriage in due course.

Conservancy

The more well-to-do have septic tanks for the disposal of nightsoil but the main standby in the rural area is the bucket latrine, or in the truly rural districts, the open pit latrine. Nightsoil is removed from the bucket latrines by contract labour and, theoretically, is disposed of by trenching. In practice it is highly probable that a very considerable amount of nightsoil finds its way to the vegetable gardens. To make a start in controlling this unsatisfactory situation all arrangements have been made to start Rural Board nightsoil collections and disposal in the villages of Bukit Timah and Bukit Panjang on the 1st January, 1950. Two large septic tanks have been re-habilitated, three nightsoil lorries have been purchased and a shed to house them erected by the Health Department. If this scheme is successful further districts may be included later.

The chemical closet is becoming popular and is being encouraged in suitable cases.

Water Supply

Although Singapore has an excellent water supply, and the Municipal Water Department supplies the rural area, only a limited number of the inhabitants benefit. In the early part of the year members of the Rural Board met the representatives of the Water Department, and a "five year plan" was drawn up for the erection of water mains along all main roads on the Island. When this scheme is completed a large proportion of the rural population will have reasonable access to good water. A start was made this year with the extension of the main on the West Coast to Tanjong Kling area.

A number of new stand pipes have been erected, but it is not always possible to get them where they are most needed owing to a shortage of pipes for the connections. Many minor extensions of the reticulation system have been made into better class building estates. Wells, often of a most insanitary kind, are still too common. Unfortunately many wells are still necessary. At the western end of the Island the soil is of a very porous nature and even very deep wells cease to function during the drier portion of the year. This area has priority in the new water scheme.

Where there are permanent anti-malarial works, water supplies are always provided by making use of the water from the subsoil pipes. In some "anti-malarial wells" form the main source of supply. It is pleasing to note that where there is a civilian population adjacent to a ravine which is being drained by the Services, anti-malarial wells are put in to afford a water supply, an extra expense which the Services are not bound to incur.

Offensive Trades

Slaughter Houses, Pigsties and Cattle Sheds

Since the Japanese occupation the slaughtering of pigs in unlicensed slaughter houses has been going on throughout the rural area. In 1949 the Board decided that this practice should cease and in 1950 all animals will have to be taken to the Municipal abattoirs. The question of making exceptions on Pulau Tekong and Pulau Ubin is under consideration.

Constant efforts have been made to improve the pigsties and to remove them from residential districts. These efforts have met with moderate success. The erratic spread of residential property into the rural area complicates the problem for both the pig breeder and the administration. The breeding of pigs is an essential factor in the provision of food for Singapore and unless the population is to be supplied with pork from outside sources in the future it may become necessary to protect the pig breeder and agriculturist from encroachment.

The problem of the small dairy and cattle-keeper has become more prominent recently as the Municipality have been removing these

people from their areas and they have to settle within the jurisdiction of the Rural Board. As they have little capital to expend on proper premises a difficult situation arises. As a piped water supply is most desirable for a dairy the competition between residential areas and the supply of food occurs again. This problem is receiving attention.

Industrial Premises

A rapid increase in the number of factories in the rural area is occurring and gives rise to many difficult problems. The siting of factories is causing much concern and recent action has given the Board more powers to control the siting of industrial premises. There is an undesirable tendency for ribbon development of factories to take place along the main roads, particularly the Bukit Timah Road, resulting in a great increase in road transport since the industrialist wishes to be beside the main trunk road for easy access to the Causeway and the North. The Health Department is particularly interested in the health and working conditions of the employees and in the disposal of waste products whether solid, liquid or gaseous. The Health Officers work in close co-operation with the Department of Chemistry when considering these problems. In some cases the conditions under which women employees work leaves much to be desired particularly with regard to the payment of maternity benefits. The Lady Health Officer (Schools) has been asked to assist in the assessment of the ages of juvenile labour.

House Inspection

Housing in Singapore is indeed a problem. Accommodation is not reckoned by the house but by the cubicle or a portion of a cubicle. But not only is the number of houses much too small; the accommodation is often grossly insanitary. A dark, ill-ventilated, leaky, hovel or portion of such hovel is the lot of too many of the inhabitants of even the rural area. When it is considered that there are at present 12,000 births in the rural area a year, and in 20–30 years' time some 4,000–5,000 couples will be seeking accommodation to set up homes and that this will happen year after year, with ever increasing numbers, the magnitude of the problem becomes apparent. This is in addition to the present acute shortage of living space.

The problem is partly economic as the greater number of the inhabitants cannot afford rents which would meet the present prices of buildings. If one thinks in terms of "homes" rather than "rooms" and "lines" this problem is magnified. There is a much greater tendency for commercial interests to go in for shop homes than for the erection of small houses. Many small houses are being built, but a large proportion of these are erected by the person who intends to live in them. He in his turn, intends to live in one room, and to sublet all available space to others.

The shop house is one of the greatest hinderances to the establishment of decent living conditions with which the Health Department has to contend. In a country which depends on the natural

movement of the external air for ventilation and comfort the external openings for the admission of light and air should be down the long sides of buildings. In a shop house the very reverse is the case, and in addition, the long shape, with a narrow frontage, permits of a large number of houses within a small amount of open space. The fight for the recognition of a minimum width of twenty feet has been waged throughout the year and at last some results are beginning to appear in recent layouts. But more stress on greater frontage in proportion to depth is what is really required. With few exceptions shops are family businesses with the owner living on the premises. All available space is sublet. As a result our towns occupy a much smaller area than towns of an equal population elsewhere.

The incidence of pneumonia and pulmonary tuberculosis is influenced very considerably by congestion of population in ill-ventilated premises, and it is noteworthy that in Singapore these diseases accounted for 2,902 deaths out of a total of 11,933 in 1948—approximately one quarter. Out of 2,878 deaths in hospital 1,230 died of pneumonia or from pulmonary tuberculosis.

Food in Relation to Health and Disease

All food factories and eating houses are inspected by the officers of the Health Department and recommendations made for licensing, or for works to be done before licensing. A considerable number of applications have to be refused on the grounds of insanitary premises. Even in cases where the building can be made perfect the sanitary conscience of the workmen, and even of the proprietor, is often primitive, and dirty habits can render the most perfect structure and apparatus ineffectual. True improvement will come when the public refuses to patronise unclean premises. The hawker and street stall problem is still with us, but it is pleasant to be able to say that, with the co-operation of the Police, considerable improvement has taken place, particularly at Bukit Timah, Bukit Panjang and Upper Serangoon. The erection of a large public market did much to solve the problem at Serangoon. Whilst much attention has been paid to the licensing of the individual, the place where he prepares his food for sale, legally a food factory, has been largely ignored. No hawker who prepares his goods in an insanitary hovel, or in the over-crowded kitchen of a shop house, should properly be considered for a licence. Here again the solution of a problem is in the hands of the public. If hawkers were not encouraged they would cease to exist.

Where a large section of the population lives in cubicles with no cooking facilities and is forced to "eat out" the eating house should meet the demand rather than the street stall. Nevertheless the hawker who carries round supplies of fresh fish, meat, and vegetables to districts remote from public markets serves a useful purpose and is a boon to the busy housewife and mother. Proper containers for carriage should be more widely used.

There is only one public market in the rural area and this was opened this year at Serangoon. It has proved so successful that an extension is contemplated in 1950. A site for another was provided in a layout at Holland Village. The success of the Serangoon market has encouraged the Rural Board to consider the erection of markets in other areas. Wholesale markets or collecting stations are contemplated in fish and vegetable producing centres.

The private markets are commercial ventures and little of the profits are expended on cleansing or proper stalls. The sooner such structures become public property the better.

All markets continue to be the haunt of numbers of unlicensed mangy dogs, and shooting of dogs in such areas is impossible. Other methods of removal have been suggested by the Board and it is hoped that this nuisance will be removed shortly.

Eating houses	10,574
Coffee shops	2,306
Butcher shops and slaughter houses	720
Fishmongers	2,808
Grocers	4,344
Markets	2,196
Milk vendors	1,428
Bake-houses	1,671
Hawkers	5,898
Food Total Inspections ..	29,746

Training of Sanitary Personnel

Teaching of public health was carried out by the Division under the auspices of the College of Medicine and the Royal Sanitary Institute. For medical students one lecture and one demonstration a week is given during terms. In 1949 the Royal Sanitary Institute course was lengthened to nine months—the six months course in 1948 being only an interim post-war phase. The course was divided into two parts; the first of three months duration consisting of the subjects of basic science, public health law, anatomy, physiology, elementary bacteriology and parasitology; the second part of six months duration dealing with the more practical aspects. Students who failed Part I were not allowed to proceed to Part II. It is too early to comment on this change, but it can be said that the teachers and better students benefited in that those who could not make the grade were weeded out in the first three months.

Seventeen students entered for the course, three of whom failed in Part I. Of the fourteen who proceeded to Part II eleven passed in the final examination. The work involved in carrying out the Royal Sanitary Institute course takes up a very considerable portion of the time of the Health staff so that less time can be spent on normal duties. This led the Board of Examiners at a meeting in July 1949 to recommend to Government that in future years the course be organised by some educational or technical institute.

External examiners from the Federation took part in the final examination for the first time during the year under review.

CHAPTER TEN

MATERNAL AND CHILD WELFARE IN THE RURAL AREAS

A NEW departure in maternity and child welfare work in 1949 in the rural areas was the appointment of a Lady Medical Officer to take charge of the work. Ever since the inception of the scheme in 1927 a public health matron had been in charge and stress had always been laid on the educational and preventive aspects of the work, treatment of minor ailments and first aid being incidental. The welfare centres were regarded as health centres where help and advice to keep children fit was given, and not as dispensaries for sick children. The appointment of a lady doctor does not mean that undue emphasis will be placed on the curative side of the work however; active preventive measures will be pursued. Thus diphtheria immunisation has been started and more will be done in ante and post-natal care for mothers.

For this purpose the rural area is divided into three sections: West, Central and East, each in the immediate charge of a Health Sister who attends the main sessions at each clinic in turn. The Western section includes the islands of the South West Coast and the Eastern section Pulau Ubin and Pulau Tekong. There are eleven main centres in operation with resident staff (Health Nurses and Midwives), five sub-centres with a resident midwife only and twenty sub-centres where clinics are held but where there is no resident staff. Only three centres are in Government buildings, two in structures built for the purpose and the third in half a Government Dispensary. One main centre and one sub-centre with a midwife have been built by the local people. The sub-centre on Pulau Brani is in a Government building and the Serangoon centre is in the old chandu shop. Many of the remaining clinics with staff are housed in insanitary premises unsuitable for use as clinics or as living quarters. The Medical Plan provides for eleven new main centres and five sub-centres with resident midwives. The Rural District Committee of Bukit Panjang completed a new brick building for the use of the Medical Department during the year and only just in time as the two old houses previously used had become structurally dangerous and had to be evacuated.

The midwives of the Department attended 7,849 cases during the year (6,545 in 1948) and a further 266 cases were sent to Kandang Kerbau Hospital during the course of labour. As there are eighteen midwives this means that the average per midwife is thirty-six cases per month. This is far too many for real efficiency and an increase in the number is an urgent need if we are to keep pace with the public demand. At present it is inevitable that many babies are born before the midwife arrives and the number of cases to be seen makes proper attention difficult. Each case should be visited every day for ten days and instructions given in the care of the

baby, as well as the necessary attention to the mother. If each visit took half an hour, including travelling, each midwife would have to work fifteen hours on every day of the month, apart from time spent at the actual birth. There are thirty-six qualified private midwives in the rural area but their functions are governed by economic factors. The total expenses incurred by a Malay family employing a qualified midwife are up to $200 and an Indian labourer will withdraw $70–$100 from the Co-operative Society for expenses in connection with a birth without employing a qualified midwife at all. It is true that this expenditure covers certain religious and semi-religious observances, but the fact remains that these expenses are too heavy.

The teaching of midwives has been in the English language only, and the result is that far too large a proportion of the midwives are Chinese. In the Health service out of eighteen midwives seventeen are Chinese and one Malay. The Health Department is trying to bring about changes in this direction so that a greater proportion of Mohammedan and Hindu women can be trained and employed as midwives. There is some difficulty in obtaining suitable women for training. In the meantime the unqualified *bidan* will continue to ply her trade although officially there are only three such women left in the rural area. It is of interest that whilst the birth rate amongst "Malays" has remained fairly constant since 1931 that for Chinese and Indians has shown a marked increase. This is partly because these rates are worked out on the total population figures and the sex ratio of the population has changed markedly during the last eleven years particularly amongst Chinese and Indians.

Apart from the work done by the midwives special clinic days are held at each large centre and pregnant women attend the ordinary clinics at the sub-centres. Difficult labours and complications of pregnancy can so be discovered and dealt with and precautions taken accordingly. Since the appointment of a Lady Medical Officer to this branch this side of the work has greatly increased in importance. Post-natal complications are dealt with in the same way. Two more Lady Health Officers will become necessary as this work proceeds.

When not engaged at clinics the health nurses are employed in visiting the women and children in their homes. 40,121 such visits were made by the nurses in 1949. In 1948 the figure for home visits by nurses was 61,431. At first sight it might appear that there has been a falling off in work done. This is not so as a much more careful check has been kept on the work actually done. A visit to a home must now be such a visit that should there be three children in a home only one visit can be counted and not three. When the time actually available for home visits and the number of nurses employed are considered, 40,000 is about the maximum number of home visits which can be expected. Even then only a quarter hour is allowed for each visit and the travelling involved to make up an eight hour day.

Eighteen midwives have made an average of sixteen visits to homes each on every working day during the year in addition to their attendance on 7,981 confinements. Attendances at clinics totalled

168,063 as compared with 90,015 in 1947 and 92,984 in 1948. 26,093 pounds of powdered milk was distributed during the year under the special scheme which is incorporated with the clinics for the purpose. Up to the present the health nurses and midwives have been dependent for transport on trishaws and bus services. Approval has now been obtained for nurses to have small cars in areas where such transport can be used to advantage and all midwives may now have bicycle allowances. This means that time spent on journeys will be cut down so that more can be spent with the mother and children in their homes.

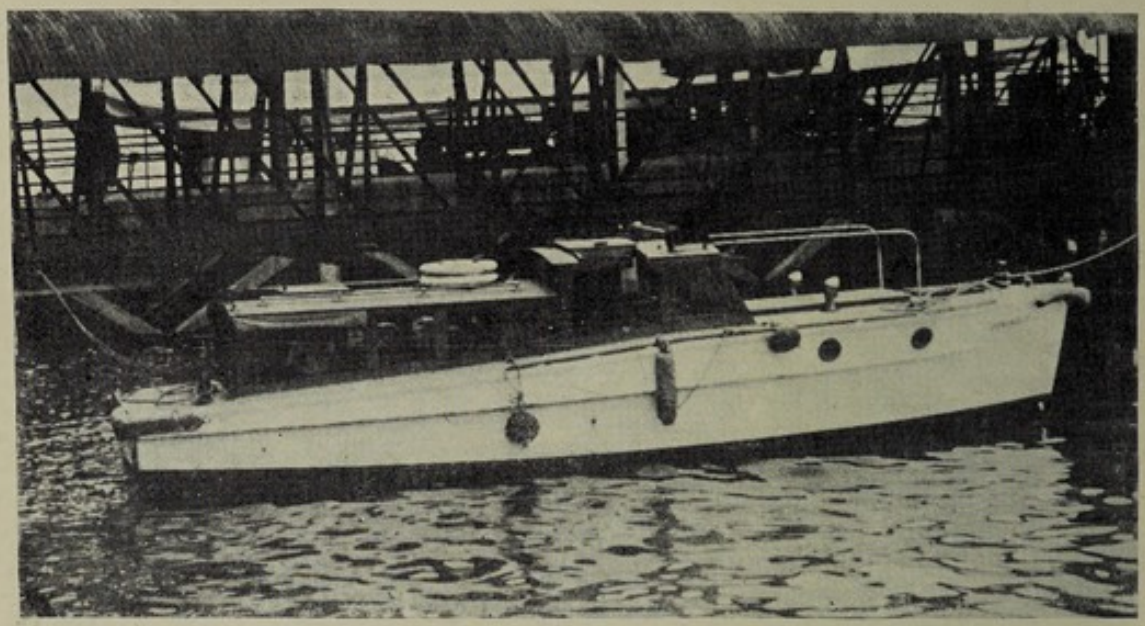
CHAPTER ELEVEN

TRAVELLING DISPENSARIES

THREE travelling dispensaries operate in the Rural area, one in the Eastern districts, one in the Centre, and one on the Western side of the Island. The eight hour day for the drivers limits the amount of work they can do and makes any increase in activity almost impossible without extra transport. All three are heavy vehicles and use large amounts of petrol. Two smaller ones of the utility van type have been asked for in 1950 and these should make a big difference in running costs. At present when one of these vehicles breaks down the service in that district has to be suspended. So in 1950 it is hoped to have a spare vehicle also so that the service will always be continuous. The response by the general public is good but could be better. There is a tendency for people to expect the service to be brought to their very doors nowadays, and a walk of half a mile to be treated for scabies is considered to be a hardship by some.

There were three outdoor dispensaries serving the rural area Bukit Timah, Paya Lebar and Pulau Brani. When that on Pulau Brani had to close down there were no other quarters available so the 1,800 civilian population is now served by a biweekly visit made by a hospital assistant from the General Hospital who works at the small Infant Welfare Centre on the Island. The Paya Lebar Clinic is situated just within the municipal area but it serves a thickly populated section in addition. Part of the dispensary building at Bukit Timah Dispensary is used as an Infant Welfare Clinic. At present all venereal disease is treated at the clinics of the Social Hygiene Branch situated in the municipal area, but there have been discussions during the year as to how best facilities for diagnosis and treatment can be offered in the rural districts as well. Whilst it is not desirable that Infant Welfare Clinics should be used as venereal disease clinics because of the effect on public opinion, it is quite proper that such cases amongst the normal attendances should receive proper advice and treatment here as a routine measure of ante-natal work. It is hoped that a beginning on this service can be made in 1950. Attendances during the year totalled 21,355 at Bukit Timah Dispensary, 12,461 at Paya Lebar, and 668 at Pulau Brani.

Travelling Dispensary Interior



New Port Health Launch—*Ellis-Raikes*

School Children on Pulau Sudong

CHAPTER TWELVE

PORT HEALTH

THERE was a considerable increase in 1949 in the number of ships inspected and cleared from infected ports; 1,733 of 4,736,472 nett tons as compared with 1,565 of 3,512,305 nett tons in 1948. There was however a considerable reduction in the number of passengers sent to the Quarantine Station and in the number inspected on ships at the Quarantine Anchorage. Passengers quarantined were 22,058 in 1949 as against 37,779 in 1948. Passengers landing and in transit were 65,072 and 79,964 respectively. The number of bills of health issued again showed an increase being 5,929 compared with 5,199 the previous year.

One passenger flat seating 200 passengers was provided during the year. This was to replace the outmoded method of conveying unberthed passengers to and from the Quarantine Station in tongkangs supplied by the agents of the various shipping companies. It has proved most successful except in regard to the limitation of seating. The flat, besides being comfortable for the passengers is popular with the agents owing to the relative cheap rate charged by Government for its use; $47.50 a trip as against $1 a head charged by the lighterage companies.

The Quarantine Station still remains deficient in modern accommodation although extensive repairs to the buildings were carried out during the year. The greatest number admitted on one day was 2,066 and the average contact stay was 4.73 days. 20,404 vaccinations were done and 100 patients treated in hospital; communicable diseases dealt with were small-pox 4 (3 among deck passengers from China and one a pilgrim returning from Jeddah) and chicken-pox 22. A returning small-pox infected pilgrim ship which arrived in December made a particularly heavy demand on existing facilities. Three cases of leprosy were discovered and sent back to India.

Throughout the year the Prisons Department used eight camps to accommodate detainees; on an average 318 detainees lived on the island daily. Medical attention was given by the medical staff, 3,417 new cases being treated as out-patients whilst total attendances by detainee out-patients numbered 40,499.

Ninety ships were fumigated with hydrogen cyanide discoids during the year and many rats destroyed.

Immunization work carried out by the Port Health Office was as follows:—

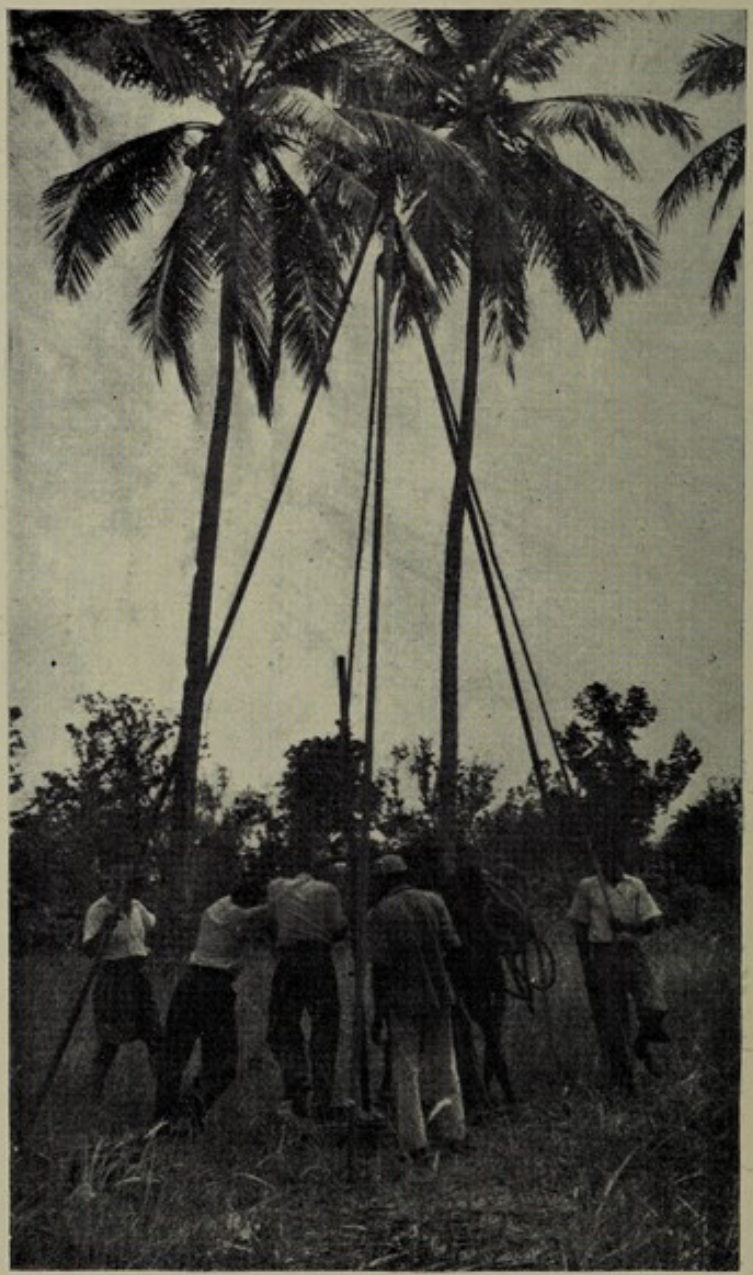
Small-pox	16,974
Cholera	27,686
T.A.B.	185

CHAPTER THIRTEEN

AIR HEALTH

SINGAPORE has two civil airports, Kallang and Tengah, the latter being an R.A.F. aerodrome used also for civilian planes. The work at the two airports is carried out by one full time civilian medical officer, one hospital assistant, and one clerk each at Kallang and Tengah. At week-ends a duty roster for the medical officer is arranged for, two Health Officers taking turns with the airport medical officer. All aircraft from infected ports were examined, 1,409 carrying in all 30,502 passengers and crew being dealt with. This is nearly double the 1948 figure of 781 aircraft and 18,182. 800 of the number with 13,667 passengers and crew were seen at Kallang and 609 and 16,835 at Tengah. The larger aircraft call at Tengah; hence the smaller number of planes.

The Hawker Problem



Boring for Water—Pulau Sudong

CHAPTER FOURTEEN

THE ISLANDS

THE two groups of small islands lying off the South West Coast of Singapore belong to a world apart. Some are merely detached portions of the mainland; others are coral reefs covered with sand. In the outer group the most heavily populated are the coral banks; the larger islands have few inhabitants. The people are almost entirely Malay fishermen and their families, and being fishermen the nature of the approach to land is most important. Although one of the smallest Pulau Sudong is the most heavily populated, and here the beach can easily be approached from the sea at all states of the tide. The larger and hilly islands to the south, Pawi and Senang, are much more difficult to reach. They are also probably more malarious owing to the nature of the ground. At any rate Pawi is supposed to be haunted by ghosts which in the long run are said to kill off all who attempt to settle there. Unless the landing can be improved it is doubtful if an attempt to lay the "ghost" would be profitable. Dangerous mosquitoes are obviously invading Pulau Sudong from somewhere, most probably from Pawi.

On Pulau Bukom Ketchil there are permanent anti-malarial works, and wells have been made in connection with the subsoil lines. This island is malaria free and has a reasonable water supply at all times of the year. There are some fishermen, but the larger numbers work on the neighbouring island of Bukom Besar. Here also are some Chinese squatters growing vegetables. The health of the population is good.

The village of Sudong is a large burial ground surrounded by homes situated at the end of the island nearest to the landing. The dead have already forced the living on to the beaches. The other end of the island is surrounded by the wide coral reef of Beting Sudong. Anti-malarial work consists of the periodic clearing of a small creek which silts at certain times of the year and in the periodic spraying of the houses with D.D.T., the spleen rate has been reduced from fifty per cent in 1948 to ten per cent in the latter part of 1949. There is a school which was visited by the Lady Health Officer (Schools), twice in 1949, and the schoolmaster has a supply of simple medicines for the use of the sick. During 1949 a spirit haunted tree justified its reputation by shedding a larger branch on to a neighbouring house and killing one of the school children. Up till 1949 there was no water supply on Sudong, but it had been noticed in the previous year that there was a possible site for a well. A bore was made and to our delight the water contained little salt and was potable. Early in 1949 this bore hole was enlarged and properly protected. For the first time there was water on Sudong. Unfortunately the catchment area is small and the well cannot be deepened owing to the danger of reaching salt water. In dry weather it tends

to dry up. Later another well was made on a new site, but it yet remains to be seen how well this new one will work.

Sudong was until recently a place where obvious signs of malnutrition could always be seen. The diet of the people was rice and fish, the only vegetable substance being the coconut. Vitamins of one form and another have been given to the women and children since the early months of 1949 with a marked improvement in health.

On Pulau Semakau there are two villages, one Chinese and a larger Malay kampong. The people do not mix. This island is much larger than Sudong and water is not such a problem. There are many more coconut trees here also. House spraying for malaria has begun. Pulau Sakeng is a small island with the same problems as Sudong.

By the courtesy of the Master Attendant a launch has been made available every Wednesday and the Infant Welfare staff go out to care for the women and children in all weathers. Each island has a visit every fortnight. More irregular visits are made by the Health Officer and the anti-malarial staff. The Lady Health Officer (Schools) made two visits to the Pulau Sudong school this year. With the Infant Welfare Clinic staff goes a hospital assistant who attends to any of the male population who are sick. Figures relating to infant welfare and school medical work done on the islands are incorporated in the figures for the rural areas as a whole.

CHAPTER FIFTEEN

SCHOOL HEALTH

School Medical Service

While the actual number of examinations made by this Service, 25,875, is less than the 34,177 in 1948, that the level of the work attempted was actually considerably improved reflects great credit on the staff concerned when it is stated that it was reduced by two medical officers owing to sickness and study leave over most of the year under review. Acute lack of sufficient medical personnel continued to hamper the work of this division as of many others in the Medical Department.

Medical Examination

The school population is approximately 115,266 and 68,854 of these are in Government and Government aided schools. Almost all the Government and Government aided English schools and Malay vernacular schools were covered by examination during the year. The large number of Chinese aided schools cannot be examined yearly with the staff available, but an endeavour is made to have them covered every two to three years. As most of the Government schools except new entrants have been fully examined since 1947 only the first two primary classes and the two senior classes (those about to leave school) were included in the routine examination this year. Any child in the intermediate classes, however, who needed an overhaul could be and was seen. Where a school on the list was not examined in 1948 all children in the school were examined. The principals of these schools were most co-operative. The large majority of the children examined were found to be in reasonably good health (87.9 per cent) as compared with 83.9 per cent in 1948.

School Dental Service

While the latter part of 1948 marked the long awaited start of the School Dental Service this work was considerably expanded during 1949 by the addition of a second dental surgeon in a scheme which envisages a steady annual expansion. During the year 4,541 children were selected for full routine treatment. Of 2,521 examined and treated 1,378 were made dentally fit. In addition 1,845 emergencies were treated, 6,681 fillings were inserted, and 1,651 permanent teeth and 3,094 temporary teeth were extracted. The dental examinations of school children of all ages showed the presence of gross dental neglect in many. Ninety-six per cent of the total examined required treatment. On an average two hours were required to treat each individual case. It is now possible to make some very general statement as to the condition of the teeth in various races. Out of eleven English, Chinese and Malay schools, the Chinese children gave the highest incidence of dental caries. To provide an efficient dental

service for all the school children in Singapore would require some thirty full time dental officers.

Undernourishment and Tuberculosis in School Children

The year 1949 indicated continued improvement in the general health of the school children in the Colony. Only twelve per cent gave definite indications of malnutrition as compared with 16.15 per cent in 1948.

The detection of early tuberculosis in school children and in teachers has been made possible this year to a much larger extent by the mass radiography technique: by the help from the Singapore Anti-Tuberculosis Association by the X-raying of 1,650 of the more senior (15–20 years) pupils in schools known to have had recent open cases; by the extra numbers X-rayed both at General Hospital and at Tan Tock Seng Hospital, and by the following up of all school children contacts of cases of tuberculosis. The latter is possible with the co-operation of the Tan Tock Seng Hospital almoner: the Tan Tock Seng Hospital tuberculosis health visitors: the Municipal tuberculosis health visitors and the two tuberculosis health visitors belonging to the Schools Section. By this combined effort all contacts of known tuberculosis patients are checked—all school contacts are tuberculin tested and X-rayed, and if found negative are 1/100 mantouxed. If any are found Mantoux negative, a register is kept and they are re-tested every three months. If and when they become positive they are again X-rayed.

As soon as it is known that an open or infiltration case has been found in a school child or a school teacher, then the class in which the case occurred is at once tuberculin tested, and the positives are X-rayed.

From the foregoing the amount of extra work done both by the doctors and staff nurses can be imagined. Any tuberculosis contacts with other ailments are also referred to the clinics and investigated. This branch of the work alone meant much extra work for both doctors and nurses.

Details are shown in the following table:—

School Children X-rayed—Boys and Girls

——	Number examined radiologically	Number with pulmonary tuberculosis present radiologically	Primary Complex		Re-infection Type		Post-Primary
			Active	Healed	Active	Inactive	
Boys ..	2,034	228	77	6	35(1.72%)	7	..
Girls ..	1,140	53	23	11	16(1.40%)	..	1
Total ..	3,174	281	100	17	51 (1.6%)	7	1

(Number dealt with in 1948=596).

These figures indicate some increase of child tuberculosis over the pre-war, although this is very difficult to gauge with the pre-war material available.

These 51 cases (1.6 per cent) discovered were considerably higher than in 1948 (21 cases) but many more children were X-rayed (3,174 as compared with 596). 0.3 per cent had a positive sputum.

It is, however, not strictly correct to call all these cases children because the ages covered ranged from six years to twenty years. In addition this figure for active cases does not include the primary complexes. Age groups were not included, but the majority of all the sputum positive cases except three were in the over sixteen age group.

It will be seen from this table that X-ray examination showed one hundred were suffering from a form of tuberculosis reaction known as a primary complex. This is not tuberculosis as it is commonly understood, but is a slight infection from which the vast majority of children recover completely and which acts as a vaccination against the disease and an insurance against future infection. Such children are given special care which includes extra feeding, as much rest as can be obtained, and a careful follow up of the case largely done by home visits from the nursing staff. This care is to ensure that the child does in fact recover completely and reaps the full benefit from this natural immunising process.

The fifty-one cases of what may be termed real tuberculosis were the result of a failure to acquire an immunity in the natural manner noted or of contact with the disease which exposed the child to too great a degree of infection for any natural immunity to combat.

From the numbers examined 150 school children were referred to Tan Tock Seng Hospital for assessment and treatment where necessary. Where the circumstances were poor, children with primary complex attended the North Canal Road Clinic under the tuberculosis domiciliary feeding scheme.

It should be noted that a number of these positive cases occurred in schools where teachers have had tuberculosis. All teachers should be X-rayed before being taken on by any school if he or she has not been X-rayed during the previous year.

Tuberculosis Domiciliary Feeding Scheme

A tuberculosis feeding clinic was held every Thursday from 9–12 noon at North Canal Road Clinic. The children accepted for feeding were those with primary foci or healing complexes, and those contacts who had suspicious X-ray findings and whose parents were not in a position financially to give the extras required.

Only a group of 100 children could be dealt with at one period under this scheme as this was the largest number which could be catered for with any degree of efficiency, the time a child remained on the list depending on its response to rest and extra food. In all 136 children were accepted for this additional feeding during the year.

The child was asked to attend once in three weeks for weighing and general check up, a parent being allowed to collect the goods the other two weeks. The extra food provided weekly consisted of:—

10 eggs.
½ lb. vitaminised margarine.
½ lb. dried milk or 1 tin condensed milk (alternate weeks).
3 oranges and 4 apples (or tomatoes, mangosteens, etc.).
1 cigarette tin full peanuts.
Vegetables, *e.g.* cabbages, and 2 large carrots or similar.

Some children, especially contacts with only suspicious findings on X-ray, were taken on the feeding list for three months only; then if the X-ray was within normal limits and the child in a much better condition generally and showing a reasonable gain in weight this particular child discontinued getting extra food to allow another the benefit for these extras.

In children with primary complex the food was continued until the radiological findings were normal and physical condition had greatly improved. Where the condition of a child was not improved and the weight was stationary then a re-X-ray was called for and the child referred to his or her particular school doctor for a thorough overhaul. As well as receiving food the scholar got Cod Liver Oil in some form, and was examined and treated regularly for any concomitant infection.

This extra food method for home consumption is by no means the ideal but it is the best that can be done with the staff and accommodation available. A nurse pays a surprise visit to a number of homes weekly to check the rate of food consumption and to advise on feeding, hygiene, cleanliness, etc. No case of selling of the goods provided has been found so far.

The time has now come to emphasise the need for a large convalescent home preferably at the seaside for children with a primary focus. Here children would be under strict supervision and get the necessary food and vitamins in circumstances where the necessary rest can be assured.

In many cases it is certain that when the pupil is supposed to be resting at home that same child is looking after and carrying younger and healthier child to his or her own detriment. Many parents in Singapore do not realise the value of rest for a child not obviously ill and so tend to ignore the medical advice given.

Forty-six per cent of the children dealt with under the scheme showed obvious and satisfactory improvement. Keeping their home circumstances in mind this is a very gratifying response. To feed these at a communal centre would be no advantage as the daily journeys to and fro must exhaust a child with a primary complex and so reduce the resting time which plays an essential part in the treatment of any tuberculous condition.

Domiciliary Visits to Tuberculous Children

The number of homes visited was 856 and the number of re-visits 2,052. Health nurses also did many Jelly Patch tests in the

homes of contacts: took children to hospital for X-ray; went to Tan Tock Seng Hospital to the clinics, and remained at the clinics as staff nurses for the tuberculosis clinic which was held twice a week. These were also on duty on Saturday mornings when school teachers attended Tan Tock Seng Hospital.

Tuberculosis Survey

Work was continued in testing the sensitivity of children to tuberculin.

In 3,695 children tested with the Jelly Patch test 1,798 (48.7 per cent) were negative reactors: in 297 tested with Evans Patch test 158 (52.5 per cent) were negative reactors.

So that of 3,992 tested 1,956 or 48.9 per cent were negative reactors, as compared with 1,697 examined and 26.40 per cent negative reactors in 1948.

Leprosy

Thirty-eight cases of leprosy were seen during the year—twenty-four boys and fourteen girls (twenty-nine Chinese, three Malays, one Indian and one Eurasian). All were early cases except four which were sent to the Leper Settlement: the rest were non-infectious and received clinic attention.

Vaccinations

Vaccinations numbering 8,073 were done, and of these nine per cent gave typical primary vaccinia reactions.

Other Conditions

These can be classified as follows:—

	Per cent
Tonsils and adenoids	10.8
Skin conditions	20.4
Anaemia	7.4
Enlarged Spleen	0.7
Defective vision	2.9
Mumps	0.18
Chickenpox	1.2
Malaria	0.05
Measles	2.3
Diphtheria	0.13
Typhoid	0.09
Poliomyelitis	0.02

School Clinics

These are held regularly at North Canal Road, Paya Lebar and Telok Kurau. The average monthly attendances at the combined clinics was 1,840 as compared with 1,250 in 1948, this despite the fact that fewer children were routinely examined in schools. North Canal Road continued to be the main clinic and work is done under great difficulty here as the admission hall, waiting rooms and laboratory are all too small for the increasing numbers attending. The new school medical and dental clinic included under the Medical Plan is urgently needed. There is also need for a doctor trained in knowledge of eye diseases and refraction to deal with the many cases referred

to the clinic and so save the pressure of work on the eye department at the General Hospital.

Spleen Rates

The general spleen rate of all schools examined was 0.7 per cent. The rate in the island schools showed considerable improvement on that for 1948—varying from 5 per cent to 27 per cent as against 5.5 per cent—50–60 per cent the previous year, the rate on Pulau Seraya dropping from 60 per cent to 20 per cent and on Pulau Sudong from 50 per cent to 27 per cent.

Special Treatment

Forty-one children attended the Physiotherapy Clinic at the General Hospital for remedial exercises. This reduction on the number attending the previous year may possibly be related to better physical training in schools and to the absence of any poliomyelitis epidemic.

Tuberculosis in School Teachers

School teachers numbering 1,520 were examined by X-ray with twenty-six definite tuberculosis findings.

School Teachers X-rayed

——	Number examined radiologically	Pulmonary tuberculosis present radiologically	Total Active Cases		Total arrested	Total still under observation	Percentage active
			Sputum positive	Sputum negative			
Males ..	713	43	2	7	61		1.26
Females ..	807	78	2	15			2.11
Total ..	1.520	121	4	22	61	34	1.71

School Feeding

In eleven of the most needy schools in Singapore 4,250 children were provided with 463,643 meals by the Social Welfare Department.

Sanitary Reports on School Premises

Eighteen plans for new school buildings and forty-six plans for alterations and additions to existing buildings were passed during the year. Fifteen new school buildings were completed and in use by the end of the year. Overcrowding is still a problem in most Chinese premises, but the recommendation to divide some schools into morning and afternoon sessions helped to a certain extent. During the year 499 inspections were paid—Chinese 370, English fifty, Malay forty-four, Indian and others thirty-five. The sanitary conditions in

most schools showed much improvement over the previous year due in part to the vigilance of the Education Department in asking for as many schools to be registered as soon as possible. With free education for elementary pupils in registered schools in the Educational Programme, many unregistered schools rushed to comply with the sanitary requirements and school regulations so as to qualify for the privileges awarded by Government. Regular inspections were made to most of the existing schools to see that their premises were kept in a sanitary state. Any nuisances found or defaults discovered, were immediately communicated to the Education Department for necessary action.

Tuck Shops

Periodical visits were paid to tuck shops in schools to see that the food sold there was wholesome, that it was prepared and kept in a hygienic condition. Several of the larger schools have made improvements by providing aluminium-top or glazed-top tables for serving and preparation tables, and sinks and drying benches and fly-proof covers have been added.

CHAPTER SIXTEEN

NUTRITION

THE NUTRITION COUNCIL

AN IMPORTANT feature of the year was the formation of a Nutrition Council for the Colony of Singapore. This Council was appointed with terms of reference to act in an advisory capacity to Government on all matters relating to the nutrition of the people of the Colony and is composed of official and unofficial members representing Education, Medicine, Biochemistry, Economics, Social Welfare and Law under the chairmanship of the Professor of Social Medicine and Public Health in the University of Malaya. It took the place of the small official body which had previously advised the Government in this connection.

One of the Council's first actions was to recommend, following the work reported on in 1948, in Singapore and other territories, that all Government institutions, such as hospitals, prisons, welfare homes and police depôts should use rice enriched with Thiamine, Riboflavin and Nicotinic Acid as a means of supplementing the daily diet. Its use in any industrial canteen was recommended to the Labour Department. The addition of enriched rice adds only one cent to the cost of one pound of rice and restores the nutritive value lost by under-milling. At the end of the year enriched rice was in use in the Government hospitals and in the institutions in which the Department of Social Welfare was interested.

The Council reviewed the evidence on the nutritional state of Singapore and considered that the existing information available since 1946 showed that there had been a considerable health improvement over the four-year period. Annual school medical examinations of 40,000 children had shown that the incidence of the physical stigmata of deficiency disease had steadily fallen; the percentage of those children categorised as in poor physical condition had been reduced from fifty per cent to twelve per cent in 1949: there had been improvement in growth, and signs of gross malnutrition were not often seen. Observation on several thousand children of families in the low income group who had been receiving special feeding showed that while forty-five per cent were in poor physical condition in 1946, only seven per cent now come into this category, although minor signs of deficiency disease are still to be found.

The marked improvement in the crude death rate and in the infant mortality rate undoubtedly reflected an improved nutritional state. Nevertheless it must be stressed that dietary surveys of the food intake of the poor classes indicate definite signs of inadequacy; that on present food prices it is difficult to secure a balanced diet for an adult of the labouring classes under seventy cents a day, a cost which must impose a disproportionate burden on the family budget. In

general it can be stated however that while evidence from available sources points to a definite improvement in the general nutritional state, this evidence has been obtained where supplementary feeding has been given and from school children who are subject to special supervision. There is little or no evidence available as to the state of a large number of pre-school children and children of school age who cannot afford schooling or who cannot gain entry to schools. These cover many thousands in both urban and rural areas. In consequence the Council considered that while it is satisfactory to record improvement there are no grounds for complacency. The dietary position of the poorer classes, disregarding the factor of unwise food habit which may be common to many classes, has been shown to be poor. The admittedly decreased incidence in the physical stigmata of deficiency disease is still sufficient to indicate that there is a large proportion of the population on the nutritional border-line which means lack of resistance to disease. So any illness may precipitate deficiency disease. Large scale unemployment may well rapidly impose an emergency community problem necessitating action against malnutrition on a considerable scale.

The Council fully reviewed the child feeding programmes in operation in Singapore while recommending the continuation of existing schemes, the suggestion was made that extension to schools and needy rural areas should be considered in due course. The use of the Children's Social Centres for testing the palatability and popularity of substitute foods for rice and the use of enriched dried Skim milk was stressed.

Child Feeding

This subject was dealt with in some detail in last year's report, in connection with the Children's Social Centres of the Social Welfare Department. Close liaison was maintained between this Department and the Nutrition Unit which acted in an advisory capacity regarding the diet provided at these Social Centres.

Medical examinations of the clinical condition of the children carried out by the voluntary medical staff of the Social Welfare Department shows that the improvement recorded since the war has continued during the year. There is little doubt, therefore, that the urgency of the problem which led to formation of Child Feeding Centres after the war, has for the present altered in degree. It is not, at the moment, so much the relief of hunger and the cure of frank deficiency disease which is important, but the need for an acceleration of growth rate, a higher standard of health, an increase of resistance to disease, and education in healthy feeding habits. This is not to say that the need for child feeding has disappeared but the objective is now a higher standard of health rather than the curing of disease.

The changing nature of the Centres from purely food depôts to centres of social education is seen in the change in the age groups which attend. At the commencement of the scheme the ratio of

children of pre-school age to school age was 25:1; while now it is 1:2 in approximately the same number of children who attend. This is partly because the centres are now attracting older children who cannot get into schools. Parents of the pre-school child do not appear to have the same urgent necessity to bring their children, and many who do use the centres use them as a creche while they are at work.

At the request of the Social Welfare Department, the Nutrition Unit undertook a joint investigation into the home conditions and diets of the children attending the feeding centres, to help to assess the status of the families who attended. 401 families were interviewed, of whom seventy-five per cent were co-operative. The survey showed that eighty per cent of the families using the centres were in the low income group; that home diets were monotonous and of an inadequate pattern, with absence of milk and fruit; that over one third of the children used the centres for their midday meal rather than as a supplement to another meal at home on their return; that the educational facilities were as great an attraction for the school child as the meal; that many working people found the centre useful as a creche while they were at work. An analysis of their total expenditure showed that Chinese families spent seventy per cent, Indians eighty-five per cent and Malays seventy per cent on food with a man value daily expenditure of forty-five, fifty-five and fifty-three cents, respectively. Bearing in mind, that seventy cents a day is required to purchase an adequate diet, it is clear that allied to ignorance, the economic status of most of the families using the Social Centres was such that it was impossible for them to feed their children adequately and meet the other essentials of daily life.

Thus, it is clear that while there are grounds for satisfaction that conditions have improved, there is still a long way to go before it can be said that there are no grounds for assistance to the children of under-privileged families in Singapore.

Dietary Surveys of Pregnant and Lactating Women

This investigation which was begun in 1948, was continued for a period during the year, in an attempt to study the food consumption during and after pregnancy in women of the three main racial groups. Women were selected from the ante-natal clinic of the Government Maternity Hospital, who were prepared to co-operate in the investigation. For this reason, they were not from the lowest income group, but from the skilled artisan, clerk, or shop assistant class with an average declared income of $150 per month.

Altogether, seventy-one women were investigated. It was impossible to measure the individual intake during pregnancy; only a measurement of the complete family intake could be done. As it is felt that any conclusion drawn as to individual intake based on such a measurement is of doubtful validity, no attempt to do so has been made and the family measurements have been used as an index of the dietary intake of the $150 per month income bracket.

In twenty-two Chinese and Indian women, it was possible to measure the intake of the lactating mother individually during the first month after delivery, but as no comparable figures are available for the period of pregnancy they are not recorded here.

It may be said, however, that the special diet taken in this first month would appear to be much better than during pregnancy, in this income bracket. It is adequate except in calcium and Vitamin *C* which are at a low level, especially in Chinese, due to their custom of refraining from eating fresh vegetables and fruit during this period.

This investigation has been suspended pending the evolution of a more accurate method of measurement, and the results are withheld for use at a later date.

Dietary Surveys in a varied Group of Families whose Income ranges from $100–$450 per month

From family values obtained during the family dietary surveys mentioned above, Table I has been constructed to show the average values for forty-six families, mainly Chinese, to whom the following remarks apply.

It is not possible to publish the full details of these families, whose social class extends from labourer to police inspector, but there is evidence to support the following conclusions:—

(1) The dietary position was unsatisfactory in most respects, except that the thiamine non fat caloric ratio was above the beri-beri level.

(2) These families in the main were above the lowest income groups, so that the picture is not one where the economic factor is necessarily the most important, yet only six of the diets were found to be satisfactory.

(3) Families with most children had to eat worse than those with few or no children. Out of seventeen families with three or more children not one family reached the minimum caloric requirement, while thirteen were below the average of their groups. Out of twenty-nine families with two or less children, eleven reached the minimum caloric requirement, while fourteen only, were below the average for the group.

(4) While economic factors undoubtedly play an important part in this unsatisfactory picture, there is evidence that unwise food budgeting and bad food habits cannot be ignored, as seventy cents per man per day can buy an adequate diet at current prices, and well over half the families exceeded this expenditure.

(5) Nevertheless, even in these groups, the Chinese and Indians spend seventy per cent of their total expenditure on food and fuel to achieve the modest yet unsatisfactory dietary position indicated. This is a disproportionate amount and there is obviously, even at this level, little margin for other essential expenditure and savings.

(6) It would appear therefore, that lack of education, bad food habits, size of family, and economic circumstances all play a part in these unsatisfactory dietary intakes, which bear a relative importance from the high to the low income levels.

After Care of Cases Hospitalised for Malnutrition

In co-operation with the Almoner of the General Hospital, the Nutrition Unit investigated, at her request, the home conditions and diet of fifteen families from whom a child had been admitted to hospital with severe malnutrition. Twelve families investigated did not have sufficient means to buy a properly balanced or adequate diet. In the case of three families, ignorance on the part of the mother was the cause of the child's illness. In the latter case, the mother was advised, and in the others attendance at the Social centres or creche was allowed. This is proving a valuable link between the hospital and the community and might well prove to be the germ of a Nutrition Service which every modern Public Health Department should have.

Industrial and Institutional Feeding

During the year, the Unit was consulted frequently in connection with dietary scales for industrial concerns, hospitals, homes, orphanages, and creches. It is likely that there will be a growing desire for such assistance as the increasing industrial development in the Colony and the improving conditions in industrial welfare are drawing more attention to the desirability of improved feeding arrangements for labour. The difficulty in this respect is persuading labour to change its customary habits. Several firms who have provided well equipped canteens have found that the employees are reluctant to either manage or use them. There is a useful field for education and experiment in this field.

Nutrition Education

During the year, the Nutrition Exhibits in the Public Health Museum attracted considerable attention and were used by schools for demonstration purposes.

A special stall at the Singapore Progress Exhibition held in October, demonstrated specimen diets for labourers in the three main racial groups, common dietary defects, and the value of enriched rice. It proved very popular and was of useful, educative value in the instruction of the public in the right choice of food within the lower income groups.

Transfer of the Nutrition Unit to the University of Malaya

The Nutrition Unit, whose activities have been directed by the Departments of Biochemistry and Social Medicine in the College of Medicine on behalf of the Health Department passed under the control of the University on its Foundation. It is now an integral part of the Division of Applied Nutrition in the Department of Social Medicine and Public Health, where it is engaged in field research.

While this Department maintains cordial relations with the University Department, (its head is Chairman of the Nutrition Council) and the fruits of its investigations are available to the administration, it should be realised that the Government Health Department has now no staff responsible for watching the state of nutrition of the Colony, for the investigation of *ad hoc* problems, and for the dissemination of knowledge amongst its people.

While the University will no doubt pursue with added vigour the investigation of the Colony's nutritional problems, there is little doubt that the administration should employ a skilled nutritionist in its Health Department.

TABLE I

AVERAGE INTAKE "PER MAN" PER DAY IN 46 SINGAPORE FAMILIES WITH INCOME RANGING FROM $100–$450 PER MONTH

Nationality	Number of families	Average number of adults	Average number of children	Average total income per month	Average total expend. per month	Food and fuel % total expend.	Food and fuel per man per day	Calories	Protein gms.	Fat gms.	Calcium gms.	Iron mgms.	Vitamin A I.U.	Thiamine mgms.	Riboflavin mgms.	Nicotinic acid mgms.	Vitamin C mgms.	Thiamine Non-fat Caloric Ratio
				$	$		c.											
Chinese	28	2.6	2.4	168	132	69	82	2255	50	41	.22	12	1776	.8	.7	8	34	.6
Indian	9	3.4	1.7	144	144	71	83	2414	53	42	.28	10	1905	.7	.6	9	34	.4
Malay	9	3.3	1.1	148	129	56	68	2169	56	40	.35	13	1846	.9	.7	10	44	.5
Minimum requirements (Aykroyd, India)								2600	65	..	.68	20	4000	1.1	1.5	20	40	..

Adult = over 12 years.

PART III

THE HOSPITALS DIVISION

CHAPTER SEVENTEEN

HOSPITALS—GENERAL REVIEW

ANNUAL REPORTS of the years 1946–1948 have recorded the steady rehabilitation and re-equipment of the hospitals in Singapore, with ever-increasing facility in dealing with the patients requiring hospitalization or out-patient treatment. The year 1949 saw continued progress in reconditioning buildings and wards so that by the end of the year approximately seventy-five per cent of the work of the rehabilitation of the hospitals had been completed. The arrival of much new equipment during the year for the various specialised services of the hospitals has greatly enhanced the quality and the quantity of the hospital services to the patients. The increase in the numbers of patients demanding admission has served to emphasise more than ever the clamant need for more accommodation in the hospitals. This lack has thrown a very heavy burden on an out-patient division quite unequipped to deal with it. A modern out-patient department in each of the main hospitals is one of our most urgent requirements—a fact sufficiently stressed in the Medical Plan which has been drawn up for the Colony. Apart from the completion of the new Rotary Tuberculosis Clinic at Tan Tock Seng Hospital in the early part of the year and a start on the extension of the Leper Settlement no new buildings have been started in any of the Hospitals as yet.

During the year the consulting architect who was called in in connection with the General and Maternity Hospital sections of the Medical Plan made a preliminary survey in this connection.

The overcrowded wards and departments have made work exhausting and difficult to the inadequate staffs, and long waiting lists for admission a source of disappointment to the sick. Thus the actual implementation of the hospitalization side of the Medical Plan is becoming a matter of ever increasing urgency.

It is also disappointing to record the difficulty in recruiting medical and nursing staff. The inability to get Medical Officers from overseas has raised very serious difficulty in staffing hospitals adequately, since the supply of locally qualified Medical Officers has just begun and will not make an appreciable effect for quite an appreciable period yet. The six short term housemen recruited from United Kingdom at the end of 1947 had all returned there by the middle of the year: fortunately eight locally qualified new housemen became available in August.

Accommodation for nurses and doctors has become a priority requirement. It will soon become impossible to press for further necessary recruitment unless added housing is available: graduates both local and expatriate will not join the medical service unless quarters are immediately forthcoming for families. Most of the young men of to-day are married or about to undertake this responsibility.

Bed Strength of Various Hospitals

Hospital	Pre-war	1946	1947	1948	1949	Remarks
General	750	550	550	600	650	
Kandang Kerbau excluding cots ..	180	200	220	240	240	195 Maternity 45 Gynaecology
Tan Tock Seng ..	600	400	400	550	572	
Orthopaedic ..	40	60	60	60	65	
Prisons	170	50	50	170	118	38 at Changi 80 at Outram
Social Hygiene excluding cots ..	included in General Hospital	60	60	60	68	8 of these are cots.
Infectious Disease ..	250	250	250	250	250	
Leper Settlement ..	200	260	260	260	260	200 extra beds due to over-crowding
Police Training School	20	20	20	20	20	
Mental	2,000	440	700	1,000	1,500	

Main Hospital Out-patients only

	New Cases	*Total Attendances*
1938	37,989	87,447
1947	85,120	258,917
1948	100,720	332,427
1949	105,118	375,344

The number of in-patients dealt with at the General and Kandang Kerbau Hospitals plus Venereal Disease compare as follows with the pre-war position:—

	In-patients	*Average occupied beds*
1938	25,913	892
1948	29,845	780 + V.D.
1949	32,998	858 K.K. 205 + G.H. + V.D. (607) (46)

Diet Costs

Cost of Diets per patient per day for the year 1949 for all hospitals, excluding the Mental Hospital

Hospitals	1st Class	2nd Class	3rd Class	Children	T.B.
	$ c.	$ c.	$ c.	$ c.	$ c.
General Hospital ..	3 71	2 54	89	1 27	—
Tan Tock Seng ..	—	—	81	—	1 45
Leper Settlement ..	—	—	1 00	—	—
Kandang Kerbau ..	3 17	2 39	84	—	—
St. Andrew's Orthopaedic	—	—	—	1 20	—
Middleton	European 2 80	Clerical 1 50	Labourers 85	—	—
Middle Road ..	—	—	65	—	—

Cost per patient per day at the General Hospital

	$ c.
1st Class patient	13 70 per day
2nd Class patient	12 53 per day
3rd Class patient	10 88 per day

A study of these and other returns in this respect will make it clear that apart from the Mental Hospital the general bed strength now approximates to the pre-war but that the comparison ceases here. The work of the new hospital out-patient department alone has increased by over five times the pre-war figure: the turnover in all institutions is well in excess of any pre-war return. In fact, a record was secured in many directions—a remarkable achievement in view of present accommodation and staff difficulties. The only accommodation that is available at the moment for ward expansion services is two half wards at the General and two wards at the Tan Tock Seng Hospital. Part of this space is required for staff amenities however. Some of the pre-war accommodation at the General is now used for physio-therapy and occupation therapy purposes—first with innovations and experiences in direction of treatment which has a very important bearing on the length of stay of many out-patients in hospital. The steady expansion that has taken place since the reoccupation has now reached the limit under existing conditions and until the Ten-year Medical Plan which exists for the Colony has been achieved to that stage then more staff can be accommodated.

The General Hospital

This hospital, which as the acute medical and surgical hospital for Singapore had to continue perforce its policy of only admitting the acutely ill case and by reducing the convalescent period to its minimum, was able to meet the demands for urgent treatment. There were 650 basic beds as compared with 600 in 1948 with 100 emergency beds in addition to cope with the periodic excessive flow of admissions. Many of the wards were very overcrowded, rendering work for the staff consequently more difficult.

During the year rehabilitation was practically completed with a general painting and cream washing which restored it to its pleasing pre-war condition. A good deal more, and specialised, equipment arrived during the year and so enabled the various departments to improve still further.

Little more can be done now until the expansion scheme under the approved Medical Plan proceeds. The priorities under this are staff accommodation and a proper out-patients division as a part of a proper scheme. It is hoped to advance on these lines during the coming year now that a preliminary architectural survey has been completed.

The total number of cases treated as *in-patients* for the year was 16,051 as compared to 15,223 in 1948 and all the departments worked at the fullest pressure possible with the staff and accommodation available.

In-patients

	Remained from previous year 1948	Admitted during the year 1949	Total treated	Discharge, Deaths, etc.					Remaining at the close of the year 1949	No. of basic beds	Average daily number of patients	Remarks
				Discharged	Transferred	Absconded	Died	Total				
1st and 2nd Class (paying)	87	2,448	2,535	2,332	38	1	76	2,447	88	140 *	95.5	*This number includes beds available for observation and isolation for all classes.
Children Wards 3rd Class Free	84	2,865	2,949	1,796	67	1	989	2,853	96	84	86.6	
	402	10,165	10,567	9,020	201	4	940	10,165	402	413	425.4	
Total ..	573	15,478	16,051	13,148	306	6	2,005	15,465	586	637	607.5	

IN-PATIENTS

Daily Average	Male	Female	Total	Deaths Percentage
607.5	11,357	4,700	16,051	12.5

Only three half wards now remain out of clinic use, one of which is about to be opened for additional children, one being used for teaching purposes. The third is at present occupied by the Medical Services Union as a Club House. So far shortage of medical and nursing staff has not made it possible to use this accommodation but 1950 is expected to see a sufficient improvement in these respects to supply a further thirty-six children's beds and twenty-five general beds. As there is no more resident accommodation now available this is a priority under the Medical Plan.

The following figures show the steady increase in the *out-patients* work attempted:—

	New Cases	*Repetitions*	*Total Attendances*
1947	40,496	73,671	114,167
1948	44,625	94,176	138,801
1949	45,966	107,568	153,534

A special feature of the general out-patient division which dealt with 104,403 attendances (45,111 women) as compared to 76,263 in 1947 was the skin clinic. This dealt with 4,714 attendances during the year. The Army Skin Specialist was good enough to attend one weekly session and this assistance is gratefully recorded.

GENERAL HOSPITAL, SINGAPORE

OUT-PATIENTS, 1949

——	New Cases	Repeats	Total
Male Out-patients Department	20,421	38,871	59,292
Female Out-patients Department ..	14,724	30,387	45,111
Medical Officer i/c Officials	1,495	6,720	8,215
Eye Clinic	5,048	15,746	20,794
Surgical Out-patient Department, Mr. B. M. Johns	1,142	9,933	11,075
Ear, Nose and Throat Department ..	1,399	2,934	4,333
Skin Clinic	1,737	2,977	4,714
Total ..	45,966	107,568	153,534

In addition:—

S.O.P.D. Operations	441
Medical Officer i/c Officials:—	
Recruits	2,544
Innoculation and Vaccination	855
Medical Boards	108
Total ..	3,507

OUT-PATIENTS

Diseases	New Cases			
	Male	Female	Children	Total
Yaws	7	2	—	9
Fever including Malaria ..	3,436	2,089	1,909	7,434
Dysentery and Diarrhœa ..	340	294	382	1,016
Skin Diseases including Ulcers	4,318	1,137	676	6,131
Helminthic Infection ..	636	325	542	1,503
Venereal Diseases	73	69	22	164
Respiratory Diseases ..	5,305	2,726	2,305	10,336
Others	11,933	4,485	2,955	19,373
Total ..	26,048	11,127	8,791	45,966

Nationalities	New Cases			
	Male	Female	Children	Total
Europeans	872	439	244	1,555
Eurasians	516	259	132	907
Chinese	14,444	7,919	6,513	28,876
Indians	6,982	1,567	1,325	9,874
Malays	2,488	601	154	3,243
Javanese	377	116	258	751
Japanese	7	—	—	7
Others	362	226	165	753
Total ..	26,048	11,127	8,791	45,966

Total Attendances	153,534
Daily Average	420.64

DIVISION OF RADIOLOGY

Diagnostic Section

This work has shown a continuous increase since 1946, and the total number of diagnostic examinations carried out during 1949, at 26,978, shows an increase of twenty-six per cent over the total for 1948.

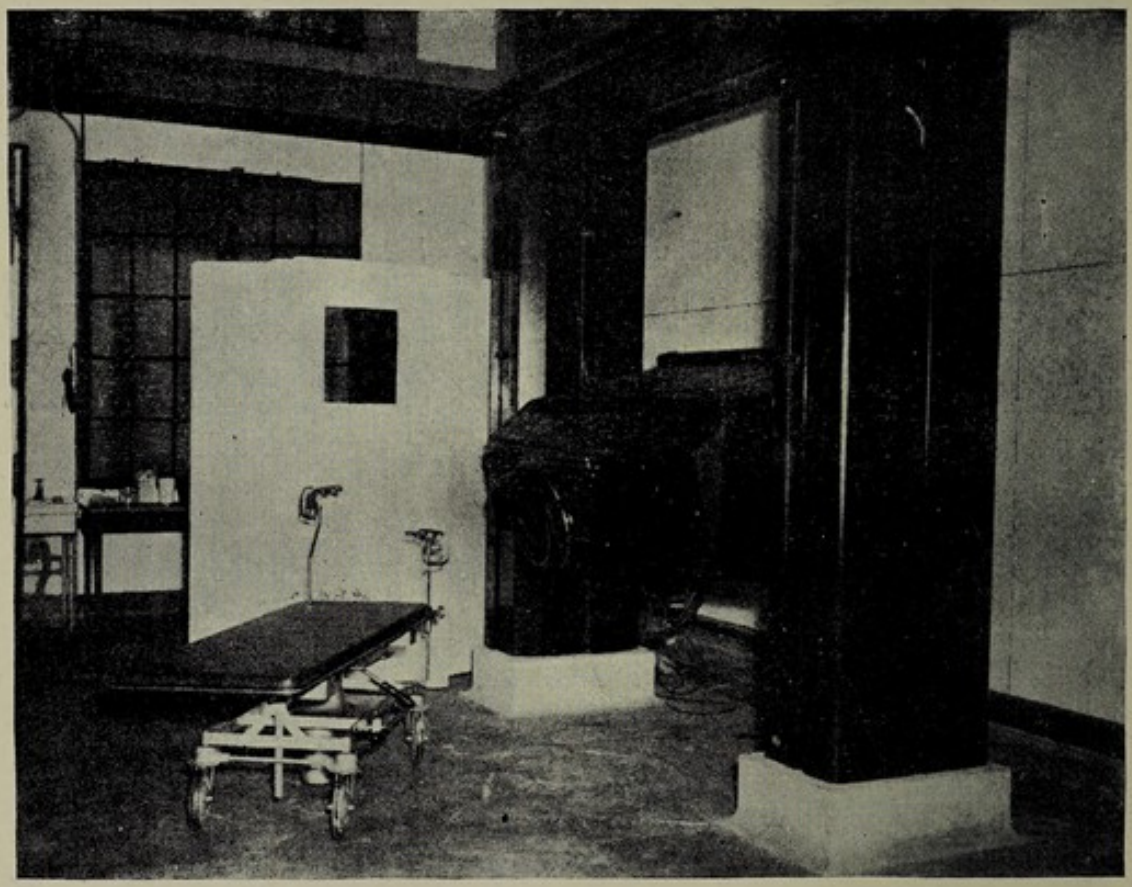
This increase has taken place in spite of the fact that, during the second half of the year, with the opening of the Rotary Tuberculosis Clinic at Tan Tock Seng Hospital, the diagnostic department at the General Hospital has been relieved of all the examinations from the wards and outpatient department at Tan Tock Seng.

The total number of examinations carried out at the Rotary Clinic during the year was 7,091, so that the total number for both departments for 1949 was 34,069, as compared to a total of 21,562 in 1948, 17,562 in 1947 and 6,000 in 1938.

An interesting feature of the work during the year has been the radiological survey of the lungs of about 4,000 officers in Government

Civil General Hospital, Singapore—New Eye Out-patients Department

Civil General Hospital, Singapore—X-ray Out-patients



Civil General Hospital, Singapore—Deep X-ray Therapy Unit

Service. This was designed to give information as to the incidence of pulmonary tuberculosis in Government servants, and to discover and bring to treatment such cases as existed. Any discovered to have radiological lesions are referred for clinical investigation by the Tuberculosis Specialist. This work will continue during 1950. Details of the cases so far investigated are to be found in the section of this Report dealing with tuberculosis.

Therapeutic Sections—(a) X-Ray Therapy

A 400 kilovolt deep therapy unit was installed during the year, and a total number of sixty cases had received treatment up to the end of the year. About half of this number were cases of post-nasal lymphoepithelioma, which is one of the most common neoplastic conditions seen in Singapore. It is generally not amenable to surgical intervention. Considerable amelioration and prolongation of life is obtained by deep X-Ray therapy, but the percentage of complete cures is likely to be low.

(b) Superficial X-Ray Therapy

The apparatus has arrived, but owing to the reconstruction of the accommodation, has not yet been installed. It is hoped to have this unit working early in 1950.

(c) Radium Therapy

The stock of radium has been increased to a total of 231 milligrammes at the General and Kandang Kerbau Hospitals and a further amount is on order now. This radium is in constant use. A total of some fifty cases was treated up to the end of the year at the General Hospital. To this must be added 119 treated at the Gynæcology ward at the Kandang Kerbau Hospital.

Head of Division—Dr. J. W. Winchester, M.D., D.M.R.E.

TABLE SHOWING NUMBER OF EXAMINATIONS, 1949

		Brought forward	25,503
Lungs	16,840	Gall Bladder	183
Bronchography	82	Pregnancy	501
Heart	320	Salpingography	27
Bones (Injury)	3,613	Encephalography	58
Bones (Pathology)	3,124	Paranasal Sinuses	532
Gastro-Intestinal Tract	902	Teeth	64
Renal Tract	622	Others	110
Carried forward	25,503	Total	26,978

Average per month .. 2,248

OPHTHALMOLOGY

There has been a considerable increase in the work of this unit over the period under review. The new out-patient department with main operating theatre has now been completed and is in use. The entire accommodation forms a single unit on one floor and is probably the most modern and best equipped ophthalmic department in the Far East. Much new up-to-date equipment has been installed.

The pressure of more important and urgent work has made it necessary to limit the amount of pure refraction work undertaken,

but when more staff becomes available it may become possible to arrange proper clinics for school children. These are part of the modern school medical service and must be supplied sooner or later.

As noted in previous reports the manifestations of *trachoma* are becoming gradually less severe; consequently operative treatment is not so often necessary. It cannot now be assumed, however, that this disease has become much less common in Singapore. Experience has shown that all Sikh immigrants from India, without exception, show signs of trachoma of varying severity and immigration is thought to keep this disease alive. Should immigration from India and China ever begin again on any scale then the question of barring all immigrants with active trachoma at ports of embarkation will have to be revived.

Keratomalacia

A deadly condition in infants due to lack of sufficient Vitamin *A* in the diet, has not decreased in frequency. It is due in nearly all cases to exclusive feeding on sweetened condensed milk. The results of an investigation into the latter undertaken in collaboration with the Department of Biochemistry would indicate that no sample of sweetened condensed milk examined contained Vitamin *A* in amount remotely approaching that considered advisable for sole infant feeding. The condition was almost absent in 1946 and has steadily increased ever since.

Head of Unit—Mr. A. D. Williamson, M.B., CH.B. (Glas.), D.O.M.S., F.R.C.S. (Edin.).

RETURNS OF OPERATIONS, 1949

Simple Intracapsular Extraction	71
Combined Intracapsular Extraction	70
Simple Extracapsular Extraction	38
Combined Extracapsular Extraction	68
Linear Extraction	10
Needlings	38
Broad Iridectomy	14
Optical Iridectomy	17
Iridectomy for Prolapse Iris	13
Enucleations	53
Eviceration	10
Exenteration	4
Strabismus	4
Mucous Membrane graft	32
Magnet Extraction foreign body	5
Diathermy Cautery	11
Diathermy Epilation	214
Paracentesis	15
Expressions for Trachomas	182
Chalazion	105
Dacryocystectomy	9
Dacryocystectomy Rhinostomy	22
Pterygium	79
Tarsorrhaphy	3
Detachment of Retina	18
Various	65
Total 1949	1,170
Total 1948	707

THE MEDICAL UNITS

There are two separate units for adult male and female patients, and one for children. These provide a total accommodation of 224 beds. This number is far from adequate for the large numbers of medical cases requiring hospitalisation however and all medical wards are chronically overcrowded with emergency beds filling the verandahs and middle areas of the wards rendering work very difficult and trying for both medical and nursing staff particularly during the emergency "take in" periods. The large increase in the number of medical students has resulted in increased difficulty in teaching not only in the medical wards but in all the other units of the hospital. The performance of the ordinary routine work of the hospital coupled with a heavy teaching programme for students have laid an onerous burden on the Senior Staff and tutors attached to the hospital. The first clinical laboratory attached to the medical units continued to cover such a considerable volume of work that it was fortunate that a second laboratory could be opened up during the year. Some 120,000 tests were undertaken.

Two special clinics functioned during the year one for cardiac cases amongst school children referred by the School Health Officers, and one for patients suffering from eosinophilic lung.

During the latter part of the year two medical officers from the Department of Social Medicine were attached to the medical wards to investigate the socio-economic background of selected cases.

There were no special features regarding the incidence of disease. The medical staff, however, was compelled to draw the attention to the marked prevalence of caustic soda poisoning amongst potential suicides. On the therapeutic side all the newer drugs, especially penicillin and the sulpha drugs, continued to be used on an ever increasing scale with highly satisfactory results. This necessitated a very considerable increase in the drug votes in the 1950 Estimates as compared to any previous year.

Streptomycin was used chiefly in selected cases of tuberculosis with marked benefit in some. Chloromycetin and aureomycin were both used on a small scale due to limited supplies. Aureomycin proved its curative value particularly in the virus Pneumonias.

The Professor of Clinical Medicine has drawn particular attention to the rising incidence of rheumatic carditis, especially amongst children, and investigation is proceeding. It is not generally known that rheumatic infection is present in Singapore, but this fact has now been established.

With the co-operation of the Education Department it is planned to establish the most suitable type of investigation test for backward children with a low intelligence quota. Accordingly this problem received special attention during the year.

A medical physiotherapy division operates in connection with the Medical Units and the Radiology Department.

In the children's medical ward the accommodation continued to be taxed to its utmost.

Statistics

Total number of cases admitted during 1948 ..	1,981
Percentage Mortality	46.18
Total number of cases admitted during 1949 ..	2,098
Percentage Mortality	41.28
Percentage Mortality after excluding deaths within 24 hours	15.88

The difference in the over and under twenty-four hour admission period death rate indicates that many deaths are caused by delay on the part of parents in bringing young children for treatment. Most of the young patients admitted however are suffering from very serious diseases liable to a fatal termination such as generalised acute tuberculosis, peritonitis, non-tubercular meningitis, advanced broncho-pneumonia and acute gastro-enteritis. Some half the admissions were due to the latter condition in infants under two years of age.

Unit Chiefs:

Professor G. A. Ransone, F.R.C.P.
Professor E. S. Monteiro, M.R.C.P., D.C.H., F.R.F.P. & S.
Dr. Gopal Haridas (children), J.P., M.R.C.P.

The Surgical Units

The three Surgical Units continued to perform a vast amount of work and like other sections of the hospital combined their ordinary routine hospital work with teaching duties. One of the units continued to cope with all the Ear, Nose and Throat work in addition to general surgery, and another carried out additional and extensive work in surgical physiotherapy and major chest surgery for pulmonary tuberculosis.

Operation Statistics: General and E.N.T.

1948	*1949*
5,070	6,828

It is quite impossible within the compass of this Annual Report to give a really adequate picture of the work accomplished during the course of a year by any of the numerous Clinical Units of the Hospitals, but my Senior Surgeon (Mr. B. M. Johns, O.B.E., M.B., CH.B. (N.Z.), F.R.C.S. (Edin.), D.T.M. & H.) requests that in celebration of his completion of twenty-one years' service in charge of a joint General Surgical and E.N.T. Unit, Surgery should this year receive special mention.

He rightly points out that a return which merely lists the numbers of operations performed gives no idea of the vast amount of work done in relation to the accommodation in which this work is performed, and to the staff, Medical and Nursing, available for this work. During 1949 in the three Surgical Units of the Civil General Hospital records show that 6,828 operations were performed. This figure continues to increase from year to year, despite the fact that the figure for staff remains almost stationary. Not only is there an annual increase in the numbers of operations performed, but in

the years since the War there has been a steady increase in the numbers of more major surgical procedures such as, Gastrectomies and Pneumectomies—a clear indication that our Western ideas on surgery are finding more and more favour with the Eastern people of our Colony.

It is also correctly stated that the time has long since passed when E.N.T. work for a Colony with a population of a million people should no longer be a sideline of a General Surgical Unit, and an entirely separate Unit is a matter of considerable urgency.

As with in-patient surgical work in all Units so is it with out-patients; an analysis of the returns of which shows an approximate ten per cent annual increase—all of which is absorbed by the smaller than pre-war staff. It is obvious that a point of saturation must be reached—if it has not already been attained—when the staff, no matter how willing or efficient will crack under the ever increasing burden.

The Administration is well aware of the defects occasioned by lack of staff and accommodation and it is sincerely hoped that it will be possible within a reasonable period to introduce the remedies for these defects that are already visualised in the Medical Plan.

Mr. J. K. Monro, M.D., M.CH. (Camb.) M.R.C.P. (Lond.) F.R.C.S. (Eng.) Professor of Surgery reports as follows:

> In this last annual report of the Department of Surgery of the King Edward VII College of Medicine tribute should be paid to the co-operation and facilities that the Medical Department of Singapore has always given to the clinical teaching units. The hope is expressed that these will be in no way impaired by the transfer of some officers from Government Service. Not that benefits have been all on one side. Many of Government's routine uninteresting jobs are done by teaching units, which have thereby less time and energy for following up cases and other studies. The staff produced by Government and Medical College together has been much below what is needed. There have recently been added to the Singapore Establishment posts for new graduates. Selected graduates are to be given the opportunity of twelve months of resident appointments, after which they can apply for admission to University service for a longer period or to Government service on a permanent basis. It is to be hoped that the scheme will be expanded, for the General Hospital, Singapore, is to remain an essential part of the clinical teaching of the University. It remains to be seen what the General Hospital, Johore, could offer (it is three and a half miles from the proposed Johore site of the University, further than the General Hospital, Singapore, is from Raffles College).
>
> Throughout the three terms of the year systematic lectures have been given in the College or Faculty of Medicine. From February to October the Professor of Surgery was away on leave in London and the United States. During this time Mr. H. M. McGladdery, F.R.C.S., had charge of his Unit and gave the systematic lectures. Lecture-demonstrations on Operative Surgery have been given in the Post-mortem Room of the General Hospital by the Professor of Clinical Surgery. The Sister-Tutor in the General Hospital gave two courses of five lecture-demonstrations to fifty-seven students during August and September, 1949.
>
> The number of students is still increasing. There are now eighty-five students attending systematic lectures.
>
> Throughout the year the two units have provided for students clinical opportunity and responsibility under supervision.
>
> Out-patient facilities remain unsatisfactory.

Mr. D. E. C. Mekie, M.B., CH.B., F.R.C.S. (Edin.), F.I.C.S., Professor of Clinical Surgery has this to say:

The Annual Report affords one an opportunity of doing more than merely recording certain figures which have to be compared with the figures of previous years on a purely numerical basis. There is no lessening of demand for admissions to the hospitals. On the contrary our admissions have gone up. A total of 1,906 admissions means that there are admitted to the Unit each day seven new cases. Seven cases per diem perhaps does not sound a great deal, but I should like to point out that every case on admission has to have a record made. The record is a record of the detailed examination, and such an examination is time consuming. This work should be done by the Junior House Surgeons which is their function. It involves a very great part of the time spent during the day, simply taking the records of these new patients, and this makes no allowances, it should be noted, for Sundays and Public Holidays. It is an index of the volume of work which should fall to Junior Members of the Staff, and it has to be noted that the total available staff is two.

Another index of the work done during the past year is the number of operations performed. Such a record of course is only a rough guide. The total operations performed during the year were 2,904. That is to say, that the Theatre is doing rather more than eight operations a day. Many of these of course are relatively minor in character, but the Theatre has got to be prepared even for the minor case, instruments sterlized, operating trays set up, and the amount of preparation entailed in this total is extraordinarily great. Against that we have to place the Theatre staff, the Sister, the Staff Nurse, two Juniors. They have to be available during the actual operations. They have to carry out the preparation for the operations. They have to be on duty on Admission Days from 8 in the morning till 8 the following morning, at least on call. Of the total operations, the group which are classified as definitely major numbers 736 in the first ten months, an average annual rate of 880 approximately. This is greater than in the previous year by approximately 100 cases.

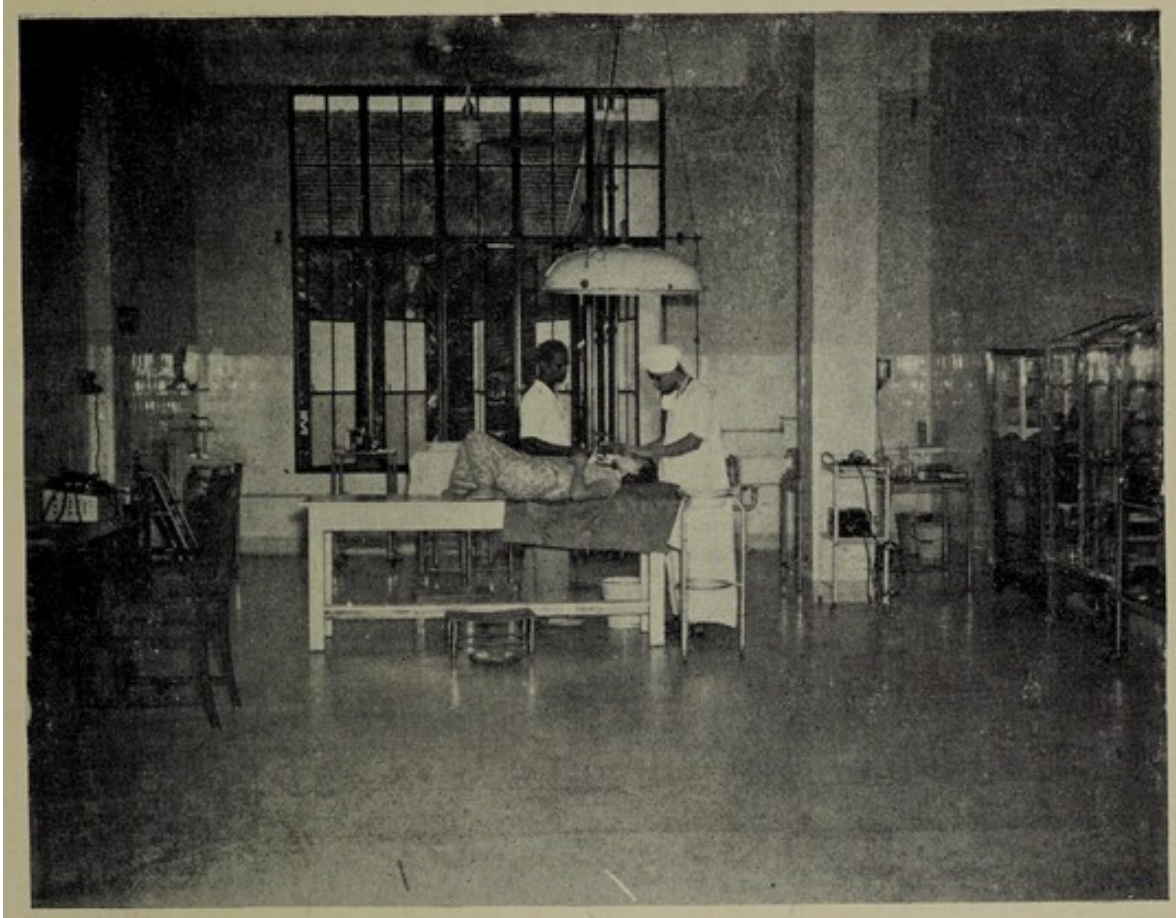
	1948	*1949*
Total Number of Operations ..	2,509	2,904

I feel it is desirable at this point to draw attention to the changing character of the operative work in Singapore. Prior to the war, major operations were of a character which to-day would be regarded as almost minor in the degree of their severity, in the degree in time they consume. It is perhaps noteworthy that during the past year certain special types of operation have been undertaken in this Unit, and the figures of these operations are attached.

Special Types of Operation

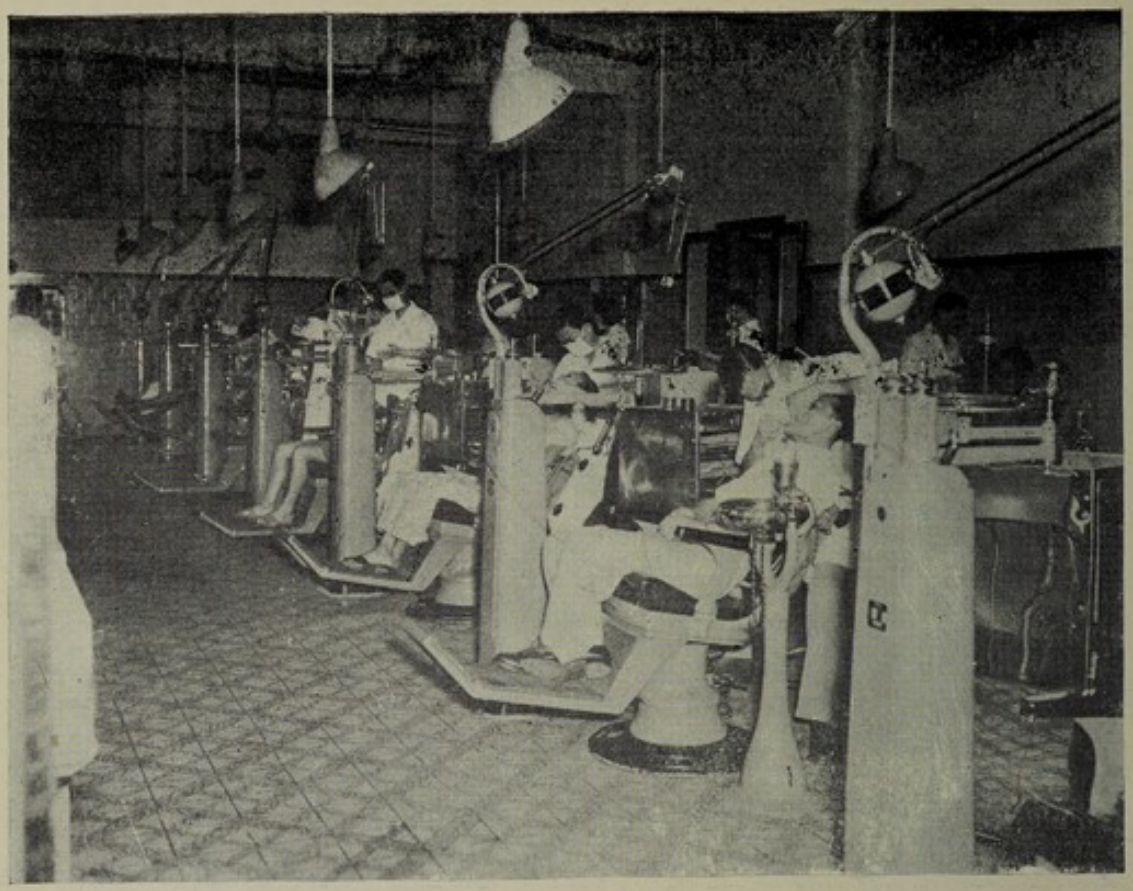
	1949 Cases
Pneumolysis (Thoracoscopy)	43
Gastrectomy	10
Thoracoplasty	29
Smithwick	14
Leucotomy	8
T.B. Hip (Britain's Arthrodesis)	8
Oesophagectomy	2

The reason for mentioning these is to draw attention to the staff and time consumed in them. A Smithwick operation carried out for high blood pressure is done in two stages. Each operation takes approximately an hour to an hour and a half to perform. It necessitates the services of a skilled Anæsthetist. The Surgeon requires two or three Assistants in doing it. Similarly, one takes the operation of Gastrectomy, an operation requiring an hour and a half to an hour and three-quarters to perform, again demanding the services of a skilled Anæsthetist, and requiring the assistance of two Junior colleagues. The time consumed in the Theatre carrying out these operations is of course well spent, but it is necessary that it should be realised that when we call for more staff to aid us in our work, one of the important factors is the increasing heaviness of the cases. The total number of these rather heavier operations is of course relatively small. Thus, in the series mentioned, the total number of operations



Civil General Hospital, Singapore—New Eye Out-patients Department
Theatre for dressings and minor operations

Civil General Hospital, Singapore—Dental Clinic
Students making dentures



Civil General Hospital, Singapore—Dental Clinic
Students treating Out-patients

Civil General Hospital, Singapore—Nurses Training School

amounts to just over hundred operations. This of course is well within the scope of the Senior Members of the Staff, but the demand upon the Junior Assistants is great, and when an Assistant is working in the Theatre he cannot simultaneously be undertaking what are primarily his duties in the Ward.

It is most fortunate that Brigadier Marsden has aided us in this Unit, both in operative work and in teaching during the past year, and I should like to place on record here my deep appreciation of all he has done for us.

The Dental Clinic

The Dental Clinic at the General Hospital serves the dual purpose of an out-patient and in-patient treatment centre and the teaching dental unit of the College of Medicine now the Faculty of Medicine of the University of Malaya. Rehabilitation and re-equipment were virtually completed during the year and some improvement in the poor staffing position was possible after the June examinations. The number of new patients seen increased from 3,895 in 1948 to 4,599 in consequence.

1949	Chinese	Indian	Malay	Others	Total
Adults	1,967	645	474	152	3,238
Children ..	1,136	146	41	38	1,361
Total ..	3,103	791	515	190	4,599

The Professor of Dental Surgery (Professor E. K. Tratman, O.B.E., M.D.S., F.D.S., R.C.S. (Eng.)) reports as follows:

On the treatment side extractions show a very large increase which is regarded with disquiet as it represents the destructive side of dentistry rather than the constructive side. Fillings also show a rise but whereas in 1948 it was three extractions to one filling, in 1949 it is 3.5 extractions to one filling, which represents a retrograde trend. The ratio of completed cases, that is cases which have received the complete dental treatment necessary in their cases, compared to the patients attending shows a slight drop from 9.7: one in 1948, to 9.9: one in 1949. This again is a symptom of the increasing pressure upon the limited treatment facilities available. It has been necessary severely to limit the acceptance of patients to the capacity of the Clinic and its staff. No acute cases are turned away but it is quite impossible to accept for treatment all the cases that present themselves. To do so would mean converting the clinic almost exclusively to a clinic for the extraction of teeth. Conservative dentistry, which is the more important side of dentistry, would be relegated to a minor role.

The provision of artificial dentures shows a very substantial rise to 1948 which is a direct reflection of the increased staff which became available during 1949. The waiting list for artificial dentures has been considerably reduced and is now probably smaller than in many dental hospitals in other parts of the world.

Of individual types of cases, osteomyelitis of the jaw shows a considerable rise over 1948 with sixty-three cases compared to fifty-one. Maxillo-facial injury cases requiring the use of splints were forty cases in 1949 as against thirty in 1948. Similar cases requiring no splints total fifty-nine as against thirteen in 1948. The total treatment hours for this group of cases has now risen approximately to one thousand hours per year as against four hundred hours in 1948. The majority of cases is the result of traffic accidents, though "falling off a bus" as a cause is

less common than in 1948. Perhaps this is a reflection on the improved transport facilities.

Of the odontomes there is a list of twenty-eight cases as against ten in 1948 but the same pattern is more or less repeated. This pattern is appreciably different from the pattern found in European populations. Other cases with tumours of the jaw totalled forty which is nearly double the number seen in 1948. A number of cases of thrombocytopenia were seen during the year. In all these cases it is particularly important to note that the first complaint of the patient was bleeding from the gums. All the cases ended fatally. There were also a limited number of cases of tooth lesions typical of congenital syphilis and in these cases the form of the teeth was the only sign present to determine congenital syphilis. These cases were confirmed by a blood examination.

It is emphasised that a single dental clinic even of the size of the one at the Civil General Hospital, Singapore, cannot cope with the needs of the population of Singapore. These needs can only be met by an extensive development of the dental services. In developing dental services the first emphasis should be upon the dental treatment of school children and children of pre-school age so that by providing treatment at this level a dentally fit population is gradually built up. In developing the dental service a long term view must be taken. The short term view of providing facilities for the extraction of aching teeth is very bad and in the end leads to dentistry becoming a system for the destruction of the teeth and not their preservation. This is an exact reverse to what should be the aims of all dental schemes.

	Total attendances	*Average daily attendance*
1948	29,355	69.6
1949	38,806	93.86

Physiotherapy Division

There is a special medical physiotherapy department where the following treatments are given:—short wave, infrared, ultra violet, massage, faradism, galvanism, remedial exercise. The following figures were recorded during the last two years:—

Total attendances for 1948	10,637
Total treatments for 1948	17,995
Total attendances for 1949	14,390
Total treatments for 1949	29,291

A special surgical physiotherapy and occupation therapy division is attached to one of the surgical units. This work has been developed only recently and is one of the most important of our post war innovations. In addition to bed accommodation for twenty patients, one half ward is reserved for daily exercises aided by varied mechanical aids for the different disabilities: another for general surgical physiotherapy and a third for occupational therapy.

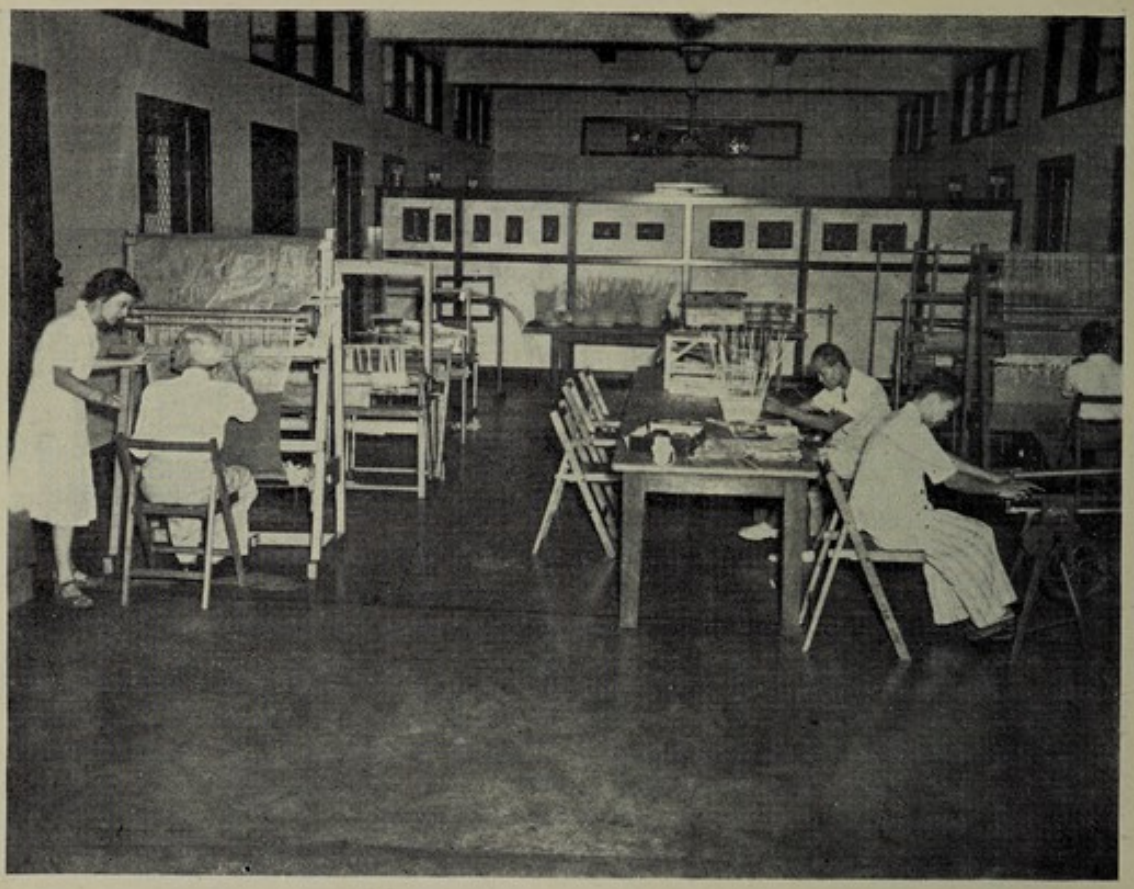
A regular Physical Training Class was started during the year for nurses of the Preliminary Training School who thus get regular physical training with undoubted benefit to their health and physique.

Classes continued for special deformities referred from schools and fracture clinics have become a regular bi-weekly feature.

The many duties of surgical physiotherapy unit have been carried out by two qualified lady physiotherapists and two hospital assistants trained in this work. These trained physiotherapists visit the other hospitals of the Colony in addition to their work at the central division at the General Hospital.

Civil General Hospital, Singapore—First Class Kitchen

Civil General Hospital, Singapore—Surgical Physiotherapy



Civil General Hospital, Singapore—Occupational Therapy

Civil General Hospital, Singapore—Children's Medical Ward

Total Treatments at the General Hospital

Ward cases	Out-patients	Polio cases	Spinal remedial	Special training	Total	
					1949	1948
18,602	4,055	3,057	779	468	26,961	22,792

Occupational Therapy as an integral part of this new department was included in the middle of the year when a qualified lady arrived from the United Kingdom. Several looms for weaving cloth have been installed and additions are being made to widen the scope of this work.

To date 482 out-patients have been able to benefit from the specialised treatment and instruction now available in this respect.

Without this new treatment many patients would have to be retained in hospital for much longer periods than is now the case and they would be discharged in a condition which would make them an added burden on the welfare service of the Colony. Many who previously remained as permanent cripples now become useful citizens again. In consequence the importance of this new service to the public cannot be overestimated. The many post poliomyelitis cases are only one instance. The service will be extended and much better housed and equipped under the Medical Plan. The two wards at present used for the purpose are really not satisfactorily placed for in-patients in any case.

CHAPTER EIGHTEEN

TUBERCULOSIS

TAN TOCK SENG AND CHILDREN'S ORTHOPÆDIC HOSPITALS

TUBERCULOSIS continues to attract the most unfavourable attention of any disease and its control and treatment have been under further and continued consideration throughout the year in consequence. Many wild statements have been made in regard to its incidence in our local population, but the fact remains that beyond crude deaths and death rates no reliable statistics exist in this direction. 1949 is the first year in which it has been possible to collect a sufficient X-ray and clinical assessment of a number of cases to be of any significance, but these come from particularly susceptible groups of persons who have suspected trouble of this sort, or from groups which cannot be said to offer any true indication of general population trends in regard to this disease. These will be analysed for what they are worth, but any conclusions from them on the actual position must be accepted with the utmost caution. Crude deaths and death rates from pulmonary tuberculosis have shown a steady decline since the re-occupation, and a definite improvement now over pre-war figures. Taking the 1939–1941 deaths as 100 (1714), the 1946 index was 93 (1976), 1947, 70 (1468), 1948, 66 (1449) and 1949, 57 (1286). Is the disease less prevalent now in the general population than before the war in consequence? What is disturbing is the amount thought to be present in the younger section of the population evidenced by a study of the school figures already quoted. While the tuberculosis death rate is some 2½ times that in the United Kingdom (145 per 100,000 as compared to 60), an analysis of deaths shows that apparently less than 17 per cent took place in the adolescent and early adult decades (15–20 and 21–30) and only some 3 per cent below the age of 15. The school figures would appear to indicate some increase of child tuberculosis over the pre-war, although this is very difficult to gauge with the pre-war material available.

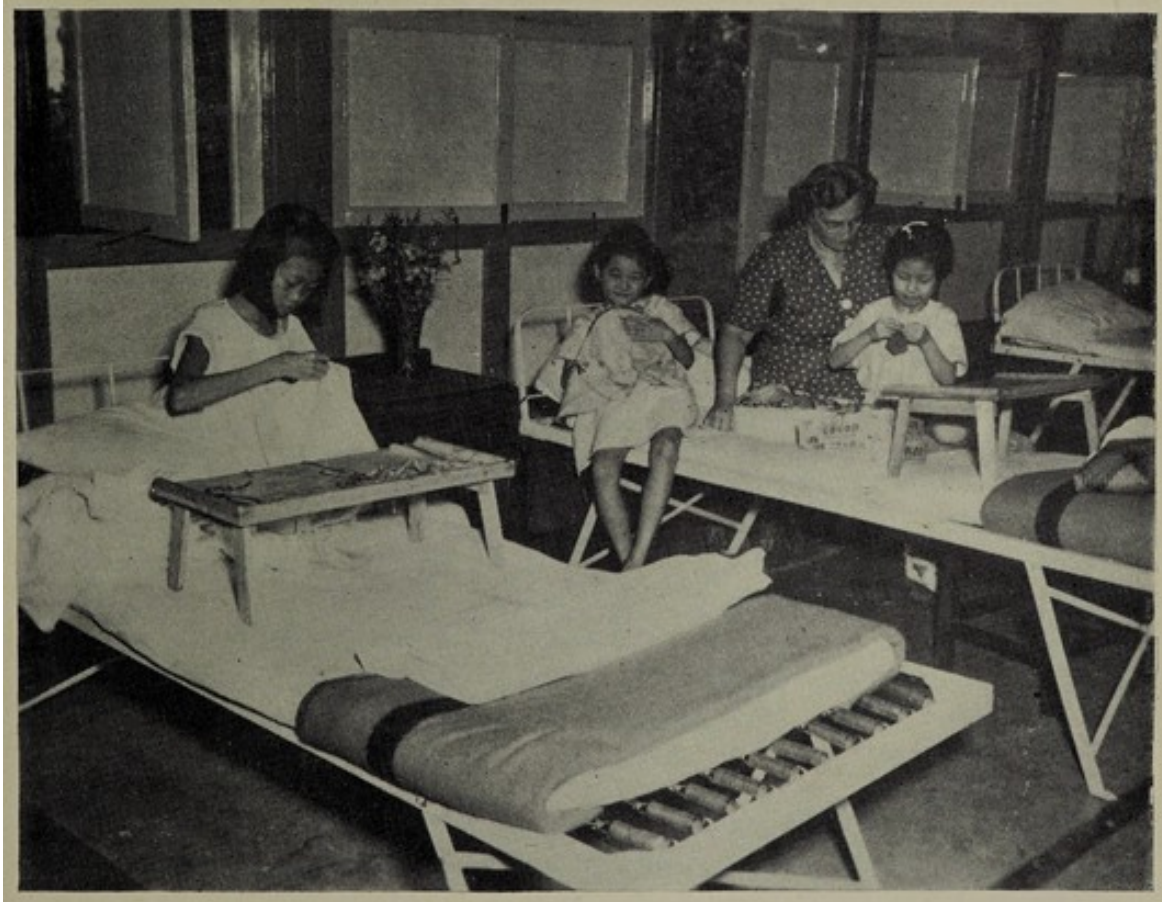
Number with T.B. present radiologically	.. ..	281
Primary complex	active	100
	healed	17
Reinfection type	active	51
	inactive	7
Post-primary	.. ..	1
Total school children X-rayed	.. .. ..	3,174

In consequence 1.6 per cent of those examined can be said to show signs of an active lesion: 0.3 per cent had a positive sputum.

The number of reinfection cases discovered were considerably higher than in 1948; fifty-one as against twenty-one but many more children were X-rayed: (3,174 as compared with 596).

It is, however, not strictly correct to call all these cases children because the ages covered ranged from six years to twenty years.

Tan Tock Seng Hospital—Christmas decorations



Tan Tock Seng Hospital—Diversional Therapy

Age groups were not included, but all the sputum positive cases except three were in the over sixteen age group.

Department	Total No. X-rayed	Total No. of cases of Pulmonary T.B.	Active		Under Observation	Arrested	Per cent Active
			Positive Sputum	Negative Sputum			
Postal	549	57	2	3	2	50	0.91
Government Health Office	224	8	..	1	1	6	0.44
Currency Commissioners	53	10	..	2	1	..	3.6
Kandang Kerbau nurses	9	1	..	1	..	..	11.1
Chemistry ..	34	3	..	1	..	2	3.
General Hospital, etc.	792	76	1	3	5	67	.5
Customs	443	31	..	2	2	27	0.45
Raffles Museum ..	38	1	..	..	1	..	..
Total ..	2,142	187	3	13	12	152	0.74

In consequence while the general anticipated fall can be attributed to an improvement in the health of the population as a result of general health measures and slowly increasing resistance which must occur in such a community as this (and the local incidence is thought to be better than in some other large centres of population in this part of the world) the fall is likely to slow up or stop altogether unless more active measures against the disease are instituted. The local situation is serious enough without any attempt at exaggeration.

Non-pulmonary tuberculosis appears to have shown a slight increase over recent years. This form of the disease is more usually associated with the use of fresh whole milk. This is not a common practice here. The introduction of cows and the use of fresh milk must be kept in mind in this connection however. The greatest care must be taken that all herds are free from tuberculosis in view of the fact that infection from this source is not thought to be a problem so far.

Notification of the disease appears to have been a failure up to date. Whether it can be established on a sufficiently satisfactory basis in such a community as this at the present time as to be of any value is a question which has to be carefully considered. Dr. Morland the visiting Tuberculosis Specialist from the United Kingdom, was of the opinion that compulsory notification could not be effective without far-reaching economic security measures.

Taking the situation as it existed in 1945 and before the war a lot has been done in the way of developing care for tuberculosis cases over the last four years. Prior to the war less than one hundred beds existed for treatment in this connection and no out-patient or domiciliary facilities were provided. Patients either came into institutions in the last stages of the disease, or for a short stay only. Thus a rapid turnover was achieved. During the Japanese occupation

nothing was done for the tuberculosis patient at all. In 1945, 200 beds were set aside for these sufferers in a special institution and a small out-patient clinic developed. Now some 500 beds are occupied as an average by tuberculosis patients with 460 in two special institutions, and a first class out-patient diagnostic treatment centre exists. The latter is called the Rotary Clinic because the building was provided as a gift by the Rotary Club of Singapore. This was officially opened by His Excellency the Governor in April 1949. This innovation has led to a steady increase in out-patients over the period, and it is clear that the numbers now coming forward will soon far exceed the staff available to deal with them.

Table of T.B. Out-patients Treated

	1948	*1949*
Newcomers	2,074	2,752
Repetitions	12,203	25,873

Out-patient demands must be expected to continue to increase until more beds are available. In this connection it is interesting to record that the Ministry of Health in the United Kingdom in its last available report for 1947 notes that some 33,000 beds were provided for tuberculosis at the end of that year for a population of some forty-two millions. That is some 760 per million as compared to Singapore's 500. The Ministry also records that "Shortage of staff continued to be the main (eighty-eight per cent) reason for empty beds being temporarily not available, although there was a slight improvement from the position in 1946, when one bed in every six or seven was so closed. These slight gains, however, are overshadowed by the steadily mounting numbers of patients awaiting admission. These beds, if adequately staffed, would absorb about half the patients on the waiting list. Meanwhile all measures for the welfare of patients whether admitted to institutional beds or not, and the protection of their associates should be pursued with unflagging zeal."

The total cost of the splendid gift by Rotary to the citizens of Singapore came to about $100,000, and Government matched this to equip the clinic. The new unit means a definite advance on the long road to tuberculosis control which is our object. For the first time in its history Singapore spent over $1 million on tuberculosis work alone—about ⅛ of the total Annually Recurrent Medical and Health expenditure of the Colony.

The Medical Plan envisages the provision of 1,100 beds for this disease within ten years in addition to further out-patient, domiciliary relief and other ancillary services, and it is hoped to make steady progress in this essential direction year by year. In the meantime the Singapore Anti-Tuberculosis Association has expanded its diagnostic clinic facilities to a treatment centre. This help should prove of invaluable assistance to the Government scheme until this has advanced to the requisite stage.

Apart from special cases and acute disease in children such as meningitis which are treated at the General Hospital, Tan Tock Seng Hospital provides an average of 400 beds for pulmonary tuberculosis

cases and the Children's Orthopædic Centre sixty beds. During the year the following in-patients were dealt with at the various Government institutions:—

Tan Tock Seng		
Pulmonary	1,305	
Disseminated	1	
Bones and joints	24	
Other forms	18	
General		
Pulmonary	445	(8 small children)
Disseminated	213	(144 small children)
Bones and joints	156	(4 small children)
Other forms	96	(17 small children)
Orthopædic		
Bones and joints	77	
Total Number of Cases ..	2,335	

Committees

There is a Government Tuberculosis Advisory Board to guide the Director of Medical Services on the best way of implementing the Policy laid down in the White Paper tabled in the Legislative Council in 1948 (No. 24/1948). Representatives of Rotary, S.A.T.A. and the Social Welfare Department sit on this Board. In addition a Streptomycin Committee operates under the chairmanship of the Chief Medical Officer to which the British Medical Association and the Alumni Association of the College of Medicine send members. The Domiciliary Relief Committee operates under the auspices of the Social Welfare Department with the Medical Department's nominee as a member.

Domiciliary Relief

Domiciliary Relief became an important and vital part of the local scheme for the first time in our history during 1949 following one of the main recommendations made in the Tuberculosis Policy Paper prepared by the Medical Department the previous year. Domiciliary relief was given to children as part of the School Medical Service in those cases where hospitalisation cannot be arranged at an annual cost of $10,260.39 while extras such as milk were provided to all infant welfare centres at a yearly figure of $75,000. All adult cases are subject to review by the Relief Committee noted above which has $240,000 at its disposal each year. The School Service provides a visiting team to administer its home relief and this work is reviewed briefly in the appropriate section of the report. In the case of adults all patients are referred to the Almoner with a note from the Medical Officer stating whether they are medically eligible for the benefits under the scheme. Only tuberculosis patients who are in need of financial assistance and have a reasonable chance of recovery if provided with medical treatment and sufficient funds to allow them to rest are eligible for allowances under the scheme. Cases must have been undergoing regular treatment in Tan Tock Seng Hospital and must be recommended by the Medical Officer who in addition to

certifying that they are in his opinion curable also recommends that the number of months allowances should be paid. The Form of Recommendation is forwarded by the Almoner of the hospital to the Department of Social Welfare whose staff investigates into the economic circumstances of the cases, checking the number of dependants, the patient's former average income and similar details. This investigation is conducted by the Public Assistance Section of the Social Welfare Department. The Supervisor of the Section examines each case, assesses the need, taking into consideration income from other sources, and calculates the treatment allowance in accordance with the scheme drawn up and approved by the Committee. His detailed report is submitted and approved before a payment can be made. In many cases this approval is made by the Social Welfare Department direct, these being only reported to the Advisory Committee for covering approval and where there are special circumstances, however, calling for larger or smaller allowances, these have to be submitted to the Advisory Committee at its monthly meeting for consideration. Even in these cases an interim payment within the rates laid down can be paid subject to adjustment later on. All cases receiving domiciliary relief must report to the Almoner and to the Medical Officer of the hospital for monthly report.

When patients reach the end of the period for which their allowances were granted and they are reported to be fit to return to their former employment, or to undertake light work, the Advisory Committee, the Department of Social Welfare and the Almoner of the Tan Tock Seng Hospital co-operate to find suitable work for any who remain unemployed, or intercede with employers to re-employ them. The rates of allowance per month are as follows:—

	$
T.B. out-patient	45
T.B. in-patient	15
Wife	25
Every dependant over 16	15
Every dependant under 16	12
Increased allowance for single person living alone ..	10
Special allowance for T.B. wife whose husband's income is very meagre	35

Rent, the actual rent paid up to a limit of $15 a month. All rents over this limit are subject to the approval of the Advisory Committee. Income from all sources such as paid leave and wife's or dependants' income is deductible from the total treatment allowances given.

The peak in the amount of domiciliary relief given approached the 300 mark towards the end of the year with expenditure running to about $20,000 a month.

The object of the scheme is to help out the wage-earner who cannot work because of his disease: and to assist families unable to provide for sick dependants. So a start has now been made in Singapore in one of the most essential parts of any tuberculosis scheme. The occurrence of tuberculosis in any family is a disaster. In many it is economic obliteration.

TAN TOCK SENG HOSPITAL.

% of T.B.Cases seen according to AGE distribution for 1948 and 1949

1948 - Total Cases: MALES = 1836 (Black line)

1949 - Total Cases: Males = 2235 (Broken line)

Age	5	10	15	20	25	30	35	40	45	50	55	60	
%	0·38	0·11	2·99	14·82	16·67	15·63	16·23	13·19	8·93	5·82	2·57	2·16	1948
%	0·40	2·51	2·99	6·76	13·74	15·70	13·96	13·65	12·71	9·35	5·46	2·77	1949

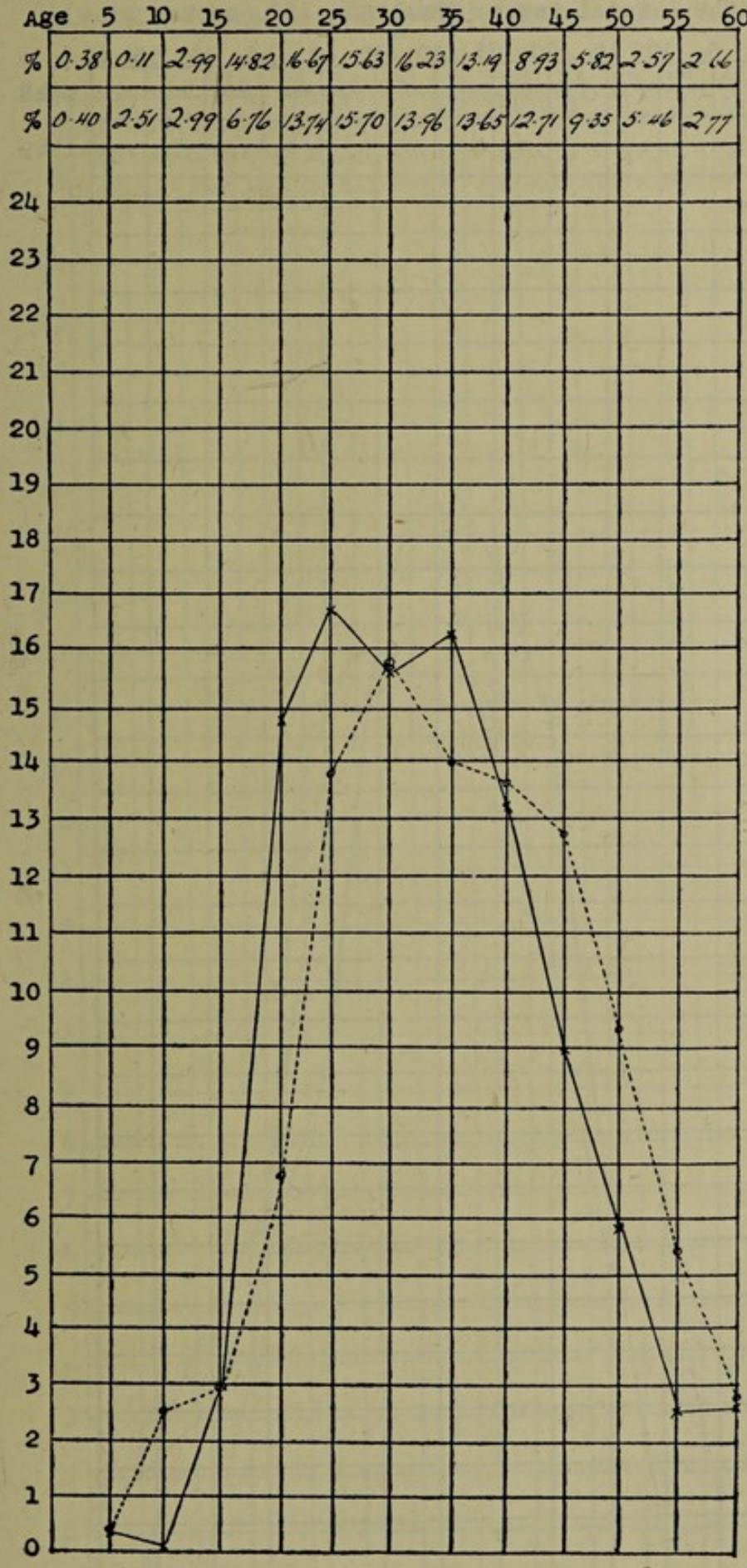


Fig. 6

TAN TOCK SENG HOSPITAL.

% of T.B.Cases seen according to AGE Distribution for 1948 and 1949

1948 - Total Cases: FEMALES = 543 (Black line)

1949 - Total Cases: FEMALES = 708 (Broken line)

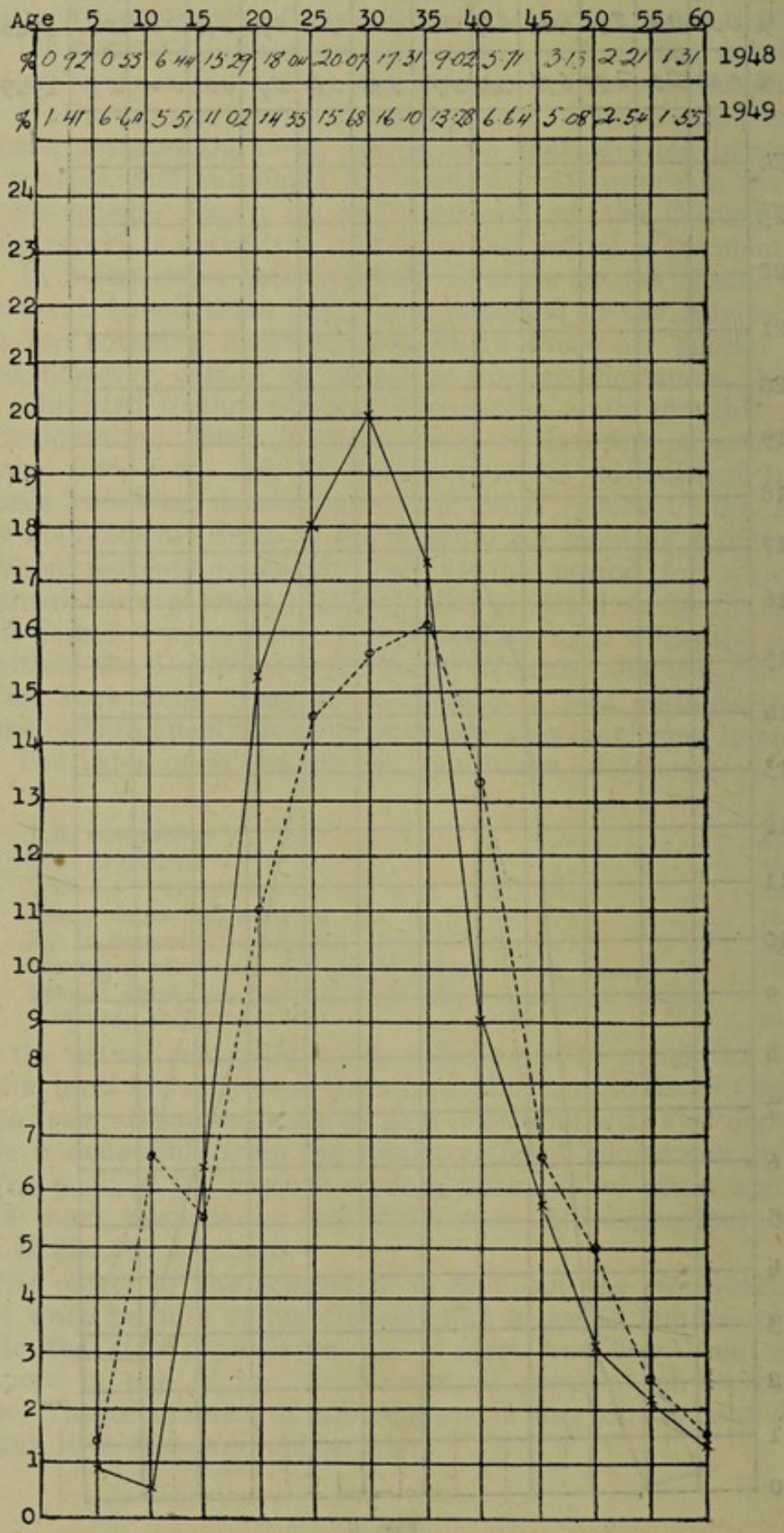


Fig. 7

TAN TOCK SENG HOSPITAL.

% of T.B.Cases seen according to AGE Distribution for 1948 and 1949.

1948 - Total Cases: = 2379 (Black Line)

1949 - Total Cases: = 2943 (Broken Line)

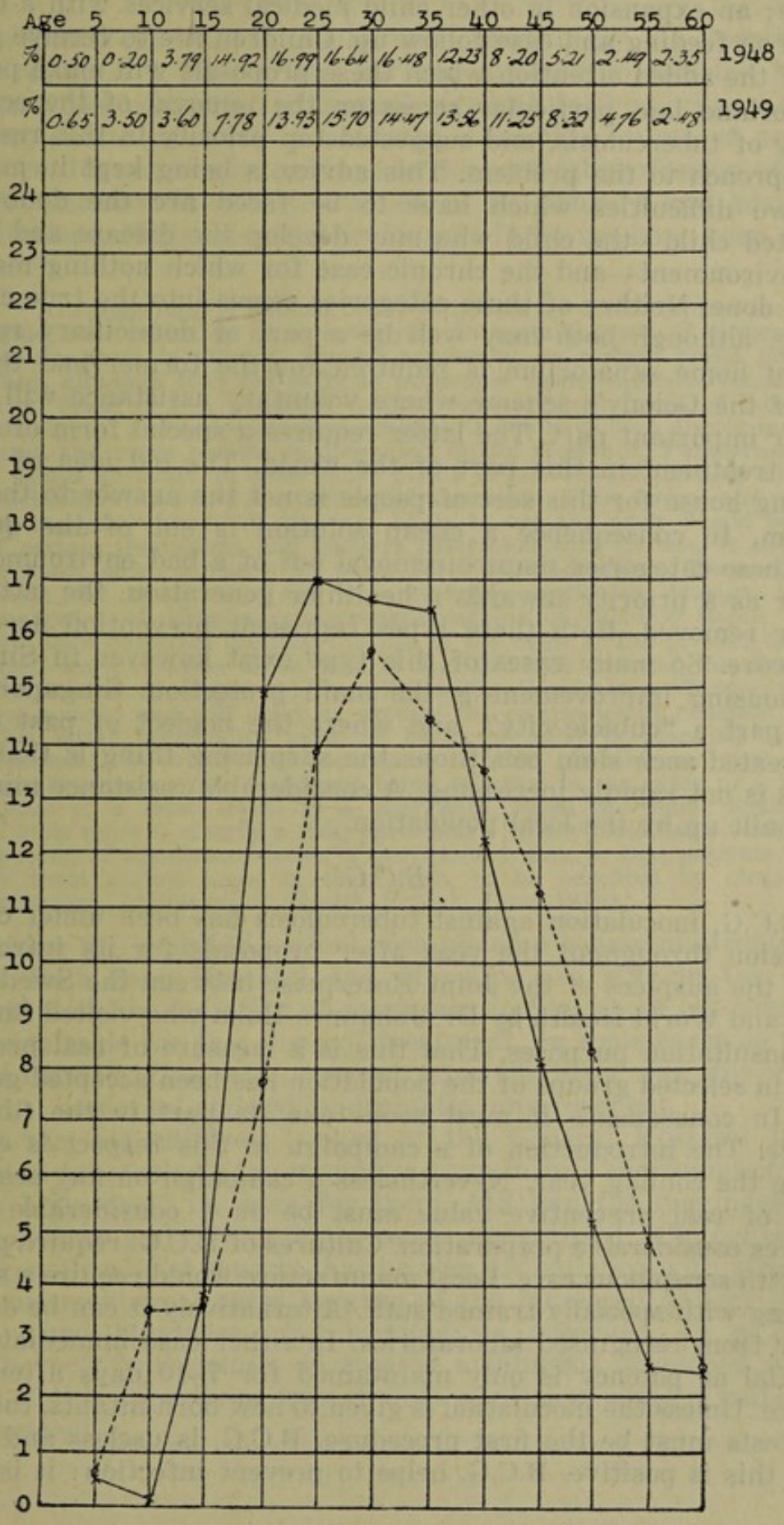


Fig. 8

Thus the Government Medical Service is slowly achieving the first phase of its Tuberculosis Policy which is a minimum hospitalisation plus domiciliary relief follow up: an expanded School Medical Service: an expansion in other child medical services with a concentration on feeding and case follow up. Children are to receive a large part of the added attention which these proposals will make possible. Dr. Morland laid particular stress on the removal of the economic penalty of tuberculosis, and suggested top priority in this respect in our approach to the problem. This advice is being kept in mind.

Two difficulties which have to be faced are the doubtful or suspected child—the child who may develop the disease and is in a bad environment—and the chronic case for which nothing medically can be done. Neither of these categories comes into the true curative picture, although both may well be a part of domiciliary relief. A form of home sanatorium is required for the former and this is a part of the Colony's scheme where voluntary assistance will play a further important part. The latter requires a special form of institutional treatment in this part of the world. The old idea of a form of dying house for this sort of people is not the answer to the latter problem. In consequence a cheap solution is out of the question. Both these categories require removal out of a bad environment, the former as a priority towards a healthier generation, the latter as a danger removed. Both these types represent prevention as distinct from cure. So many cases of this type exist however in Singapore that housing improvement is the main protection. Singapore is in large part a "cubicle city", and where the neglect of past decades has created such slum conditions the surprising thing is that tuberculosis is not rapidly increasing. A considerable resistance must have been built up by the local population.

B.C.G.

B.C.G. inoculation against tuberculosis has been under constant discussion throughout the year after proposals for its introduction under the auspices of the Joint Enterprise between the Swedish Red Cross and World Health by Dr. Johannes Holm who visited Singapore for consultation purposes. That this is a measure of real preventive value in selected groups of the population has been accepted generally now. In consequence it must soon take its part in the Singapore picture. The introduction of a campaign in this respect is expected during the coming year. Nevertheless a campaign on any scale—and to be of real preventive value must be on a considerable scale—requires considerable preparation. Cultures of B.C.G. require preparation with scrupulous care. Local manufacture would require a separate building with specially trained staff. Alternatively it can be delivered by air from recognised laboratories. In either case immediate use is essential as potency is only maintained for 7–10 days after manufacture. Unless the inoculation is given to new born infants, tuberculin skin tests must be the first procedure. B.C.G. is useless and painful when this is positive. B.C.G. helps to prevent infection: it is useless

when infection has occurred. In the meantime the Singapore Anti-Tuberculosis Association has started on a small preliminary B.C.G. test scheme.

STREPTOMYCIN

Streptomycin was controlled until recently by the Special Committee referred to above, and its use confined to selected hospital patients. Since relaxation of control occurred in the United Kingdom however, public pressure necessitated a similar course of action in Singapore. Its use is now confined to the medical profession of course and practitioners have been warned of its dangers and advised on its limitations. More recently the dangers in its use have been further stressed:

> Although finality has not been reached in the assessment of the dosage, value and limitation of streptomycin in certain types of clinical tuberculosis, there is already general agreement on certain broad principles. Thus, although it is too early to pronounce upon long-term results, there is no doubt it is a powerful weapon against those forms of tuberculosis (meningeal and acute miliary) which hitherto have been almost invariably fatal, and every patient so diagnosed should receive it. Furthermore, it is a useful adjuvant in some other forms of the disease, notably ulcerative tracheobronchitis and laryngitis and ulceration of the tongue and pharynx. On the other hand, all who are likely to use the drug should be aware of certain limitations and dangers associated with its use. It should not be used indiscriminately in every form of tuberculosis. Toxic effects of which the most important is irreversible vestibular damage, and the emergence of streptomycin-resistant strains of tubercle bacilli are the two main obstacles limiting the use of the drug at the present time, and much work remains to be done to find for each form of the disease the best scheme of dosage which will combine therapeutic effectiveness with low toxicity and will delay or prevent the emergence of resistant strains. This latter eventuality must be borne in mind in planning long-term treatment, in which the occurrence of this phenomenon may prevent further streptomycin treatment being effective in the event of a recrudescence of a fresh lesion at a later date. From the public health point of view there is clearly a risk, particularly in advanced cases with copious sputum, of the dissemination of resistant strains, so that patients infected by them cannot hope, in their turn, to be benefited by streptomycin treatment. (*Ministry of Health Report*, June, 1949).

During the year 118 patients completed a course of streptomycin in Tan Tock Seng Hospital and fifty-nine are still on the course. Unfortunately the majority of cases seen in Singapore are considered to be unsuitable for this form of treatment. In some cases so treated a rapid deterioration was observed after the drug was stopped. The majority, however, showed a dramatic improvement.

Of the 144 children treated at the General Hospital for disseminated tuberculosis the majority came in in a moribund condition and so little could be done for them. 118 had the meningeal form of the disease and twenty-eight acute generalised tuberculosis. The Pediatrics Specialist reports that he was not satisfied with streptomycin in his meningeal cases because of the increased danger of optic atrophy and blindness, and hæmoptysis observed. In a case of intra-thoracic tuberculosis so treated meningitis developed while in others of this type there was clinical remission without radiological improvement.

Another drug with far-reaching important effects in certain types of tuberculosis has recently come in for discussion and this is para-aminosalicylic acid, a chemotherapeutic substance of comparatively simple chemical structure. It would seem to be particularly indicated in acute cases of pulmonary tuberculosis of the exudative type, where streptomycin has proved of little avail and to fail to produce resistant strains of the tubercle bacillus. Its use with streptomycin has been stressed in this latter connection. "The relationship between the antibiotic streptomycin and the chemotherapeutic agent para-aminosalicylic acid is one of the most important problems in the study of the chemotherapy of tuberculosis. In the present state of knowledge, no patient with any form of miliary tuberculosis, tuberculous laryngitis, or tuberculous tracheo-bronchitis should be denied streptomycin, but in all other types of acute pulmonary tuberculosis the use of P.A.S. should be seriously considered before exposing the patient—and later the general public—to the possibility that streptomycin-resistant strains will predominate in the sputum." "No chemotherapeutic agent—antibiotic or otherwise—can be said to have replaced the accepted forms of treatment in pulmonary tuberculosis—bed rest, sanatorium regime, collapse therapy, major surgery."

P.A.S. has only been used locally to a very limited extent. Its further study is about to be extended.

	In-patients		Out-patients	
	Inductions	Refills	Inductions	Refills
A.P.	20	181	15	1,255
P.P.	109	1,549	225	5,129

Phrenic Crush	275
Pneumolysis	12
Thoracoplasty	8
A.P. abandoned	11
P.P. abandoned	46

Almoners and Health Visitors

With the advent of the new "Rotary" outpatient clinic, the domiciliary relief scheme and the special bi-weekly school clinics the monthly total of tuberculosis work was steadily expanded up to some 200 new cases with some 2,500 re-examinations, with 50 aspirations and 600 pneumothorax or pneumoperitoneum refills, the opening of an almoner and health visitors departments could no longer be delayed. Two almoners were working towards the end of the year at Tan Tock Seng Hospital but, unfortunately, only in a temporary capacity. Two specially trained staff nurses were seconded to assist these ladies as "visitors" however.

The Diversional Therapy Unit and its splendid work has been adequately described in the section of this Report dealing with voluntary organisations. The work consists chiefly in providing materials to patients and teaching them to knit, to embroider, to make toys and in basket design of various kinds. During the year the number of trained patients rose from some 60 to 360. Although 30 ladies are giving much time and thought to this essential to modern tuberculosis treatment, more helpers are urgently required to expand the scheme and to replace those who have to leave Singapore.

Amongst the many problems which an almoner must deal with in such an institution the following may be noted:—

(1) The care of the family while the bread winner is without the means and unable to work.

(2) The boarding out of young children while the mother requires hospital treatment, or when either patient is particularly infectious.

(3) The finding of new jobs for those patients who have lost employment due to their illness.

(4) The provision of extra nourishment for a patient at home, or for his family.

(5) The repatriation of patients wishing to return to their countries of origin.

(6) The investigation of the financial circumstances of a patient when relief is asked for, followed by the recommendation to the Social Welfare Department for relief in suitable cases, and the subsequent supervision of patients while on relief.

A main effort is thus directed to relieving the burden of the afflicted family and this often entails a great deal of work before a suitable solution is found. Some firms in Singapore have shown marked consideration to members of their staffs by keeping jobs open for short periods and continuing to pay full or half salary while the patient undergoes treatment. Others have agreed to employ another member of the family in place of the wage earner. One firm has granted a widow a sum sufficient for the support of her family while she trains as a mid-wife. All are not as co-operative as this however and other avenues have to be explored in obtaining relief. This is where the Almoner comes in. Many now get this from the Government scheme for a "tuberculosis allowance" to those patients likely to improve within a reasonable period of time. The number which can be so dealt with is very limited by the money available.

Every effort is made to obtain employment for members of an afflicted family and the special child help scheme which is run by the School Medical Service also comes into the picture. The nurses visit those patients who have been referred to the Lady Almoner—to examine home conditions; to advise on general measures of health and hygiene; to teach and to safeguard other members of the family from infection; to arrange for contacts to attend for examination and to visit patients who are on home treatment while awaiting admission to hospital. From June to November the two nurses visited 1,192 persons and jelly-tested 438 child contacts. All positive cases are referred to the Rotary Outpatient Clinic where they were X-rayed

and those found to have lesions are examined, assessed, and, if necessary, treated.

A Health Sister who has experience in this type of work has recently taken charge of the health visitors. So in future the Health Sister and Health Visitors will function as a separate unit although close liaison with the Almoner's Department will be retained. It is hoped to recruit another Health Visitor next year as the volume of this work is increasing from day to day.

A new vehicle of the station wagon type has been bought for the Health Visitors and for the Lady Almoner to make them independent of other hospital transport. Mobility is an essential if this type of work is to be satisfactorily expanded.

The year 1949 is the first year in which anti-tuberculosis work of the nature described above has been attempted. It marks an outstanding advance in our attack on the disease and one which must receive an ever increasing attention.

Laboratory

It was only possible to spare three Hospital Assistants for this type of work but 647,757 different examinations were undertaken.

New methods have been developed in England for the discovery of the tubercle bacillus in the sputum by a fluorescence technique using ultra violet light and special equipment has now been obtained for this purpose. It is hoped to start with this form of examination in the immediate future.

Further note on Tan Tock Seng Hospital

Year	Daily average No. of patients	Patients Treated		Total	Deaths	Percentage of deaths to total treated
		Male	Female			
1948	553.62	2,067	249	2,316	557	24.05
1949	561.59	1,790	402	2,192	418	19.07

	Total treated	*Deaths*	*Mortality per cent*
Respiratory Tuberculosis ..	1,305	310	23.75
Other Tubercular Diseases ..	43	6	7.16
Other Diseases	844	102	12.09
Total ..	2,192	418	—

	Out-patients			
	Non-T.B. cases		*T.B. cases*	
	New cases	*Repetitions*	*New cases*	*Repetitions*
1948	6,745	15,076*	2,074	12,203
1949	5,992	8,943	2,752	25,873

* The 1948 non-tuberculous figures include new cases in females and children now dealt with at the Kandang Kerbau Hospital General Out-patients Department. While both males and females attend the Tuberculosis Clinic only males attend the general clinic at this hospital.

As 415 beds were in use towards the end of the year for tuberculosis at Tan Tock Seng Hospital it is clear that this institution continued to be the main centre for this disease in Singapore. The opening of the Rotary Clinic within its grounds in April 1949 with complete X-ray and other necessary units attached has made what was a very poor out-patient department a really up-to-date one. The tuberculosis out-patient attendances doubled during the period under review. In-patients suffering from tuberculosis increased from 817 in 1948 to 1,305 in 1949.

Other diseases admitted totalled 844 during the year. Tan Tock Seng Hospital has still to cover an acute in and out-patient duty, however, in view of the overworked General Hospital. It also acts as a chronic disease overflow from that institution. In consequence of this latter feature valuable beds had to be cluttered up with a proportion of cases more suitable to a decrepit home than to a medical institution.

Of the twenty wards available at the hospital only seventeen could be put into full medical use during the year as two had to be reserved for staff accommodation and one had to remain empty because of staff shortage. When the part of the hospital usually reserved for females (Mandalay Road section) has been rehabilitated a further two wards will come into use. One of these is to be turned into a school and general dental clinic as a temporary measure however. The rest of the accommodation remaining will be used as a self help tuberculosis centre for the more chronic case as an experiment in the direction of camps for in-patients in the incurable category.

Tan Tock Seng Hospital had the services of a Tuberculosis Specialist throughout the year. Up to June Dr. R. J. Grove White acted in this capacity and also as the Administrator. From June to December Dr. C. E. Smith was the Specialist and Dr. A. L. Greenway, M.B.E. the Medical Officer in Charge. One Tuberculosis Specialist and the equivalent of three-and-a-half full time Medical Officers is not sufficient to deal with such a large and expanding in and out-patient organisation as this.

The nursing staff of one Matron, four Sisters, nineteen female nurses and sixty-six male nurses was augmented during the year by five nursing nuns from the Franciscan Order of the Divine Motherhood and these ladies are in the process of forming a special tuberculosis nursing service for the institution. Thus the nursing standards at this institution should be considerably improved in due course.

All members of the staff are tuberculin tested before starting work in this hospital, and only those who show evidence of immunity to tuberculosis are permitted to work in the wards. All undergo a medical and X-ray examination and are subsequently examined every six months. Probationer nurses coming to Tan Tock Seng Hospital are examined both before and after their three months tour of duty.

All members of the staff receive fresh milk daily and strict attention is paid to seeing that all have regular days off and leave.

During 1949 no case of active tuberculosis was discovered among the nurses. One probationer hospital assistant contracted the disease, and in his case, it was discovered in an early stage and he is making good progress towards recovery.

The incidence of tuberculosis as shown by X-ray is considerably lower among the younger members of the staff than in corresponding age groups in the general population. In a recent X-ray survey of a large Chinese school in Singapore catering for both boys and girls of approximately similar social standing in the age group 16–21 twenty boys showed evidence of active disease out of a total of 298, and three girls out of a total of thirty-two so far examined.

In Tan Tock Seng Hospital there were no cases discovered out of thirty-two nurses between the ages of 18–26, and one case out of thirty-three hospital assistants between the ages of 19–28.

The rehabilitation of the hospital was started on in earnest during 1949 but a tremendous amount remains to be done to reach the level of the 800 bedded sanatorium hospital envisaged under the Medical Plan.

Further note on the Children's Orthopædic Hospital

Apart from the seventy-seven children who were treated as in-patients at this hospital during the year (twenty-three spinal and fifty-four bone and joint tuberculosis), twenty-nine suffering from the after effects of Acute Poliomyelitis were also cared for. A feature of the institution is now the spinal diversional therapy practised at this institution. Trained physiotherapists also visit the patients, and a general nursery school was continued throughout the year.

CHAPTER NINETEEN

VENEREAL DISEASE

THE Social Hygiene Division in Singapore was organised on its present lines in October 1945 soon after the liberation of Malaya. A private Japanese hospital located at 250 Middle Road was taken over and with some reconditioning and improvisation started to function as an institution for venereal disease treatment with both in and out-patient departments. The pre-war Seamen's Clinic in the dock area (Tanjong Pagar Clinic) was also rehabilitated and has been in use since February 1946. The activities of the division during the year under review continued to be confined chiefly to these two institutions which in Singapore are devoted exclusively to the diagnosis and treatment of venereal disease.

Middle Road Hospital has been greatly improved during the last four years, although the accommodation, particularly for the male section, continues to be insufficient for the number of patients seeking treatment. The building is equipped with thirty-five female and fifteen male beds, and there are eight cots for children. In addition accommodation has been made available for ten young girls in a separate ward. These girls are referred by either the Social Welfare Department or the Anti-Vice Squads of the C.I.D. for diagnosis and treatment, and for detention if necessary.

The provision of a separate hospital of this nature for these conditions has been criticised, but the fact is that experience has shown that the scheme which has been developed is eminently suitable for the purpose. During 1949 the average monthly attendance of new cases in its out-patient clinics has been just under the 1,000 mark as compared with 867 in 1948. Similarly the total attendances have increased from some 4,600 in 1948 to 6,000 per month in 1949.

IN-PATIENTS

Whilst the hospital serves as a rapid treatment centre for a certain proportion of the early cases, it deals with difficult cases particularly those with complications. 2,168 of these were dealt with during the year. The number of adult admissions was slightly less than the 1948 figure (2,168 as compared with 2,478) as an effort was made to prevent overcrowding. More use of the out-patient department was possible by advanced modern techniques available but the need for more in-patient facilities still remains. 276 cases of congenital syphilis—practically all babies—and 129 of gonorrhœal ophthalmia were admitted during the period under review.

Patients suffering from such conditions as tabes dorsalis, G.P.I., meningovascular syphilis early or late, interstitial keratitis or cardio-vascular syphilis generally seek treatment in the other medical institutions of the Colony such as the Mental Hospital. These totalled

658 (129 at the Mental Hospital, 136 at the General Hospital and 393 with 1,236 repetitions at other hospitals.)

Dock Area Clinic

This clinic was designed primarily for seamen, but it now serves the needs of the male population in that area of the town in which it is situated as well. Total of new cases and attendances during the year at the centre was as follows:—

New Cases		*Attendances*	
1948	*1949*	*1948*	*1949*
2,582	2,966	17,577	24,463

Total monthly attendances in both V.D. clinics rose from some 6,000 in 1948 (5,000 males and 1,000 females) to some 8,000 in 1949 (6,000 males and 2,000 females). 862 of the male cases were seamen.

Non-V.D. Cases

Over twenty-seven per cent of the new cases seen during the year turned out to be non-venereal in nature. This is an increase over previous years and is an interesting development in that it tends to show the growing consciousness in regard to venereal disease in the public mind especially of the women of the poorer classes. There is no doubt that the public in Singapore is becoming slowly but steadily more V.D. minded and this in itself is likely to lead to a steady increase in cases, apart from the actual amount of the disease which comes to our notice. It is interesting to note that in Western countries non-venereal cases attending V.D. centres approaches the forty per cent mark.

New Cases	1939	1947	1949
Females	851	2,540	3,721
Males	9,586	8,065	10,757

A study of the figures and tables included in this short report should make it abundantly clear that the steady advance in the number of cases coming up for treatment reported previously has continued into 1949. In fact this year can be stated to be an all time record in this respect. This is an excellent effort in view of the limited accommodation and small staff available.

Under the Medical Plan the present organisation will be more than doubled, but it is impossible to accommodate more in-patients at present. The two full-time and two part-time doctors available have their hands more than full in dealing with the present numbers. Under the Medical Plan the out-patient facilities will be considerably improved and increased, while in-patient accommodation will rise from the present 60 beds to at least 120. It must be stressed again that comparative increases do not necessarily mean an increase in the incidence of the disease in Singapore, but to new methods of approach and treatment. These are bringing more and more patients

forward. The time has come in fact when present arrangements are proving quite inadequate to meet the public demand in this direction. In the meantime in consequence more attention is being paid to evening clinics and a travelling dispensary scheme is being arranged for the rural districts on an experimental basis.

Within the limits of staff and accommodation available the V.D. campaign in Singapore can be said to have met with a definite success. Far more is being done today to combat the disease than ever before. A tremendous amount remains to be done of course. It is still the contention that progress should be on the present lines—a scheme founded on persuasion and confidence between the patient and the doctor. Compulsory notification and segregation have been advocated again and again, but these ideas do not meet with favour by those who have to deal with the problem locally. Measures of force would mean the immediate destruction of the present scheme, and progress and loss of confidence in the classes most concerned. Accommodation would have to be of a definite prison nature and would without doubt necessitate a very large staff. So a steady advance on present lines is advocated as far as the *medical* side of the problem is concerned.

Routine Work in the Clinics

This included a good deal of laboratory work in addition to the usual injection treatment: 15,339 blood specimens for Kahn tests were taken of which 3,240 proved to be positive: cerebro-spinal fluid for Kahn tests gave 11 positives out of 78 taken. Dark Ground specimens examined totalled 4,810 of which 423 showed spirochæts and 123 trichomonas. 9,046 urethral, cervical, eye and prostatic smears were taken of which 3,434 were positive. 169,563 injections were given during the year, 6,319 megaunits of aqueous penicillin being used, and 2,202 megaunits of procain penicillin. Arsenical injections totalled 24,045 and bismuth 21,670.

Treatment

Penicillin of course remains the treatment of choice both for syphilis and gonorrhœa. The World Health Organisation is trying to standardise the treatment of venereal disease in an infectious state, and in the meantime both British and American experience is adding to our knowledge. So ever changing schedules of treatment are necessary. That followed in the clinics in Singapore to date is what has been recommended by the World Health Organisation modified in the light of this practice. In primary sero-negative syphilis for example, in addition to 5 megaunits of penicillin, 5 mepharsen injections of 0.04 grams daily, and at least 10 weekly bismuth injections (0.2 grams metallic) are given. Due to the prolonged "depot" action of bismuth this method serves to protect persons against re-infection for a considerable period after the last injection, a very necessary requisite in many of Singapore cases.

Lymphogranuloma, soft sore, and gonorrhœa have not presented any difficulty in treatment. In congenital syphilis the penicillin dose

recommended by the World Health Organisation (100,000 unit per pound of body weight) has been found insufficient for local babies. At least two or three times the recommended dose is ultimately given followed by bismuth and acetylarsan.

The course of penicillin now takes 10–14 days instead of the previous 7½ days as in many children and adults the initial few doses given have to be smaller than the standard dose because of the frequency of Herxheimer reaction. This reaction means that a person gets a general and focal increase of symptoms, *i.e.* fever and marked predominance of primary, secondary or tertiary lesions.

A noteworthy feature has been the non report of any case of Granuloma Venereum (Inguinale) throughout the year.

Contact Investigation

A senior supervisor and a staff of six assistants have been responsible for work in this connection. The chief qualification of these ladies is their knowledge of the various Chinese dialects in addition to a knowledge of Malay and English. For the purpose of administration Singapore has been divided into two Municipal and four Rural areas. During the year 196 propaganda visits to new homes were made and 2,130 routine visits to defaulting patients. Case follow up is one of the chief functions of this service at the moment especially in regard to infectious women who refuse admission. The service is confined to the female section of the population only. Defaulting men are contacted through their wives wherever possible.

Cases usually come from three sources in Singapore. They are either referred from other Government hospitals and clinics, by private practitioners, or by the Anti-Vice Squads of the C.I.D. and Social Welfare Department or voluntarily. Those who come voluntarily make the majority and form at least eighty-five per cent of the total.

Incidence of V.D. in Singapore

It is impossible to indicate the true incidence of venereal disease in Singapore at the present time. In pre-penicillin days it was estimated that clinic figures in England represented seventy-five per cent of cases in that country, but Singapore must be looked at from the point of view of a large port, and it is in port areas where the incidence is always higher than elsewhere. It is questionable whether the disease is any more prevalent in Singapore than in any other large port today.

Teaching

Throughout the year medical students from the King Edward VII College of Medicine, now a part of the University of Malaya, attended the Middle Road Hospital for clinical instruction as in previous years. Each student attends for approximately one month. There are normally up to six students present in any one month. Encouragement is given for each individual to make himself familiar with the techniques of examination, taking smears, specimens for

dark field examination, blood for serological tests and so on. The large numbers of patients available provide a wide range of clinical material.

Advisory Committee

A V.D. Advisory Committee was formed during the year consisting of representatives from the three Services, from the Police and Social Welfare Departments and from the Medical Department under the chairmanship of the Director of Medical Services, Singapore. This committee met on three occasions and fully reviewed the whole of this difficult subject both as it affects the civil and the military sections of the public. Particular attention was given to the question of the control of prostitution, and various avenues of study were reviewed in this direction. Dr. L. E. C. Davies, a private practitioner with a very considerable experience in the civil and military field in the Colony kindly attended as a member of the committee in an advisory capacity.

During the early part of the year Dr. T. Lyall was the Senior Medical Officer in charge of the Division. He was succeeded by Dr. C. Marcus and latterly by Dr. L. M. Ram.

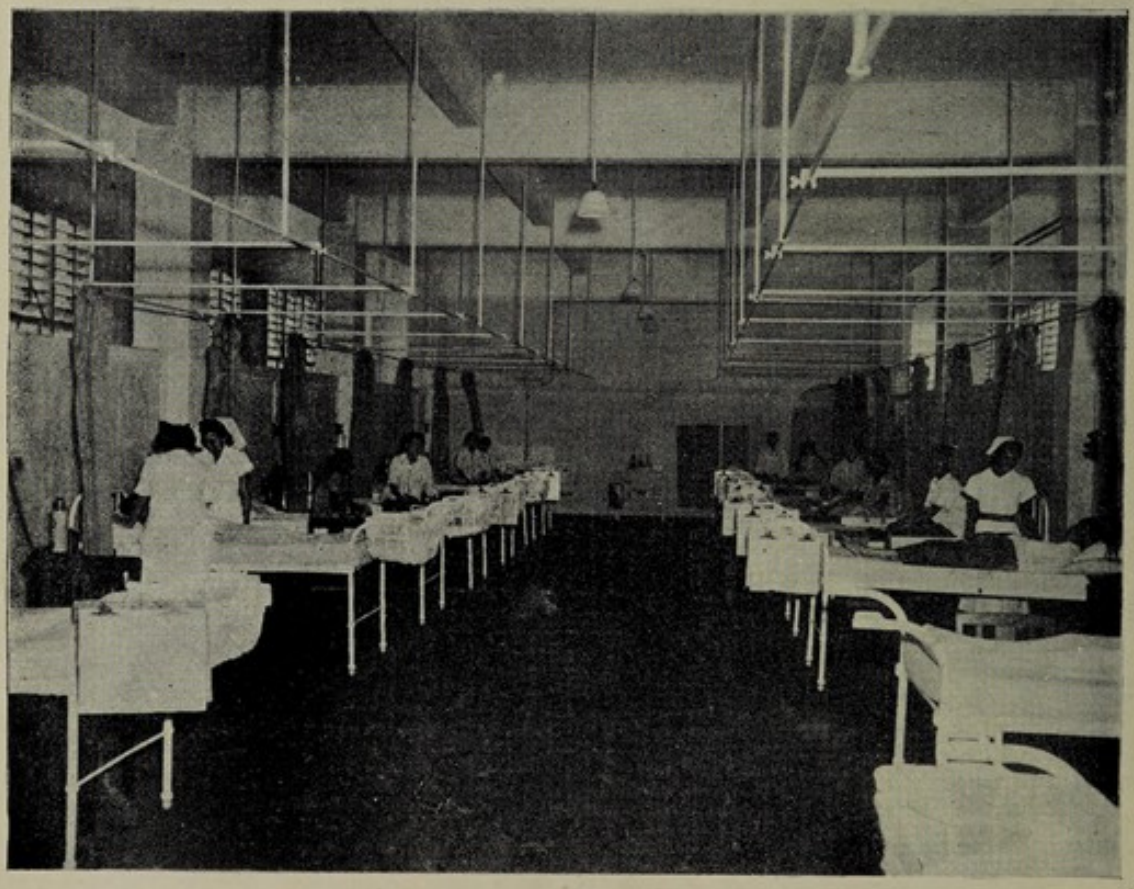
SOCIAL HYGIENE BRANCH

TABLE SHOWING TYPE OF V.D. MALE AND FEMALE PATIENTS TREATED AT THE MIDDLE ROAD HOSPITAL AND TANJONG PAGAR CLINIC DURING THE YEAR 1949

DISEASES	IN-PATIENTS			OUT-PATIENTS				OUT-PATIENTS				OUT-PATIENTS			
	NEW CASES			NEW CASES				REPETITIONS				TOTAL ATTENDANCES			
	Males	Females	Total	M. R.H. Males	M.R.H. Females	T.P.C. Males	Total	M.R.H. Males	M.R.H. Females	T.P.C. Males	Total	M.R.H. Males	M.R.H. Females	T.P.C. Males	Total
SYPHILIS															
Primary	21	72	93	270	79	299	648	1,426	806	2,154	4,386	1,696	885	2,453	5,034
Secondary	204	250	454	2,229	255	457	2,941	19,215	1,968	5,113	26,296	21,444	2,223	5,570	29,237
Tertiary	32	373	405	69	479	16	564	706	5,740	211	6,657	775	6,219	227	7,221
Hereditary	3	273	276	4	348	1	353	75	1,991	8	2,074	79	2,339	9	2,427
Period not indicated ..	..	74	74	..	69	..	69	..	1,545	..	1,545	..	1,614	..	1,614
OTHER VENEREAL DISEASES															
Soft Chancre	28	5	33	1,284	34	478	1,796	6,195	94	5,671	11,960	7,479	128	6,149	13,756
Gonorrhoea	10	217	227	2,097	370	740	3,207	9,490	1,548	5,561	16,599	11,587	1,918	6,301	19,806
Gon. Opthalmia	..	129	129	3	130	..	133	30	247	..	277	33	377	..	410
Other Gono. Complications ..	46	9	55	140	24	74	238	838	158	404	1,400	978	182	478	1,638
Lymphogranuloma ..	2	6	8	27	14	102	143	180	38	758	976	207	52	860	1,119
Mixed Infections	6	70	76	208	83	77	368	672	1,093	604	2,369	880	1,176	681	2,737
Non-Venereal Diseases ..	6	332	338	1,460	1,836	722	4,018	2,746	3,482	1,013	7,241	4,206	5,318	1,735	11,259
Total ..	358	1,810	2,168	7,791	3,721	2,966	14,478	41,573	18,710	21,497	81,780	49,364	22,431	24,463	96,258

Kandang Kerbau Hospital

Kandang Kerbau Hospital—Out-patients



Kandang Kerbau Hospital—Second Class Maternity Ward

CHAPTER TWENTY

MATERNITY AND GYNÆCOLOGY

KANDANG KERBAU HOSPITAL

KANDANG KERBAU Hospital continued to be the centre for all Government maternity and gynæcology work in Singapore and provided 240 beds for the purpose, some 200 of these being reserved for maternity purposes. There has been a further marked increase in the number of patients dealt with during the year and again an all time record has been reached. 1948 was thought to have indicated the very limit in the work of this hospital. So this further increase is an outstanding tribute to the staff of a very overcrowded and overworked institution. It is only by limiting the in-patient period to some three days for most of the cases in the maternity section that the increasing volume of admissions has been met so far. Approximately the same institution and staff now deals with twice the pre-war admissions, and many more out-patients.

A study of the figures included in this section of the Report makes it abundantly clear that the doubling of the accommodation and staff envisaged under the ten year Medical Plan of the Colony in this respect has been a very urgent problem indeed. Fortunately post-war rehabilitation of the existing buildings will be completed in the near future. There must always be a very grave risk of infection when such an institution as this is so overcrowded and so overworked however.

Professor English who was for many years the Professor of Midwifery and Gynæcology in Singapore has recorded the following hospital deliveries over the years until his departure in 1947:—

1915	.. .. ..	174
1916	.. .. ..	195
1917	.. .. ..	206
1918	.. .. ..	221
1919	.. .. ..	232
1920	.. .. ..	342
1921	.. .. ..	496
1922	.. .. ..	466
1923	.. .. ..	797
1924	.. .. ..	688 (moved to a new site)
1925	.. .. ..	588
1926	.. .. ..	753
1927	.. .. ..	1,019
1928	.. .. ..	1,304
1929	.. .. ..	1,606
1930	.. .. ..	1,882
1931	.. .. ..	1,955
1932	.. .. ..	2,146
1933	.. .. ..	2,306
1934	.. .. ..	2,575
1935	.. .. ..	3,548
1936	.. .. ..	4,707
1937	.. .. ..	5,214
1938	.. .. ..	5,551
1939	.. .. ..	6,034

1940	6,184	
1941	6,425	(only 300 in December)
1942	1,913	(Japanese Occupation)
1943	2,037	
1944	1,657	
1945	1,584	
1946	5,101	
1947	7,802	

Since then the statistics read as follows:—

1948	10,272
1949	10,928

Towards the end of the year over 1,000 deliveries a month began to be entered for the first time. No wonder Professor English has stated that "the fear of hospitals seems to have largely disappeared and the advantages appreciated, especially antenatal supervision, as shown by the enormous increases in attendances." For years there was no antenatal supervision of any kind. Antenatal and gynæcological attendances in this respect have increased from 24,683 in 1947 to 37,010 in 1949. (New cases 7,033 in 1947 to 12,665 in 1949.) Postnatal work only started towards the latter part of 1947: 6,931 new cases attended this clinic in 1949. In addition to these an ordinary Women's and Children's Out-patient Department operates where 31,908 attendances in 1947 increased to 49,140 during the year under review (16,334 new cases). Abnormal deliveries dealt with have also decreased considerably over the post-war period—a very satisfactory feature. 1,293 came into the hospital in 1949 as compared with 1,541 in 1947.

Cases numbering 2,101 were admitted to the gynæcological wards as compared with 1,704 in 1947 and 1,846 in 1948. 1,902 were operated on.

There has been an interesting increase in the number of Cæsarean operations over the post-war period 121 in 1949 with only 20 to 30 in 1947 and previous years, about half for placenta prævia. 106 cases were delivered with forceps 357 breech presentations and 22 transverse presentations were seen. 745 premature births were recorded of whom 615 survived to satisfactory growth. 296 still births occurred and fifty-four fœtal abnormalities were recorded. One of the difficulties is still the arrival of women in childbirth and 137 children were delivered on the way to hospital. 12,678 admissions were made to the maternity division in all during the year.

Decrease in Maternal Mortality Rates

The mortality in the midwifery section was 0.51 per cent of total deliveries compared with 0.62 in 1948, 0.92 in 1947 and 1.6 per cent before the war. This reduction in the mortality rate is a matter for real satisfaction when it is noted that all abnormal and difficult cases find their way to this hospital from a population of one million and that many women only arrive when labour is far advanced or even after labour.

Percentage of Controlled Births

Kandang Kerbau Hospital is now a free institution except for a small paying block where patients can be dealt with by their own practitioners. This system is a necessity in Singapore where private maternity homes cover only a negligible number of beds. With the facilities provided by this hospital, by the rural Government maternity service and by the Municipal maternity service 54.2 per cent of all births in the Colony are now controlled. The hospital deals with 21.5 per cent of the total births. The rural service covers 60.1 per cent of the births in the rural districts.

The following conclusions can be drawn from present experience:—

(*a*) the disappearance of any fear of hospitalisation by the women of the Colony and a steadily increasing demand for both inpatient and outpatient treatment. In 1919 only 232 patients sought maternity care: 1,606 in 1929: 6,034 in 1939 and 12,678 in 1949. An institution designed for 240 in-patients on a ten day stay and a small antenatal division only, and staff quarters accordingly, can only reach the present record figures with a serious danger of exhaustion and loss of efficiency. The present aim is still to admit all who seek admission on the assumption that some aid is better than none;

(*b*) the rapidly increasing desire for ante and postnatal supervision—a most satisfactory feature which must be met by increased facilities at the earliest possible moment. It is no good having health propaganda without the means to meet it. This is leading to—

(i) The continued reduction in the maternal mortality figure.

(ii) The increase in the number of abnormal cases seeking early admission. The increase in the number requiring Cæsarean operation.

(iii) The disappearance of destructive operation on the child. (Decapitation, etc.)

(iv) The low forceps delivery figure.

(v) The reduction in eclampsia. (0.6 per cent in 1947 0.5 per cent in 1949).

(vi) The reduction in transverse presentations (0.3 per cent in 1947 0.2 per cent in 1949).

Training

A good deal of attention has been given to the question of the training of midwives during the year both by the Central Midwives Board of the Colony and the Medical Directorate. It is proposed to increase the present course of one year to two for the non-nurse pupil, and to raise the quality and standing of the midwife in practice

accordingly. Improvements in pay conditions are also under consideration in this respect. This hospital is the main training centre and will continue to be so under the new scheme. Thirty-seven pupil midwives completed the present course during the year. Twenty-one nurses also qualified in midwifery. Pupil midwives now have to spend a short time working in the Rural Districts attached to the Rural Health Service Centres as a part of their training.

Twenty-five medical students also completed a three months course of practical midwifery during the year, attending on an average thirty-five cases each.

Unfortunately housing remains one of the main difficulties in the training scheme and one which will not be overcome until the Medical Plan is sufficiently advanced in this respect. Students should be at hand and readily available when on such courses.

The Medical Officer in Charge of the institution is Dr. W. A. Balhatchet, O.B.E., L.M.S. The Specialist and Acting Professor is Dr. B. H. Sheares, L.M.S., M.R.C.O.G.

CHAPTER TWENTY-ONE

LEPROSY

ADMINISTRATION

THE permanent staff at the Leper Settlement, Singapore, consists of one visiting medical officer (Dr. R. S. Corbitt) and one resident hospital assistant (Mr. V. J. Stephen). The Medical Officer in charge of Tan Tock Seng Hospital acts as the administrative head. In addition the Matron of this hospital visits once a week in an advisory capacity while two nursing nuns from the Order of the Franciscan Missionaire worked in a full-time capacity from October onwards. These arrangements have improved the nursing standard of the settlement considerably—an important fact in view of the extensive use of the latest treatments now practised. The six female and two male nurses employed from amongst the inmates were increased to ten and thirteen respectively and these responded splendidly to the further training, supervision and encouragement now possible.

The steady progress previously reported in regard to the settlement and its amenities, in the physical appearance of the patients and in their morale was maintained throughout 1949. On the liberation in 1945 there remained a mere miserable collection of neglected and diseased individuals in a dirty and shunned enclosure. To-day the settlement receives the same care as any other medical institution in the Colony. The difficulty up to the present has been the continued necessity for the use of outmoded structures built to accommodate some 240 housing some 450 persons. By the end of the year a start had been made in this part of the Medical Plan however. Extension is proposed on open settlement lines in separate hutments, a form of structure which has proved so successful elsewhere. Each of these quarters will accommodate two to three persons and is supplied with its own kitchen. A more communal form of bathroom and latrine is provided to groups. Thus much added and necessary privacy and comfort will be achieved.

Statistics	*Male*	*Female*	*Total*
Patients on 1.1.49	226	156	382
Admission from 1.1.49 to 31.12.49 ..	179	52	231
Absconded from 1.1.49 to 31.12.49 ..	130	10	140
Deaths from 1.1.49 to 31.12.49 ..	9	3	12
Discharged from 1.1.49 to 31.12.49 ..	18	10	28
Transferred to Sungei Buloh, Pulau Jerejak and other hospitals in the Federation	57	25	82

Total on 31.12.49

——	Adults	Children	Total
Male	256	35	291
Female	135	25	160
Total ..	391	60	451

It is hoped that the not too distant future will show an increased discharge rate as the result of modern treatment. However there has been an average entry of some seventeen per month. While this flow of new cases may be in the nature of a temporary abnormality there is no question that the disease seems to be more prevalent to-day than before the war. Presumably the neglect of the Japanese Occupation years can be held responsible in part at any rate for this phenomenon. A large proportion of present and future inmates of the Singapore institution have little hope of ever leading a non-institutional life. Many are not seen until the disease is so far advanced that a grave deformity must result, and the later the treatment the more difficult the cure. With improved prospects of cure brought about by the use of the new drugs and the consequent abolition of the stigma associated with leprosy, it is hoped that earlier treatment will be sought and so lead eventually to considerably increased out-patient care as compared with the in-patient. Discharge, however, is proving very difficult to-day. Those who have left often demand re-admission: they cannot face the outside world again. This is a problem which will have to be faced on an increasing scale in a community which fears this disease and treats its sufferers as outcasts whatever is said to the contrary.

All these factors have had to be considered in drawing up a long range policy. The accepted Plan is thought to be a suitable compromise to a difficult and perplexing problem.

A large part of the land surrounding the settlement is farmed by the inmates. This gives many of them the occupation which is so essential in such a community. Pigs and poultry are reared and a variety of vegetables and flowers are grown. Individual farmers sell their produce to inmate contractors who in turn deal with Government at contract rates for feeding the inmates of the settlement itself and the Mental Hospital. In addition 135 other lepers are employed in the settlement in paid posts such as tailors, cooks, carpenters, bakers and sweepers.

The gates of the settlement are now left permanently open and every effort is made to dispel the feeling of internment or imprisonment. All the glass and barbed wire which was placed on top of the surrounding walls has been removed and the walls painted in attractive colour. Creepers are being planted inside the walls to increase the garden effect.

Diet

The diet of the inmates of the settlement has received very considerable attention during the year, and was again improved this year with the addition of better class fish, butter and fruit. The total cost now approximates one dollar per day per individual. Farm workers added considerably to this fare from their own produce. The diet of this institution has received added attention because of the very important part it plays in treatment in a disease with a very prolonged course. The drugs now in use also demand a reasonably healthy physique.

Specimen Diet Per Patient Per Diem

	Ounces	*Cents*
Pork	4	21¼
Second Class Fish	4	15
Vegetables	6	7¼
Rice	10	11¼
Sugar	1	3
Bread	2	3
Butter	½	16
Fruits	4	13
Coffee	½	3
Salt	½	¼
Ingredients	—	6¾

The Singapore Cold Storage Company very generously supplies every patient with free ice-cream every month, a gesture which is very greatly appreciated.

The manner of food preparation in the settlement leaves much to be desired because the present kitchens are inadequate and antiquated. There are no separate rooms for storage or preparation or for dining purposes. These are matters which are receiving attention under the extension plan which is being started. All that can be done with the present feeding arrangements is to see that these are as clean as possible. The cooks themselves are inmates and in consequence have little real knowledge of cooking. This is a point which it is hoped to deal with as the dietetic side of the medical organisation is built up.

Transport

A van for the Leper Settlement was added to the hospital transport system during the year. This now makes the place relatively independent of other hospitals, an important point owing to the isolated position of the settlement.

Education

There are now thirty boys and eighteen girls between the ages of five and seventeen. An educational system has been organised whereby two inmate lady teachers up to Standard VIII and one with a Cambridge School Certificate are available. Elementary English, reading and writing, and handicrafts have been dealt with by these under the supervision of Miss Atherton of the Education Department and Miss Buxton. In October the Education Department also released

Mr. Champion for part-time work and he visits three times a week for two-hour sessions for teaching up to Standard IV. A more satisfactory educational system for the inmates of the settlement is under consideration. With the increased prospects of cure this is very necessary.

A class in occupational therapy has been started to assist inmates in basket work. This is under the control of Miss Marie who visits the settlement for two hours each week. Patients are showing great interest in this development and it is hoped to include needlework, embroidery and other classes in the near future.

Eighteen boy apprentices are now doing carpentry, brick laying, plumbing, electrical repairs and tailoring under inmates who have knowledge of these subjects. What is required here is an increase in the number of instructors.

Thirty-six boys are members of a scout troop. Mr. Stephen, the hospital assistant, is the Scout Master. He is helped by two Assistant Scout Masters from the Royal Air Force Station at Seletar. Meetings are held on every Monday afternoon and visitors from other troops come to lecture on different subjects and introduce new games and songs. A hiking party is arranged once a month followed by a camp fire party. Occasional sea trips are made. A guide company also flourishes under Miss Eastaugh and Miss Winton from the General Hospital. The workers who are undertaking this task under the supervision of Canon Adams are to be congratulated on a very fine piece of work.

Leper Welfare Committee

A Leper Welfare Committee under the vigorous guidance of Canon Adams continues to do the good work which has been a feature of this organisation for quite a time now. The Christmas Party which is one of the features of the work of the Committee was held towards the end of December as usual. On this occasion every inmate received a useful present and many visitors attended. The Committee arranges cinema shows at frequent intervals. Swings and slides have been provided for the school children in the grounds of the school. Homes are found on a non-legal adoption basis for children born in the settlement. The Leper Welfare Committee is a voluntary organisation which has operated since September 1947 and no words are adequate to convey the thanks due to its members in performing a task of outstanding merit and value to a peculiar and unfortunate section of the community and so to the general public.

Treatment

Treatment is intimately bound up with the question of staff and accommodation—or more correctly the lack of it. The chief obstacle to rapid progress here continues to be insufficient doctors and nurses and insufficient wards. Treatment with modern drugs requires proper facilities if these are to be used without danger and research is to be properly followed out.

The advent of the nursing nuns in the second half of the year and the stationing of a medical officer in the settlement on a part-time basis enabled this work to be carried on in a more satisfactory way than ever before. In consequence a considerable advance in treatment is to be indicated. Up to then nearly all patients received Sulphetrone tablets by mouth only. As Sulphone in oil has been found now to be not only more generally effective but considerably cheaper, it was substituted for all cases other than those which were responding exceptionally well to Sulphetrone. Supplies of Sulphone in oil are now made up locally. At the end of the year 278 cases were receiving this treatment. Most lepromatous and mixed types of leprosy appear to tolerate Sulphone treatment very well and ulcerating lesions appear to heal rapidly. Prominent nodules have subsided and thickened skin has become more normal in appearance. In fact in some cases there are definite signs of healing within four months of starting treatment. As with Sulphetrone, neural tuberculoid lesions have shown the most striking improvement. Reactions to Sulphone are not so severe or so frequent as to other treatments, and anæmia is not so nearly as common a sequel as with Sulphetrone.

Sulphetrone has produced good results in purely neural cases, infective or non-infective, and in the early lepromatous case a prerequisite to this form of treatment would appear to be a good general condition with no tendency to anæmia or chronic intestinal disorder—conditions very difficult to obtain in many cases especially in the advanced lepromatous or mixed forms of the disease. Pure neural cases especially the tuberculoid variety have shown marked improvement under this treatment, most striking in those cases not complicated with anæmia or general debility due to other causes. Sub-lepromatous or mixed forms of leprosy do not seem to respond well to the drug. Temporary improvement has been followed in many cases by lepromatous reactions and breaking down of nodules necessitating discontinuance of the drug. Others who have less severe reactions continue the treatment with reduced dosage. Others again developed a resistant anæmia in spite of iron and vitamins being given along with the treatment. Children tolerate the drug much better than adults and on the whole have shown far better results during similar periods of treatment.

It would appear therefore that Sulphetrone produces good results in certain types of leprosy, and those patients who tolerate the drug well or show signs of improvement are being kept on this form of treatment.

On the whole, however, Sulphone therapy has several marked advantages over the oral administration of Sulphetrone. These are:—

(*a*) easier and more effective control as Sulphone is given by injection;

(*b*) less danger of absorption from the alimentary tract in cases of intestinal parasites or chronic bowel disorder.

Sulphetrone tends to cause a deterioration in the general condition in spite of anti-anæmic treatment which is not the case with Sulphone;

(*c*) the morale factor. In the East injections are morale-boosters and develop a psychological lift to patients;

(*d*) Sulphone treatment appears to be less toxic. Cases on it do not develop the severe anæmia which is apparent with Sulphetrone treatment;

(*e*) beneficial effects appear to be noticeable earlier with Sulphone;

(*f*) Sulphone in oil is much cheaper than Sulphetrone by the mouth.

Eleven cases were put on Streptomycin towards the end of the year, but it is too early yet to make any definite statement in this respect. Some slight improvement appears to have occurred.

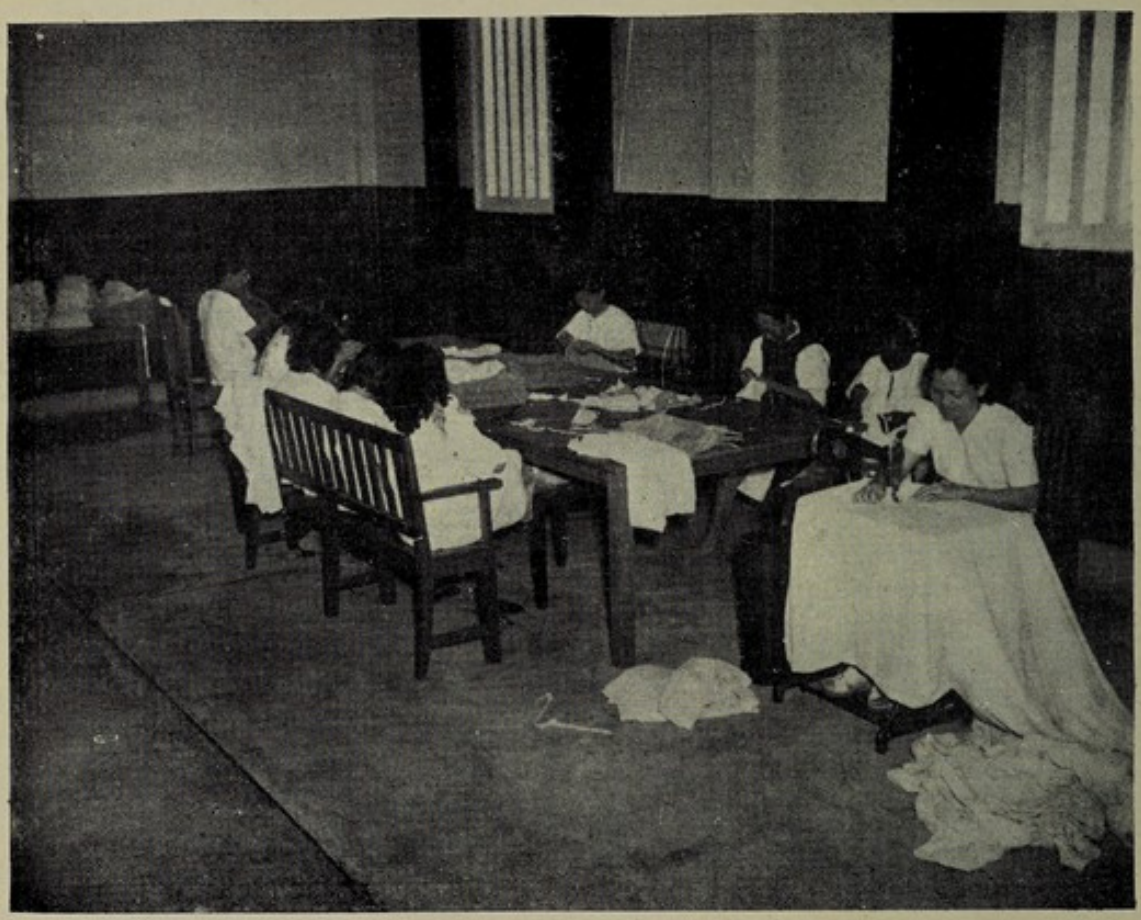
Cases unable to tolerate Sulphetrone or Sulphone were continued with Hydnocarpus Oil.

The time has come when the services of a physiotherapist will be invaluable in preventing gross deformity and for dealing with cases of muscle wasting. A whole-time laboratory assistant is also necessary to carry out the frequent checks in microscopical examination of smears and other procedures associated with the new treatments. These posts are being kept in view for entry in 1951 estimates.

So far it has not been possible to discharge an appreciable number of cases as cured. This result has been reported from other leper settlements, however, and is expected in Singapore in the not too distant future. It is to be noted that there has been no shortage of drugs and no patient has failed to receive the treatment prescribed on this account.

Action was taken during the year to buy dressing trolleys, instruments and other new equipment. In the past there has been a definite tendency to pass on old and dilapidated equipment to the Leper Settlement, but this solution can no longer be tolerated in view of the modern procedures which must take place.

Leper Settlement—Christmas Party



Mental Hospital—Sewing Patients Clothing

CHAPTER TWENTY-TWO

OTHER SPECIAL DEPARTMENTS

INFECTIOUS DISEASE

THE total number of infectious disease cases admitted to Middleton Hospital during the year amounted to 1,678. This figure includes 313 sent in to ascertain if they were typhoid carriers, 89 for observation and 40 contacts.

There were no cases of *plague*, *cholera* or *small-pox*.

As described earlier in this report cases of *anterior poliomyelitis* continued to occur during the year and sixty-eight cases were admitted to hospital, of which two died. The mechanical respirator was used for three of the cases. The youngest patient was aged two-and-a-half months and the oldest fifty-five years.

There were 62 cases of *typhoid* of which 7 died; 8 cases of *tropical typhus*, 5 being *scrub typhus* and 3 of the urban type; 373 of *chicken-pox;* 4 of *cerebro-spinal meningitis;* 106 of *amœbic dysentery*, most being chronic relapse cases; 11 of *bacillary dysentery* and 193 cases of *measles*.

There was an increase in the number of cases of *diphtheria* admitted; 256 as compared with 216 in 1948. Of these 67 required immediate tracheotomy. 42 of the total cases died; (a case mortality of 16.5 per cent) of these 33 were under 5 years of age and 17 died within 24 hours of admission. Of the 256 cases 232 were from the Chinese community. None of the cases admitted had had any preventive inoculation against the disease. The types of cases were classified as follows:—

	Admitted	*Died*
Laryngeal and tracheal	116	31
Nasopharyngeal	35	11
Faucial	66	—
Nasal	2	—
Penial	1	—
Contact carriers	36	—
Total ..	256	42

Classifying the cases by age-group shows that children under five years of age were the most affected—

Age-group	*Admitted*	*Died*
Under 1 year	23	6
Between 1 and 2 years	67	12
„ 2 and 5 years	87	15
„ 5 and 10 years	47	8
„ 10 and 15 years	12	—
„ 15 and 20 years	5	1
Above 20 years	15	—
Total ..	256	42

Preventive inoculation against diphtheria is carried out in both municipal and rural areas.

Towards the end of the year there was an increase in the number of cases of *whooping cough*, but only eight serious cases were admitted to Middleton Hospital of which two died. The question of immunisation against this disease was under careful consideration for some time, but in view of the uncertainty about the efficacy of whooping cough vaccine it was not considered advisable to conduct a publicity campaign for the inoculation of all children. Facilities for free inoculation were available in both the municipal and rural areas by the end of the year.

Mental Disease

Several new ventures were undertaken during the year notably the introduction of insulin shock therapy, the establishment of a farm garden and the use of streptomycin.

The number of in-patients increased during the year by 150 to 1,008 in spite of a fairly high discharge rate, and it would appear that a steady annual increase is to be expected for several years to come. The proportion of persons in the population requiring mental hospital treatment is much the same as in the United Kingdom and on this basis it appears probable that the number of insane for whom provision may need to be made will be well in the region of 2,000. That the increase in the admissions is not much greater is due to the high discharge rate which has been maintained by the intensive use of shock therapy in suitable cases and continued attention to the general health of the patients, adequate diet, provision of supplementary foods and vitamins and eradication of focal sepsis.

The main diagnostic categories were toxic confusional states, schizophrenia, manic depressive states and general paralysis of the insane. At the end of the year inmates included fifty-five criminal lunatics and eighteen cases accused of minor crime.

Treatments

Two wards have been opened for insulin shock therapy and the work done in six months is shown below—

Number of treatments	2,900
Number of patients treated	60
Discharged fully recovered	10
Deaths	2
Treatment stopped because of intercurrent illness	11
Institutional recoveries	4
Total showing improvement	29.16 per cent

"Institutional" recoveries are those who are able to care for their own hygiene and do simple jobs.

It is to be noted that nearly all these schizophrenic patients were chronic cases of more than two years duration of illness. Insulin shock therapy is most effective during the first eighteen months of illness.

Convulsant Therapy, electrical and chemical, continued to be used.

Electric Convulsant Therapy

Number of treatments	.. .. ..	5,220
Number of patients treated	.. .. ..	420
Discharged fully recovered	.. .. ..	130
Percentage Recoveries	.. .. ..	30.9 per cent

Occupational Therapy

Indoor and outdoor sports equipment and games were introduced and have done much to improve patients' condition. The employable women work in the sewing room, in the female laundry or in cleaning duties. Men work in the grounds, garden, kitchens and elsewhere.

Dental Clinic

A dental clinic continued to operate throughout the year but work is still confined to extractions and conservation. The number of extractions done in the past year was 2,019.

Laboratory

Work is still handicapped by lack of equipment and by the lack of more trained laboratory assistance. Several new pieces of apparatus have arrived but a microtome is still awaited.

Every new admission has a Kahn test carried out on blood and cerebro-spinal fluid which means that over 1,262 tests were carried out during the year. In addition the usual routine cell counts, urinalysis and so on were performed. When fully equipped and staffed this laboratory will be self-sufficient and so relieve the Pathology Department of the General Hospital of a good deal of routine work.

Grounds

A further fifty acres was rehabilitated during the year and new mechanical cutters have been a help in checking lallang.

A new netting wire and barbed wire fence has been built round the perimeter of the hospital reserve. A farm garden has been started and during a period of about 7 months has produced 4,363 pounds of assorted vegetables. This garden will be extended into a large farm given mechanised equipment (tractor, ploughs, hoes, etc.). In time the hospital should be self-sufficient in farm produce with some to spare.

Quarters

Quarters were re-decorated and repaired during the year, but no new buildings were erected. New houses and barracks are urgently required but this is a part of the already approved Medical Plan.

The following table indicates a twenty-five per cent recovery in patients treated during the year.

Sex	No. of patients remaining in hospital on 31–12–48	No. of patients admitted during 1949	No. of Patients discharged during, 1949			No. of patients died in 1949	No. of patients remaining on 31–12–49
			Recovered	Improved	Not Improved		
Male	532	367	218	24	8	44	605
Female	326	264	152	13	3	19	403
Total ..	858	631	370	37	11	63	1,008

The question of nursing our mental sick is still a subject of serious concern to the Department. The system in operation for many years has been a very small trained staff with primary reliance on selected hospital servant attendants. The skill and knowledge of these is very far from what one would desire in this respect and modern standards of administration and treatment demand an adequate and competent qualified staff of nurses, both male and female. While it is impossible to attain this requirement at the moment owing to shortages in this kind of personnel in every direction and in the accommodation required, attention has been given to the possibility of introducing a grade of mental aide—intermediate between the senior hospital servant and the qualified hospital assistant.

Pathology Division

Nature of Work

The work of this department includes:—

(*a*) post-mortem examinations (H.M. Coroner's cases and clinical cases) at the General Hospital, Tan Tock Seng Hospital and Kandang Kerbau Hospital;

(*b*) histological examinations of biopsy and autopsy from the hospitals, clinics, dispensaries, etc.;

(*c*) bacteriological investigations of specimens from the Government hospitals, dispensaries and clinics;

(*d*) serological tests of bloods and cerebro-spinal fluids from the hospitals, clinics, dispensaries, etc.;

(*e*) administrative duties in connection with the Blood Transfusion Service;

(*f*) teaching of pathology to medical and dental students—morbid anatomy, lectures and practical classes;

(*g*) teaching of Forensic Medicine to medical students—Lectures and Practical classes;

(*h*) maintenance of a museum of specimens of pathological and medico-legal interest.

The account of the work done in this laboratory is not representative of Singapore as a whole, because similar examinations are done at the Municipal and Command Laboratories. Further, the hospital laboratories undertake all biochemical and certain clinico-pathological and hæmatological investigations.

The Senior Pathologist continued to act as the Professor of Pathology throughout the year. It is hoped that the University authorities will appoint a Professor of Pathology in the near future and then the Senior Pathologist will be able to give his undivided attention to the administration of his division.

The vacancy for Medical Officer (Jurisprudence) remains unfilled.

Though more apparatus, chemicals, etc. ordered through the Government Medical Stores have been received during the year, many items are still in short supply.

A general increase in the volume of work in the various sections had been recorded during the year. Unless the vacant posts are filled by permanent officers and the University teaching staff is increased it is going to be a great strain on the present staff to carry out efficiently the increasing volume of work, year after year.

Teaching

The teaching of Medical and Dental students in Pathology and Forensic Medicine was continued throughout the year. Owing to the increase in the number of students from twenty in 1946 to seventy-three in 1949, difficulties have arisen in providing suitable accommodation not only for the practical classes, but also for lectures. One temporary solution would be to replace the present chairs in the lecture hall with tables and benches which can be used for both lectures and practical classes.

Post-Mortem Examinations

Post-mortems numbering 1,351 were performed during the year as compared with 1,103 in 1948—an increase of 248 cases for the year. Out of these 763 were Coroner's cases and this forms about 56 per cent of the total number of post-mortems, about the same percentage as in 1948 (58 per cent).

When the various causes of death as found on post-mortem are compared with the 1948 figures the following points are worth noting:—

Death from respiratory diseases increased from 94 to 164.

Poisoning increased from 34 to 71 (especially caustic soda poisoning from 30 to 54).

Malignant tumours from 48 to 76.

Injuries from motor vehicles from 67 to 84.

Deaths from protozoal diseases and helminthiasis decreased from 36 to 10 in 1949.

The number of deaths noted for Malaria was exactly the same as in 1948, *i.e.* 4.

Histology

The total number of histological sections examined during the year was 3,043, an increase of 154 over the 1948 figures. The increase was mainly in the number of biopsy sections (267).

Bacteriology

A total number of 6,352 specimens were examined during the year, an increase of 1,595 specimens over that of 1948. The increase was general and was not in any particular examination. Animal inoculation (guinea-pig) increased from 53 in 1948 to 119 in 1949. Four strains of L. icterohæmorrhagica were isolated from guinea-pig inoculations.

During the year autogenous vaccines were prepared for 195 cases as compared with 86 in 1948. Also 14,000 cc. of cholera vaccine and 3,700 cc. of T.A.B. vaccine were prepared and supplied to the various Government departments through the Central Medical Stores.

Serology

The number of bloods and cerebro-spinal fluids received for the Kahn test was 27,915 as compared with 22,701 in 1948—an increase of 5,214 for the year.

A summary of examinations carried out by the Department will be seen in Appendix XV.

Blood Transfusion Service

The Blood Transfusion Service in Singapore has shown a very substantial expansion in the scope of its activities every year since the liberation and 1949 has proved to be no exception in this respect as a 300 per cent increase in the number of donors is shown over the 1947 figure. Unfortunately, however, the demand for this vital service from the hospitals continues to exceed the supply, a situation which has been aggravated recently by the considerable reduction in the amount of blood plasma available from overseas. Action is being taken to try out synthetic blood plasma: this is a good deal more expensive than the natural product however. The machinery for making local blood plasma is extremely expensive, and such material is very extravagant on the blood bank. In consequence it will not be possible to indulge in an expansion in this direction in Singapore until many more donors are available.

The following is a tabulated statement of the 1949 donors and recipients classified by race:—

Donors	*Total*	*Blood Groups*				*Recipients*
		O	*A*	*B*	*AB*	
Europeans ..	1,179	590	440	117	32	68
Chinese ..	953	424	240	224	65	2,007
Indians ..	263	95	48	104	16	318
Malays ..	337	121	86	102	28	112
Eurasians ..	192	101	46	31	14	36
Others ..	22	2	10	7	3	9
1949 ..	2,946	1,333	870	585	158	2,550
1948 ..	1,622	769	485	304	63	1,315
1947 ..	996	538	263	167	28	725

(287 only in 1946).

It will be noted that while only one third of the donors were Chinese, nearly eighty per cent of the recipients were of this race. Obviously most of the blood must be used for the Chinese section of the population as it forms the vast majority in Singapore. So an advisory voluntary committee was formed by the Department early in 1949 in an attempt to get over this difficulty. The enthusiasm and drive of its members is to be particularly recorded: its work and co-operation is a happy reminder of what can be done in the field of voluntary assistance to a Government Department in the medical sphere. Mr. George E. Lee donated $3,500 to start a special propaganda drive through his colleague on the Committee, Mr. Ong Eng Lian, and Messrs. Shaw Brothers gave free and willing service in producing a propaganda film which will be shown in Singapore's cinemas during 1950 Chinese New Year. Through the generosity of the East Asiatic Company, Nestles Limited, and Peter Jackson and Company donors are provided with free beer, coffee, milk and cigarettes. The Committee has worked out the details of a special propaganda drive to coincide with the 1950 Chinese New Year during which all donors past and future will receive due recognition according to the number of donations of blood each has or will provide, by means of certificates, badges and medals. The valuable assistance of the Public Relations Secretary and his staff has been noted by the Committee in this connection, as is that of Mr. R. Walker in the designing field.

The Secretary-Supervisor of the Transfusion Unit has to spend a lot of her time in the effort to persuade the public to come forward as donors through personal contact. Ward Sisters and nurses of the Hospital Service also attempt to get all friends and relatives of patients who have received blood to come forward. Relatives and friends are not yet sufficiently co-operative, however, and only 744 responded out of 2,550 patients dealt with. Relatives cannot apparently be made to realise the importance of giving blood in the saving of the lives of their own folk. A word of gratitude to the 484 Service donors is required. The Army has been remarkably generous in this

direction since the liberation. In fact, in the early stages our Blood Transfusion Service was kept going by this means.

Analysis of Distribution of Blood

	1949	*1948*
General Hospital	1,063	625
Kandang Kerbau Hospital	1,414	606
Tan Tock Seng Hospital	30	31
Others	43	52
Total ..	2,550	1,314
Plasma for Serum Testing	26	
Bottles used for Plasma for issue to Shock cases	90	
Total ..	2,666	

Distribution of Liquid Plasma and Sets

Liquid Plasma	40
Giving Sets	3,687
Taking Sets	3,068

(There has been an increase of over fifty per cent in the number of sets issued compared with 1948).

The Service continues to be housed in accommodation which is both inadequate and unsuitable, in rooms set aside in the Pathology Division. In June, the venesection room was enlarged to house six beds, and improvements made in the lighting and ventilation. While this action has resulted in much greater comfort for donors and staff nothing better can be arranged now until the Medical Plan is sufficiently advanced. This question of accommodation will become an increasingly difficult one until this happens as this is a service which *must* increase in size and scope. While 1949 has shown a considerable advance in these directions over any previous records so has the demand which continues considerably to exceed supply.

In August the first mobile transfusion unit ever to function in Singapore became an accomplished fact. It has been out in action on a number of occasions and a properly equipped van will be the next stage. A further technician was taken on during the year but the time has come to increase the existing staff of fourteen as far as accommodation allows.

The work of the Division falls into two categories: Administrative and Technical.

Administrative

This consists in the obtaining of donors in the manner described above and the maintenance of a panel of donors. The upkeep of a panel by personal contact and propaganda is one of the most important objects of the service. The Public Relations Office and the Press have always been of great assistance in this respect. Publicity in the Press has been the most productive of donors so far, while broadcast appeals and special drives have also brought in large temporary numbers.

DIAGRAM SHOWING BLOOD DRAWING FOR FOURTEEN MONTHS ENDED 31ST DECEMBER, 1949

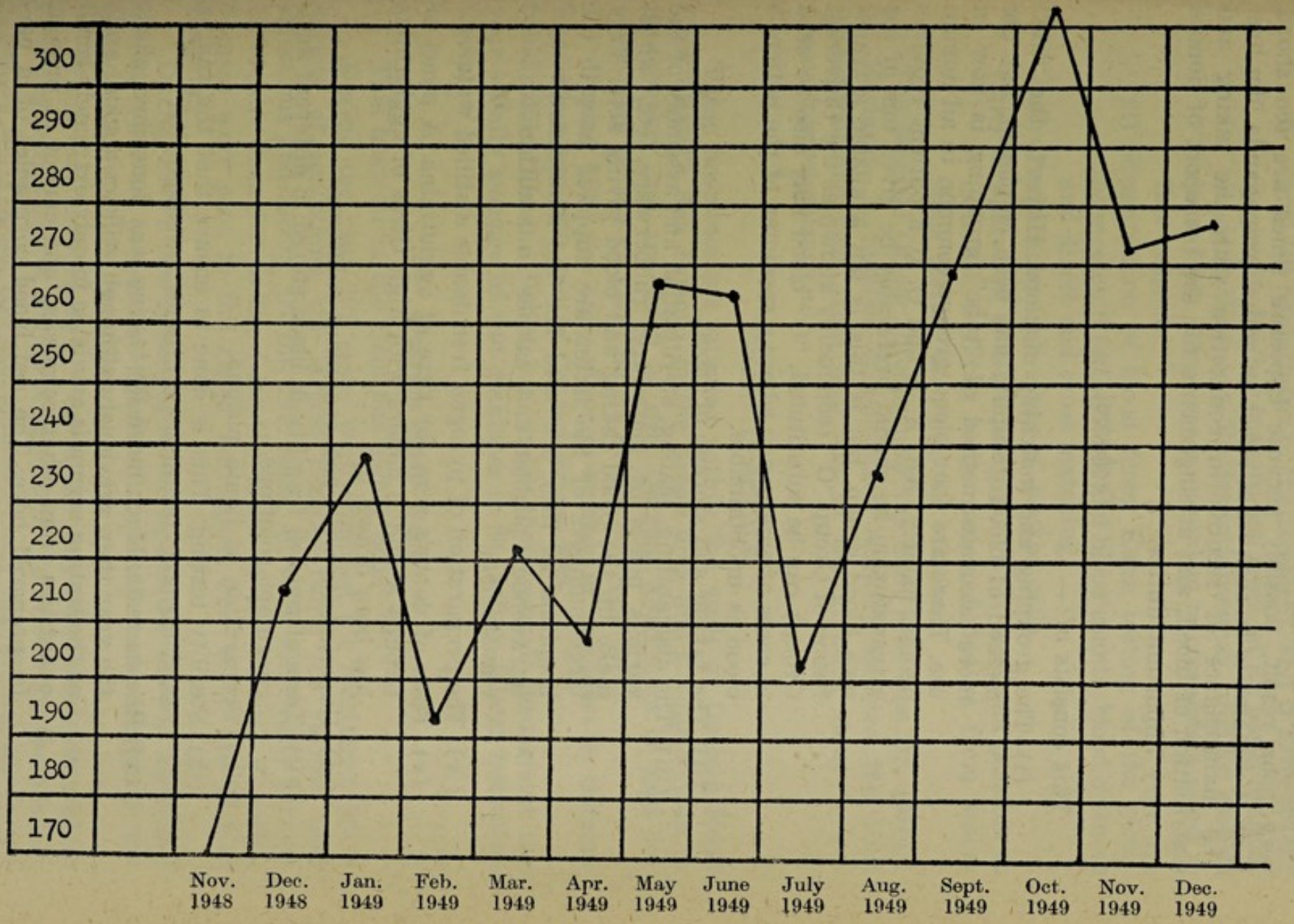


Fig. 9

Response to posters has been fair, and response to lectures very varied. Lantern slides shown at cinemas are thought to have had a very poor result, possibly because exposure times are too short. Now it remains to be seen what effect an actual propaganda film has. The maintenance of records in connection with the taking and distribution of blood, and arrangements for the transport of donors are very important duties.

Technical

This consists of:—

(i) The grouping and matching of blood. Hitherto the "tile" method of blood grouping has been employed, but the more accurate method of "tube" grouping is now in use. There are four blood groups common to all human beings, namely, AB, A, B and O. If a patient requires a transfusion he should preferably be given one of his own blood group, but if this is not available a transfusion of Group "O" (commonly known as the Universal Group) can be substituted. "O" blood may also be used in cases of emergency where a specimen of the patient's blood is unobtainable.

(ii) The taking and storage of blood.

(iii) The dismantling, sealing, sterilization and assembly of the various pieces of glassware, rubberware, etc. which make up the blood taking and blood giving sets. Very large numbers of the latter are supplied now to the hospitals as they are used for the administration of intravenous plasma and salines in addition to blood transfusion.

(iv) The preparation of pyrogen free double distilled water.

(v) Tests of donor's sera for titre of agglutinins. A panel of Groups A and B donors with high titres of agglutinins has been drawn up.

(vi) Experiments with anti-coagulant solutions.

(vii) Tests of red cell fragility in blood stored in different anti-coagulant solutions.

(viii) Preparation of liquid plasma.

(ix) Sterility testing. This is done to ensure that the taking and capping technique continues satisfactorily.

(x) Rhesus tests. Much more Rh testing was done throughout the year than previously although still on a small scale as the testing serum is available in only extremely small quantities from other countries, and cannot at present be prepared here. The red blood corpuscles of a percentage of persons contain a factor known as Rhesus (Rh), but normally human plasma contains no anti-Rh agglutinins. Consequently hæmolysis will not occur when

Rh positive blood is transfused into an Rh negative recipient. There may, however, be a slow formation of anti-Rh agglutinins in the recipient, and if after a long interval a further transfusion from an Rh positive donor is given these anti-Rh agglutinins may produce serious hæmolysis. Steps are being taken to complete a panel in this respect.

(xi) Examination of blood films, Kahn testing of the blood, hæmoglobin estimations and blood counts, blood cultures and direct and cross matching.

(xii) Preparation and issue of packed cells.

(xiii) Preparation of stock testing sera. It has been possible to establish a fairly large panel of donors from whom stock testing sera may be obtained.

The Medical Officer in charge of the Unit here was Dr. (Mrs.) M. Maclaren. A number of voluntary workers assisted the Unit throughout the year. This help was of the greatest value to our expanding organisation.

Prison Hospitals

These hospitals are situated within the walls of Outram Road Gaol (Pearl's Hill Prison) in the urban area and Changi Prison in the country and are small in size. Outram Road Gaol is used for short-term prisoners and Changi Prison for long term.

During 1949 the daily average number of prisoners in Outram Road Gaol was 950 and in Changi Prison 833.

In addition the Police had under their control throughout the year a daily average of 444 detainees in St. John's Island Detention Camp.

Outram Road Gaol

This hospital in the Gaol has eighty beds.

During the year 792 cases were admitted for treatment for a variety of conditions, the largest number being for various skin infections and ulcers. Of the 792 cases, 43 were sufficiently serious to require transfer to the Lock-Up Ward of the General Hospital. 3 cases were sent to the Leper Settlement and 19 to the Mental Hospital.

During 1949 a new system of recording outpatients was instituted with a view to presenting figures that would assess properly the general health of the prisoners.

Thus for the purpose of record the only outpatients accurately recorded were those of sufficient importance to be seen by the medical officer of the Prison. The attendances of any significance numbered 2,717 of which 1,429 were new cases. These cases were noted according to disease and nationality.

In addition the Hospital Assistants provided treatment for a large number of prisoners in the yards and prison blocks. These cases were of a minor nature such as headaches, aches, indigestion, constipation, bruises, etc., and a great many were of a trivial nature. It was considered a waste of time and as serving no useful purpose to itemise such complaints or specify nationality or sex in these cases, since they were of the domestic nature so common in all institutions.

In a sense the out-patients inside prisons are in a different category from out-patients from the general public attending hospitals and dispensaries and so are now recorded as a separate item.

The Medical Officer at Outram Gaol visited St. John's Island once weekly to see sick detainees from the Detention Camp.

Changi Prison

Cases numbering 481 were admitted for treatment. The daily number of out-patients seen by the Medical Officer was 17.2 as compared with 11 in Outram Road Gaol, and a large number were attended by Hospital Assistants as in Outram Road Gaol.

Total out-patient attendances numbered 46,762 of which 1,270 were new cases but the same new method of recording as at Outram Road is now adopted.

In addition 216 operations were performed by the Medical Officer in the Operating Theatre attached to the prison hospital where there are thirty-eight beds for in-patients.

The general health of prisoners in both Outram Gaol and Changi Prison was very satisfactory indeed during the year resulting in a substantial decrease in the number of prisoners requiring medical attention.

	New cases	*Repetitions*	*Total*	
Outram Gaol (Medical Officer)	1,429	2,717	4,146	
Outram Gaol (Hosp. Assistants)	—	—	43,966	(New cases & Reps.)

Police Hospitals

During the year 11,852 attendances were recorded at the Out-patient Department compared with 9,021 in 1948. The total in-patient admissions were 854.

At the clinic for families of the police force run at and from Hill Street Police Station 20,720 attendances were made, of which 1,652 were new cases.

Almoner

The 1948 Report summarised an investigation by Miss N. Tanburn a visiting senior almoner from St. Thomas's Hospital, London, which showed the urgent need for an Almoner's Division in Singapore to include the study of the patients apart from actual disease: to report to the doctors factors which may well be relevant to diagnosis and treatment: to advise patients on home treatment

and improvement on home conditions. She recommended the following stages of development for Singapore Hospital system:—

	First Stage	*Second Stage*	*Third Stage*
3 trained Almoners	..	.. 6	12
2 students	.. ..	.. 6	6
3 clerks	.. ..	.. 6	9

Following excellent work by a temporary fully trained almoner Mrs. Smyth, Miss K. J. Eastaugh arrived early in 1949 and began to develop the service at the General Hospital. Mrs. Smyth then started at the tuberculosis hospital helped by a trained assistant and two health visitors. A total of five almoners posts have been entered in the 1950 estimates with two pupils and three general clerks. Two of the almoners posts will be filled by Chinese ladies now under training in the United Kingdom.

Miss Eastaugh writes as follows in her first year's work:—

"A review of the work done by the Almoner's Department in the General Hospital during 1949 serves two main functions. Defining the work accomplished clarifies the usefulness of the new Department and without any doubt stresses the need and definite purpose of bringing medico-social work into the hospitals in Singapore. Having assessed the work done and the methods used it is useful in indicating the direction which future developments should take. The end of this report will therefore take the form of recommendations which should produce an Almoning service which will be effective in relieving the social distress associated with illness and which will be effective in helping the work of the prevention and cure of disease.

The aim during 1949 has been, firstly, to give medico-social care to individual patients receiving treatment in the wards and attending the Out-Patient Departments, secondly to co-operate with voluntary and statutory organisations outside the hospitals who can give assistance in the treatment of patients. By this co-operation it is also possible for the Almoner to indicate to these organisations the definite needs of the sick in their multiple difficulties, and to attempt the introduction of new schemes to meet these specific needs. Thirdly, it has been possible to introduce more generalised welfare measures for patients within the hospital. The first two aims have equal importance and one is interdependent upon the other. Individual casework is impossible without adequate social services in the community and their development is a necessary parallel to all casework.

The individual patients dealt with have had a common factor as they have been referred for help by the doctors because their social problems have a definite relationship with the cause of their illness, or these problems have been found to aggravate their condition or retard their progress. The variety of problems presented will also show the usefulness of the work. The department has been instrumental in raising money for families where the wage-earner has been unemployed due to sickness or where low income results in a standard of living not compatible with maintenance of health. Home

investigations have been carried out prior to discharge of men, women and children to their own homes in order to ascertain the conditions they are returning to and make improvements in the environment where necessary. Admission to schools has been arranged for children and the chronic sick have been transferred to various institutions. Temporary accommodation and shelter has been arranged for the destitute and for those who for any reason cannot be sent back home. Cases of attempted suicides and many instances of cruelty have been investigated. The department has arranged the supply of artificial limbs and surgical appliances, has arranged transport for patients attending at frequent intervals for treatments and clinics. In a few cases legal aid has been obtained especially where a legal action may be necessary following an accident. All cases requiring advice on Workmen's Compensation have been referred on to the Department of Labour and this department has also interviewed and helped many of our patients who have been unemployed on their discharge. Repatriation to India, Macassar and Java has been organised by the Department of Social Welfare when we have referred these needs to them.

Special mention must be made here of the difficulty encountered in getting patients better accommodation. The housing situation is a very definite cause of social distress and produces endless complications in the family unit and has made the solving of problems in some cases almost impossible. Such difficulties as trying to get patients who are crippled into downstairs accommodation, relieving the over-crowding in families where the patients are suffering from asthma, and tuberculosis, have been overcome in a few isolated cases but success in this sphere is limited.

Many patients, especially children, have suffered from varying degrees of malnutrition. We have tried to arrange for an increased standard of living in all cases either by finding the bread-winner a higher paid post, reducing travelling expenses and getting financial grants so that more money can be spent on food. The practical work in this field has been based upon the investigations done by the Nutrition team from the Social Medicine Department. These investigators who are specially trained in food values, the dietary patterns of the various nationalities and the general economic standard of the local families, have in many cases given advice to the families who have been referred to them from this department. The absence of definite follow up clinics has made it impossible to assess the results of this work. So at this stage it must be considered experimental.

It should be stressed that the co-operation with voluntary and statutory organisations outside the hospital is an essential part of an Almoner's work in order to secure the help necessary to carry out the above-mentioned individual casework. This close contact with outside bodies in conjunction with the study of individual problems gives the Almoner a very unique opportunity of finding out how far the facilities outside meet the needs of patients and by constant contact with the patients she can appreciate what is lacking. It has

been possible in many cases to ask outside organisations to extend their work to cover the specific needs of the sick and also to introduce complete new forms of social service for certain groups of patients.

The two major illustrations of this are (1) the opening of a class specially for physically disabled children who are able to live in their own homes but who are unfit to attend a normal competitive school. Because of the great problems of securing vacancies in the schools of all kinds in Singapore it was originally thought that the majority of physically fit children should be given education before any disabled child was considered. However a child who is disabled would through sheer necessity have to support itself in one of the sedentary occupations and education is of even more importance to them as they will be unable to do any kind of manual work. An experimental class has therefore run for one complete term with success from September 1949. The Education Department supplies a classroom and a teacher and all admissions are arranged through the Almoner's Department. It was essential to arrange transport from the homes of these children to the School as most of them are crippled or unfit to make their own way. It also gave great encouragement to the parents who were at first rather sceptical of giving any advantages to the disabled children and it is interesting to know that they are now very enthusiastic. This transport was arranged by the Social Welfare Department in consultation with the Almoner and has been a major factor in the success of the school. The degree of improvement in the mental and physical condition of these children has been considerable as a result of their more natural life. The Almoner is extremely grateful to both these Government departments for their help in making this first non-residential school for disabled children in Singapore a success.

The opportunity given to the Senior Almoner to do preliminary work outside the hospital was that afforded to her when she was sent as a delegate to the International Labour Organisation Conference held in Singapore in September. Information was exchanged on the present condition of the disabled person in the field of employment. The Almoner is directly concerned with the re-employment of disabled discharged from the hospital and great difficulty has been experienced in trying to find openings for those who lack previous experience or training. Discussions will shortly take place and it is hoped that a representative body will be able to examine the necessity for the vocational training for the disabled, and the immediate action which can be taken in Singapore to replace the disabled person in employment.

There are in the wards of the hospitals children who remain in for a considerable length of time, *i.e.*, for three months to two years. The Almoner's Department has arranged for voluntary teachers from the Convents to visit them and teach them in the wards. Final arrangements are being made with other volunteers secured through the co-operation of the Education Department to come and teach those

who require special tuition. By the end of December each child should be receiving instruction.

The Singapore Branch of the British Red Cross Society has now taken over the organisation of the Hospital Library. A special room has been granted to them so that the books and magazines collected from voluntary sources can be sorted and kept in good condition. Voluntary workers are also distributing these to the ward patients at regular intervals during the week.

Future Developments

Direct contact with the work in this Department shows that a great deal more home visiting is essential if effective practical work is to be done. It is often impossible to recommend lines of action without an accurate picture of the conditions in the homes. Much time is wasted by asking outside agencies to report on the homes and the approach and resulting report from those who are untrained has been of no lasting value either to the medical staff or to the patient. Time must be allowed in the Almoner's work to do a certain amount of this home visiting herself.

This is mentioned here as the time taken up by home visiting will have some effect on the amount of work one Almoner can undertake and therefore will have an indirect bearing upon the numbers of Almoners required to fully staff the hospitals in Singapore. The Unit system which has been developed aims to have a complete team of people who deal with specific aspects of a patient's treatment. In the development of the Almoner's Department it should be borne in mind that an Almoner can be of use in specialised work and Almoners should be attached to each Unit. Until the numbers increase the work of the Units will be distributed but it is a practical aim to have an Almoner in the surgical Units, one working specifically for orthopædic patients, one specialising in children and babies and one in the Medical Unit.

The Almoner at the General Hospital has given practical help to patients in St. Andrew's Orthopædic Hospital where the supply of surgical appliances has been considerable. These children suffer from tuberculosis and the general social care necessary has been given. A problem arising from this Hospital is the amount of residual disablement arising from the specific diseases treated and resettlement and retraining must become an important part of the medico-social work undertaken for patients treated there. Patients have also been helped in the Leper Settlement and the detailed casework necessary for these patients, whose treatment is very long term, and their families deserves special mention. An Almoner could be employed full time to minimise the family difficulties. So often the bread-winner of a family is admitted at a moment's notice leaving the family destitute, or women are admitted leaving large families with no one to care for them. As many of the non-infectious types are not admitted but treated as out-patients they need follow up by an

Almoner to encourage them to continue their treatment. Many do not return to the clinics for treatment and this is largely due to the economic difficulties involved.

The development of the Almoner's Department is at present entirely dependent upon the numbers of Almoners employed. This will, of course, take some time but it is as well to appreciate where Almoners could do very constructive work. Apart from the separate Units within the hospitals mention can be made of the need in the Social Hygiene Centre and the Mental Hospital."

At the tuberculosis institutions the Almoner and her three assistants had to develop what amounted to an after care organisation to fit into the new domiciliary relief scheme. Among the many problems that had to be solved were:—

(*a*) the care of the family while the bread-winner was without the means and unable to work;

(*b*) the boarding out of young children while the mother required hospital treatment, or when either patients were particularly infectious;

(*c*) the finding of new jobs for those patients who have lost employment due to their illness;

(*d*) the provision of extra nourishment for a patient at home, or for his family;

(*e*) the repatriation of patients wishing to return to their countries of origin;

(*f*) the investigation of the financial circumstances of a patient when relief was asked for, followed by the recommendation to the Social Welfare Department for relief in suitable cases, and the subsequent supervision of patients while on relief.

The main effort was thus directed to relieving the burden of the afflicted family and this often entailed a great deal of work before a suitable solution could be found. Some firms in Singapore have shown marked consideration to members of their staffs by keeping jobs open for short periods and continuing to pay full or half salary while the patient underwent treatment. Others have agreed to employ another member of the family in place of the wage-earner, and one firm granted a widow a sum sufficient for the support of her family while she trained as a midwife. Still others are not so praiseworthy however and other avenues had to be explored to obtain relief in these instances.

The Government scheme for T.B. allowances to those patients likely to improve within a reasonable period of time could only cover a limited number of cases naturally, but this required the most careful scrutiny and supervision.

Over 1,100 tuberculous patients passed through the hands of the division during the year.

Government Medical Store

With the expansion of hospital and clinic services the work of the Store and Supply Section was increased by some thirty per cent during the year and that of the laboratory manufacturing section more than doubled; this with no increase in staff and premises. The department continued to operate in the Maxwell Road Mission premises, a four storied building which is most unsuitable for a store and has no proper facilities for the work of the laboratory. Plans for construction of an entirely new building on a site adjacent to the General Hospital were finalised and work on building is to start early in 1950.

The difficulties recorded in the 1948 report were considerably eased by a "settling down" of the supply position which was particularly acute during the two post-occupation years and was by no means straightforward in 1948. The Crown Agents for the Colonies improved their supply service, and routine supplies of medicines, drugs, and chemicals can now be expected to arrive within six months of despatch of order. Some drugs were still scarce however such as Santonin which is indispensable for treatment of intestinal roundworm. The picture with regard to equipment is not so rosy; some surgical instruments are available for immediate despatch but in many cases a period of two months or more is stipulated. Textiles continued to be difficult; materials for uniforms, sheeting, etc. are released in instalments and stocks are low. Large quantities of dressing are on order, but manufacturers are unable to export more than a quota each month and in the case of gauze the stock was depleted for a fortnight or so. Several other "lines" continue to be difficult, such as scientific glassware some of which is badly needed, orders for which have been outstanding for three years. Suture catgut for which the earliest delivery date given was some four months has created a special difficulty.

Local Purchase

With supplies of medical products more or less normal there was practically no purchase of local surplus stores from the Disposals Board or elsewhere. The policy on local purchase was thoroughly investigated during the year nevertheless and the present system of bulk purchase from the Crown Agents was confirmed as being the most economical and suitable method. Many home manufactured products which are also produced locally are now bought here both as an encouragement to local industry and on grounds of economy. These include such articles as soap, samples of which proved comparable in quality with United Kingdom brands; medicinal gases; rubber products, including vaccine bottle caps, waterproof sheeting and rubber tubing; and hospital furniture such as beds, ward screens, and lockers for which several large orders were put out to public tender during the year. Some $300,000 was spent locally out of a total expenditure of some one million dollars (Malayan).

Shipping

The shipping position is now quite normal and the work of the docks staff is routine but by no means diminished, the number of cases, drums, etc. received being 3,700 compared with 2,500 in the year 1948. The exchange of old ex-army trucks for three new vehicles in June helped the shipping and despatch department considerably. Quite a number of packages were brought out by air freight during the year, the reasons being heavy prescribing of new medical products and suddenly increased demands for certain biological preparations. If minimum packings are brought out in this way it does not prove too expensive. The Crown Agents were very helpful in arranging prompt air despatch in cases of urgency.

Survey of Stores

The Surgical Section of the Stores was surveyed during the year and the remaining deteriorated surplus stocks which were sent here under the Young Plan and other emergency supply arrangements were condemned, their value amounting to about $8,000. The survey of the Drugs and Chemicals Section could not be carried out but the deteriorated and time expired stocks were set aside for condemnation. Their value amounted to about $79,000 of which $77,000 represents biological products which could not be used beyond a certain limit set by the manufacturers, all of which came out under immediate post-occupation emergency supply arrangements and were not required.

In 1948 the teaching, store and laboratory duties which had previously been shared between two senior officers were split up and separate lecturers posts created at the College of Medicine, later to become University appointments. The single post of Superintending Pharmaceutical Chemist which had been held by an acting divisional head since that time, was filled during the year. There is a multiplicity of duties associated with the post and the new officer had difficulty in finding time to give all of them the attention required. This was especially manifest in the manufacturing side where a great deal of experimental work is waiting to be done when suitable premises have been built and the pressure of routine work, caused by greatly increased demands from hospitals and clinics, and poor facilities, has been eased. Experimental work on tablet formulæ, on an ampoule multiple-filling unit, on bacteria proof filter units and on obstetric creams and various other ethical products is badly needed but lack of time, equipment and premises preclude the possibility of dealing with them promptly. The Singapore Hospitals Formulary needs revising and bringing up to date and in line with the National Formulary issued under the United Kingdom Health Scheme. It is hoped to accomplish this during 1950.

Amongst other duties work in connection with new or revised legislation took up a good deal of the Pharmaceutical Chemist's time. The statistical work in connection with returns required for the Drug Supervisory Body of the United Nations was largely, and very

ably, handled by the locally appointed pharmacist. After a lot of work on the part of the various divisions concerned and the Pharmacy Board of the Colony new legislation on Dangerous Drugs was brought to the stage of a final draft. Work was also carried out in consultation with the Federation Medical Department on revision of the Registration of Pharmacists Ordinance, the Poisons Ordinance, the control of Sodium Arsenite, and concerning the further use of duty-free alcohol for medicinal purposes. Very little time could be spared for inspection of retail pharmacies and premises of poisons licence holders; the post of Inspecting Officer to the Pharmacy Board remained vacant, no applications being received in response to public advertisement.

The problem of meeting demands from our hospitals and clinics for laboratory manufactured products is becoming increasingly grave in the absence of new premises. Throughout the year there was a remarkable upsurge in the demands for sterile distilled water, glucose saline, ergometrine ampoules, vitamin tablets, iron compound tablets and numerous other products. A further problem arose when the Leper Settlement switched over treatment from sulphetrone tablets to the newer sulphone which is packed locally as a sterile suspension in oil for injection. This preparation and many others should be dispensed under aseptic screens in a room proofed against bacterial contamination, but these conditions cannot be attained until new laboratories have been built.

The division is indebted to the Pharmacy Department of the University Medical Faculty for the use of premises and assistance in laboratory experimental work and for the service rendered by the Senior Lecturer in Pharmacy whilst on leave in the United Kingdom, in inspecting the equipment of various firms to assist purchase for the new laboratories.

Voluntary Organisations and Assistance

Various sections of this report refer to the diverse activities of the Medical Department in which non-Government voluntary bodies interest themselves as well as to Committees of different kinds on which members of the public sit. The Department is indeed grateful for this assistance which is invaluable both in the field of actual therapy and in that of advice. Without this co-operation a difficult task would become infinitely more difficult.

In the field of therapy or active assistance the following should be particularly mentioned:—

The Ladies Diversional Therapy Unit
The Leper Welfare Committee
The Rotary Club of Singapore
The Tuberculosis Treatment Allowance Advisory Committee
The Singapore Anti-Tuberculosis Association
The Blood Transfusion Committee
The St. John Ambulance Association and Brigade.

The Hospital Diversional Therapy Unit has carried out a notable and essential task amongst tuberculosis patients both at Tan Tock Seng Hospital and at the Children's Orthopædic Hospital. A group of ladies of all nationalities teamed up for this purpose under the leadership of Lady Gimson and latterly under that of Lady McKerron, and the enthusiastic chairmanship of Mrs. Scrivener and latterly of Mrs. Shaw, developing into a most active body which is extending its services into other hospitals of the Medical Service. This work must not only be continued but expanded until it reaches and covers every hospital in the city. It must remain a permanent feature of the medical scheme. It cannot be in better hands than those at present available: only more and yet more will be required. The work of this unit is one of the most important steps in the cure of any illness which necessitate prolonged institutional care. Tuberculosis appears to be the ideal example, but it is only one of many types of disease catered for. Funds were obtained at first from voluntary subscriptions and a small contribution from a Silver Jubilee Fund. Since then money has been voted by the Tan Tock Seng Hospital Committee. Now small sums are being made available in the official estimates of the various medical institutions. Where small boys and girls are concerned all materials provided must be written off: such patients cannot be regarded as productive in this connection. With older patients, however, most of the work produced is of a very high standard and is very readily marketable. Such firms as Messrs. Robinson & Co., Ltd. and Messrs. Lee Chay & Co. have given stall space for this purpose: their assistance is a further notable example of voluntary help in a worthy cause.

The Leper Welfare Committee extends aid to lepers outside the scope of departmental activity in the way of Christmas and other treats when presents are provided, and by the provision of many desirable amenities. Leper children have been "adopted" by people who give them their special attention. A troop of Scouts has been formed. Efforts in this direction mean a lot to a section of the community which needs increasing attention from the public. Canon Adams and his splendid co-operators have given up their time and energy to a condition which is not always pleasant to contemplate: the public cannot thank them sufficiently in consequence. Now that the prospect exists of easier and earlier cure of leprosy the rehabilitation of discharged patients must arise. This further problem will need added aid from the public—certainly from that section which puts service before self.

One of the most difficult problems at the present day is that connected with tuberculosis. This is because it is such a large one, and one which has been so much neglected in the past. In consequence assistance to the growing service of the Government organisations cannot be too gratefully accepted. The Rotary Club of Singapore, the Singapore Anti-Tuberculosis Association and the Tuberculosis Treatment Allowance Advisory Committee deserve special thanks in this connection. Rotary has presented Government with a fine and

modern clinic for the diagnosis and out-patient treatment of tuberculosis. This stands in the grounds of Tan Tock Seng Hospital and has provided a long felt want to what is to become the main centre for the institutional treatment of this condition in the Colony. In fact with its present 400 beds and daily out-patient attendance of some 14,935 persons this hospital has already become such a centre in the van of a considerable expansion. Rotary's gift can well be marked down as the first notable step in the accepted Medical Plan of the Colony.

The Singapore Anti-Tuberculosis Association now runs an important diagnostic treatment centre in the city well away from the Rotary Clinic. It has started an experimental B.C.G. operation in addition. These efforts are and will be a notable step in the history of Singapore's advance towards the control of tuberculosis. The Tuberculosis Treatment Allowance Advisory Committee has taken the first steps in the scheme for the relief of the economic factor in tuberculosis without which any tuberculosis organisation must fail—a truth which has been realised in the United Kingdom and elsewhere. This aspect of our problem will be discussed at greater length in the chapter dealing with the disease.

The scheme for domiciliary relief was outlined originally in a paper entitled the *Tuberculosis Policy for Singapore* laid before the Legislative Council in 1948. Its successful implementation by the Committee under the auspices of the Department for Social Welfare has meant a lot of hard work. This Committee is to be congratulated on what it has done in starting an essential service.

The Blood Transfusion Committee came into being early in 1949 to advise and co-operate with the Director of Medical Services in this important field of medical endeavour. Through its efforts the number of donors built up from 287 in 1946 to 1,622 in 1948, has been doubled again to a 1949 total of 2,946. The Committee rejected the idea of paid donors and concentrated on obtaining new candidates through increased propaganda and the distribution of certificates, with suitable badges for further gifts of blood. Messrs. Shaw Brothers are completing a film for showing in local cinemas. Mr. George E. Lee presented the Committee with $3,500 for further propaganda purposes. All this assistance is gratefully recorded. The number of donors is on the increase but unfortunately the demand for blood from the hospital services continues to be well in excess of any supply. In consequence it has been impossible to build up a suitable blood bank so far. The excellent work of this Committee is to be commended.

The public always appreciates the work of the St. John Ambulance Association and Brigade. This is evidenced by the very generous donations totalling some $12,000 on the annual Flag Day, by $1,500 from the Malayan Badminton Association and $1,000 from the Singapore Chinese North Borneo Rice Exporters' Association during the year. These sums with the annual contribution from Government have enabled the Association and Brigade to build up a

solid nucleus of active workers and a busy training programme. In the meantime a Singapore Branch of the British Red Cross Society has just been inaugurated to deal with emergency relief and handicapped children and welfare work—again supplementing certain aspects of the medical services. Both these organisations play an essential part in times of trouble and emergency as auxiliaries to the established Medical Department. They are recognised organisations in all civilised communities.

Government Committees and Boards on which members of the public sit continue to play an essential part in the medical and health development of the Colony. The Hospitals Board, the Tan Tock Seng Hospital Committee, the Pharmacy Board, the Dental Board, the Medical Council, the Nutrition Council and the Government Anti-Tuberculosis Advisory Board can be named in this connection. The Tan Tock Seng Hospital Committee functions outside the Hospitals Board which deals with all the other leading hospitals of the city because this hospital started as a charitable trust in 1851. It has retained its distinctive and individual character ever since.

The Public Health Conferences which have been a feature of the public health control of the Colony ever since the advent of the Civil Government in 1946 and the Venereal Diseases Committee are composed of members of all the Services (Navy, Army and Air Force) in addition to the various Government Departments concerned. The representatives of the World Health Organisation, the Federation Medical Department and the Singapore Municipality also sit on the former. Dr. L. E. C. Davies (late Brigadier in Charge of Army V.D.) now a general practitioner is a member of the latter.

APPENDICES

APPENDIX *I*—THE FUTURE

REPORT OF A SELECT COMMITTEE OF THE LEGISLATIVE COUNCIL ON THE MEDICAL PLAN FOR SINGAPORE

1. At a meeting of the Legislative Council held on 18th May, 1948, a Select Committee consisting of the Acting Financial Secretary, Mr. M. J. Namazie, Mr. C. C. Tan, Mr. P. F. de Souza and Mr. Lim Yew Hock was appointed to examine and report to the Legislative Council on "The Singapore Medical Plan" prepared by Dr. W. J. Vickers, Director of Medical Services, Singapore, and set out in Council Paper No. 4 of 1948.

2. It is observed that the Plan was first placed before the Advisory Council as Council Paper No. 12 of 1947. In this Plan a total capital expenditure of $51,082,000 was envisaged over a period of five years. Additional items amounting to $7,736,000 were marked for consideration if possible. The date of this Plan is 11th February, 1947. It was necessary to review this Plan for two reasons; firstly, the impossibility of providing funds on such a scale over so short a period, and, secondly, the incapacity of the Public Works Department of the Colony to undertake so vast a task in addition to its normal works. In consequence, the Director of Medical Services, with the assistance of a Committee consisting of the Principal of the College of Medicine, the Chief Health Officer, the Chief Medical Officer, the Professor of Surgery, the Professor of Midwifery, Dr. Haridas and Dr. Nicholas, suggested some modifications to the original Plan in February, 1948. The original Plan, together with the modifications recommended by that Committee and a note by the Director of Medical Services on how the Plan arose, are all contained in the Council Paper first mentioned, namely, Legislative Council Paper No. 4 of 1948. The actual details of the Plan, arranged as a Ten-year Plan and as a Fifteen-year Plan, are shown in the Schedule on pages 26 and 27 of the Paper.

3. The Committee held meetings on the 7th and 17th of June, the 8th, 22nd and 30th of July, on the 12th August and on 8th September, 1948. The Director of Medical Services (Dr. Vickers) attended the meetings throughout and assisted us greatly with explanations and advice. The Director of Public Works (Mr. Kirk) and the Government Architect (Mr. Cuthbertson, and, later, Mr. Brundle), also attended most of our discussions and provided us at very short notice with numerous sketch-plans and figures; and the Committee wishes to acknowledge with gratitude the very valuable assistance given to us by these Officers. The Committee also paid a visit to the General Hospital and saw every aspect of the work there. This was most valuable to us not only for the practical view it enabled us to take of the particular problems there but also for the knowledge which it enabled us to apply to the consideration of other aspects

of the Medical Plan generally. In addition, two members made a special visit to the Venereal Diseases Hospital, and the Chairman was able to give Members first-hand information gained by him in extensive inspection of the Leper Settlement, the Quarantine Station at St. John's Island and the Tan Tock Seng Hospital.

4. The Committee desires to state at once that the Medical Plan is one which, in our opinion, should, subject to the comments and modifications set out in this Report, be accepted. In this connection we wish to emphasise that we decided not to concern ourselves with the question to what extent the Colony can afford to execute this Plan. That is a question which it will be possible to answer only when all the other calls likely to fall upon the Colony during the next few years are known. There are many items in view—the University, Housing, Education and Social Welfare, Changi Air Port, etc.—which will make formidable demands upon the finances of the Colony. It will be necessary for all of them to be fitted into the picture before it can be seen in proper perspective. As regards the Medical Plan, the problem to us took the form of a simple question—Does Singapore need this Plan? And our answer to the question is "Yes". We agree with the opinion of the substantive Financial Secretary (Mr. J. D. M. Smith) as expressed in a Minute he wrote on the 29th December, 1947. In that Minute he stated:—

> ..... I think that the correct approach to the Plan as a whole is first to discuss medical policy as such and on its merits, without intruding the financial aspect. It is obvious that the Colony can never spend on medical services any more than it can afford to spend at any time on medical services. Therefore, once the main lines of medical policy are settled, the Colony then spends along those lines what it can afford to spend. And the breadth of those main lines of policy, in relation to the lines of policy in other fields, will determine the ratio of expenditure on medical services. The first step, therefore, is examination of the Plan on its merits as a statement of medical policy in the Colony .....

In stating our agreement with these views, we do not, of course, mean to infer that the amount which the Colony can afford to spend on medical (or for that matter other) services is necessarily to be governed by present revenue figures. It may be necessary, and probably will be necessary, to find additional funds to carry out this and other Plans. Some of this may have to be by additional revenue; some from loans. What we mean is that we have considered this Plan independently of financial considerations; we think that we should the better discharge the duties laid upon us by trying to arrive at conclusions as to whether the Plan is in itself a desirable plan of medical policy. The case for the Plan is fully and ably set out in the Council Paper, and we have no intention of trying to add further reasons to those already given. We consider that it is a desirable Plan, and not only desirable but necessary if the Government is to meet its obligations to the people of the Colony.

5. We should like at the outset to refer to one matter which intruded itself upon all our discussions. It is the question of quarters. It was quite clear to us that the question of the provision of quarters for the institutional staff of the Medical Department is one upon

which most of the others depend. Until considerably more accommodation is available, extensions and improvements in other directions will be of no avail. The Committee which assisted Dr. Vickers have dealt with this aspect of the problem in paragraph 5 of their Report (Annexure *B* to the Plan). They say:—

> Until more staff accommodation has been provided further recruitment and expansion is out of the question. The Committee wishes to bring this fact forcibly to the attention of Government: proper and up-to-date quarters for existing staff is first priority, and must take priority over further hospital expansion.

We have made a close examination of this aspect of the Plan and have no hesitation in supporting the above opinion. We gather that the housing position of Government servants generally is unsatisfactory. Nevertheless we consider that the problem of accommodating hospital staffs takes priority over any general scheme. We consider, therefore, that medical quarters should be regarded not only as a part of the Medical Plan, but as its most urgent part.

In connection with the question of quarters, the Committee is unanimously of the opinion that a better type of quarters for the lower grades of hospital workers should be provided. We feel strongly that the building of the one-room type of quarters should be discontinued and that quarters with two rooms of somewhat smaller size should be provided in future.

6. We now deal with the individual items shown in the Schedule to the Plan:—

1. Base Medical Store, Pharmacy School and Essential Manufactory

The purpose of this Store is to safeguard medical stores which arrive in the Colony, to make possible the local manufacture of expensive drugs with an ultimate saving to Government by so doing, and to concentrate the storage and manufacture at one point. We inspected the plans and the proposed site for this Store and approve them. We recommend that this item be included in the Plan. Further investigation has revealed that the building can be built and equipped for about $450,000, which gives a probable saving of $250,000 on the estimate shown in the Schedule to the Plan.

2. Leper Settlement

The Committee is in entire agreement with the Director of Medical Services that the accommodation at the Leper Settlement is both inadequate and unsuitable. For these reasons, we consider that the amount of accommodation ought to be considerably increased and that the type of accommodation should be improved by progressively providing semi-detached quarters wherever desirable. Ancillary works in the form of roads, water supply and sewerage should also be provided. We investigated the estimates as far as it was possible for us to do so, and we agree that the

estimate of $780,000 is a fair one. The Committee was informed that this item has been entered as one for allocation of funds from the Colonial Welfare and Development Fund, and that it should stand a good chance of being accepted as such. We consider, however, that it is a proper item to be included in the medical Plan and that, therefore, it should stay in the Plan, irrespective of where the funds come from with which to implement it.

In making the above recommendation, the Committee assumed that the necessary extensions and improvements will be carried out on the present site at Yio Chu Kang. At a late stage in our discussions, however, the Committee was asked to consider a suggestion to remove the Settlement from its present site to one of the neighbouring islands. As no alternative investigations on these lines had been made, and as no information is available as to whether a suitable site could be found or as to what the project would cost if such a site were available, the Committee considered it undesirable to delay this Report for such investigations to be made. Moreover, for various reasons, the Committee considered that the extensions and improvements should be carried out on the present site. In the absence of information, Mr. C. C. Tan wishes to reserve his opinion on this point.

3. General Hospital

This is the largest and most important item in the Medical Plan, and we are completely satisfied that it is necessary. We visited the hospital and thoroughly examined the proposed improvements and extensions. In the original plan two General Hospitals were envisaged, each to take 1,000 beds. This was to be achieved by modernising the present hospital at a cost of $10,300,000 and by the building of a second hospital at a cost of $21,500,000.

The Committee which assisted the Director of Medical Services early this year, upon reviewing this part of the Plan, recommended that the present General Hospital should be extended to take 1,500 beds to overcome the delay involved in implementing the original scheme. This recommendation was incorporated in the schedule to the Plan as item No. 3 at an estimated cost of $16 millions, whilst a second item (No. 14) provided for one or two District Hospitals at a later date at an estimated cost of $11 millions. These were to provide a further 500 beds. The main lines upon which the extension of the General Hospital is proposed are:— the provision of quarters, a proper out-patient department and clinics, an up-to-date Children's Block and a satisfactory Pathological Block.

As stated above, the cost of the proposed improvements and extensions at the General Hospital is shown at $16

millions. We examined the estimates in detail and a breakdown of revised estimates is contained in Appendix *A* to this Report. It will be seen that two-thirds of the estimates of expenditure are accountable to the building of quarters. We most emphatically agree. We are pleased to report that further investigation has shown that a saving of approximately six millions can probably be effected on this part of the Plan, but we would emphasise that final estimates cannot be given with complete accuracy until the fullest investigations are made. We strongly recommend that this item should be proceeded with without any more delay than is necessitated by the capacity of the Public Works Department to do the work. We consider that it is the most urgent need, and that, if the work can be pushed on with quickly, the building of District Hospitals, which we shall deal with later, can wait.

The Committee agrees with the recommendation at the end of paragraph 8 of the Report of the Committee which assisted the Director of Medical Services (Annexure *B* to the Plan) that the bed ratios among the different classes of patients should be 80 1st class, 200 2nd Class and 1,220 3rd Class.

4. KANDANG KERBAU MATERNITY HOSPITAL

The Committee is entirely satisfied with the proposals for the extension of this hospital. Here again, the main cost will be on account of quarters. A breakdown of the estimates is shown in Appendix *B* to this Report. A Schedule of proposed accommodation is shown in Appendix *C* from which it will be seen that the ward additions will give a bed ratio of 35, 77 and 410 as between Classes I, II and III excluding provision for labour rooms (1st Class 3 bed size; 2nd Class 6 bed size and 3rd Class 27 bed size) and isolation rooms (1st and 2nd Class 10; 3rd Class 20 rooms).

5. RURAL CLINICS AND DISPENSARIES

The provision in this part of the Plan is for 16 clinics at $41,000 each and three dispensaries (with quarters for Hospital Assistants and Hospital Attendants) at $19,000 each. Thirteen of the Clinics will be established at the following places:—

Paya Lebar.	Pulau Bukom Kechil.
East Coast Road (8 mile).	Sembawang.
Thomson Road.	Pasir Panjang.
Ulu Bedok.	Pulau Brani.
Pulau Tekong.	Tampenis (5 mile).
Holland Road.	Jurong Road (17 mile).

Yio Chu Kang (6¼ mile).

We agree that the choice of the three remaining sites should be left over until more information is available as

to how the needs of the population will develop. The dispensaries will be sited at Changi, Sembawang and Pasir Panjang.

The need for these Clinics is stated in paragraph 13 of the Medical Plan and is the subject of severe comment in paragraph 16 of the Report of the Committee which assisted the Director of Medical Services (Annexure *B* to the Plan). We are satisfied with the need for the proposals made and agree that the distribution proposed is suitable. Ancillary work will cost a further 10%, making $784,000, a slight increase upon the estimate shown in the Plan.

Most of the expenditure for this item also, we were informed, has been entered for allocation under the Colonial Development and Welfare Fund, and the remarks we have already made in regard to the Leper Settlement apply to it.

6. St. John's Island Water Supply

We did not visit St. John's Island, but the Committee took note of the publicity that the Quarantine Station has received in the press and discussed the question at length in Committee. The problem of the water supply is a difficult one, and investigations are not yet completed. We consider, however, that the item is one that should be accepted. We were informed that it was hoped to receive an allocation covering the whole cost from Colonial Development and Welfare funds and the remarks we have made in regard to the Leper Settlement and the Rural Clinics and Dispensaries apply to this item. Until such time as fuller investigations can be made and firmer estimates prepared, we recommend that the provision of $250,000 should stand in the Plan.

7. School Medical and Dental Clinic

The Committee discussed this item at some length, but the discussions turned mainly upon the site. We are entirely satisfied with the necessity for the provision of such a clinic, but consider that the closest attention should be paid to the choice of the most suitable site and that, if necessary, land should be purchased. The breakdown of figures for this work is as follows:—

	$
Building	122,000
Piling	24,000
Staff Nurse Quarters (3)	25,000
Hospital Assistant Quarters (1) ..	15,000
Hospital Servants' Quarters (2) ..	9,000
Ancillaries at 10%	19,600

making in all approximately $215,000, a slight addition to the estimate as shown in the Plan.

The estimate for piling is, of course, based on the present site proposals, and if our recommendation for the

investigation of a suitable alternative site is accepted, it is possible that the overall estimate can be reduced on this account.

This item is also included in the proposals for allocation under the Colonial Development and Welfare Scheme, and the remarks we have made in regard to such items apply to this one.

8. Sea and Air Ports

It was explained to the Committee that a considerable amount of work would have to be done in the next few years if Singapore were to present its quarantine facilities as models, as it had done in the past. The work would fall into two parts, namely, the rehabilitation and extension of the quarantine station at St. John's Island and the provision of facilities at the new Changi Airport. The St. John's Island station was designed thirty years ago and in the main was satisfactory, but the neglect from which it had suffered during the war, and modern requirements in respect of quarantine, demanded complete rehabilitation. It is proposed that of the sixteen existing Camps eight should be reconstructed at a cost of $400,000, and that the other eight should be rehabilitated at a cost of about $152,000. The plans for quarantine arrangements at Changi Airport are not ready yet, but it was expected that something like $270,000 would be required for this work.

The Committee agreed with these items. The Committee was informed that part of this work had been entered as one for an allocation of funds from the Colonial Development and Welfare Fund. The full amount could not be entered owing to the overall limit set for medical items in that scheme by the Singapore Committee dealing with the matter, but it was hoped to obtain sufficient money from the Fund to pay for one-half of the cost of the proposed work at St. John's Island. The remarks we have already made in regard to projects listed under the Colonial Development and Welfare Fund apply, therefore, to this item.

9. Venereal Diseases Hospital

Considerable discussion took place in the Committee in respect of this item, during which the desirability of making suitable provision at the General Hospital was considered as an alternative to having a special hospital for the treatment of venereal diseases. The Medical Plan envisages a Hospital to accommodate 200 persons at a cost of $4½ millions. The Committee eventually came to the conclusion that the building of a new Hospital to accommodate 200 persons should be postponed for further consideration in a few years time, that the work should continue to be done in the present

hospital at Middle Road, but that the accommodation should be increased by making available those parts of the building that are at present used for staff accommodation, and building staff accommodation elsewhere. It was estimated that in this way accommodation could be increased from 50 to 120 beds. It was further considered that one clinic should be built at a suitable place, and that a travelling dispensary organisation should also be provided. The Committee recommends that the present buildings and the land on which they stand should be acquired under the provisions of the Land Acquisition Ordinance.

It is, therefore, recommended that item 9 be omitted from the Plan for the time being and that a new item on the above lines be substituted. A breakdown of the Estimates is shown in Appendix *D* to this Report.

We desire to emphasise, however, that it may be necessary to reconsider this problem in a few years' time.

10. ORTHOPÆDIC HOSPITAL

In connection with this item the Committee would refer to the additional item on page 7 of Council Paper No. 4 of 1948, namely a Tuberculosis Hospital of 300 beds at an estimated cost of $5,871,000. The Committee discussed the question of hospitalisation for tuberculosis at considerable length with reference to Council Paper No. 24 of 1948 prepared by the Director of Medical Services. After considerable discussion the Committee decided to recommend that the Medical Plan should contain provision for the building of a Sanatorium to include an Orthopædic section and that the present item should be deleted. We therefore asked for rough estimates to be prepared of the cost of such a hospital and these are set out in Appendix *E* to this Report. We accept these tentative estimates and recommend that this item, at a cost of $2,217,000, should be substituted for the present item at a cost of $1,100,000. In recommending the inclusion of this item in the Medical Plan we desire, however, to emphasise that it is not our intention that this should be a substitute for other measures in the fight against tuberculosis, namely the extension of Tan Tock Seng in the Medical Plan and the provision of other facilities in the ordinary Medical, Social Welfare and Education Departments budgets. Tuberculosis, we are convinced, is a gigantic problem which can only be attacked successfully if attacked at every angle simultaneously, namely by better housing conditions, better feeding, school medical services, infant welfare, home treatment, etc. We therefore wish to state clearly that this item is recommended as an additional unit in the fight and not in substitution of those other methods of attack which we have outlined.

11. EXTENSION OF TAN TOCK SENG HOSPITAL

This item is shown in the Medical Plan as requiring $1¼ millions. In Committee the Director of Medical Services asked for a reconsideration of the original scheme to enable the question of quarters to be tackled satisfactorily. The Plan envisages that the whole of the 800 beds at Tan Tock Seng Hospital should be devoted to use as a hospital-clinic for the treatment of Tuberculosis. A revised breakdown of estimates was produced to and examined by the Committee and is attached to this Report as Appendix *F*. It will be seen that the major part of the work is the provision of quarters. The Committee examined these proposals in detail and approved them. We therefore recommend that this item should stand in the Plan and that the estimate should be revised from $1,758,000 to $2,800,000.

12. RURAL LABOURERS' LINES

It was represented to the Committee that out of a total force of rural health labourers of 776, only 25 per cent were housed. We were informed that it is expected that the figure of 776 will remain fairly constant. The Committee were unanimously of the opinion that it should be an integral part of the Medical Plan to provide accommodation for all such labourers over a period of years. We also consider that quarters should be provided for Sanitary Inspectors, Technical Subordinates and other officers who are required to live in the area they serve. Revised estimates show a reduction on the original estimate of $2 millions for labourers' quarters of $400,000 to $1,600,000. If, however, the recommendation is accepted to provide quarters for Sanitary Inspectors and Technical Subordinates, a further amount of $670,000 will be necessary, making $2,270,000 in all.

We also consider that the description of this item should be changed to "Health Department Housing".

13. ANTI-MALARIA WORK

It was explained that this item cannot at present be allocated to any particular work, but is an attempt to make an intelligent forecast of special capital work which will be required in the future. Maintenance of present anti-malarial works is well-looked after by annual provision.

Although not an urgent matter, the Committee considered that the item should have a place in the Medical Plan if the picture of the future needs was to be correct. We therefore recommend its inclusion.

14. DISTRICT HOSPITALS

In view of the revision of item 3 relating to the General Hospital to provide for 1,500 beds instead of 1,000 beds as

in the original 1947 Plan, and of the opinion expressed to us that patients generally preferred to go a longer disatnce to one good central hospital rather than a shorter distance to a secondary hospital, and of the desirability of waiting to see how the expansion of the town areas of Singapore might affect this problem, it was agreed that this item should be deleted from the Plan, but with a recommendation that the matter should be re-considered in a few years' time. This recommendation effects a reduction of $11 millions.

15. Expansion of Infectious Diseases Hospital

The Director of Medical Services explained that a Special Committee was being formed to consider this problem, jointly with the Municipal Health authorities. For these reasons it was agreed that until the problem was more fully resolved this item could be omitted from the Plan.

16. Mental Hospital Improvements

Before the war there were 1,800 patients in this hospital. The number was considerably fewer now owing largely to the callous attitude adopted by the Japanese towards this type of infirmity. The Committee supports the Director of Medical Services in considering that planning on the basis of a population of 2,000 inmates was reasonable. The Committee also agreed that provision should be made for recreational facilities. A revised estimate of cost was produced to the Committee and is attached as Appendix *G* to this Report. We recommend that this item be included in the Plan and that the estimated provision be increased from $1,880,000 to $3 millions.

17. Additional Item

In the course of its discussions the Committee was asked to consider an additional item not appearing in the Plan contained in Council Paper No. 4 of 1948. This is a proposal by the Director of Medical Services to establish a Mental Defectives Home to house 150 low-grade defective and feeble-minded children who, without proper care and control, are liable to become a danger to public peace and morality. These children cannot be dealt with in the same way as adults, nor is their problem the same as that connected with handicapped children who, apart from their physical infirmities, are mentally normal. The proposal has the complete support of this Committee, and an item of $1 million has been entered in the Plan which we now recommend. A breakdown of the Estimates for this item is contained in Appendix *H*. The question of the site for this Home was discussed at length, and it was agreed that the Home should be separate and distinct from the Mental Hospital and that it should be constructed in an area which made this distinction clear,

even though it may be necessary to acquire land for the purpose.

7. The Committee endorses the opinion expressed in paragraph 3 of the Report of the Committee which assisted the Director of Medical Services (Annexure *B* to the Plan) that a ten-year period should be the maximum in which the proposals contained in this Plan should be completed. We have been much impressed by the medical needs of the Colony, and therefore strongly recommend that the revised Plan which we have prepared and attach as Appendix *I* to this Report should be approved, and that it should be carried out within the period of ten years into which we have fitted it.

It will be seen that the Plan we recommend for adoption is expected to cost about $33 millions compared with about $50 millions as set out in the original Plan. The reasons for this are mentioned at their appropriate places in this Report, but we may summarise the main reasons briefly and approximately as follows:—

(*a*) a saving on estimates for the General Hospital of $6 millions;
(*b*) a saving of $2¾ millions on the proposals for the Venereal Diseases Hospital;
(*c*) a saving of $250,000 on the Medical Store;
(*d*) a saving of $11 millions on the proposals for District Hospitals;
(*e*) a saving of $1½ millions on the proposals for Infectious Diseases.

Against these savings, however, there has to be set additional expenditure in connection with the Tuberculosis Sanatorium ($1,000,000); extension at Tan Tock Seng ($1,000,000); Health Department Housing ($750,000); Mental Hospital improvements ($1,000,000) and the Home for Mentally Defective Children ($1,000,000).

In this connection we wish to emphasise two things. Firstly, some of the "saved" items may have to be considered again at a later date; secondly, the figures given are not firm estimates. It would have been impossible for the work of this Committee to have been completed for a very long time if final lay-outs had had to be decided and final plans prepared. When this is done, some variations from the estimates given must be expected.

8. In conclusion we desire to record our thanks to our Secretary (Mrs. D. Alexander) for the able way in which she carried out her duties.

A. WILLIAMS, *Chairman.*
M. J. NAMAZIE.
C. C. TAN.
P. F. de SOUZA.
LIM YEW HOCK.

SINGAPORE, 12*th September*, 1948.

APPENDIX *A*

SINGAPORE GENERAL HOSPITAL

	$	$
ALTERATIONS TO EXISTING BUILDINGS:—		
Additional Storey over Ward 4	265,000	
Additional Storey over Ward 5	265,000	
New Theatre block	300,000	
Air Conditioning for above	60,000	
Two new lifts and one shaft	47,000	
Electrical work to Foregoing	66,000	
		1,003,000
Alterations to existing Ward (1)		20,000
Alterations to existing Ward (7)		20,000
Alterations to existing Ward (10)		20,000
Alterations to existing Ward (11)		20,000
Alterations to X-ray Therapy and Theatres A and B		10,000
Additional Storey over Ward 17		300,000
Electrical work to last		22,500
Lift and Shaft to existing Theatre		27,000
Re-design Ward (14)		25,000
Demolition of old buildings		40,000
NEW WORKS:—		
Pathological Laboratory	350,000	
piling	70,000	
		420,000
Out-patients Dept.		185,000
Children's 200 bed Wards		580,000
Laundry building	125,000	
equipment	225,000	
		350,000
New Kitchens		100,000
HOSPITAL QUARTERS:—		
M.O's qrs. 27 Nos. @ $40,000		1,080,000
M.O's flats 34 Nos. @ $35,000		1,290,000
Sisters and Matrons qrs. – 83 suites + 6 rooms ..		800,000
Nurses hostel – 110 rooms + 10 Air Conditioned rooms		800,000
Hospital servants 323 qrs. (2 room units) (if single room units $1,250,000)		1,400,000
Lab. Assistants and Dental Mech. 20 single @ $5,500 + 20 married @ $15,000		410,000
15 garages and 12 qrs.		70,000
Site Formation		50,000
Roads		200,000
Modernisation of electrical mains and substation ..		200,000
Modernisation of water supply		500,000
New Sewers		100,000
Acquisition of Land (not known)		
		10,042,500

APPENDIX *B*

KANDANG KERBAU HOSPITAL

				$
EXISTING ADMINISTRATION BLOCK:—				
Three floors to be converted to provide 32 3rd class Ante Natal beds, Septic Labour Room, 27 3rd Class labour beds, creche and 48 3rd Class Maternity beds plus additional Lavatory accommodation				60,000
Additional Storey to provide 64 3rd Class Maternity Beds ..				200,000
Existing Out-patients Department converted to Nurses Quarters				10,000
Existing Maternity Block—				
Converted to provide six 36 bed wards and extra lavatory accommodation				40,000
Electrical Work				11,000
NEW BUILDING:—				
Labour Wards for 3 1st Class 6 2nd Class and 27 3rd Class patients				
Maternity Wards for 25 1st Class and 50 2nd Class patients				
Gynæcology Wards for 10 1st Class 27 2nd Class and 50 3rd Class patients				
Theatres—One Large One Septic				
Kitchen and Stores—				
Administration—				
Out-patients three Departments				
Path. Lab., Dispensary				
X-ray Room, Admission, Almoner's Office				
Secretary, Clerical Staff, Steward, Stores, Matrons' Room				1,038,000
Electrical Work on New Hospital Building				95,000
QUARTERS:—				
(1) Hospital Servants 360 Midwives 60				
420 2 room units				1,856,000
(2) M.O's quarters 12 Nos. @ $40,000				480,000
(3) Hospital Assistants—10 married @ $15,000 and 4 single @ $5,000				172,000
(4) Sisters and Nurses quarters:—				
Sisters 24 Matrons 4				
28 suites plus 2 air conditioned rooms				225,000
Nurses 75 single rooms 52 double rooms				
plus 6 air conditioned rooms				953,850
(5) Five Garages and nine syces quarters				25,000
ANCILLARY WORKS:—				
Piled foundations to all new buildings				945,000
Sewers to new building				50,000
Water supply to new building				8,000
Roads and two new bridges—Roads			$70,000	
Bridges			$20,000	
				90,000
Fences				6,000
Acquisition of Land (not known)				
				6,264,850
		Contingencies ..		335,150
		TOTAL ..		6,600,000

APPENDIX *C*

KANDANG KERBAU HOSPITAL

SCHEDULE OF PROPOSED ACCOMMODATION

EXISTING ADMINISTRATION BLOCK:—

Ground Floor—			
3rd Class Ante Natal:			
Two 8 bed wards	16 beds		
One 16 bed ward	16 „		
	—		32 beds
A Septic Labour Room:			
First Floor—			
3rd Class Labour:			
Three 9 bed wards			27 „
Creche			
Second Floor—			
3rd Class Maternity:			
One 24 bed ward	24 „		
One 9 bed ward	9 „		
One 8 bed ward	8 „		
One 4 bed ward	4 „		
One 3 bed ward	3 „		
	—		48 „
Additional Storey—(New)			
3rd Class Maternity			
Two 32 bed wards			64 „
Existing Maternity Block—			
Six 36 bed wards			216 „
	Total 3rd Class ..		387 „

NEW BUILDING:—

Second Class Maternity—			
Ten 5 bed wards	50 beds		
Second Class Labour—			
Three 2 bed wards	6 „		
	—		56 „
First Class Maternity—			
Nine double wards 18 beds			
Seven single wards 7 „			
—	25 „		
Labour—Three Single Units	3 „		
	—		28 „
Isolation (All Classes)—			
Thirty cubicles			30 „
Gynæcology—			
3rd Class—Five 10 bed wards ..	50 „		
2nd Class—Three 9 bed wards ..	27 „		
1st Class—Ten single bed wards ..	10 „		
	—		87 „
	TOTAL ..		588 beds

SUMMARY

Class	Ante Natal	Maternity	Labour	Gynaecology	Total	Isolation
1st ..	—	25	3	10	38	30
2nd ..	—	50	6	27	83	
3rd ..	32	328	27	50	437	
Total ..	32	403	36	87	558+30=588	

APPENDIX *D*

VENEREAL DISEASES HOSPITAL

Conversion of existing Venereal Diseases Hospital at Middle Road to accommodate 120 beds

	$	$
EXISTING BUILDINGS:—		
Alterations and additions to three existing buildings ..		100,000
NEW BUILDINGS:—		
Chief Medical Officer's House (1)	40,000	
Quarters for Medical Officers (5)	175,000	
Quarters for Sisters, Supervisor, Laboratory Assistants, Hospital Assistants and Clerks (42)	630,000	
Quarters for Nurses and Female Clerks (33) ..	264,000	
Quarters for Hospital Servants (46)	200,000	
Garages for four Ambulances	10,000	
Ancillaries	91,000	
		1,410,000
CLINIC:—		
Building for Clinic	80,000	
Quarters for Medical Officers (2)	70,000	
Quarters for Hospital Assistants (6)	90,000	
		240,000
		1,750,000

APPENDIX *E*

NEW 300 BED T.B. HOSPITAL NEAR BEDOK—

PRELIMINARY ESTIMATE OF COST

	$	$
HOSPITAL:—		
Three two storey Ward Blocks each of 100 beds @ $280,000		840,000
Administration block single storey		70,000
Kitchen block single storey		60,000
Covered ways		5,000
Electrical work		77,500
QUARTERS:—		
Senior M.O.	45,000	
Two A.M.Os. @ $35,000	70,000	
1 Matrons qrs.	35,000	
5 Sisters qrs.	40,000	
35 Nurses qrs.	270,000	
6 Hospital Assistants qrs.	42,000	
8 Cooks, 80 Ward Staff, 10 Kebuns, 10 Artisans .. .. 108 quarters ..	370,000	
		872,000
ANCILLARY WORKS:—		
Roads say one mile		47,500
Sewer and disposal plant		30,000
Water Supply		25,000
Site Formation		40,000
Contingencies		150,000
TOTAL ..		2,217,000

APPENDIX *F*

TAN TOCK SENG HOSPITAL

	$
IMPROVEMENTS:—	
Modern Sanitation to existing Mandalay Road Hospital and quarters	97,000
Re-roofing 18 wards and covered ways with asbestos, replacing corrugated iron	113,000
QUARTERS:—	
Medical Officers Quarters—	
Extensive repairs to five existing, new quarters 3 Nos. ..	200,000
Sisters quarters—	
Ten Sisters plus one Almoner—11 suites	88,000
Nurses quarters—	
Hostel for 60 Nurses (if Students' Hostel available no expenditure required on this item)	300,000
Hospital Assistants quarters—	
Extensive repairs to 19 married quarters	95,000
Extensive repairs to 12 single quarters	18,000
Extensive repairs to Bachelors Mess (12)	10,000
New married quarters for 31 families	465,000
New single quarters for six single	33,000
Hospital Servants quarters—	
New quarters for 172 families	745,000
New quarters for 88 single	340,000
ANCILLARY WORKS	
Water Supply	30,000
Sanitation	75,000
Roads (say one mile)	47,000
Site formation	20,000
	2,676,000
Contingencies ..	124,000
TOTAL ..	2,800,000

APPENDIX *G*

MENTAL HOSPITAL

	$	$
ESSENTIAL WORKS:—		
Two 50 bed wards	225,000	
Pantry to each ward	30,000	
Two T.B. wards	125,000	
Cold room of 1,000 cub. ft.	10,000	
New boiler house and move existing boilers etc. ..	9,000	
Clerk and Stewards stores	100,000	
Garage, two vehicles and qrs. for two drivers ..	12,000	
QUARTERS:—		
Two M.Os. @ $40,000	80,000	
Six Nursing Sisters and Matron	60,000	
12 Hospital Assistants or similar	120,000	
320 Hospital Servants	1,393,000	
32 Local Nurses	256,000	
Four Male Nurses	80,000	
		2,500,000
Carried forward ..		2,500,000

APPENDIX *G—continued*

	$	$
Brought forward ..		2,500,000
DESIRABLE WORKS:—		
Modernisation of wards	120,000	
Two rooms for visitors	12,000	
Renovation of Male Workers Dining Room ..	2,250	
Store for farm implements, etc.	17,300	
Occupational Therapy	85,000	
Central recreation hall	80,000	
Work on Kitchens	10,000	
Gate Lodge	3,500	
Day rooms to two wards	30,000	
Airing Court to one female ward	1,000	
		361,050
Contingencies say ..		138,950
		3,000,000

APPENDIX *H*

HOME FOR MENTALLY DEFECTIVE CHILDREN

	$
150 bedded children's wards	435,000
Quarters for Medical Officer (1)	40,000
Quarters for one Matron and five Sisters	50,000
Quarters for one Steward and two Hospital Assistants	45,000
Quarters for Hospital Servants (80)	345,000
Ancillaries	85,000
	1,000,000

APPENDIX *I*

MEDICAL PLAN

Institution	1949	1st year	2nd year	3rd year	4th year	5th year	6th year	7th year	8th year	9th year	10th year	Total
1. Base Medical Store, Pharmacy School and Essential Manufactory ..	145,000	152,000	153,000	..	..	..	..	..	..	..	..	450,000
2. Leper Settlement ..	114,000	114,000	200,000	200,000	152,000	..	..	..	..	..	..	780,000
3. General Hospital ..	..	760,000	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000	1,282,000	10,042,000
4. Kandang Kerbau Hospital	..	587,000	587,000	500,000	500,000	500,000	750,000	1,000,000	1,000,000	1,076,000	100,000	6,600,000
5. Rural Clinics and Dispensaries	82,000	90,000	90,000	90,000	90,000	90,000	110,000	110,000	32,000	..	..	784,000
6. St. John's Island Water Supply	..	..	..	250,000	..	..	..	..	..	..	..	250,000
7. Medical and Dental School Clinic	..	215,000	..	..	..	..	..	..	..	..	..	215,000
8. Sea and Air Ports ..	..	..	200,000	200,000	100,000	100,000	72,000	150,000	..	..	..	822,000
9. Veneral Diseases Hospital	..	..	250,000	250,000	250,000	250,000	250,000	250,000	250,000	..	..	1,750,000
10. T.B. Sanatorium ..	..	..	750,000	750,000	500,000	217,000	..	..	..	..	..	2,217,000
11. Tan Tock Seng Hospital	..	288,000	250,000	250,000	250,000	500,000	500,000	500,000	..	262,000	..	2,800,000
12. Health Department Housing ($100,000 (1948)) ..	100,000	100,000	100,000	200,000	200,000	200,000	200,000	300,000	300,000	200,000	370,000	2,270,000
13. Anti-Malarial ..	..	..	..	..	..	50,000	50,000	50,000	50,000	100,000	200,000	500,000
14. Mental Hospital ..	..	60,000	140,000	100,000	100,000	100,000	500,000	500,000	500,000	500,000	500,000	3,000,000
15. Mental Defectives ..	..	..	..	200,000	200,000	200,000	200,000	200,000	..	..	..	1,000,000
Total Capital Expenditure ..	**441,000**	**2,366,000**	**3,720,000**	**3,990,000**	**3,342,000**	**3,207,000**	**3,632,000**	**4,060,000**	**3,132,000**	**3,138,000**	**2,452,000**	**33,480,000**
Approximate Annual Increase above present Annually Recurrent Expenditure ..	..	250,000	500,000	1,000,000	1,500,000	2,000,000	2,750,000	3,000,000	3,750,000	4,000,000	4,000,000	Expected annual increase in recurrent expenditure on completion of Plan—4 millions.

APPENDIX *II*

FINANCIAL STATEMENT FOR 1949

(*a*) RECEIPTS

Hospital Fees, etc.	*Medical, General and Health*	*Total*
$ c.	$ c.	$ c.
679,333 76	288,102 92	967,436 68

(*b*) PAYMENTS

	Medical and General	Hospitals and Dispensaries	Health Branch	Social Hygiene Branch	General Clerical Service	Government Medical Store	Total
	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.
Personal Emolments ..	475,337 38	1,956,282 09	366,291 43	100,151 78	122,552 51	56,379 10	3,076,994 25
Other Charges	248,990 38	3,743,199 46	346,449 42	106,277 90	..	107,480 52	4,552,397 68
Special Expenditure ..	503,760 21	222,192 25	77,354 68	428 70	..	22,574 20	826,310 04
Total ..	1,228,087 97	5,921,673 80	790,095 53	206,858 38	122,552 51	186,433 82	8,455,702 01

Note:—(1) Payments include Contributions to College of Medicine and Tan Tock Seng Hospital Committee.
(2) Above statement also include cost of indents on Crown Agents.

APPENDIX *III*

ANTI-MALARIAL WORKS CARRIED OUT IN THE YEAR 1949

Locality	MATERIALS USED						WORK DONE						
							No. of Yards of Drain Maintained		No. of Yards of sub-soil pipes laid	No. of Yards of Open Drain		No. of Yards of open drain repaired	No. of Yards of sub-soil pipes repaired
	Subsoil Pipes	Channels	Slabs	Bricks	Cement	A.M. Oil	Earth	Concrete		Earth	Concrete		
Pasir Panjang ..	750	880	1,110	2,250	103	4,520	29,765	8,945	256	136	389	330	285
Bukit Timah ..	683	214	236	6,320	261	6,882	32,020	48,789	676	1,550	180	982	895
Bukit Panjang ..	215	117	245	2,180	97	3,996	10,109	8,250	2,270	2,697	450	3,725	1,449
Sembawang ..	473	567	194	200	36	3,117	70,400	12,392	150	12	348	167	34
Serangoon ..	998	1,594	1,435	18,550	389	7,263	238,170	108,796	112	3,718	763	1,732	3,291
Bedok	50	315	165	4,950	115	7,078	112,835	40,100	..	3,855	140	414	18
Changi	1,300	404	683	3,190	151	2,590	14,892	1,295	350	150	360	655	150
Town	1,000	..	500	100	15	..	4,380	9,800	..	..	..	..	150
Total ..	5,469	4,091	4,568	37,740	1,167	35,446	512,571	238,367	3,814	12,118	2,630	8,005	6,272

APPENDIX *IV*

SUMMARY OF WORK CARRIED OUT BY DISTRICT SANITARY INSPECTORS DURING 1949

I. Infectious Diseases and Disinfections

No. of cases of Plague	—
No. of cases of Small-pox	—
No. of cases of Cholera	—
No. of cases of Diphtheria	52
No. of cases of Measles	—
No. of cases of Enteric	22
No. of cases of Chickenpox	86
No. of cases of Other infectious diseases*	195

II. Inspection and Sanitation

No. of inspections house to house	16,693
No. of inspections Police Stations	640
No. of inspections Schools	1,482
No. of inspections Government buildings	1,121
No. of buildings with insanitary latrines	2,394
No. of buildings with insanitary urinals	473
No. of latrines inspected	18,017
No. of recommended reconstruction	871
No. of latrines abolished	635
No. of latrines constructed or reconstructed	1,784
No. of bored hole latrines constructed	108
No. of night-soil pails on removal list	5,293
Daily average amount of refuse in cubic feet	2,078
No. of village incinerators serviceable	12
No. of village incinerators unserviceable	2
No. of buildings with inadequate drainage	536
No. of linear yards drains cleared yearly	168,209
No. of linear yards new earth drains dug	13,203
No. of linear yards masonary drains constructed	2,341
No. of linear yards masonary drains repaired	7,715
No. of linear yards subsoil drains constructed	870
No. of linear yards subsoil drains repaired	6,142

III. Buildings

No. of permits issued	285
No. of permits rejected	10
No. of plans passed	177
No. of plans approved conditionally	84
No. of plans rejected	13
No. of new buildings erected	116
No. of buildings reconstructed	89
No. of buildings condemned	18
No. of buildings demolished	16

* Includes Typhus (Scrub) 10, Leprosy 59.

IV. Factories, Workshops and Offensive Trades

Factories and Godowns	1,370	
Others	3,725	
Total inspected		5,095

V. Food Total Inspections 29,746

Eating houses	10,574	
Coffee Shops	2,306	
Butcher Shops and Slaughter	720	
Fishmongers	2,808	
Grocers	4,344	
Markets	2,196	
Milk Vendors	1,428	
Bake-Houses	1,671	
Hawkers	5,898	

VI. Keeping of Animals—Total Inspections .. 6,501

Cowsheds	1,342	
Piggeries	4,708	
Goat pens	117	
Others	127	
Nuisances in Cowsheds		275
Nuisances in Piggeries		1,656
Goat pens		19

VII. General

Water—No. of samples taken for examination from wells, etc. ..	45
Rats—No. of rats submitted for examination	425
Complaints—No. received	231
Interviews with agents and owners	6,013
No. of Intimation notices served	1,046
No. complied with	811
No. of nuisances notices served	815
No. complied with	448
No. of anti-mosquito notices served	206
No. complied with	68
No. of new lepers discovered	32

VIII. Prosecutions

Total number		159
Results of prosecutions	Total fines ..	$2,945.00

APPENDIX *V*

Maternity and Child Health Rural Centres

—	Year 1948	Year 1949
Visits to Homes by Health Nurses ..	61,431	40,121
Midwives' work:		
Home Visits, Pre-natal	4,793	5,846
Confinements attended	6,545	7,849
Nursing Visits to Mothers and Babies	33,363	38,978
Patients in labour sent to Hospital ..	165	266
Attendances at Clinics:		
Pre-natal	15,597	23,168
Infants under one year	68,478	85,385
Children over one year examined and treated	21,019	47,208
Vaccinations	11,224	11,620

APPENDIX *VI*

Return of Milk Distribution at Rural Health Clinics for 1949

Clinics	Number of Feeds		Total	Amount used
	Mothers	Children		Powdered Milk
Pasir Panjang and Islands	29,275	24,620	53,895	2,246
Bukit Timah	74,451	112,689	187,140	6,074
Jurong	27,645	4,900	32,545	2,760
Bukit Panjang and Lim Chu Kang	27,705	52,727	80,432	2,756
Seletar	1,920	51,160	53,080	2,095
Yio Chu Kang	6,915	27,563	34,478	1,241
Upper Serangoon ..	23,281	51,183	74,464	2,426
Lorong Tai Seng ..	8,310	24,552	32,862	1,044
Kampong Batak	22,455	56,245	78,700	2,845
East Coast and Ulu Bedok	25,710	44,159	69,869	2,616
Changi and Pulau Tekong	15,661	31,126	46,787	2,146
Grand Total ..	263,328	480,924	744,252	28,249

APPENDIX *VII*

WORK COVERED BY MOBILE DISPENSARIES

New Cases	12,819
School Cases	19,585
Repetitions	3,826
Revaccinations	431

APPENDIX *VIII*

ST. JOHN'S ISLAND, QUARANTINE STATION

Figures for the year 1949

Total passengers admitted during the year		22,058
Greatest number admitted on any one day (8-12-49)		2,066
Maximum number in residence on any one day (8-12-49)		2,066
Minimum number in residence on any one day		1
(*a*) Total deaths during the year in Hospital		12
(*b*) Total deaths prior to admission to Hospital		Nil
(*c*) Death on board. Buried on St. John's East		1
(*d*) Death in Camp		1
(*e*) Death after discharge from Hospital on 23-12-49		1
Death rate per mille amongst passengers admitted		.545
Number of Municipal Contact admitted		Nil
Number of Government Contacts admitted		3
Number of Municipal Contacts who developed infectious diseases on the island		Nil
Number of Government Contacts who developed infectious diseases on the island		Nil
Number of gallons of Singapore water provided		16,315,264
Average stay of contacts (days)		4.73
Passengers are divided into:—		
Chinese	13,938	
Northern Indians	1,778	
Southern Indians	4,036	
Malays and Javanese	2,138	
Eurasians	4	
Others	164	
TOTAL	22,058	

HOSPITAL—ST. JOHN'S ISLAND

No. of cases treated	100
Total number of deaths	f2
Average daily number of patients in Hospital	0.27
Total number of vaccinations	22.963
Total number of anti-cholera inoculations	1,106
Total number of out-patients treated*	4,134
Total number of attendances*	42,139
Total number of births	20

* Including "detainees".

APPENDIX *IX*

IN-PATIENTS—ALL HOSPITALS FOR THE YEAR 1949

The following table shows the hospitals maintained by the Medical Department, Singapore, the daily average number of patients in each, the number of patients admitted during the year, the total number of patients treated, the number of deaths and the death rate per hundred treated. (*The Quarantine Hospital and Leper Settlement are not included*).

Hospitals	Average daily No. of patients	Admissions during the year	Cases Treated during Year			Deaths	Mortality Per cent
			Male	Female	Total		
General	607.51	15,478	11,351	4,700	16,051	2,005	12.49
T.T.S.H. (Tuberculosis and General) ..	561.59	1,637	1,790	402	2,192	418	19.07
K.K. (Maternity and Gynaecology) ..	205.00	14,779	..	14,925	14,925	87	0.58
Police	12.46	854	869	..	869	..	..
Prison, Outram ..	47.00	792	891	..	891	9	1.01
Prison, Changi ..	25.90	481	523	..	523	..	..
Mental	943.00	631	899	590	1,489	63	4.23
St. Andrew's Orthopaedic	63.97	44	63	46	109	..	..
Social Hygiene ..	46.74	2,168	371	1,850	2,221	17	0.77
Middleton ..	48.50	1,678	1,140	566	1,706	97	5.69
Total ..	..	38,542	17,897	23,079	40,976	2,696	6.58

N.B.—Total cases treated in 1948=38,803.

APPENDIX *X*

HOSPITALS, COLONY OF SINGAPORE IN-PATIENTS

Return of Diseases and Deaths for the Year 1949

Diseases	Remaining at end of 1948*	Yearly Total		Total cases treated†	Remaining at end of 1949‡	Remarks
		Admissions	Deaths			
I.—*Infectious and Parasitic Diseases*						
1. Typhoid fever	4	131	17	135	3	
2. Paratyphoid fever ..	..	3	..	3	..	
3. Typhus:—						
(1) Other than Tropical typhus ..	1	11	2	12	..	
(2) Tropical typhus 'x 19' (or W or Urban) ..	..	18	..	18	..	
(3) Tropical typhus 'K' (or rural), or Tsutsugamushi fever	..	16	2	16	1	
(4) Other rickettsia infections ..	..	..	..	..	..	
4. Relapsing fever ..	..	..	..	..	..	
5. Undulant fever ..	..	..	..	..	..	
6. Small-pox	..	..	..	..	..	
7. Measles	..	226	30	226	..	
8. Scarlet fever	..	..	..	..	..	
9. Whooping cough ..	..	11	2	11	..	
10. Diphtheria	14	276	47	290	8	
11. Influenza	4	228	4	232	5	
12. Cholera	..	..	..	..	..	
13. Dysentery:—						
(1) Amœbic ..	3	150	9	153	3	
(2) Bacillary ..	1	39	6	40	..	
(3) Mixed	..	..	..	..	..	
(4) Undefined or due to other causes ..	1	16	2	17	..	
14. Plague:—						
(1) Bubonic ..	..	..	..	..	..	
(2) Pneumonic ..	..	..	..	..	..	
(3) Septicæmic ..	..	..	..	..	..	
(4) Undefined ..	..	..	..	..	..	
15. Erysipelas	..	18	1	18	..	
16. Acute Poliomyelitis or Polioencephalitis	7	76	2	83	5	
17. Encephalitis lethargica ..	..	3	1	3	..	
18. Cerebro-spinal fever ..	..	12	2	12	..	
19. Glanders	..	..	..	..	..	
Carried forward ..	35	1,234	127	1,269	25	

The form shows in the main the arrangement of diseases in the *International Nomenclature, 1931 Edition* To save space the unimportant diseases of any class can be grouped in their places as "Other Diseases" of the Class.

*That is, the year previous to that for which the return is made.

†"Total cases treated" will, of course, include those remaining in Hospital at the end of the previous year.

‡The figures in this column to be carried on to the next year's Return.

APPENDIX X—*continued*

RETURN OF DISEASES AND DEATHS FOR THE YEAR 1949—*continued*

Diseases	Remaining at end of 1948*	Yearly Total		Total cases treated†	Remaining at end of 1949‡	Remarks
		Admissions	Deaths			
Brought forward ..	35	1,234	127	1,269	25	
I.—*Infectious and Parasitic Diseases*—(contd).						
20. Anthraz	..	..	..	..	..	
21. Rabies	..	..	..	..	..	
22. Tetanus:—						
(1) Tetanus of the newly born ..	..	43	36	43	..	
(2) Other forms of tetanus ..	1	36	12	37	2	
23. Tuberculosis of the respiratory system	406	1,429	389	1,835	446	
24. Tuberculosis of the central nervous system ..	9	183	161	192	6	
25. Tuberculosis of the intestines or peritoneum ..	2	35	10	37	..	
26. Tuberculosis of the vertebral column	30	68	8	98	26	
27. Tuberculosis of other bones and joints	61	98	2	159	63	
28. Tuberculosis of the skin or subcutaneous tissue (Lupus)	..	2	..	2	..	
29. Tuberculosis of the lymphatic system	5	43	1	48	4	
(abdominal and bronchial glands excepted) ..	..	..	..	..	..	
30. Tuberculosis of the genito-urinary system ..	2	25	..	27	..	
31. Tuberculosis of other organs	..	9	2	9	3	
32. Tuberculosis disseminated ..	4	25	18	29	3	
33. Leprosy	4	11	..	15	1	
34. Syphilis (also *see* 35 (7)):—						
(1) Primary ..	2	109	1	111	4	
(2) Secondary ..	19	481	4	500	5	
(3) Tertiary ..	14	410	2	424	6	
(4) Hereditary ..	12	294	19	306	13	
(5) Period not indicated	12	154	8	166	20	
35. Other venereal diseases:—						
(1) Soft chancre ..	3	38	..	41	1	
(2) Gonorrhœa ..	8	246	..	254	4	
(3) Gonorrhœal ophthalmia	..	135	..	135	1	
(4) Other gonorrhœal complications ..	7	76	..	83	5	
(5) Granuloma venereum ..	..	..	..	..	..	
(6) Tropical bubo (Lymphogranuloma inguinale) ..	1	16	..	17	1	
(7) Mixed venereal infections ..	2	77	1	79	1	
Carried forward ..	639	5,277	801	5,916	640	

APPENDIX X—*continued*

RETURN OF DISEASES AND DEATHS FOR THE YEAR 1949—*continued*

Diseases	Remaining at end of 1948*	Yearly Total		Total cases treated†	Remaining at end of 1949‡	Remarks
		Admissions	Deaths			
Brought forward ..	639	5,277	801	5,916	640	
I.—*Infectious and Parasitic Diseases*—(contd.)						
36. Purulent infective septicæmia or Pyæmia	3	50	36	53	1	
37. Yellow fever	..	..	..	..	..	
38. Malaria:—						
(1) Tertian (Benign) ..	1	54	..	55	..	
(2) Quartan ..	..	..	..	..	..	
(3) Aestivo-autumnal (Subtertian) ..	3	132	27	135	3	
(4) Mixed infections ..	1	8	1	9	1	
(5) Unclassified ..	6	206	1	212	..	
(6) Cachexia ..	2	4	..	6	1	
(7) Blackwater fever ..	1	..	..	1	..	
39. Other diseases due to Protozoa:—						
(1) Yaws (framboesia) ..	..	12	1	12	..	
(2) Spirochætosis icterohæmorrhagica ..	..	20	2	20	..	
(3) Leishmaniasis (dermal)	..	..	..	..	..	
(4) Kala azar ..	..	2	..	2	..	
(5) Other diseases ..	..	12	..	12	4	
40. *See* 42 (6)	..	..	..	..	..	
41. *See* 42 (3)	..	..	..	..	..	
42. Other diseases due to Helminths:—						
Cestodes						
(1) Taenia solium ..	..	2	..	2	..	
(2) Tænia saginata ..	..	1	..	1	..	
(3) Other cestodes, including hydatid cyst	..	..	..	..	..	
Nematodes						
(4) Filiara	..	16	..	16	..	
(5) Ascaris ..	4	89	2	93	4	
(6) Ankylostoma ..	4	90	..	94	2	
(7) Oxyuris vermicularis	..	..	..	..	..	
(8) Dracunculus medinensis ..	..	..	..	..	..	
Trematodes						
(9) Schistosomum japonicum ..	..	..	..	..	..	
(10) Clonorchis sinensis	..	..	..	..	..	
(11) Other helminths ..	..	..	..	..	..	
Carried forward ..	664	5,975	871	6,639	656	

APPENDIX X—*continued*

RETURN OF DISEASES AND DEATHS FOR THE YEAR 1949—*continued*

Diseases	Remaining at end of 1948*	Yearly Total		Total cases treated†	Remaining at end of 1949 ++	Remarks
		Admissions	Deaths			
Brought forward ..	664	5,975	871	6,639	65	
I.—*Infectious and Parasitic Diseases*—(contd.)						
43.—(1) Sprue	..	1	..	1	..	
(2) Actinomycosis ..	..	2	..	2	..	
(3) Other mycotic infections excluding purely dermal mycosis ..	..	2	..	2	..	
44. Other infectious or parasitic diseases:—						
(1) Vaccinia including post vaccinal encephalitis ..	..	..	..	..	..	
(2) Other sequelæ of vaccination ..	..	1	..	1	..	
(3) Rubella ..	..	10	..	10	..	
(4) Varicella (chickenpox)	7	375	..	382	4	
(5) Mumps and its complications ..	1	12	..	13	..	
(6) Dengue ..	..	29	..	29	..	
(7) Melioidosis ..	..	..	..	..	..	
(8) Myiasis ..	..	..	..	..	..	
(9) Glandular fever ..	..	..	..	..	..	
(10) Others	..	3	..	3	..	
II.—*Cancer and other Tumours*						
45. Cancer or other malignant diseases of the buccal cavity, and pharynx and œsophagus	6	60	13	66	4	
46. Cancer or other malignant tumours of the digestive organs and peritoneum:—						
(1) Stomach ..	3	58	26	61	3	
(2) Liver	..	39	20	39	..	
(3) Other digestive organs ..	..	62	23	62	2	
47. Cancer or other malignant tumours of the respiratory organs	4	27	11	31	2	
48. Cancer or other malignant tumours of the uterus ..	..	4	2	4	..	
49. Cancer or other malignant tumours of other female genital organs ..	..	3	1	3	..	
50. Cancer or other malignant tumours of the breast ..	1	23	4	24	2	
Carried forward ..	686	6,686	971	7,372	673	

APPENDIX *X—continued*

RETURN OF DISEASES AND DEATHS FOR THE YEAR 1949—*continued*

Diseases	Remaining at end of 1948*	Yearly Total		Total cases treated†	Remaining at end of 1949††	Remarks
		Admissions	Deaths			
Brought forward ..	686	6,686	971	7,372	673	
II.—*Cancer and other Tumours* —(contd.)						
51. Cancer or other malignant tumours of the male genito-urinary organs ..	1	18	1	19	4	
52. Cancer or other malignant tumours of the skin ..	..	23	4	23	..	
53. Cancer or other malignant tumour of organs not specified	6	76	12	82	5	
54. Tumours non-malignant:—						
(1) Of female genital organs ..	..	11	..	11	..	
(2) Of other sites ..	2	75	..	77	..	
55. Tumours of undetermined nature:—						
(1) Female genital organs ..	..	3	..	3	..	
(2) Other sites ..	..	102	16	102	3	
III.—*Rheumatism, Diseases of Nutrition and of Endocrine Glands and other General Diseases*						
56. Rheumatic Fever:—						
(1) With cardiac involvement ..	..	66	17	66	4	
(2) Without cardiac involvement ..	1	14	..	15	3	
57. Rheumatism and Arthritis (non-suppurative) ..	8	123	..	131	9	
58. Gout	1	11	..	12	..	
59. Diabetes (not including diabetes insipidus) ..	5	99	11	104	4	
60. Scurvy (including Barlow's disease)	..	2	..	2	..	
61.—(1) Beri-beri including epidemic dropsy ..	7	32	12	39	1	
(2) Beri-beri associated with pregnancy or labour	..	..	..	..	..	
62. Pellagra	..	2	..	2	..	
63. Rickets	1	17	..	18	2	
64. Other diseases due to hypovitaminosis	2	5	1	7	..	
65. Diseases of the pituitary gland	..	5	..	5	1	
Carried forward ..	720	7,370	1,045	8,090	709	

APPENDIX X—*continued*

RETURN OF DISEASES AND DEATHS FOR THE YEAR 1949—*continued*

Diseases	Remaining at end of 1948*	Yearly Total		Total cases treated†	Remaining at end of 1949‡	Remarks
		Admissions	Deaths			
Brought forward ..	720	7,370	1,045	8,090	709	
III.—*Rheumatism, Diseases of Nutrition and of Endocrine Glands and other General Diseases*—(contd.)						
66. Diseases of the thyroid and parathyroid glands:—						
(1) Simple goitre ..	1	23	..	24	..	
(2) Exophthalmic goitre	..	43	2	43	7	
(3) Myxœdema, cretinism ..	..	1	..	1	..	
(4) Tetany ..	..	3	..	3	..	
(5) Others	..	2	..	2	..	
67. Diseases of the thymus ..	..	..	..	..	..	
68. Diseases of the adrenal glands (excluding tuberculosis) ..	..	2	2	2	..	
69. Other diseases of metabolism, etc.	..	7	3	7	..	
IV.—*Diseases of the Blood and Blood Forming Organs*						
70. Hæmorrhagic conditions:—						
(1) Purpura ..	1	22	11	23	2	
(2) Hæmophilia ..	..	3	1	3	..	
71. Anæmia and chlorosis:—						
(1) Pernicious anæmia	..	1	1	1	..	
(2) Splenic anæmia ..	..	7	..	7	1	
(3) Chlorosis ..	..	..	..	..	..	
(4) Secondary anæmia	7	20	..	27	3	
(5) Tropical macrocytic anæmia ..	..	6	1	6	..	
(6) Others	10	98	5	108	8	
72. Leukæmia:—						
(1) Leukæmia ..	..	7	4	7	..	
(2) Hodgkin's disease ..	..	9	4	9	2	
73. Diseases of the spleen not elsewhere mentioned ..	..	2	1	2	..	
74. Other diseases of the blood and blood forming organs	..	..	..	..	..	
V.—*Chronic Poisoning*						
75. Alcoholism (acute or chronic) including inebriety ..	1	24	..	25	..	
76. Poisoning by other organic substances (not by violence):—						
(1) Opium	5	19	..	24	1	
(2) Morphia, cocaine ..	..	..	..	..	..	
(3) Others	..	1	..	1	..	
Carried forward ..	745	7,670	1,080	8,415	733	

APPENDIX *X—continued*

RETURN OF DISEASES AND DEATHS FOR THE YEAR 1949—*continued*

Diseases	Remaining at end of 1948*	Yearly Total		Total cases treated†	Remaining at end of 1949‡	Remarks
		Admissions	Deaths			
Brought forward ..	745	7,670	1,080	8,415	733	
V.—*Chronic Poisoning*—(contd.)						
77. Poisoning by mineral substances (not by violence):—						
(1) Lead	..	1	..	1	..	
(2) Arsenic ..	..	10	3	10	..	
(3) Others	..	3	..	3	..	
VI.—*Diseases of the Nervous System and Sense Organs*						
78. Encephalitis (not including encephalitis lethargica):—						
(1) Cerebral abscess ..	1	11	11	12	..	
(2) Other forms of encephalitis ..	1	26	20	27	1	
79. Meningitis (not including tuberculous meningitis or cerebrospinal meningitis)	3	66	34	69	5	
80. Tabes dorsalis (Locomotor ataxia)	7	11	2	18	1	
81. Other diseases of the spinal cords§	12	48	4	60	21	
82. Cerebral vascular accidents	3	177	70	180	7	
83. General paralysis of the insane	4	87	20	91	51	
84. Other forms of insanity, *i.e.* not 83, 150 (1), 162 (1), or 203	860	692	45	1,552	948	
85. Epilepsy	3	82	..	85	18	
86. Infantile convulsions (age under 5 years) ..	..	14	2	14	1	
87. Other diseases of the nervous system:—						
(1) Chorea ..	..	3	..	3	..	
(2) Neuritis and neuralgia	6	35	..	41	3	
(3) Paralysis agitans ..	24	19	4	43	24	
(4) Disseminated sclerosis	..	1	1	1	..	
(5) Neurasthenia ..	1	25	..	26	1	
(6) Hysteria ..	3	24	..	27	1	
(7) Others	1	66	4	67	1	
88. Diseases of the eye:—						
(1) Conjunctivitis ..	7	91	..	98	3	
(2) Trachoma ..	3	23	..	26	1	
(3) Corneal ulcer ..	2	46	..	48	4	
(4) Cataract ..	8	269	..	277	15	
(5) Others	49	603	1	652	49	
Carried forward ..	1743	10,103	1,301	11,846	1,888	

§ Of this: Post-Poliomyelitis:—Remaining 1948, 10; Admissions 1949, 19; Total cases treated 1949, 29 Remaining 1949, 12.

APPENDIX X—*continued*

RETURN OF DISEASES AND DEATHS FOR THE YEAR 1949—*continued*

Diseases	Remaining at end of 1948*	Yearly Total		Total cases treated†	Remaining at end of 1949‡	Remarks
		Admissions	Deaths			
Brought forward ..	1,743	10,103	1,391	11,846	1,888	
VI.—*Diseases of the Nervous System and Sense Organs*—(contd.)						
89. Diseases of the ear and/or the mastoid sinus:—						
(1) Otitis externa ..	..	19	..	19	..	
(2) Otitis media and its complications ..	..	48	4	48	4	
(3) Others	..	33	1	33	..	
VII.—*Diseases of the Circulatory System*						
90. Pericarditis	..	7	6	7	..	
91. Acute endocarditis:—						
(1) Malignant ..	..	13	7	13	..	
(2) Others (not included elsewhere) ..	1	12	4	13	..	
92. Chronic endocarditis: valvular disease (except due to specific cause elsewhere stated)	8	115	23	123	7	
93. Diseases of the myocardium (except due to specific cause elsewhere stated) ..	..	3	2	3	1	
94. Diseases of the coronary arteries (including Angina pectoris)	..	29	13	29	..	
95. Other diseases of the heart (unless due to specific cause elsewhere stated):—						
(1) Auricular fibrillation	..	19	1	19	5	
(2) Heart block ..	2	4	2	6	..	
(3) Others	9	33	10	42	..	
96. Aneurysm (unless due to specific cause elsewhere stated):—						
(1) Aneurysm of aorta ..	..	10	5	10	..	
(2) Aneurysm of other arteries ..	..	..	..	..	..	
97. Arterio-sclerosis (other than (82), etc.)	2	12	3	14	4	
98. Gangrene	1	11	3	12	..	
99. Other diseases of the arteries	1	22	2	23	1	
100. Diseases of the veins:—						
(1) Varicose veins ..	1	33	..	34	2	
(2) Hæmorrhoids ..	6	181	1	187	1	
(3) Phlebitis ..	..	11	1	11	..	
(4) Thrombosis ..	4	6	2	10	..	
(5) Others	..	1	..	1	..	
Carried forward ..	1,778	10,725	1,391	12,503	1,913	

APPENDIX *X—continued*

RETURN OF DISEASES AND DEATHS FOR THE YEAR 1949—*continued*

Diseases	Remaining at end of 1948*	Yearly Total		Total cases treated†	Remaining at end of 1949‡	Remarks
		Admissions	Deaths			
Brought forward ..	1,778	10,725	1,391	12,503	1,913	
VII.—*Diseases of the Circulatory System*—(contd.)						
101. Diseases of the lymphatic system:—						
(1) Lymphangitis ..	..	6	..	6	..	
(2) Lymphadenitis ..	1	34	..	35	2	
(3) Bubo (non-specified)	2	43	..	45	..	
102. Abnormalities of blood pressure:—						
(1) High blood pressure	11	227	39	238	26	
(2) Low blood pressure	..	..	..	..	..	
103. Other diseases of the Circulatory system:—						
(1) Epistaxis ..	..	12	..	12	..	
(2) Others (including unexplained hæmorrhages) ..	..	14	2	14	..	
VIII.—*Diseases of the Respiratory System*						
104. Diseases of the nasal fossæ and its annexa:—						
(1) Diseases of the nose	4	73	..	77	..	
(2) Diseases of the accessory nasal sinuses	1	103	..	104	..	
105. Diseases of the larynx:—						
(1) Laryngismus stridulus ..	..	..	..	..	..	
(2) Laryngitis (acute or chronic, of non-specific etiology)	..	11	..	11	..	
(3) Other diseases of the larynx ..	..	2	..	2	..	
106. Bronchitis:—						
(1) Acute	6	90	3	96	2	
(2) Chronic ..	5	58	3	63	..	
(3) Not defined as acute or chronic ..	1	148	2	149	2	
107. Broncho-pneumonia ..	6	532	304	538	3	
108. Lobar-pneumonia ..	2	152	17	154	1	
109. Pneumonia (not otherwise defined)	2	61	4	63	3	
110. Pleurisy:—						
(1) Empyema ..	2	27	6	29	4	
(2) Other pleurisy ..	6	122	5	128	7	
Carried forward ..	1,827	12,440	1,776	14,267	1,963	

APPENDIX *X—continued*

RETURN OF DISEASES AND DEATHS FOR THE YEAR 1949—*continued*

Diseases	Remaining at end of 1948*	Yearly Total		Total cases treated†	Remaining at end of 1949‡	Remarks
		Admissions	Deaths			
Brought forward ..	1,827	12,440	1,776	14,267	1,963	
VIII.—*Diseases of the Respiratory System*—(contd.)						
111. Congestion and hæmorrhagic infraction of lung, etc.:—						
(1) Hypostatic congestion of lung ..	..	2	1	2	..	
(2) Massive collapse ..	..	..	..	..	..	
(3) Pulmonary embolism	..	3	1	3	..	
(4) Others	..	2	1	2	..	
112. Asthma	4	153	6	157	6	
113. Pulmonary emphysema ..	2	14	7	16	3	
114. Other diseases of the respiratory system:—						
(1) Chronic interstitial pneumonia (including occupational diseases of the lung) ..	..	1	..	1	..	
(2) Gangrene of the lung	..	2	..	2	..	
(3) Abscess of the lung	1	34	12	35	6	
(4) Bronchiectasis ..	2	35	2	37	7	
(5) Others	2	12	1	14	..	
IX.—*Diseases of the Digestive System*						
115. Diseases of the buccal cavity, pharynx, etc.:—						
(1) Pyorrhœa and Gingivitis	2	106	..	108	3	
(2) Dental caries ..	1	25	..	26	..	
(3) Stomatitis ..	..	18	..	18	..	
(4) Vincent's or Ludwig's Angina ..	..	20	2	20	..	
(5) Diseases of the tonsils	6	477	2	483	6	
(6) Others, including coryza, acute nasopharyngitis, etc.	5	213	1	218	4	
116. Diseases of the œsophagus ..	3	45	5	48	1	
117. Ulcer of the stomach or duodenum:—						
(1) Ulcer of the stomach	21	137	25	158	10	
(2) Ulcer of the duodenum ..	1	54	6	55	1	
118. Other diseases of the stomach:—						
(1) Gastritis ..	5	102	..	107	5	
(2) Others, *e.g.* indigestion	2	107	4	109	6	
Carried forward ..	1,884	14,002	1,852	15,886	2,021	

APPENDIX *X—continued*

RETURN OF DISEASES AND DEATHS FOR THE YEAR 1949—*continued*

Diseases	Remaining at end of 1948*	Yearly Total		Total cases treated†	Remaining at end of 1949‡	Remarks
		Admissions	Deaths			
Brought forward ..	1,884	14,002	1,852	15,886	2,021	
IX.—*Diseases of the Digestive System*—(contd.)						
119. Diarrhœa and enteritis (under 2 years)	16	576	235	592	12	
120. Diarrhœa and enteritis (2 years and over):— ..						
(1) Colitis	..	25	1	25	..	
(2) Otherwise defined, including gastro-enteritis ..	6	232	17	238	1	
121. Appendicitis	10	484	11	494	11	
122. Hernia, Intestinal obstruction:—						
(1) Hernia ..	10	261	2	271	6	
(2) Strangulated hernia	2	52	6	54	..	
(3) Intestinal obstruction (including intussusception) .	..	42	21	42	2	
123. Other diseases of the intestines:—						
(1) Constipation, intestinal stasis ..	..	29	..	29	..	
(2) Diseases of Rectum or Anus ..	1	29	..	30	..	
(3) Others, *e.g.*, intestinal colic ..	4	187	4	191	8	
124. Cirrhosis of liver (non-syphilitic):—						
(1) Alcoholic .	3	12	4	15	..	
(2) Not returned as alcoholic ..	1	69	22	70	4	
125. Other diseases of the liver:—						
(1) Acute yellow atrophy	..	6	4	6	..	
(2) Toxic hepatitis ..	1	60	2	61	1	
(3) Amœbic abcess and hepatitis ..	4	58	9	62	2	
(4) Others	2	9	4	11	..	
126. Biliary calculi or Biliary colic	1	29	6	30	1	
127. Other diseases of the gall bladder and ducts:—						
(1) Cholecystitis without record of calculi	3	61	1	64	6	
(2) Others, *e.g.* catarrhal jaundice ..	..	21	4	21	..	
128. Diseases of the pancreas (excluding diabetes mellitus)	..	5	2	5	..	
129. Peritonitis, without stated cause:—						
(1) Acute	..	32	17	32	1	
(2) Chronic ..	..	16	1	16	..	
Carried forward ..	1,948	16,297	2,225	18,245	2,076	

APPENDIX *X—continued*

RETURN OF DISEASES AND DEATHS FOR THE YEAR 1949—*continued*

Diseases	Remaining at end of 1948*	Yearly Total		Total cases treated†	Remaining at end of 1949‡	Remarks
		Admissions	Deaths			
Brought forward ..	1,948	16,297	2,225	18,245	2,076	
X.—*Diseases of the Genito-Urinary System (non venereal)*						
130. Acute nephritis ..	6	72	10	78	7	
131. Chronic nephritis ..	7	112	29	119	8	
132. Nephritis (undefined as acute or chronic)	5	35	22	40	2	
133. Other diseases of the kidney and annexa:—						
(1) Pyelitis ..	1	88	5	89	3	
(2) Others	3	55	3	58	5	
134. Calculi of the urinary passages:—						
(1) Calculi of the kidney and ureter, or renal colic	6	115	..	121	2	
(2) Calculi of the bladder or urethra ..	3	32	2	35	..	
(3) Calculi of unstated site	..	6	..	6	..	
135. Diseases of the Bladder:—						
(1) Cystitis ..	..	18	1	18	..	
(2) Others	..	26	1	26	..	
136. Diseases of the urethra:—						
(1) Stricture ..	4	46	1	50	..	
(2) Others	2	24	..	26	..	
137. Diseases of the prostate ..	2	32	2	34	3	
138. Diseases of the male genital organs:—						
(1) Epididymitis ..	..	21	..	21	..	
(2) Orchitis ..	2	26	..	28	..	
(3) Hydrocele ..	2	76	..	78	..	
(4) Others, *e.g.* phimosis	3	68	..	71	2	
139. Diseases of the female genital organs:—						
(1) Diseases of the ovary	..	89	3	89	..	
(2) Diseases of the fallopian tube ..	..	127	1	127	2	
(3) Diseases of the parametrium	..	39	..	39	..	
(4) Diseases of the uterus, including menorrhagia and dysmenorrhœa ..	1	569	4	570	4	
(5) Diseases of the breast	2	41	..	43	1	
(6) Other diseases of the female genital organs, *e.g.* prolapse ..	..	311	..	311	2	
Carried forward ..	1,997	18,325	2,309	20,322	2,117	

APPENDIX *X—continued*

RETURN OF DISEASES AND DEATHS FOR THE YEAR 1949—*continued*

Diseases	Remaining at end of 1948*	Yearly Total		Total cases treated†	Remaining at end of 1949‡	Remarks
		Admissions	Deaths			
Brought forward ..	1,997	18,325	2,309	20,322	2,117	
XI.—*Conditions arising in Pregnancy, Childbirth and the Puerperal State*						
140. Post abortive sepsis ..	..	30	5	30	..	
141. Abortion not returned as septic	..	696	5	696	4	
142. Ectopic gestation ..	..	70	4	70	1	
143. Other accidents of pregnancy	..	159	..	159	2	
144. Hæmorrhage connected with childbirth:–						
(1) Placenta prævia ..	..	86	5	86	1	
(2) Others	..	..	..	..	..	
145. Puerperal sepsis:—						
(1) Puerperal septicæmia	..	22	4	22	..	
(2) Puerperal sepsis, not including septicæmia	..	508	1	508	5	
146. Abuminuria and convulsions connected with pregnant state:—						
(1) Ante-partum eclampsia (2) Intra-partum eclampsia (3) Post-partum eclampsia	..	58	9	58	1	
(4) Albuminuria of pregnancy ..	..	314	4	314	4	
(5) Pyelitis of pregnancy	..	20	..	20	..	
(6) Otherwise defined ..	..	1	..	1	..	
147. Other Toxæmias of pregnancy:–						
(1) Hyperemesis gravidarum ..	..	34	1	34	..	
(2) Others	..	1	..	1	..	
148. Puerperal phlegmasia or embolism:–						
(1) Puerperal phlegmasia	..	..	..	..	..	
(2) Puserperal embolism	..	..	..	..	..	
149. Condition associated with Labour:—						
(1) Normal labour ..	135	10,831	..	10,966	159	
(2) Abnormal labour, *e.g.* needing instrumental interference ..	10	307	4	317	..	
(3) Labour complicated with intercurrent disease ..	..	..	..	..	..	
(4) Accidents of childbirth ..	..	432	19	432	4	
Carried forward ..	2,142	31,894	2,370	34,036	2,298	

APPENDIX X—*continued*

RETURN OF DISEASES AND DEATHS FOR THE YEAR 1949—*continued*

Diseases	Remaining at end of 1948*	Yearly Total		Total cases treated†	Remaining at end of 1949‡	Remarks
		Admissions	Deaths			
Brought forward ..	2,142	31,894	2,370	34,036	2,298	
XI.—*Conditions arising in Pregnancy, Childbirth and the Puerperal State*—(contd.)						
150. Other or unspecified conditions of the puerperal state:—						
(1) Puerperal insanity ..	..	4	..	4	1	
(2) Puerperal disease of the breast ..	..	13	..	13	1	
(3) Others	..	..	..	..	..	
XII.—*Diseases of the Skin and Cellular Tissues*						
151. Carbuncle, boil	3	144	1	147	1	
152. Cellulitis, or abscess (except due to cause given elsewhere)	34	687	14	721	17	
153. Other diseases of the skin, hair, and nails:—						
(1) Ulcers	28	152	2	180	2	
(2) Dermal mycoses ..	..	..	..	..	..	
(3) Herpes including Zoster ..	..	18	..	18	1	
(4) Scabies ..	15	188	..	203	7	
(5) Others	18	537	1	555	11	
XIII.—*Diseases of the Bones and Organs of Locomotion*						
154. Acute or chronic infective osteomyelitis and periostitis, except due to cause given elsewhere ..	10	121	1	131	3	
155. Other diseases of the bones ..	2	17	..	19	1	
156. Diseases of the joints and other organs of locomotion:—						
(1) Diseases of the joints (other than stated elsewhere) ..	1	31	..	32	3	
(2) Diseases of the other organs of locomotion	1	53	3	54	..	
Carried forward ..	2,254	33,859	2,392	36,113	2,346	

APPENDIX X—*continued*

RETURN OF DISEASES AND DEATHS FOR THE YEAR 1949—*continued*

Diseases	Remaining at end of 1948*	Yearly Total		Total cases treated†	Remaining at end of 1949‡	Remarks
		Admissions	Deaths			
Brought forward ..	2,254	33,859	2,302	36,113	2,346	
XIV.—*Congenital Malformations*						
157. Congenital malformations:—						
(1) Congenital hydrocephalus ..	..	12	5	12	1	
(2) Spina bifida and meningocele ..	..	4	1	4	..	
(3) Congenital malformation of the heart	..	29	10	29	..	
(4) Monstrosities ..	..	..	..	..	..	
(5) Congenital hypertrophic pyloric stenosis ..	..	..	..	..	..	
(6) Cleft palate, harelip	..	48	2	48	1	
(7) Imperforate anus ..	..	11	2	11	..	
(8) Other congenital malformations ..	1	25	5	26	1	
XV.—*Diseases of early Infancy*						
158. Congenital debility, including marasmus of unknown cause	..	10	6	10	..	
159. Premature birth ..	..	22	11	22	2	
160. Injury at birth	..	2	1	2	..	
161. Other diseases peculiar to early infancy:—						
(1) Atelectasis pulmonum	..	8	5	8	..	
(2) Icterus neonatorum:						
(*a*) Mild ..	..	..	..	..	..	
(*b*) Grave ..	..	4	4	4	..	
(3) Affections of the umbilicus ..	..	13	4	13	..	
(4) Pemphigus neonatorum ..	..	..	..	..	..	
(5) Others	..	4	1	4	..	
XVI.—*Conditions Associated with Old Age*						
162.—(1) Senile dementia ..	..	5	..	5	1	
(2) Other forms of senile decay	3	23	2	26	1	
Carried forward ..	2,258	34,079	2,451	36,337	2,353	

APPENDIX *X—continued*

RETURN OF DISEASES AND DEATHS FOR THE YEAR 1949—*continued*

Diseases	Remaining at end of 1948*	Yearly Total		Total cases treated†	Remaining at end of 1949‡	Remarks
		Admissions	Deaths			
Brought forward ..	2,258	34,079	2,451	36,337	2,353	
XVII.—*Affections Produced by External Causes*						
163. Suicide, or attempted suicide, by poisoning (including corrosive poisoning) ..	1	88	47	89	1	
164. Suicide, or attempted suicide, by gas poisoning ..	..	..	..	..	..	
165. Suicide, or attempted suicide, by hanging or strangulation	..	3	1	3	..	
166. Suicide, or attempted suicide, by drowning	..	7	..	7	..	
167. Suicide, or attempted suicide, by firearms	..	..	..	..	..	
168. Suicide, or attempted suicide, by cutting or piercing instruments	1	11	3	12	..	
169. Suicide, or attempted suicide, by jumping from a height	1	3	..	4	..	
170. Suicide, or attempted suicide, by crushing	..	..	..	..	..	
171. Suicide, or attempted suicide, by other means ..	..	1	1	1	..	
172. Infanticide	..	..	..	..	..	
173. Assault or homicide, by firearms	3	7	1	10	..	
174. Assault or homicide, by cutting or piercing instruments	3	32	3	35	..	
175. Assault or homicide, by other means	..	157	2	157	3	
176. Attacks by venomous animals:—						
(1) Snake bite ..	..	7	..	7	..	
(2) Insect bite ..	..	5	..	5	..	
(3) Others	..	8	..	8	1	
177. Food poisoning ..	..	6	..	6	..	
178. Accidental absorption of irrespirable or poisonous gas	..	3	..	3	..	
179. Other acute accidental poisoning	1	48	6	49	1	
180. Injuries due to conflagration	..	..	..	..	..	
181. Accidental burns (Conflagration excepted):—						
(1) Burns by fire ..	2	111	6	113	1	
(2) Scalds	3	99	4	102	3	
(3) Burns by corrosive substances, external or internal ..	..	5	..	5	1	
Carried forward ..	2,273	34,680	2,525	36,953	2,364	

APPENDIX *X—continued*

RETURN OF DISEASES AND DEATHS FOR THE YEAR 1949—*continued*

Diseases	Remaining at end of 1948*	Yearly Total		Total cases treated†	Remaining at end of 1949‡	Remarks
		Admissions	Deaths			
Brought forward ..	2,273	34,680	2,525	36,953	2,364	
XVII.—*Affections Produced by External Causes*—(contd.)						
181. *Accidental burns* (contd.):—						
(4) Dermatitis due to exposure to sun ..	1	2	..	3	..	
(5) Dermatitis due to exposure to other forms of radiation	..	..	..	..	..	
182. Accidental mechanical suffocation	..	..	..	..	..	
183. Accidental immersion or drowning	..	9	1	9	..	
184. Accidental injury by firearms	..	7	..	7	..	
185. Accidental injury by cutting or piercing instruments ..	1	119	..	120	..	
186. Accidental injury by fall, crushing, etc.:—						
(1) By fall ..	30	804	46	834	37	
(2) By machinery ..	..	51	..	51	1	
(3) By motor vehicles ..	28	539	45	567	20	
(4) By railway vehicles	..	1	..	1	..	
(5) By other means ..	32	571	18	603	42	
187. Cataclysm:— (tidal waves, cyclones, etc.)	..	..	..	..	..	
188. Injury by animals (except bites or stings of venomous reptiles or insects) ..	..	18	..	18	1	
189. Hunger or thirst ..	..	3	..	3	..	
190. Excessive cold	..	..	..	..	..	
191. Excessive heat	..	..	..	..	..	
192. Lightning	..	1	..	1	..	
193. Electricity	..	5	..	5	1	
194. Other unstated forms of violence:—						
(1) Inattention at birth	..	..	..	..	..	
(2) Others, *e.g.*, foreign body swallowed ..	..	58	1	58	1	
195. Violence of an unstated nature (*i.e.* suicidal, homicidal, or accidental, by poisoning or any other means)	..	18	5	18	..	
196. Wounds or other injuries of War	..	..	..	..	..	
197. Execution of civilians by belligerent armies ..	..	..	..	..	..	
198. Execution	..	..	..	..	..	
Carried forward ..	2,365	36,886	2,641	39,251	2,467	

APPENDIX *X—continued*

RETURN OF DISEASES AND DEATHS FOR THE YEAR 1949—*continued*

Diseases	Remaining at end of 1948*	Yearly Total		Total cases treated†	Remaining at end of 1949‡	Remarks
		Admissions	Deaths			
Brought forward ..	2,365	36,886	2,641	39,251	2,467	
XVIII.—*Ill-defined Conditions*						
199. Sudden illness (cause unknown)	..	8	..	8	1	
200. Cause of illness unstated or ill-defined	64	1,233	55	1,297	52	
201. Diseases not included in this classification elsewhere which have caused no deaths	..	1	..	1	..	
202. Malingering	..	1	..	1	..	
203. Cases admitted to hospital for observation as to mental condition	1	176	..	177	7	
204. Cases admitted for observation (not mental) ..	4	198	..	202	..	
205. Persons accompanying patients	..	39	..	39	..	
Total ..	2,434	38,542	2,696	40,976	2,527	

Nationalities	Remaining in hospital at end of 1948*	Yearly Total		Total cases treated†	Remaining in hospital at end of 1949‡	Remarks
		Admissions	Deaths			
Europeans	50	1,303	13	1,353	39	
Eurasians	43	824	48	867	50	
Chinese	1,783	27,760	2,310	29,543	2,016	
Indians	339	5,532	227	5,871	240	
Malays	195	2,660	75	2,855	141	
Javanese	11	139	17	150	9	
Japanese	11	173	2	184	19	
Others	2	151	4	153	13	
Total ..	2,434	38,542	2,696	40,976	2,527	
Persons accompanying patients ..	..	39	..	39	..	

APPENDIX *XI*

TYPES OF MALARIA SEEN IN THE GENERAL HOSPITAL DURING THE YEAR 1949

Type	*Admissions*	*Deaths*
Subtertian	113	22
Tertian	48	—
Quartan	—	—
Mixed	8	1
Black Water Fever	—	—
TOTAL ..	169	23

TERMINAL CAUSES OF DEATH IN MALARIA

Cause	*Number*
Cardiac Failure	5
Cerebral malaria	15
Malaria with pneumonia	3
TOTAL ..	23

APPENDIX *XII*

TABLE SHOWING MAIN CAUSES OF DEATHS OF IN-PATIENTS IN THE GENERAL HOSPITAL FOR THE YEARS 1949 AND 1948

Causes of Death	1949		1948	
	Admissions	Deaths	Admissions	Deaths
Enteric Group	69	10	61	14
Typhus	33	2	34	2
Malaria	252	24	328	20
Diphtheria	20	5	10	3
Influenza	31	4	38	4
Dysentery Diarrhœa and Enteritis	784	264	808	294
Leprosy	5	—	3	—
Tuberculosis of Respiratory System	421	72	410	67
Other Tuberculous Diseases ..	425	193	384	173
Cancer	550	104	284	61
Beri-beri	26	10	19	9
Cerebral Hæmorrhage ..	168	67	93	39
Diabetes	89	11	88	9
Bronchitis	236	8	218	7
Pneumonia (all forms) ..	677	314	745	296
Other Respiratory Diseases ..	278	33	350	22
Ulcer of Stomach Duodenum, etc.	169	30	224	22
Ankylostomiasis	57	—	60	2
Other Intestinal Parasites ..	70	2	74	3
Appendicitis	469	9	471	13
Cirrhosis of Liver	67	19	60	15
Acute and Chronic Nephritis	153	30	137	25
Venereal Affections ..	135	14	131	18
Congenital Debility and Malnutrition, Premature Birth, etc.	53	17	53	8
Suicidal	113	52	87	23
Other Forms of Violence ..	2,487	136	2,693	159
Other Diseases	7,641	575	6,820	554
TOTAL ..	15,478	2,005	14,683	1,862

APPENDIX *XIII*

THE FOLLOWING IS A SUMMARY OF THE EXAMINATIONS CARRIED OUT BY THE CLINICAL LABORATORIES OF ALL HOSPITALS, SINGAPORE, DURING THE YEAR 1949

Physiological examination of blood	79,618
Biochemical examination of blood and urine ..	5,675
Examination of cerebro-spinal fluid	3,538
Examination of cisternal pleural and other fluids ..	274
Examination of gastric contents	2,610
Examination of smears	16,859
Examination of urine including microscopic ..	43,312
Examination of faeces	26,985
Examination of sputa	30,022
Total Examinations ..	208,893
(1948 ..	156,030)

APPENDIX *XIV*

OUT-PATIENTS

TOTAL ATTENDANCES AT THE OUT-PATIENT CLINICS DURING THE YEAR 1949 WERE DISTRIBUTED AS FOLLOWS:—

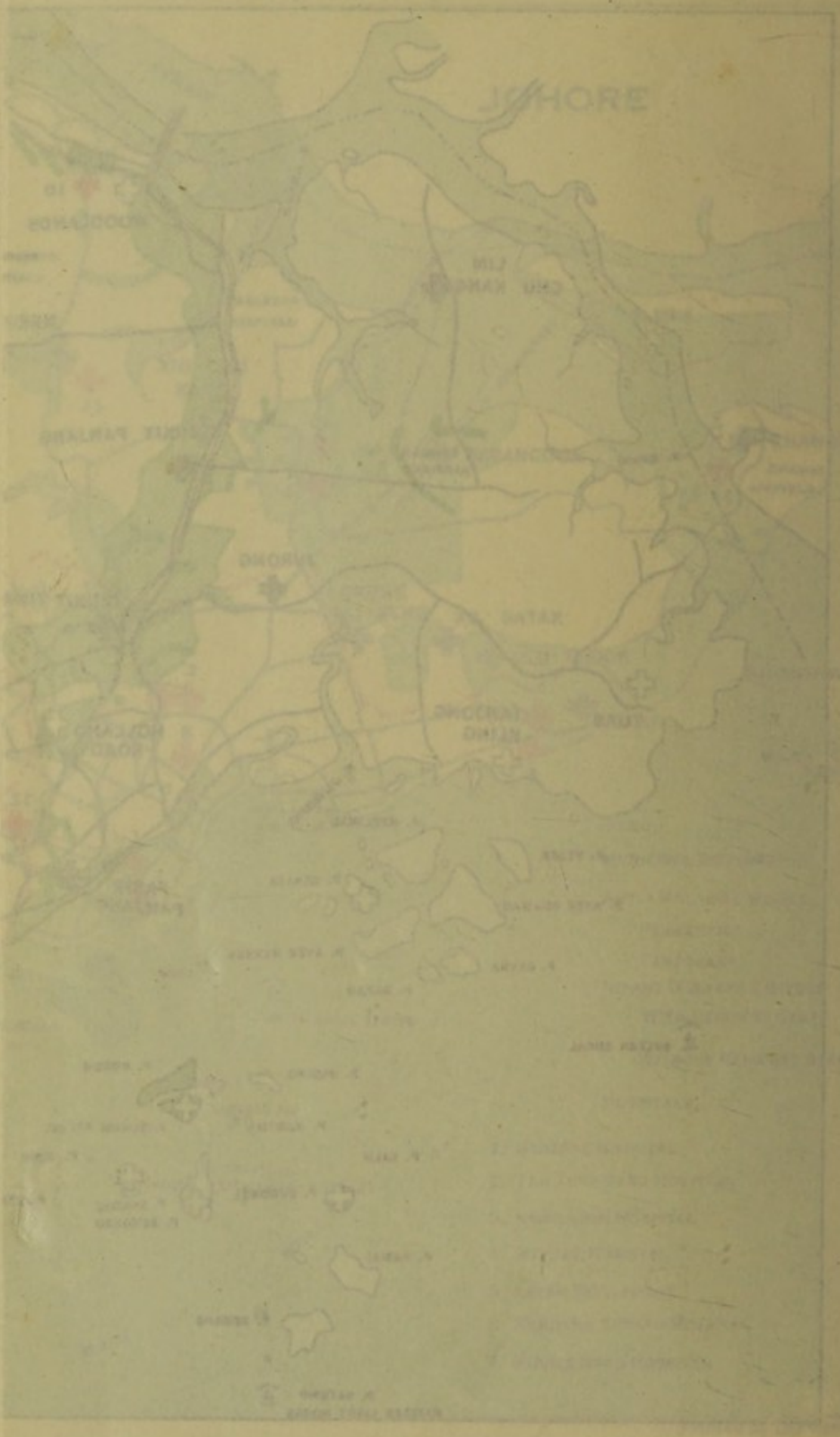
Hospital	New Cases	Repetitions	Total Attendances
General Hospital	45,966	107,568	153,534
Kandang Kerbau, Ante Natal and Post Natal	12,665	24,345	37,010
Kandang Kerbau, O.D.D. ..	16,333	32,806	49,139
Tan Tock Seng, General ..	5,992	8,943	14,935
Tan Tock Seng, T.B.	2,944	26,779	29,723
Bukit Timah O.D.D.	10,126	11,229	21,355
Paya Lebar O.D.D.	7,465	4,996	12,461
Police Training O.D.D. ..	3,832	8,020	11,852
Social Hygiene	14,478	81,780	96,258
Police Clinic (families) ..	1,652	19,068	20,720
TOTAL ..	124,152	373,743	541,861

APPENDIX *XV*

THE FOLLOWING IS A SUMMARY OF THE EXAMINATIONS CARRIED OUT BY THE DEPARTMENT OF PATHOLOGY DURING 1948 AND 1949

	1948	*1949*
Autopsies	1,103	1,351
Histological Sections	2,889	3,043
Serological Tests (blood) ..	22,701	27,915
Serological Tests (C.S.F.) ..	702	1,330
Bacteriological Investigations ..	4,757	6,352
Medico-Legal Examinations ..	646	12
Blood Donors	1,622	2,946

Printed by the Survey Department Federation of Malaya No. 116-1950


JOHORE