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FEDERATED MALAY STATES.

ANNUAL REPORT

OF THE
MEDICAL DEPARTMENT

FOR THE YEAR

1933

BY

R. D. FITZGERALD, M.C., M.D.,
Adviser, Medical and Health Services, Malay States.

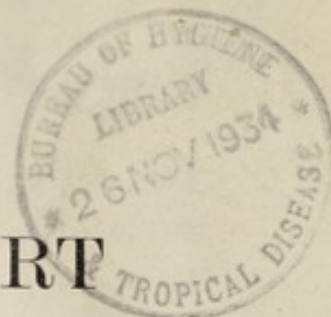
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FEDERATED MALAY STATES.

ANNUAL REPORT OF THE MEDICAL DEPARTMENT FOR 1933.

INTRODUCTION.

The policy of decentralization of Government referred to in the previous report of the Medical Department was continued during the year and received an impetus towards fulfilment after reception of the recommendations of Sir Samuel Wilson following his tour of Malaya. Many of the difficulties inseparable from a radical change in the administration of a large Government department which came to light during the earlier period of transition have been steadily surmounted. The control of State medical and health affairs has been gradually transferred to the State Governments concerned and the State Medical and Health Officers are now responsible to their respective State Governments for the administration of the medical and health services within their respective territories. The executive functions of the Adviser, Medical and Health Services, have been confined to the direct control of certain institutions which were still maintained on a Federal basis throughout the year.

These are :

- (a) The Institute for Medical Research.
- (b) The Central Mental Hospital.
- (c) The Leper Settlements.
- (d) The Decrepit Settlement.

I.—ADMINISTRATION.

A.—STAFF.

Dr. C. J. Wilson, M.C., Adviser, Medical and Health Services, proceeded on leave prior to retirement on the 14th December, 1933. This report therefore covers the period of his final year of administration in Malaya. Dr. Wilson assumed the unified control of the Straits Settlements and Federated Malay States Medical Departments on the 1st September, 1931, and was called upon to give effect to the policy of decentralization as it affected the Medical Services at a time of peculiar anxiety owing to the deep economic depression. The successful establishment,

in face of these difficult conditions, of a new chapter in the development of the medical services in Malaya steadily progressed under his administration till he proceeded on leave.

Decentralization has placed the provision and disposal of the European personnel throughout the several States under the control of the Adviser.

The manifold details connected with the leave arrangements of a large and scattered European personnel have been considerably simplified by the concentration of the executive control of the arrangements for leave and replacements in the Malayan Establishment Office in Singapore.

The Medical Officers and Health Officers of the Malayan Medical Service are now interchangeable between the Straits Settlements and the Federated Malay States and this development of the new policy is proving advantageous not only from an administrative view-point but also from that of the officers who were previously restricted largely to service in the Federated Malay States. All higher and superscale appointments in the Straits Settlements and Federated Malay States are now open on equal terms to officers of the Malayan Medical Service wherever serving.

The process of retrenchment was continued during the year and it is hoped that, with the emergence of signs of returning prosperity, it will not be necessary to abolish any further posts or retrench any more officers. The following posts were abolished during the year:

(a).—*Chief Medical Officer, Social Hygiene.*

This post was held by Dr. E. R. C. Cooke until the 1st April, 1933, when he proceeded on leave prior to retirement on abolition of the appointment. The services controlled by this officer will henceforth be merged in those under the control of the State Medical and Health Officer in each State. No loss of efficiency in the prevention and treatment of venereal disease and no deterioration in the facilities provided has been noticeable since the change occurred.

(b).—*Radiologist, Federated Malay States.*

Dr. C. F. Constant, the holder, vacated this post on its abolition on the 2nd November, 1933, and proceeded on leave prior to retirement. It was found that in a system of decentralization there was no place for a Radiological Officer whose sphere of activities extended to all the Federated Malay States. The radiological services in each State will henceforth be rendered by Medical Officers on the time-scale who possess special radiological experience. An adequate supply of such officers is being assured by calling upon suitable officers to undertake post-graduate study as provided by the scheme of post-graduate study whereby additional full-pay leave may be granted to officers for this purpose.

(c).—*Central Mental Hospital, Federated Malay States.*

The post of Assistant Medical Superintendent was abolished and Dr. A. W. H. Smith proceeded on leave prior to retirement on the 16th September, 1933.

The following Medical Officers left the service during the year on retrenchment terms as laid down by the Secretary of State and these posts have been deleted from the Establishment as an economy measure:

Dr. G. D. Gordon, Medical Officer, Federated Malay States, on the 9th October, 1933.

Dr. G. I. Shaw, Medical Officer, Federated Malay States, on the 1st August, 1933.

Dr. W. B. Sutherland on the 31st March, 1933.

No further curtailment of staff was under contemplation at the end of the year and experience during the year has shown that although no serious loss of efficiency has been evident through the retrenchment already effected there is little room for doubt that the limit of safety has been reached.

The satisfactory health conditions of the community which this report discloses have been helped by an important consideration which cannot be expected to continue indefinitely and may indeed become modified without warning at any time. I refer to the undoubted wave of health which has been evident throughout the spell of economic depression and the remarkable absence of serious epidemic disease. Should evidence of a cessation of these fortunate factors appear, then the call for an increase of staff will become insistent and will require immediate attention if the health of the country is not to revert to the conditions existing some years ago when staffs were too meagre to cope with the widespread ill-health then prevailing.

B.—LEGISLATION.

The Prevention of Disease Enactment, No. 38 of 1932, which was passed on the 31st October, 1932, came into force on publication in the *Gazette* on the 13th January, 1933. As stated in the last year's report, this Enactment completes the revision of the law relating to quarantine and the prevention of disease.

Lepers (Amendment) Enactment, No. 16 of 1933, was passed during the year. By this Enactment certain sections of the Lepers Enactment, 1926, are amended to:

- (a) give power to any Magistrate to authorise transfer of lepers from one settlement to another in the Federated Malay States;
- (b) authorise the Chief Secretary to arrange for transfer of lepers from a Federated Malay States Settlement to a Colony Settlement;

- (c) hand over to the Residents powers to make orders of discharge in certain cases;
- (d) make provision for the reception into a settlement of lepers from the Colony and the Unfederated Malay States and for the return and discharge of such lepers.

The rules under the following Enactments were published during the year:

- (a) Sale of Food and Drugs Enactment, 1932 (Rules).
- (b) Workmen's Compensation Enactment, 1929 (Rules).

C.—FINANCE.

The total expenditure of the Medical and Health Department for the year was \$3,957,933 (£461,758 17s.) excluding leave salaries of European officers paid from Miscellaneous Services, Treasury. Of this sum \$2,217,228 (£258,676 12s.) was incurred under the heading of "Personal Emoluments"; \$1,729,789 (£201,808 14s. 4d.) under "Other Charges", Annually Recurrent, and \$10,916 (£1,273 10s. 8d.) was "Special Expenditure".

In addition to the amount directly expended by the department, the Public Works Department expended \$10,461 (£1,220 9s.) on new buildings, hospitals and other institutions, and \$79,878 (£9,319 2s.) on upkeep, repairs, etc., while a sum of \$388,106 (£45,279 8d.) was expended on anti-malarial measures from Sanitary Boards and other Government funds.

The revenue of the department was \$282,574 (£32,966 19s.). The total revenue of the Federated Malay States for 1933 was \$47,198,807 (£5,506,527 9s. 8d.) and the total expenditure was \$50,258,671 (£5,863,511 12s. 4d.).

II.—PUBLIC HEALTH.

It is satisfactory to be in a position to record comparatively healthy conditions during 1933, following a year which was itself remarkable for its low sickness rate. The number of admissions to Government hospitals was 76,297 in 1933 compared with 85,978 in 1932. The decline in the hospital admissions during the past two years may be attributed mainly to the large exodus of Chinese and Indian labourers which has been imposed by the severe economic depression. The demand for Chinese labour on the tin mines was curtailed still further during 1933 by the application of the tin quota under the International Tin Restriction agreement. It may be confidently predicted that with a return of even a moderate degree of prosperity and the removal of restriction on the production of tin, the hospitals and their staffs will be called upon to cater for a greater number of sick. With an influx of labourers on a large scale from China and India, many of the latter with their dependents, the standard

of health in the community may be expected to decline and the incidence of disease to increase. Experience supports the belief that many immigrants possess low powers of resistance against some of the communicable diseases prevalent in this country. It may thus be inferred that health statistics compiled for the past two years reflect the double advantage that many decrepit and sub-healthy labourers have left the country, and only a few susceptible immigrants have entered it; and further that these favourable conditions cannot be regarded as being permanently established.

POPULATION.

With a view to obtaining a more accurate estimation of the true birth and death-rates in the community the method of calculating the population during intercensal periods by geometrical progression which has been the rule previous to last year has been discarded. The method formulated by the Registrar-General of Statistics which estimates the population for an intercensal period by a process of balancing equation has been adopted in this report. The figure thus arrived at is reached after making due allowance for the excess of births over deaths and the difference between the records of emigration and immigration during the year. The figures of the migrational surplus for Malaya are distributed racially to each State or Settlement in the proportion which each race in the State or Settlement bore to the total number of that race in Malaya as found at the Census of 1931.

The population so estimated for the year 1933 was 1,597,700. Compared with the population in the previous year estimated by the same formula of balancing equation the population in the year under review shows a decrease of 25,203 from the previous year's figure of 1,622,903. The population was distributed as follows:

State.	Malays.	Chinese.	Indians.	Non-Asiatics.	Others.	Total.
Perak... ..	282,445	292,404	129,698	2,209	6,383	713,139
Selangor	128,244	220,718	128,817	2,615	10,241	490,635
Negri Sembilan	90,734	83,492	40,363	807	3,194	218,590
Pahang	114,228	47,506	11,874	357	1,441	175,406
Total	615,651	644,120	310,752	5,988	21,259	1,597,770

It is considered that by the method of balancing equation now adopted a more accurate estimation of the population can be reached in a country such as Malaya where such sharp fluctuations occur in the numbers of the non-Malay inhabitants from year to year. The total population is swelled by immigration in years marked by prosperity and shrinks through emigration during periods of economic depression such as the one that has ruled for the past two years.

The comparisons made between birth and death-rates in the years 1932 and 1933 are based on the population estimated in each of the two years by the method of balancing equation just described and therefore offer true comparative figures representing, as accurately as can be ascertained, the birth and death-rates in each of the two past years.

BIRTHS.

There were 56,787 births registered during the year, being an increase of 1,616 over the total of 55,171 births in the previous year. The increase was distributed fairly evenly throughout the States of Perak, Negri Sembilan and Pahang. Selangor was alone in showing a slight decrease. The increase in the other States was due almost entirely to an increase in the number of Malay births which registered a percentage increase of 9.2.

The birth-rate was 35.5 per mille compared with 34.0 per mille in 1932.

Of the total births recorded, 29,689 were males and 27,098 were females, thus giving a sex ratio of male births to female births of approximately 110:100.

DEATHS.

Thirty-two thousand three hundred and forty deaths were recorded in 1933, an increase of 2,343 over the previous year.

The crude death-rate was 20.2 per mille compared with a crude death-rate of 18.5 per mille in the previous year. The death-rate in 1932 was the lowest hitherto recorded and so the increase of 1.7 per mille in 1933 over the previous year cannot be regarded as indicating any marked deterioration in the health conditions of the community. It is probable that the relatively low death-rates recorded during the past two years reflect to some extent the lessened number of aged and decrepit labourers resulting from the large scale emigration and repatriation of Chinese and Indian workers which followed soon after the onset of the slump. With a reversal of the wave of migration a change for the worse may become evident in the health conditions of the community with a coincident rise in the death-rate.

INFANT MORTALITY.

The number of deaths of infants under one year of age occurring in each thousand infants born alive was 146 compared with 137 in the previous year. The increase was common to all the Federated Malay States except Pahang. In seeking for a cause for the higher rate of mortality amongst infants the explanation which appears to be most convincing is one that associates it with the economic stress of the past two years which now appears to be manifesting itself in a lowered vitality of mothers and infants. Although the infant mortality rate must be regarded as high, it nevertheless compares favourably with a rate of 163 in 1930 which was the last year of comparative prosperity before the onset of the slump.

III.—HYGIENE AND SANITATION.

1.—SPECIAL DISEASES.

(i)—Malaria.

The number of deaths recorded under the general heading of malaria and of fever of undefined origin, and the percentage of deaths so recorded to deaths from all causes are shown in the following table:

Disease.	Perak.	Selangor.	Negri Sembilan.	Pahang.	Total.
Malaria	668	266	196	83	1,213
Fevers of undefined origin ...	6,563	2,794	1,564	1,777	12,698
All causes	15,496	8,936	4,267	3,641	32,340
Percentage ratio of deaths from malaria to deaths from all causes	4.3	3.0	4.6	2.3	3.8
Percentage ratio of deaths from malaria and deaths from fevers of undefined origin to all causes	46.7	34.2	41.2	51.1	43.0

There was an increase in the number of recorded cases of malaria in certain areas. The increase was most marked in Perak where 8,165 patients suffering from malaria were admitted to Government hospitals in 1933 compared with 7,287 in 1932. There was however a decrease in Selangor where 2,940 cases of malaria were admitted to Government hospitals compared with 3,338 admissions in 1932. All cases of malaria admitted to Government hospitals are accurately diagnosed and the number of such cases may therefore be regarded as a more reliable index of the incidence of the disease in the areas served by such hospitals than the number of deaths occurring outside hospitals and which are returned as due to this cause. During the year an attempt has been made to classify the diseases known generally by the Malay term "demam" to ensure more accurate returns on the part of the medically untrained Deputy Registrars who certify a large number of the medically unattended deaths which occur in the rural areas.

As a substitute for quinine in the treatment of malaria, atabrin has been tried in some districts. Experience in Perak shows that its use has reduced to some extent the expenditure on the treatment of malaria and that its extended use may be expected to result in a diminution of the number of admissions for malaria to hospitals. The recommendation of the Health Organisation of the League of Nations touching a new method of giving quinine was tried in Perak with encouraging results.

The anti-malarial measures throughout the country have been maintained as adequately as the need for strict economy permitted. Should evidence accumulate of further recrudescence of malaria in any of the States, the need for increased expenditure on anti-malarial measures may be expected to become increasingly pressing.

(ii)—Plague.

No case of plague occurred during the year. It is noteworthy that the Federated Malay States have been free from this disease since the year 1927.

(iii)—Cholera.

No case of cholera occurred during the year. The Federated Malay States have been free from this disease also since the year 1927.

(iv)—Smallpox.

No case of smallpox occurred during the year. The following table summarises the number of vaccinations performed during the year:

			Total vaccinations.		Number of recorded results.
Perak	...	...	27,855	...	17,756
Selangor	...	...	20,042	...	14,136
Negri Sembilan	...	...	10,270	...	6,944
Pahang	...	...	6,173	...	3,063

A lymph station has been maintained under the control of the Serological Division of the Institute for Medical Research and has met all demands made upon it for supplies of lymph throughout Malaya. Vaccination by multiple pressure technique has been under investigation and certain advantages have been noted.

(v)—Typhus.

Eighteen deaths were recorded as due to tropical typhus. This is the same number as was recorded in 1932. The general incidence of tropical typhus during 1933, as judged by the Weil-Felix reactions carried out, has been very similar to that of 1932.

Research, which has steadily progressed during the past six years, relating to the viruses of tropical typhus and Japanese river fever was continued during the year at the Institute for Medical Research. Full details of the results attained will be found in the Report of the Institute for Medical Research for 1933.

(vi)—Enteric Fever.

Forty-six deaths were recorded as due to enteric fever compared with 59 deaths in 1932. Out of this total no fewer than 21 deaths or nearly half the total number occurred in five of the larger towns of the Federated Malay States. The largest number of deaths was noted in the decade of ages between 20 and 29 years.

In connection with the efforts of Health Officers to deal with carriers of enteric infection amongst food-hawkers and others, a large number of specimens of blood and excreta was submitted to the Bacteriological Division of the Institute for Medical Research for examination.

(vii)—Dysentery and Diarrhoea.

There was a decrease in the number of deaths under these headings in 1933. One thousand one hundred and eighty-four deaths were recorded compared with 1,300 in 1932. The highest rate was recorded in Selangor, the lowest in Perak. The continued decrease in the mortality from these diseases indicates a higher degree of sanitary supervision and possibly an improvement in the sanitary habits of the people. It is possible, however, that the improvement may in part be due to the emigration and repatriation of a number of carriers and chronic sufferers.

(viii)—Cerebro-spinal Meningitis.

Four cases of cerebro-spinal meningitis were reported of which all ended fatally. The number reported for the previous year was 11 all of which were fatal cases.

(ix)—Diphtheria.

There were 57 deaths recorded as due to diphtheria compared with 46 in the previous year. The following table shows that the number of recorded cases and deaths from this disease has been steadily increasing since 1928. The disease is found principally in the towns and is engaging the serious attention of the Health Officers in urban areas:

Year.	Cases.	Deaths.
1928	57	8
1929	88	27
1930	112	31
1931	143	29
1932	170	46
1933	211	57

(x)—Leprosy.

Sungei Buloh Settlement.—There were 1,082 patients in this settlement at the beginning of the year. This number had grown to 1,104 at the end of the year in spite of the transfer of 100 patients to Pulau Jerejak Settlement, Penang. The total number treated in the settlement during the year was 1,531. The settlement was built to accommodate 888. The settlement is rapidly gaining the confidence of the community and the increasing number of applications from lepers for admission and treatment is already a serious embarrassment to the administration faced with the problem of accommodating them. A noteworthy feature has been the increased number of Malays voluntarily entering the settlement for treatment. Eight Malays were admitted in 1932; 42 were admitted in 1933. The question of the extension of the settlement is receiving immediate attention.

Modern treatment has been carried out extensively. Persistent propaganda, improved organisation and insistence on regularity of treatment by intra-muscular and intra-dermal injections of ethyl esters has succeeded in firmly establishing amongst the inmates the popularity of and confidence in this form of treatment. It is particularly gratifying to those concerned in treatment to find patients in increasing numbers voluntarily subjecting themselves to treatment by the painful process of intra-dermal injections. The measure of success attained may be gauged by the number of sufferers freed from leprosy, 151 patients were discharged during 1933 in whom the disease had been arrested, and it was very satisfactory to be able to free all these patients without danger to the public.

Kuala Lumpur Leper Asylum.—This asylum is used solely for the accommodation of advanced and incurable cases. There were 373 patients at the beginning of the year and 330 at the end.

Pulau Pangkor Laut Settlement.—This leper settlement has 57 males and 24 females; all are Malays. Treatment is administered once a week by the Deputy Medical Officer, Dindings. Ten patients were discharged as non-infective during the year, 14 were transferred to Sungei Buloh and 11 died.

(xi)—Tuberculosis.

Tuberculosis in various forms was responsible for 1,409 deaths compared with 1,627 in 1932. All the deaths except 67 occurring in 1933 were due to the pulmonary form of the disease and this form presents one of the major health problems facing the Health Department. It is significant that 501 of the deaths from pulmonary tuberculosis occurred in urban areas, a fact which points the lines along which preventive measures may be most profitably pursued. As the disease is most prevalent in overcrowded areas the main attack must be directed against conditions which conduce to the crowding of ignorant communities into insanitary dwellings in concentrated areas. Efforts on these lines, coupled with the persistent education of the people on the elements of healthy home conditions and personal hygiene are engaging constant attention. The following table presents figures which offer encouragement to persist on these lines :

Year.	Deaths in Government hospitals.	Ratio per 100,000 population.
1923	1,006	72.3
1924	1,037	73.1
1925	1,051	72.6
1926	995	67.4
1927	1,118	74.2
1928	1,074	70.0
1929	1,078	64.4
1930	1,061	61.5
1931	975	56.6
1932	919	51.9
1933	821	51.4

2.—GENERAL MEASURES OF SANITATION.

(i)—Sewage Disposal.

Owing to the prevailing financial stringency no new work of any magnitude was undertaken during the year.

In Kuala Lumpur experiments were carried out on various septic tank installations in an endeavour to ascertain the probable cause of certain unsatisfactory results found on an analysis of some of the effluents. An improved method for bucket washing was introduced which produced a better effluent and afforded more protection to the coolies engaged. Rubber night-soil buckets were in use as an experiment in Kuala Lumpur and Kinta, and the Kinta Sanitary Board, as a result, has decided to adopt this type as a standard night-soil bucket. It is probable that as funds permit and a sufficient supply becomes available, the use of rubber buckets will be extended to other urban areas.

In certain cases the filtration of effluent from private septic tank installations in the ground by means of sub-soil pipes is being approved. The saving in cost thereby effected encourages private householders to install their own septic tank.

The use of tube latrines in suitable localities was steadily extended, especially in kampongs and full use was made of this simple and effective method of sewage disposal wherever applicable.

(ii)—Refuse Disposal.

Refuse disposal in the larger townships continued to be effected by the removal of all rubbish from house and street bins by covered lorries to a central incinerator. In the larger centres the collection of refuse is carried out daily. Progress has been made in the substitution of concrete street bins for the old metal ones formerly in use.

(iii)—Drainage.

The problem of drainage is closely associated with anti-malarial measures, and for this reason has always received special attention in Malaya. Generally speaking the drainage system throughout the country is of a high standard, as indeed it must be in order to cope with the heavy rainfall. The river deviation in Kuala Lumpur again proved its value during periods of heavy rain and no doubt saved the town more than once from serious flooding.

The Health Officer initiated in Kuala Lumpur a campaign against the discharge of urine and other noxious effluents into open drains in the town.

(iv)—Water Supplies.

The water supplies throughout the country were kept under observation and repeated chemical and bacteriological examinations of the water supplied to the larger towns were carried out at the Institute for Medical Research. The results show that any change which has been noted has been for the better.

The water supply in Kuala Lumpur was extended to many of the poorer parts of the town and with the provision of public stand pipes it was possible to close a number of earth wells.

All those responsible for the water supplied to urban and rural areas have consistently maintained their efforts to improve by every means at their disposal the quality of the water supplied to the consumers. A scheme has been prepared in collaboration with the Public Works Department, the Medical Department and the Branch Laboratory at Ipoh for a further detailed series of experiments in connection with several water supplies in Perak.

The existing water supplies to villages, estates and mines were maintained at as high a standard of purity as possible in spite of the acute economic condition of some of the owners. Experiments were carried out on the banks of the Perak River with a view to providing a cheap method of filtration which will provide water which is reasonably potable.

The sedimentation tank for the Seremban supply was completed and used during the year.

A temporary chlorination plant was installed at Cameron Highlands. It is proposed to effect permanent improvement in this supply as soon as funds permit.

(v)—Offensive Trades.

The number of licences granted was restricted as much as was expedient with a view to keeping the offensive trades within bounds; and efforts to confine them to defined districts were continued.

(vi)—House Inspections.

House to house inspections were carried out in all Sanitary Board areas. In Kuala Lumpur 7,540 notices were served for the abatement of various nuisances resulting in 2,022 prosecutions. The maintenance of sanitary dwellings is engaging the constant attention of the Health Branch, more especially in relation to the problem of unventilated and ill-lighted cubicles. This aspect of health activities has an important bearing on the prevention of pulmonary tuberculosis and other diseases connected with overcrowding.

(vii)—Estate Visiting.

Officers of the Health Branch regularly visited estates throughout the year.

The steady, if modest, increase in the price of rubber has been reflected in the ability and willingness of many estates to carry out recommendations for improvement in their health conditions. Much discretion has been used in making such recommendations as the economic condition of many of the estates is still poor and on these estates attention has been concentrated on essential and urgent needs only. Nevertheless there was a distinct tendency evident throughout the year and particularly in the later months to undertake improvements affecting the health of the labour forces. Several companies built new lines. Group hospitals were maintained in better condition, and money was more freely spent on anti-malarial measures.

During the latter part of the year, Health Officers in Perak were advised that when they were satisfied that certain estates could be relied upon to carry out necessary health measures on their own initiative, such estates might at the Health Officer's discretion be subjected less often to routine visitation. In this way, if the experiment proves successful, much valuable time will be available for other important health activities by the Health Officer.

It is satisfactory to record that the repeal of the Health Boards Enactments has not been followed by any marked deterioration in the general level of health of the estate population.

The following table gives the estate population in 1932 and 1933 :

State.	1932.		1933.	
	Labourers.	Total estate population.	Labourers.	Total estate population.
Perak ...	44,972	69,213	45,633	69,595
Selangor ...	47,089	73,964	46,352	72,179
Negri Sembilan ...	35,088	42,902	34,058	41,668
Pahang ...	7,672	9,435	8,662	10,474
Total ...	134,821	195,514	134,705	193,916

(viii)—Mine Sanitation.

It was realised during the year that while some estates were receiving more attention than was necessary under present conditions, mines were receiving too little personal attention from Health Officers. Estates have been, for many years past, closely supervised. At first, a regrettable feature was the

ignorance shown, by a section of managers and owners, of the economic value of the health measures that were advocated, with resulting misunderstanding of the motives of the Health Branch and in some cases definite antagonism. During the past few years, however, happier relations have become firmly established and the former attitude of suspicion has been replaced by one of ready co-operation. Health Officers have thus been able to trust estates to carry out their recommendations and so have found more time to devote to the inspection of mines. Health Officers in Perak are now attending to health on mines, so far as the Labour Code permits, in the same way as on estates.

(ix)—**Railway Sanitation.**

Health conditions on the Federated Malay States Railways, with the extension into the Unfederated Malay States and the Colony, were under the control of the Railway Health Officer and his staff of Health Inspectors, Anti-Malarial Inspectors and Dressers. Anti-malarial work has been carried out vigorously along the whole length of the lines, and regular oiling has been done in 120 areas. In addition oiling has been attended to in railway reserves in 23 places by local authorities such as the Mosquito Destruction Committees and by estates. In many instances estates and other land bordering the railway line have benefited considerably in health by the anti-malarial measures undertaken by the Railways. The spleen rate of all the daily paid staff was ascertained. The rates varied greatly in different areas. The Kedah rate was nil, while the Pahang and Kelantan rates were comparatively high.

The passenger coaches of the night-mail trains were sprayed with an anti-mosquito mixture at the points of departure and, *en route*, during the Customs examination at Parit Buntar.

The general health of the Railway staff remained good and there was no outbreak of epidemic disease.

(x)—**School Hygiene.**

School medical inspections were carried out by Health Officers, Health Inspectors, Lady Medical Officers and Nursing Sisters.

During visits to schools, in addition to the medical examination, school premises were inspected and such recommendations were made as were thought necessary to improve latrine accommodation, water supply, lighting, ventilation or seating arrangements.

1. Number of schools inspected	...	...	955
2. ,, visits to schools	...	...	1,666
3. ,, scholars examined	...	...	53,066

The table below gives a summary of the conditions found in all the schools visited, with the percentage of each:

	Perak.	Selangor.	Negri Sembilan.	Pahang.
Dental disease ...	27.8	27.9	37.05	31.85
Skin disease ...	2.6	6.1	10.24	13.46
Eye defects ...	0.3	1.1	1.46	1.95
Spleen enlargements	7.2	3.8	20.57	17.33
Pediculosis ...	5.7	5.2	2.83	3.41

The valuable work performed by the Dental Surgeon was continued in Selangor. Of the 4,287 patients who attended the Dental Clinic a large proportion was composed of school children. The following classes of schools in Selangor contributed patients:

English schools ...	26 schools
Malay schools ...	19 „
Chinese schools ...	48 „
Tamil schools ...	6 „

The great majority of the patients were children of school-age but some of those who attended the clinic were children of pre-school age.

The Dental Surgeon found time to visit the schools in the Kuala Lumpur and Klang areas and he has been successful in overcoming, to a large extent, the nervousness that was formerly evident amongst the children, and in inspiring confidence.

(xi)—Labour Conditions.

A.—ON ESTATES.

In the early part of the year there was a diminution over last year in the number of labourers engaged on estates but in most parts of the country there was a steady if small increase in the numbers employed during the second half of the year so that by the end of the year the earlier decrease had been made good. This is shown in the numbers returned for the labour force of all nationalities which were 134,705 in 1933 compared with 134,821 in 1932. It seems evident that the efflux of labourers which has been a feature of the past two years had been replaced at the close of the year by an influx which may be expected to continue and present problems of health calling for renewed vigilance by the health authorities. There is some evidence that the problem has already arisen. The increase in the number of labourers was accompanied by a definite rise in the death-rate on estates in Perak which increased from 4.8 per cent. in 1932 to 6.1 per cent. in 1933.

It was emphasized in last year's report that the reduction in the labour force then evident had been effected largely by repatriation of the unhealthy and sickly employees, and that, therefore, the low death-rate then recorded could not be regarded

as a normal figure or one which was likely to be attained except under abnormal conditions of repatriation. The figures just quoted for Perak support these views and indicate that with an influx of less healthy labourers an increase in the abnormally low death-rate of last year must be expected.

The following table shows the distribution by districts of the labour force, and the death-rate in each district:

District.				Average labour force.	No. of deaths.	Death-rate per mille.
Perak—						
Krian	...	...	...	6,561	30	4.6
Selama	...	...	...	1,651	14	8.5
Larut and Matang	...	...	...	5,000	24	4.8
Upper Perak	...	...	...	347	1	2.9
Kuala Kangsar	...	...	...	6,591	54	8.2
Kinta	...	...	...	6,380	44	6.9
Batang Padang	...	...	...	6,795	47	6.9
Lower Perak	...	...	...	9,618	57	5.9
Sitiawan	...	...	...	2,689	9	3.3
Selangor—						
Kuala Lumpur	...	...	...	5,135	30	5.8
Ulu Selangor	...	...	...	8,542	29	3.4
Ulu Langat	...	...	...	5,729	16	2.8
Klang	...	...	...	9,775	39	4.0
Kuala Selangor	...	...	...	8,865	59	6.7
Sabak Bernam	...	...	...	1,313	3	2.3
Kuala Langat	...	...	...	6,993	41	5.9
Negri Sembilan—						
Seremban	...	...	...	10,646	50	4.7
Tampin	...	...	...	6,653	51	7.7
Kuala Pilah	...	...	...	8,918	67	7.5
Port Dickson	...	...	...	6,943	22	3.2
Jelevu	...	...	...	898	4	4.5
Pahang—						
Kuala Lipis	...	...	...	2,271	26	11.4
Raub	...	...	...	1,050	4	3.8
Bentong	...	...	...	2,296	7	3.0
Temerloh	...	...	...	1,550	7	4.5
Kuantan	...	...	...	1,455	6	4.1
Pekan	...	...	...	40	—	—
Total				134,705	741	5.5

The table hereunder gives the number of hospital admissions and deaths, for all cases of sickness and for malaria cases particularly, for the total estate population and for labourers only, for all nationalities and for Indians particularly :

	1932.	1933.	Decrease increase.
1. Labour force, all nationalities ...	134,821	134,705	- 116
Hospital admissions ...	26,271	29,506	+3,235
Deaths, all causes ...	730	741	+ 11
Death-rate per mille ...	5.4	5.5	+ .1
Hospital admissions, malaria only ...	6,475	7,818	+1,343
Deaths, malaria only ...	122	94	- 28
Death-rate, malaria only ...	0.9	0.7	- 0.2
2. Estate population, all nationalities including dependants ...	195,514	193,916	-1,598
Hospital admissions ...	39,517	45,123	+5,606
Deaths, all causes ...	2,560	2,627	+ 67
Death-rate per mille ...	13.1	13.5	+ .4
Hospital admissions, malaria only ...	8,875	11,076	+2,201
Deaths, malaria only ...	245	230	- 15
Death-rate, malaria only ...	1.3	1.2	- .1
3. Labour force, Indians only ...	93,651	92,302	-1,349
Hospital admissions ...	24,271	27,658	+3,387
Deaths, all causes ...	630	661	+ 31
Death-rate per mille ...	6.7	7.1	+ .4
Hospital admissions, malaria only ...	6,063	7,509	+1,446
Deaths, malaria only ...	106	82	- 24
Death-rate, malaria only ...	1.0	.9	- .1
4. Estate population, Indians only including dependants ...	148,646	145,427	-3,219
Hospital admissions ...	37,289	43,005	+5,716
Deaths, all causes ...	2,366	2,466	+ 100
Death-rate per mille ...	15.9	16.9	+ 1.0
Hospital admissions, malaria only ...	8,523	10,730	+2,207
Deaths, malaria only ...	223	210	- 13
Death-rate, malaria only ...	1.5	1.4	- .1

Comparison of death-rates in the four States for 1931, 1932 and 1933 :

Average death-rate among labourers.			
	1931.	1932.	1933.
Perak ...	6.2	4.8	6.1
Selangor ...	6.9	5.2	4.7
Negri Sembilan ...	10.1	5.8	5.3
Pahang ...	12.7	8.7	5.7

Further details of vital statistics of estate labourers will be found in the report of the Registrar-General of Births and Deaths.

B.—ON MINES.

As already stated under the heading Mine Sanitation (section VIII) an attempt has been made during the year to allow Health Officers to devote to mines some of the time that they previously spent in making routine visits to estates. This has been done with a realization that the inability to comment on existing health conditions in an important industry like tin mining in this country leaves a serious deficiency in the knowledge which is necessary to enable effective steps to be taken to guard the health of the general population. Health returns from mines are not required by law and there are not the same means as exist in the case of estates to enable an accurate estimate to be made of the mortality amongst the labourers on tin mines, or to enforce measures for the improvement of the health of this particular class of labourers. There is, however, no reason to believe that the labourers on tin mines were any less healthy during the past year than other sections of the population or to doubt that they shared in the favourable factors which influenced the low death-rates.

The following table shows the number of mining coolies recorded for 1931, 1932 and 1933.

				Labour force, all nationalities.			
				1931.	1932.	1933.	
Perak	...	...	33,486	...	22,777	...	22,634
Selangor	...	...	18,990	...	16,275	...	14,140
Negri Sembilan	...	...	1,252	...	891	...	660
Pahang	...	...	3,433	...	3,201	...	3,561
Total	...	...	57,161	...	43,144	...	40,995

It will be seen that there was a reduction of 2,149 from the 1932 figure.

C.—IN GOVERNMENT DEPARTMENTS.

Little difficulty was encountered during the year in housing labourers employed by Government and the position was rendered easier by the large reduction in the numbers employed owing to the curtailment of work which was general throughout the country. Labourers and their dwellings were regularly attended to and inspected by officers of the Health Department. The travelling dispensaries attend to the needs of the sick in outlying areas.

(xii)—Housing and Town Planning.

Meetings of the Town Planning Committees, of which the respective Health Officers are members, were held regularly throughout the year and steady progress was made so far as available funds permitted. During 1932 the Kuala Lumpur Committee considered some of the more urgent local problems

and guiding decisions have now been made with reference to future policy. This may be regarded as a move in the right direction which should enable necessary improvements to be initiated without delay as soon as circumstances permit. The question of overcrowding in the larger towns has been simplified temporarily by the decrease in the number of people requiring accommodation. Attempts have been made in many areas to restrict the number of temporary houses, and applications to build temporary dwellings are rarely approved by the authorities concerned.

(xiii)—Food in Relation to Health and Disease.

(1)—BAKERIES.

All bakeries within Sanitary Board areas were regularly inspected and reported upon by the Health staff. Improvements in the conditions of many bakeries have been reported during the year.

(2)—MILK.

Persistent endeavours to improve the milk supplies of the towns were continued. Milk sellers in Kuala Lumpur were registered with the object of eliminating eventually the more unsatisfactory premises and of keeping all handlers of milk under sanitary control.

The Government Dairy in Selangor was well maintained. To overcome the difficulty of deterioration of milk in transit this dairy has introduced churns of a vacuum-flask type and has provided a milk cooler.

The Ipoh Government Dairy continued to maintain its improvement in the technique of the production of clean milk.

(3)—AERATED WATER FACTORIES.

These were all kept under close sanitary supervision and one was closed in Kuala Lumpur for failing to carry out the Sanitary Board's requirements.

(4)—MARKETS.

The sanitary condition of the markets was satisfactorily maintained during the year under the close supervision of the Health Department.

(5)—FOOD FACTORIES.

It is believed that very few food factories escaped inspection during the year. Pineapple factories have been established at several places in recent years and unless carefully supervised by the sanitary authorities they readily become a nuisance. Important improvements were put into effect in one such factory at Klang on the recommendation of the Health Officer.

(6)—RESTAURANTS AND EATING SHOPS.

The food, and the conditions of its preparation, in all eating shops within Sanitary Board areas were regularly inspected by the Sanitary Board staff and a reasonable standard of cleanliness was maintained. Outside Sanitary Board areas all restaurants and eating shops are licensed by the Health Officers but in the smaller and remoter places it is often impossible to obtain more than a slight amelioration of unsatisfactory conditions.

(7)—PIGGERIES.

The policy of many Sanitary Boards to ban the keeping of piggeries within their areas has been continued and extended. Piggeries elsewhere have been closely supervised.

(8)—SAMPLES UNDER THE SALE OF FOOD AND DRUGS ENACTMENT.

Tinned food.—During the year greater interest was taken by the health authorities in tinned food. As the result of a concerted search in many parts of the State of Perak a very large number of tins containing unsound food was seized, condemned and destroyed. The good effect of this action is shown by the fewer number of unsatisfactory tins exposed for sale in the succeeding months and by the increase in the number of tins voluntarily surrendered. Detailed returns were being made by all Health Officers at the end of the year and it is expected that continued attention may be expected to reduce very considerably the quantity of unsound food exposed for sale in tins.

Six thousand seven hundred and fourteen tins of milk and 8,053 tins of other foodstuffs were destroyed in Perak. Samples of various foodstuffs were examined in other States and appropriate action was taken when necessary.

(9)—DEFICIENCY DISEASES.

BERI-BERI.

The number of deaths from beri-beri was 254 compared with 264 in 1932 and 352 in 1931.

The deaths were distributed throughout the States as shown in the following table:

State.	Deaths.		
	1931.	1932.	1933.
Perak	62	32	49
Selangor	110	97	97
Negri Sembilan ...	102	60	51
Pahang	78	75	57
Total	352	264	254

It will be seen that there has been a substantial decrease since 1931 which is most marked in the State of Negri Sembilan. It is interesting to observe that in Malaya the incidence of beri-beri appears to show recessions corresponding to periods of lessened prosperity.

(xiv)—Measures Taken to Spread Knowledge of Hygiene and Sanitation.

The lecture van of the Committee for Public Health Education was kept in commission during the year and toured the country giving numerous exhibitions of the films "Aminah" (Infant Welfare) and "Rescue of Swee Kim" (Tuberculosis) and films on "Malaria". A portable power unit has been added to the van's equipment which has enabled films to be shewn in villages away from the roads and on the rivers.

The Malayan Agri-Horticultural Exhibition was utilised to exhibit a Public Health and Infant Welfare Section which was well attended, and the exhibits aroused much interest amongst the 16,718 persons who visited the section, 5,223 of whom were Malays. Repeated lectures and demonstrations were given and propaganda films were shown throughout the course of the exhibition. Health exhibits were staged at various other centres during the year and succeeded in attracting several thousands of villagers.

In Perak health lectures in selected kampongs (villages) have been inaugurated and at the end of the year were being given in all the districts. The principle which has been followed was that it is better to lecture frequently in the same place than to lecture once or perhaps twice a year in many scattered places. In each district, therefore, four or five large kampongs have been selected in consultation with the District Officer, and a Malay Health Inspector lectures in each of these once or twice a month. The lecture is short (about quarter of an hour), deals with some principle of hygiene or sanitation and it is followed by a walk round the kampong, when any insanitary condition is demonstrated and advice is given as to the simplest and cheapest method of removing the nuisance. Health Inspectors and Penghulus report definite progress in some kampongs, which is most encouraging. There is no doubt that the kampong dweller is willing and, in most cases, eager to adopt measures which will improve his lot, provided the knowledge is brought to him in the right manner; and this method of disseminating "health consciousness" has many points which cause the health authorities to consider it the method of choice.

Health Officers also now make visits to kampongs for the purpose of discussing health matters with the people as a part of their programme and devote a certain portion of each week for this purpose.

On 20th November His Highness the Sultan of Perak made a trip down the Perak River accompanied by the Health Officer and visited several kampongs where he visited houses and exhorted the people to clean their kampongs and carry out the Health Officer's recommendations.

The following table shows the number of lectures per annum which the system in force at the end of 1933 would give to each district:

Kinta	...	...	...	...	...	49
Perak North	...	...	...	...	...	23
Kuala Kangsar	...	...	...	...	...	112
Batang Padang	...	...	...	...	...	82
Lower Perak	...	...	...	...	...	48

Reports from Health Officers indicate that these lectures are appreciated and that they result in good, particularly in those areas where the Penghulu (village head-man) or Ketua is sufficiently energetic and open-minded to encourage appreciation of the advice given by Health Inspectors.

(xv)—Training of Sanitary Personnel.

Constant training of the health staff is carried out.

Seven Health and Sanitary Inspectors attended the course of the Royal Sanitary Institute during the year. Three Dressers and two Mosquito Destruction Committee Volunteers were given instruction and training at Health Offices. Twenty-six Antimalarial Inspectors, Collectors and Overseers were examined at the Health Office, Kuala Lumpur, for purposes of promotion and test for proficiency.

IV.—PORT HEALTH AND ADMINISTRATION.

Port Swettenham.—During the year under review 845 (comprising 2,679,307 tons) ocean-going, and 488 (comprising 252,542 tons) local vessels passed through Port Swettenham. Of these, 130 arriving from infected ports were boarded by officers of the Health Branch. A statement showing the nature of work done is given below:

Total ships.	Total tons nett.	Total crew.	Total passengers.		Total examined.		Passengers.		
			Cabin.	Deck.	Crew.	Passengers.	U.	Q.	R.
130	538,634	19,280	2,386	23,340	8,010	15,449	547	2,675	22,348

Immigrant Ships.—Twenty-six ships from infected ports, included in the above total, brought 13 State-aided immigrants and 2,658 ordinary immigrants. They were all admitted to the quarantine camp to complete the appropriate period of observation.

Pilgrim Ships.—Three pilgrim ships passed through the port—of these two were outgoing and one incoming. One returning pilgrim disembarked.

U. = Granted undertaking. Q. = Quarantined. R. = Remaining on ship.

Following the arrangement made during the previous year exemption permits granted to vessels at Straits Settlements ports were recognised at Port Swettenham.

During the year 2,739 persons were detained in quarantine; of these 64 remained from the previous year. The camp was occupied for 161 days during the year; no repatriates were accommodated. The quarantine camp hospital remained closed. Minor ailments were treated in the observation huts and minor infectious diseases were segregated and treated in the section huts. Non-infectious cases requiring treatment in hospital were transferred to the District Hospital, Klang.

A comparative statement showing the amount of vaccination done during the last three years is given below:

	1931.	1932.	1933.
State-aided immigrants ...	57	8	—
Ordinary immigrants ...	1,613	492	310
Camp staff ...	—	—	—
Others ...	—	—	7
Total ...	1,670	500	317

Perak.—No case of suspected infectious disease was reported during the year at either Port Weld or Teluk Anson.

V.—MATERNITY AND CHILD WELFARE.

The scheme for training Malay midwives for work in the villages has been continued and expanded during the year. Midwives so trained are now practising in many Malay centres throughout the country and are under the supervision of the staff of the nearest Infant Welfare Centre.

Six Infant Welfare Centres were maintained during the year—one each at Ipoh, Taiping, Kuala Lumpur, Klang, Seremban and Telok Anson.

The attendances at the Kuala Lumpur Centre show an increase of 15,040 over the total for 1932. The attendances for Malays were almost double those of the previous year and Chinese attendances also show a substantial increase. At Klang the attendances of all races increased by 4,822. An attempt has been made during the year to popularise soya bean milk as a substitute for tinned milk, the price of which is found to be beyond the means of many poor mothers. This vegetable product (so called "vegetable milk") has been found to possess a high protein content. The carbo-hydrates are generally low and extra sugar must be added. The fat content is also on the low side and the addition of cod liver oil is necessary to supply this deficiency. When properly prepared it was found that children

and infants accepted it readily. The chief objection to its general adoption is that it is troublesome to prepare in a small household, as much time and effort with a grind-stone are necessary to make it palatable. It is, however, remarkably cheap and can be bought in many kampongs for about two cents a pint.

An important part of the duties of the Health Visitors is the visiting of new-born babies and their mothers. Most of the births registered are followed up and visited. The Health Visitors advise and teach the mothers to breast-feed their babies. They also teach them how to wash their infants properly and train them to sleep and feed at regular intervals. These home visits are paid weekly until the mother and infant are well enough to visit the Centre. In addition to these routine visits several visits were paid to some of the remoter kampongs during the year and in one instance to a Sakai camp. These visits appeared to be much appreciated and requests were made to repeat them.

The educational side of the work at the Centres was stressed and lectures and demonstrations were given daily to groups of mothers. Posters and models were freely used to adorn the Centres and illustrate the demonstrations.

VI.—HOSPITALS, DISPENSARIES AND SPECIAL CLINICS.

(1)—HOSPITAL IN-PATIENTS.

The following table shows the hospitals maintained by the Medical Department of each State, the average daily number of patients in each, the total number of patients admitted during the year, the total number of deaths, and the death-rate per hundred admissions:

Hospitals.	Average daily No. of patients.	Total No. of patients admitted.	Deaths.	Deaths per 100 admissions.
I.—PERAK.				
Ipoh, District	286	7,373	758	10.28
Taiping, General	74	2,254	229	10.11
„ District	118	3,198	282	8.82
Batu Gajah	144	3,120	231	7.40
Kuala Kangsar, District ...	79	1,873	153	8.16
„ „ Women's	61	1,640	117	7.13
„ „ Malay	27	873	14	1.60
Teluk Anson, General	132	3,453	327	9.47
Kampar, District	100	1,560	242	15.51*
Tapah, District	114	2,707	260	9.60
Parit Buntar, District	41	1,260	103	8.17
Tanjong Malim, District ...	36	1,336	56	4.19
Grik, District	10	397	18	4.53
Klian Intan, District	18	456	37	8.11

* NOTE.—Tuberculosis cases are transferred to this hospital.

Hospitals.	Average daily No. of patients.	Total No. of patients admitted.	Deaths.	Deaths per 100 admissions.
II.—SELANGOR.				
Kuala Lumpur, Bungsar	12	415	1	0.24
" " Tanglin	109	3,062	184	6.00
" " District	461	7,612	829	10.88
" " Malay	57	1,648	39	2.36
Klang, District	182	3,436	312	9.08
Kajang, District	78	1,962	147	7.49
Kuala Kubu Bahru, District	49	1,411	84	5.95
Serendah, District	13	478	14	2.92
III.—NEGRI SEMBILAN.				
Seremban, 1st Class A Wards	4	108	1	.93
" " General	310	6,018	486	8.08
Kuala Pilah, District	150	2,388	120	5.03
" " Women's	61	1,299	129	9.93
Tampin, District	80	1,409	88	6.25
Port Dickson, District	55	902	58	6.43*
Jelebu, District	31	756	30	3.97
IV.—PAHANG.				
Kuala Lipis, General	105	2,560	140	5.47
Kuantan, General	109	1,944	111	5.71
Bentong, District	87	1,826	185	10.13
Raub, District	63	1,562	86	5.50
Mentakab, District	37	1,131	55	4.86
Pekan, District	25	433	8	1.85
Kuala Rompin	—	7	—	—

This table excludes patients in gaol hospitals and criminal vagrant wards (*vide* section VIII) which are included in the return of diseases shown in Tables III and IV on pages 57 and 68.

Many patients were transferred from one hospital to another for special treatment; each patient transferred has been recorded as one case only in Table III, which is a return of the total number of in-patients in Government hospitals.

The total number of in-patients admitted during 1933 was 76,297 with 6,024 deaths. The corresponding figures for 1932 were 74,177 patients with 6,085 deaths.

The distribution in the four States was as under:

	Admissions.	Deaths.
Perak	33,579	2,911
Selangor	20,251	1,616
Negri Sembilan	13,004	912
Pahang	9,463	585

* NOTE.—Tuberculosis cases are transferred to this hospital.

The existing hospital accommodation at the end of the year, and the average daily number of in-patients during the year, in the four States is shown hereunder:

			Total number of beds.					Average daily number of patients.	
			1932.	1933.				1932.	1933.
Perak	...	...	3,107	2,996	...	1,582	...	1,308	
Selangor	...	...	1,519	1,488	...	1,023	...	976	
Negri Sembilan	...	...	1,139	1,157	...	670	...	694	
Pahang	...	...	678	696	...	400	...	428	

Table III (page 57) sets out the full return of all cases treated as in-patients. As a ready indication of the comparative incidence of those diseases or groups of diseases which were responsible for a large number of admissions, the following summary is here included:

PREVAILING DISEASES AMONG HOSPITAL PATIENTS.

Diseases.			Admissions.		Deaths.		Mortality.	
Malaria	...	...	17,146	...	686	...	4.00	
Venereal disease	...	...	3,769	...	77	...	2.04	
Influenza	...	...	3,788	...	8	...	.21	
Chest Affections—								
Bronchitis	...	...	2,418	...	57	...	2.36	
Pneumonia and broncho-pneumonia	...	...	1,873	...	908	...	48.48	
Pulmonary tuberculosis	...	...	1,848	...	821	...	44.43	
Intestinal Affections—								
Dysentery	...	...	1,096	...	197	...	17.98	
Diarrhoea and enteritis	...	...	1,306	...	220	...	16.85	
Other Affections—								
Helminthic diseases	...	...	2,379	...	8	...	.34	
Beri-beri	...	...	384	...	45	...	11.72	
Anaemia	...	...	1,028	...	200	...	19.45	
Surgical Conditions—								
Chronic ulcers	...	...	3,486	...	9	...	.26	
Wounds	...	...	3,118	...	35	...	1.12	
Fractures, etc.	...	...	2,605	...	72	...	2.76	
Abscesses, etc.	...	...	2,247	...	47	...	2.09	

NOTES ON PREVAILING DISEASES AMONG HOSPITAL PATIENTS.

(i) *Malaria*.—It will be noted that there was a slight increase in the number of admissions for malaria from 16,463 to 17,146 but these figures are nevertheless well below the average of the yearly totals for the past five years. These totals are shown in the following table:

							Total cases of malaria.
1929	...	...	...	...	...	...	35,306
1930	...	...	...	...	...	...	36,647
1931	...	...	...	...	...	...	22,901
1932	...	...	...	...	...	...	16,463
1933	...	...	...	...	...	...	17,146

Yearly average—25,693.

Of the 17,146 patients diagnosed, the diagnosis was confirmed by microscopic examination in 13,032 and the specific infections so found were:

Sub-tertian infection	...	...	...	67.76 per cent.
Tertian infection	...	...	...	25.02 "
Quartan infection	...	...	...	3.27 "
Mixed infection	...	...	...	3.92 "

There were 19 cases of blackwater fever admitted to hospital, with seven deaths.

Malaria admissions for each of the twelve months of the year to the hospitals of the four States are shown in the following table:

Months.	Perak.	Selangor.	Negri Sembilan.	Pahang.	Total.
January	582	191	183	172	1,128
February	522	186	206	122	1,036
March	536	179	240	161	1,116
April	631	307	333	231	1,502
May	974	458	494	250	2,176
June	1,057	328	425	310	2,120
July	863	223	287	264	1,637
August	827	234	262	275	1,598
September	550	224	249	243	1,266
October	609	194	240	246	1,289
November	465	214	210	249	1,138
December	562	202	179	194	1,137

Racial incidence among hospital patients is shown in the table on page 29.

The administration of atebryn in tablet form as a substitute for quinine was tried in a number of hospitals. The results were encouraging and tended to show that its extended use in the treatment of malaria may be expected to reduce the number of re-admissions to hospital.

The method of treating malaria advocated by the Health Organisation of the League of Nations was tried with encouraging results.

In the treatment of malaria full advantage was taken of the results of the research and experiments relating to the therapeutic problems of malaria undertaken by the Institute for Medical Research.

(ii) *Venereal Disease*.—The total number of cases treated in hospitals during the year was 3,769 with 77 deaths. This subject is discussed more fully on page 36 under the section "Social Hygiene".

(iii) *Pneumonia*.—The number of cases diagnosed as pneumonia or broncho-pneumonia was 1,873, of which 908 were fatal; the case-mortality was therefore 48.48 per cent.

(iv) *Pulmonary Tuberculosis*.—The number of admissions to hospitals was 1,848 compared with 1,829 in the previous year and 2,197 in 1931. The case mortality was 44.43 per cent. One of the chief obstacles to the satisfactory treatment of tuberculosis is found to be the difficulty of bringing the poorer class of patients under treatment at a sufficiently early stage of the disease, and the reluctance of labourers to enter an institution until they are too feeble to continue working. For this reason nearly all the patients admitted to hospital are found to be in an advanced and hopeless stage of the disease and the mortality is consequently regrettably high.

(v) *Dysentery*.—The number of patients recorded under "dysentery" was 1,096, and the number of deaths was 197. In addition to cases recorded as dysentery, there were 1,306 recorded as diarrhoea or colitis, with 220 deaths. If the records under the different, though related, headings are combined, the figures for the year are 2,402 admissions with 417 deaths compared with 2,775 admissions and 476 deaths in 1932.

(vi) *Beri-beri*.—The number of cases recorded as beri-beri was 384, compared with 574 in 1932. It is gratifying to note the remarkable decrease in the number of cases of this disease. It is possible that the lack of urban employment has caused many more of the population to depend on their own production of foodstuffs.

(vii) *Anaemia*.—There were 1,028 cases recorded as suffering from "anaemia" with no indication of other pathological condition. As previously noted, many cases so recorded may be suffering from malaria, syphilis or ankylostomiasis. In addition there were recorded 67 cases of anaemia of pregnancy, with 42 deaths.

(viii) *Chronic Ulcer*.—The number of cases of chronic ulcer reported was 3,486 as against 3,223 in 1932 and 4,438 in 1931.

NOTES ON OTHER DISEASES.

(i) *Leprosy*.—The recorded number of new cases of leprosy detected and segregated during the year was 315. The number reported for 1932 was 293. Leper settlements are dealt with in section VII (B), page 42.

Modern treatment has been intensively administered to the patients at Sungei Buloh Settlements. The measure of success may be gauged by the number of those freed from active manifestations of leprosy. Of the 1,531 patients treated during the year 151 were discharged. The Medical Superintendent has devoted much time and thought to experiments and research directed towards improving the treatment of leprosy; and several new possibilities of curative treatment have been explored. Full details of the therapeutic agents used and the results obtained to date will be found in the Report on Leper Settlements on page 42.

(ii) *Enteric Fever*.—The number of diagnosed cases was 262 with 45 deaths compared with 233 and 57 deaths in 1932.

It will be observed that an increase in the number of cases was accompanied by a diminished number of deaths.

(iii) *Tropical Typhus*.—The number of cases during the year was 181 with 14 deaths.

(iv) *Leptospirosis*.—There were 18 cases diagnosed, with seven deaths.

(v) *Japanese River Fever*.—There were five cases with one death.

(vi) *Cancer*.—The number of patients in Government hospitals recorded as suffering from malignant tumour was 408 with 170 deaths. These figures are slightly higher than those of last year. A statement of the nature of 273 tumours examined microscopically will be found in the Report of the Institute for Medical Research.

The number of cases recorded during the past three years has shown a steady increase which may be due partly to more accurate diagnosis and the greater readiness of Asiatic patients to submit themselves to treatment for conditions requiring surgical operations.

RACIAL INCIDENCE OF CERTAIN DISEASES AMONG HOSPITAL IN-PATIENTS.

Diseases.	Chinese.		Indians.		Malays.		Others.	
	Admissions.	Deaths.	Admissions.	Deaths.	Admissions.	Deaths.	Admissions.	Deaths.
Malaria	5,747	406	9,842	264	1,303	12	251	3
Dysentery	555	146	1,247	185	151	9	42	3
Pneumonia and broncho-pneumonia	650	414	1,149	475	54	13	17	4
Pulmonary tuberculosis ...	999	519	702	266	104	19	43	17
Cirrhosis of liver	249	120	53	27	32	5	11	6
Chronic ulcer	1,661	9	1,057	—	714	—	54	—
Beri-beri	359	42	5	2	19	1	1	—
Appendicitis	53	4	105	6	26	—	64	1

HOSPITAL ADMISSIONS AND DEATHS, BY RACES FOR ALL DISEASES.

Race.	Admissions.	Deaths.	Case mortality, per cent.	Admission rate, per cent.
Chinese	26,459	3,271	12.74	34.68
Indians	39,939	2,488	6.23	52.35
Malays	7,752	176	2.27	10.16
Others	2,147	89	4.15	2.81
Total	76,297	6,024	7.90	100.00

The explanation of the higher mortality among Chinese patients, as shown above, is to be found in the comparative reluctance of the Chinese to enter hospital until disease is far advanced.

(2)—OUT-PATIENTS.

The total number of out-patients treated during the year is recorded as 645,974. This comprises those treated at all Government hospitals and dispensaries, including travelling dispensaries, as well as patients visited in their own homes: it does not include those treated at Infant Welfare Centres, or at school inspections, nor does it include attendances at special clinics, e.g., social hygiene and ophthalmic clinics, all of which are recorded elsewhere in this report.

These out-patients can be classified under three headings:

	Male.	Female.	Total.
I.—At Hospitals	199,558	65,106	264,664
II.—At Stationary Dispensaries ...	153,327	49,487	202,814
III.—By Travelling Dispensaries ...	132,233	46,263	178,496
	485,118	160,856	645,974

The figures for the four States are shown below:

(1)—PERAK.			
	Male.	Female.	Total.
I.—At Hospitals	62,667	21,992	84,659
II.—At Stationary Dispensaries ...	62,514	21,752	84,266
III.—By Travelling Dispensaries ...	42,600	12,926	55,526
	167,781	56,670	224,451
(2)—SELANGOR.			
	Male.	Female.	Total.
I.—At Hospitals	58,731	16,960	75,691
II.—At Stationary Dispensaries ..	61,320	19,382	80,702
III.—By Travelling Dispensaries ...	43,485	14,867	58,352
	163,536	51,209	214,745
(3)—NEGRI SEMBILAN.			
	Male.	Female.	Total.
I.—At Hospitals	28,979	9,886	38,865
II.—At Stationary Dispensaries ..	20,618	4,740	25,358
III.—By Travelling Dispensaries ...	13,605	5,921	19,526
	63,202	20,547	83,749
(4)—PAHANG.			
	Male.	Female.	Total.
I.—At Hospitals	49,181	16,268	65,449
II.—At Stationary Dispensaries ...	8,875	3,613	12,488
III.—By Travelling Dispensaries :			
(a) Road	17,362	6,982	24,344
(b) River	15,181	5,567	20,748
	90,599	32,430	123,029

A return of the diseases of out-patients is given in Table IV.

**(3)—LABORATORY AND POST-MORTEM EXAMINATIONS
IN HOSPITALS.**

1.—Laboratory.

(a).—BLOOD FILM EXAMINATIONS.

States.	Number of patients examined.	Number positive for malarial parasites.				Total number of examinations of blood films.
		Sub-tertian.	Benign tertian.	Quartan.	Mixed infection.	
Perak	69,586	6,817	4,587	205	441	110,716
Selangor	28,977	2,542	2,360	147	102	49,765
Negri Sembilan	21,105	3,478	1,182	221	153	41,670
Pahang	14,188	2,153	1,036	154	155	36,365
Total	133,856	14,990	9,165	727	851	238,516

In this table cases of mixed infection have been included also under the specific headings.

Sub-tertian malaria was again the commonest form of infection in all four States.

(b).—MICROSCOPICAL EXAMINATION OF FÆCES.

State.	Number of patients examined.	Positive for Entamoeba histolytica.	Positive for ova.			Total number of examinations.
			Ascaris.	Ankylostome.	Mixed infections.	
Perak	60,871	552	12,116	3,847	1,655	73,753
Selangor	20,000	126	5,399	2,577	1,061	28,048
Negri Sembilan	15,616	77	2,934	1,767	502	26,121
Pahang	11,268	66	2,022	1,082	266	27,958
Total	107,755	821	22,471	9,273	3,484	155,880

(c).—POST-MORTEM EXAMINATIONS.

	Medico-Legal.			Clinical.		
Perak	...	466	...	...	611	...
Selangor	...	238	...	...	199	...
Negri Sembilan	...	126	...	...	56	...
Pahang	...	74	...	...	54	...
Total	...	904	...	...	920	...

(4)—DISEASES AMONG EUROPEANS.

The figures for in-patients which follow may be taken as indicative of the incidence of serious disease among the general European population, since Government hospitals are open alike for Government servants and the general public, and no other hospitals or nursing homes are available.

In-patients.—The total number of admissions, exclusive of 75 cases of normal labour, was 789, and there were nine deaths. The number of admissions shows a decrease of 131 due no doubt to less Europeans being resident in the country during the year. The causes of death in the nine fatal cases were :

Myocarditis	1
Broncho-pneumonia	1
Aestivo autumnal malaria	1
Chronic nephritis	1
Cirrhosis of the liver	1
Diarrhoea and enteritis (in children under two years of age)	1
Other affections of the intestines	1
Other affections of infancy	1
Wounds by firearms	1

The diseases from which Europeans were found to suffer were :

	Admissions.	Deaths.
Malaria	100	1
Tonsillitis, pharyngitis, etc.	44	—
Admissions for the puerperal state other than normal labour	35	—
Dysentery, etc.	24	1
Appendicitis	54	—
Influenza	46	—
Fractures and other injuries	41	1
Enteric fever	2	—
Tropical typhus	6	—
Dengue	6	—
Pulmonary tuberculosis	2	—
Bronchitis	9	—
Diseases of the ear	4	—
Diseases of the nose	10	—
Cancer	2	—
Leptospirosis	4	—
Diseases of the liver	15	—

Of the malaria cases, benign tertian infection was definitely diagnosed in 43, and sub-tertian in 44. There were seven cases of mixed infection, and only six acute cases in which diagnosis was not confirmed microscopically.

European Out-patients.—

States.	Male.	Female.	Total.
Perak	356	207	563
Selangor	1,072	521	1,593
Negri Sembilan	435	186	621
Pahang	728	564	1,292

The figures for out-patients refer mainly to Government servants and their families, since other European patients are usually treated by private practitioners. The large number of European out-patients shown under Pahang is due to the inclusion of the Gap and Fraser's Hill dispensaries in the figures of that State.

(5)—SURGERY.

The following are the figures returned for surgical operations, excluding ophthalmic surgery, in all the hospitals in the four States:

	Major operations.	Minor operations.
Perak	826	3,428
Selangor	645	2,300
Negri Sembilan	275	2,490
Pahang	22	1,160
Total	1,768	9,378

The number of major operations performed in the larger hospitals was as follows:

PERAK.

District Hospital, Ipoh	389
General Hospital, Taiping	54
District Hospital, Taiping	76
	130
District Hospital, Teluk Anson	79
European Hospital, Batu Gajah	43

SELANGOR.

Tanglin Hospital, Kuala Lumpur	467
District Hospital, Kuala Lumpur	22
Bungsar Hospital, Kuala Lumpur	91

NEGRI SEMBILAN.

General Hospital, Seremban	252
European Hospital, Seremban	22

Comparative figures of the major operations performed in 1932 and 1933 are shown below:

	1932.	1933.
District Hospital, Ipoh	378	389
European Hospital, Batu Gajah	26	43
European Wards, Taiping	4	—
	408	432

The figures shown below record the number of major operations performed in the three hospitals in Kuala Lumpur in 1932 and 1933. Emergency surgical work at the District Hospital is carried out by the Medical Officer in charge of that hospital.

	1932.	1933.
Tanglin Hospital	296	467
Bungsar Hospital	120	91
District Hospital	226	22
	642	580

The figures below give the return of major operations performed in Seremban.

	1932.	1933.
General Hospital, Seremban ...	254	252
European Hospital, Seremban ...	26	22
	280	274

(6)—RADIOLOGY.

COMPARATIVE TABLE OF WORK DONE DURING THE LAST TWO YEARS.

	X-Ray examinations.		Treatments.	
	1932.	1933.	1932.	1933.
Kuala Lumpur	1,541	1,228	1,134	1,673
Ipoh	1,614	1,354	406	314
Total	3,155	2,582	1,540	1,987

In this table the X-Ray examinations represent the number of patients examined (repetitions being excluded), but the treatments refer to the total number of attendances for treatment.

(7)—OPHTHALMOLOGY.

Special clinics for treatment of diseases of the eye were in operation at the following centres:

I.—Perak—(a) Ipoh Hospital.

(b) Taiping Hospital.

II.—Selangor—Kuala Lumpur, Tanglin Hospital.

III.—Negri Sembilan—Seremban Hospital.

IV.—Pahang—Kuala Lipis Hospital.

The total number of patients treated in the four States was 10,788, of which 1,664 were in-patients and 9,124 out-patients (the figures records new cases, excluding repetitions and routine examinations).

TABULATED RETURNS.

	Eye diseases proper.	Eye injuries.	Refraction.	General diseases affecting eyes.	Disorganised eyes.	Total.
PERAK.						
(1) Ipoh, In-patients	370	31	11	16	4	432
„ Out-patients	1,972	164	263	11	15	2,425
(2) Taiping, In-patients	61	4	...	2	4	71
„ Out-patients	1,649	27	33	14	7	1,730
SELANGOR.						
(1) Kuala Lumpur, In-patients	557	153	54	29	19	812
„ Out-patients	1,757	275	449	99	3	2,583
NEGRI SEMBILAN.						
Seremban, In-patients	214	16	4	9	7	250
„ Out-patients	495	65	126	8	1	695
PAHANG.						
In-patients	88	8	3	...	...	99
Out-patients	1,435	20	230	...	6	1,691
Total In-patients	1,290	212	72	56	34	1,664
„ Out-patients	7,308	551	1,101	132	32	9,124
GRAND TOTAL	8,598	763	1,173	188	66	10,788

	Major operations.	Minor operations.	Sub-conjunctival injections.
Ipoh	124	192	13
Taiping	61	73	—
Kuala Lumpur	170	239	16
Seremban	60	86	98
Pahang	1	13	—
Total	416	603	127

Amongst nationalities the Chinese again preponderated to an extent of over 50 per cent.

A comparison between the work done in 1932 and 1933 is set out below :

	1932.	1933.
Ipoh—		
In-patients	377	432
Out-patients	2,680	2,425
Taiping—		
In-patients	105	71
Out-patients	925	1,730

				1932.		1933.
Kuala Lumpur—						
In-patients	...	...	...	384	...	812
Out-patients	...	...	...	2,353	...	2,583
Seremban—						
In-patients	...	...	...	173	...	250
Out-patients	...	...	...	697	...	695
Pahang—						
In-patients	...	...	...	161	...	99
Out-patients	...	...	...	968	...	1,691

(8)—SOCIAL HYGIENE.

It will be noted that the number of cases of venereal diseases attending the Government hospitals and clinics continued to decrease. The table below shows that the decrease has been progressive since 1929, the year when the policy of closing the known brothels was introduced. Other factors, some of which have been found to be coincident with a lessened incidence in other regions, cannot, however, be ignored. To mention a few:

- (a) The provision, in recent years, on a large scale of facilities for free treatment which has quickly rendered many cases no longer contagious.
- (b) The economic crisis which has no doubt curtailed the number of visits to brothels.
- (c) The increase in the sex ratio of females to males amongst Chinese in Malaya.
- (d) The favourable effects of propaganda.
- (e) The exodus of a large number of labourers many of whom, especially the Chinese, are unmarried and particularly subject to venereal infection.

During the year 23,176 patients were treated for venereal disease as against 25,207 patients in 1932.

The following table shows the nationality, diseases and number of those treated throughout the Federated Malay States for the years 1932 and 1933:

Nationality.	Syphilis.		Gonorrhoea.		Soft sore.		Total number.	
	1932.	1933.	1932.	1933.	1932.	1933.	1932.	1933.
Chinese	8,054	6,689	3,698	2,995	455	703	12,207	10,387
Indians...	3,766	3,869	3,189	2,973	619	1,023	7,574	7,865
Malays...	1,625	1,682	1,019	943	66	99	2,710	2,724
Sikhs	792	587	570	441	113	212	1,475	1,240
Eurasians	65	64	136	97	11	23	212	184
Europeans	53	26	234	87	8	17	295	130
Others	403	362	308	229	23	55	734	646
Total	14,758	13,279	9,154	7,765	1,295	2,132	25,207	23,176

A total of 56,788 injections of arsenical and bismuth compounds were given.

Propaganda.—The importance of this side of social hygiene work has been impressed on all those in charge of State medical institutions. Posters in English and the vernacular languages are displayed at all hospitals and dispensaries and pamphlets in these languages are distributed. Lantern lectures were continued during the year. A Social Hygiene Section was on view at the Public Health Exhibition at the Malayan Agri-Horticultural Association and was very well attended.

TOTAL NUMBER OF VENEREAL DISEASE CASES TREATED AT
GOVERNMENT HOSPITALS AND CLINICS.

1929	...	...	...	...	...	...	40,802
1930	...	...	...	...	...	...	35,734
1931	...	...	...	...	...	...	31,817
1932	...	...	...	...	...	...	25,207
1933	...	...	...	...	...	...	23,176

(9)—HOSPITALS FOR WOMEN.

There were three hospitals reserved exclusively for the admission of women patients, one each at Kuala Lumpur (Selangor), Kuala Pilah (Negri Sembilan) and Pekan (Pahang). At other centres women are admitted to the female wards of the Government hospitals.

The hospitals, besides treating in-and-out-patients, serve as centres for medical work amongst women in the surrounding district. The hospitals are also utilised for the training of Asiatic midwives, who then return to the villages to practise. There has been a considerable increase in the number of confinements so attended in the outlying districts.

(10)—NEW BUILDINGS.

STATE OF PERAK.

No new buildings were erected during the year under review.

STATE OF SELANGOR.

An Asiatic ward was erected at Kuala Kubu Bahru Hospital and alterations were carried out to improve the Bungsar, Malay and General Hospitals in Kuala Lumpur.

STATE OF NEGRI SEMBILAN.

The following additions were made to the District Hospital, Port Dickson :

- (a) Erection of two bath-rooms for Wards I and III.
- (b) Provision of a bathing pagar.

WOMEN'S HOSPITAL, KUALA PILAH.

Erection of quarters for a midwife.

STATE OF PAHANG.

No new buildings were erected during the year but minor extensions to the hospitals at Kuala Lipis and Mentakab were completed.

VII.—INSTITUTIONS FOR MENTAL DISEASES AND FOR LEPROSY.

A.—CENTRAL MENTAL HOSPITAL.

The number of patients under treatment in the hospital at the end of the year was 2,506. This figure is 66 less than at the end of 1932 and is exactly the same figure as that at the end of 1931. Figures for the last three years are shown in the following table :

	Remaining at end of 1931.			Remaining at end of 1932.			Remaining at end of 1933.		
	M.	F.	Total.	M.	F.	Total.	M.	F.	Total.
FEDERATED MALAY STATES UNFEDERATED MALAY STATES.—	1,544	571	2,115	1,597	612	2,209	1,543	619	2,162
Kedah	162	59	221	154	55	209	162	49	211
Kelantan	6	4	10	6	3	9	5	2	7
Perlis	11	5	16	11	5	16	10	6	16
1ST CLASS PATIENTS	...	...	...	...	...	...	...	...	...
CRIMINALS	139	5	144	126	3	129	107	3	110
Total ...	1,862	644	2,506	1,894	678	2,572	1,827	679	2,506

ADMISSIONS.

	1931.			1932.			1933.		
	M.	F.	Total.	M.	F.	Total.	M.	F.	Total.
FEDERATED MALAY STATES UNFEDERATED MALAY STATES.—	553	216	769	500	211	711	479	206	685
Kedah	49	21	70	46	8	54	58*	10	68
Kelantan	...	1	1	1	...	1	...	...	...
Perlis	...	...	...	1	...	1	4†	1	5
Trengganu	...	...	...	...	...	...	1	...	1
1ST CLASS PATIENTS	...	...	...	...	...	...	...	...	...
CRIMINALS (F.M.S.)	38	2	40	39	1	40	35	3	38
Total ...	640	240	880	587	220	807	577	220	797

ADMISSIONS.

Admissions by nationality are shown hereunder :

	1931.		1932.		1933.	
	Males.	Females.	Males.	Females.	Males.	Females.
Europeans	—	—	—	—	—	—
Eurasians	1	—	2	1	1	—
Chinese	309	109	267	91	285	108
Indians	201	90	198	86	159	67
Malays	116	32	113	33	115	42
Javanese	8	10	6	7	—	—
Others	5	6	1	2	7	3

The number of admissions from all sources during the year was 10, less than during 1932, and 83 less than during 1931.

* Including 11 criminal cases. † Including 1 criminal case.

The most common forms of mental disorder among the admissions were:

Confusional insanity	...	...	...	...	258
Primary dementia (dementia praecox)	...	...	...	...	130
Senile dementia	...	...	...	...	87
Mania	...	...	...	...	61
Melancholia	...	...	...	...	57

The most common aetiological factors ascertained were:

Intestinal worms	...	...	...	...	273
Syphilis	...	...	...	...	176

It was found that the presence of intestinal worms was the most frequent factor discoverable and this confirms the investigations which were recorded in the report for 1932 regarding the significance of ankylostomiasis as an aetiological factor in the causation of insanity. In former years only 7 per cent. of the admissions were recorded as being infested. In 1933 the proportion of those infested was 34.13 per cent. No doubt further experience will give a figure that represents the true incidence.

The treatment of all cases found to be infested with intestinal parasites was attended to during the year and, in the opinion of the Medical Superintendent, this measure has helped to effect the reduction in the number of patients remaining in the Mental Hospital at the end of the year. Two hundred and seventy-three of the admissions were so treated and of these 140 were still under treatment or had not improved mentally at the end of the year; 62 were discharged as mentally recovered; 38 as relieved; 6 as not improved; 4 absconded; and 23 had died.

The specific treatment of many patients who showed a positive Wassermann and Kahn reaction was instituted during the second half of the year. It is impossible after such a short trial to state definitely the value of the results. Not all cases showing a positive Wassermann or Kahn reaction were treated but only those which could be reasonably expected to improve. Further experience will show in which type of cases the treatment is most beneficial.

Four patients were treated with gland extracts. Extract of thyroid gland was given and one case recovered completely while two others showed a marked improvement. One showed no improvement with the dose given and as he appeared to be a primary dement no other result could reasonably be expected. The other two cases that improved under thyroid treatment relapsed when the extract was withdrawn but showed a still greater improvement when given extract of mixed glands. It remains to be seen if this improvement will be maintained when the course of treatment ceases.

The total number of patients discharged during the year was 608 as against 534 during the previous year. The practice of discharging patients as early as possible was continued throughout the year. In this way it has been found possible to keep the numbers of patients within a reasonable limit.

The recovery rate was 42.15 per cent. on the admissions which is considerably better than last year when it was 32.34 per cent. This rate compares favourably with the recovery rate in modern mental institutions in Great Britain.

There were 57 more deaths during the year than in 1932, the numbers being 238 and 181 respectively. The rate was 7.07 per cent. on the total treated and 9.33 per cent. on the average daily number of patients.

The general health of the hospital was good throughout the year although there was a higher incidence of malaria in the first half of the year. There were 194 cases of malaria during the year compared with 54 in 1932. This incidence compared with the number of residents is not regarded as alarming but the matter has received due attention by the Health Branch.

The incidence of dysentery has remained low throughout the year, being much less than for many years past. This may be attributed to the anti-dysentery measures initiated last year. The septic tank and automatic flushes at the male isolation ward were completed in the second half of the year and they have worked satisfactorily.

Suitable patients were given occupation, as in former years, on the farms, in the workshops, in general gangs, etc., though some difficulty was experienced in maintaining the same volume of work inasmuch as there are now fewer suitable patients available than in former years owing to the practice of discharging patients as early as possible.

There was a large increase in produce from the farm during the year. With the exception of one week in January all the pork consumed in the hospital was produced on the pig farm. This result is by far the best that has so far been achieved. The number of pigs multiplied so much beyond requirements that 70 of them were sold. The hospital pig farm provided 38,552 katties of pork in 1933 compared with 13,106 katties in 1932.

The poultry farm also prospered and produced 4,651 hen eggs and 1,929 duck eggs as compared with 1,454 hen eggs and 232 duck eggs in 1932.

Vegetables and fruits were produced in largely increased quantities and it was found possible on one day a week to substitute fruit and vegetables for mutton in the dietary.

The farms have thus proved their worth from an economic point of view as well as providing an excellent form of occupational therapy.

The total expenditure on the hospital during the year was \$303,537, a decrease of \$41,773 on the previous year.

The maintenance vote was \$110.71 per patient per year as against \$135.24 for 1932.

Appended is a table showing the classification of patients treated during the year.

Diagnosis.	Remaining at end of 1932.			Admissions.			Discharges.		
	M.	F.	T.	M.	F.	T.	M.	F.	T.
A.—CONGENITAL.									
1. Intellectual—									
(a) With epilepsy ...		21	21	5		5			
(b) Without epilepsy ...	56	22	78	14	15	29	15		15
2. Moral ...	1		1	4		4			
B.—INSANITY OCCURRING LATER IN LIFE.									
1. Insanity with epilepsy ...	64	15	79	4	5	9	8	1	9
2. General paralysis of the insane	57	5	62	18	7	25	10	1	11
3. Insanity with gross brain lesion	6		6	1	1	2	1		1
4. Confusional insanity ...	274	65	339	227	31	258	246	15	261
5. Manic depressive—									
(a) Simple ...	1	2	3	15		15	8		8
(b) Mania ...	93	85	178	24	37	61	33	29	62
(c) Melancholia ...	274	125	399	25	32	57	31	27	58
(d) Alternating insanity ...	15	6	21	1		1			
6. Delusional insanity—									
(a) Systematised (paranoia)	45	7	52	4		4			
(b) Non-systematised ...	41	5	46	28	1	29	20	2	22
7. Dementia—									
(a) Primary ...	602	222	824	83	47	130	42	30	72
(b) Senile ...	152	41	193	63	24	87	42	8	50
(c) Secondary ...	196	56	252	10	8	18	14	8	22
8. Not insane ...	1		1	17		17	17		17
9. Under observation ...	16	1	17	34	12	46			
Total ...	1,894	678	2,572	577	220	797	487	121	608

Diagnosis.	Absconded.			Died.			Remaining at end of 1933.		
	M.	F.	T.	M.	F.	T.	M.	F.	T.
A.—CONGENITAL.									
1. Intellectual—									
(a) With epilepsy ...				1	3	4	4	18	22
(b) Without epilepsy ...	2		2	3	4	7	50	33	83
2. Moral ...							5		5
B.—INSANITY OCCURRING LATER IN LIFE.									
1. Insanity with epilepsy ...	1		1	5	2	7	54	17	71
2. General paralysis of the insane				16	7	23	49	4	53
3. Insanity with gross brain lesion							6	1	7
4. Confusional insanity ...	6		6	23	9	32	226	72	298
5. Manic depressive—									
(a) Simple ...							8	2	10
(b) Mania ...	1		1	13	8	21	70	85	155
(c) Melancholia ...	2		2	8	21	29	258	109	367
(d) Alternating insanity ...							16	6	22
6. Delusional insanity—									
(a) Systematised (paranoia)				3	1	4	46	6	52
(b) Non-systematised ...	2		2	3	1	4	44	3	47
7. Dementia—									
(a) Primary ...	2		2	30	14	44	611	225	836
(b) Senile ...	1		1	26	11	37	146	46	192
(c) Secondary ...				9	17	26	183	39	222
8. Not insane ...							1		1
9. Under observation ...							50	13	63
Total ...	17		17	140	98	238	1,827	679	2,506

M=Males. F=Females. T=Total.

B.—LEPER SETTLEMENTS.

1.—Federal Leper Settlement, Sungei Buloh.

The Leper Settlement at Sungei Buloh is laid out in the form of a village settlement and most of the patients are accommodated in small detached houses each designed to hold two, four or six inmates. Each house has its own kitchen and is surrounded by its own garden. Groups of houses are provided with bathing and sanitary buildings. The village is divided into four sections, one each for married couples, single men, single women and Indians.

In addition to the small houses there are twelve hospital wards, each containing twenty beds. The administration offices, dispensary and treatment centre are conveniently sited for purposes of supervision and treatment. There is a school for larger children and there are two clubs for the use of the inmates. The settlement is lit throughout by electric light; a piped water supply is laid on to every part, and there is a complete system of water flushed latrines and sewerage with septic tank installations.

The buildings are pleasantly sited on the slopes of a wooded hill and the surrounding area has been cleared and planted with vegetables and provides space for the pig farms. The surrounding valleys and ravines have been treated by a complete system of permanent anti-malarial drainage.

Dr. G. A. Ryrie has been in charge of the settlement throughout the year.

STATISTICAL TABLE OF THE PATIENTS.

Nationality.	Remained on 31st Dec., 1932.	New cases admitted, 1933.	Re-admission during 1933, i.e., returning from absconding, etc.	Total cases treated.	Discharged.	Transferred.	Absconded.	Died.	Remaining on 31st Dec., 1933.
Chinese	872	259	57	1,188	73	160	32	47	876
Indians	185	71	12	268	70	5	13	5	175
Javanese	8	2	...	10	2	...	...	...	8
Malays	12	40	1	53	6	1	7	2	37
Eurasians	4	5	1	10	...	3	...	...	7
European	1	1	...	2	...	...	...	1	1
Total	1,082	378	71	1,531	151	169	52	55	1,104

Discharges.—One hundred and fifty-one cases were discharged during the year as being free from danger to the public.

The following details of the treatment of patients at Sungei Buloh Settlements have been extracted from the Medical Superintendent's report.

Medical.—It was felt at the end of 1932 that the intramuscular and intradermal injections of fresh Siamese ethyl esters represented the best method of treatment that Sungei Buloh could reasonably recommend to patients. In accordance with this all other methods of routine treatment were given up and the organisation of intramuscular and intradermal esters injections was developed for the majority of cases. The Settlement has then been divided medically into four main groups.

- (1) The majority of patients on intramuscular and intradermal esters.
- (2) A subsidiary group unsuitable for esters who receive Tai Foong Chee.
- (3) A hospital group for medical and surgical cases.
- (4) Experimental group.

Intramuscular and Intradermal Ethyl Esters.—With persistent propaganda, improved organisation and insistence on regularity this treatment has become both popular and effective. The figures speak for themselves. In the first half of 1932 twenty-six patients were receiving injections of ethyl esters. By the end of 1932 there were 225. In 1933 six hundred and seventy-one patients received full courses. This increase is a very gratifying one and can justifiably be correlated with the increased number of cases who have been discharged. For a full course a patient receives forty injections rising from 2 cc. twice weekly to the maximum he can tolerate as judged clinically or by the sedimentation test. In 1933, 24,374 intramuscular injections have been given, an average of 720 injections a week during the treatment periods. This works out at an average of 36 injections per patient. During the first half of the year there were a number of cases of abscess formation due to injections from a faulty supply of esters. It is however a tribute both to the leper dressers and to the good quality of the esters that in the second half of the year with over sixteen thousand injections there was no single case of abscess due to injection.

In an increasing proportion of cases the larger doses of ethyl esters have been given subcutaneously instead of intramuscularly in order to save induration by the routine round of alternate deltoid and gluteal injections. Absorption seems fairly rapid and there is on the whole less pain. Strict asepsis is of course essential.

Intradermal Esters.—A total of 199 cases received combined intramuscular and intradermal injections. The total number of areas injected has been 2,169. These figures are still too low but they are nearly double the 1932 figures and the year 1934 starts with a still increased number. In spite of the painful and tedious nature of this treatment it is popular and in our experience represents by far the best form of treatment available. Cases treated with intradermal esters show over 80 per cent.

local improvement. As a result of esters treatment generally 587 cases out of a total of 671 show varying degrees of improvement—85 per cent. 53 cases or 8 per cent. showed no change. Thirty-one or 4½ per cent. were worse. No case was given esters during the period of, or for a month after, lepra reaction. In non-reaction cases with erythematous raised lesions of under twelve months duration we have obtained no improvement with esters treatment.

Tai Foong Chee.—The year began with 393 cases on Tai Foong Chee. The number fell during the year to 126 and its use is restricted to advanced non-resisting cases. There is some evidence that this drug helps to check the advance in such cases towards the mutilation of advanced phases of the disease. Advanced cases believe in it and apparently derive a certain amount of comfort from its administration in spite of the gastro intestinal irritation that may follow from prolonged dosage. Our policy is now to confine the administration of Tai Foong Chee to intractable cases and to those who are too senile or advanced for energetic treatment. Out of 252 cases who had uninterrupted courses of Tai Foong Chee 218 claimed varying degrees of improvement. Six or 2.4 per cent. showed no change. Twenty-eight or 11.2 per cent. were worse. These statistics on Tai Foong Chee require careful sifting. Few advanced cases among the Chinese in Sungei Buloh will admit that they are getting worse. In other cases where there is little possibility of ultimate arrest patients naturally prefer the easiest drug. For a number of other reasons the process of wish-fulfilment seems to influence the patients views on Tai Foong Chee more than on any other drug.

Hospital Patients.—A total of 719 cases were treated in hospital as inpatients for complicating medical and surgical conditions and for the acute phases of leprosy. There were 558 males and 161 females. These numbers give a good idea of how large a percentage of lepers require hospital investigation and treatment at one period or another of their disease.

Septic Conditions.—Of the hospital patients 209 were admitted for leprotic and trophic ulceration, gangrene necrosis of bone and septicaemia. A regrettable feature in the year's work is that there have been nine deaths among these septic cases. This figure is too high and it will be lowered in 1934. There were sixteen cases of severe nephritis with symptoms of chronic uraemia. Treatment of this condition forms one of the bug-bears of leprosy work here. There were 11 deaths. Out of seventeen cases of pulmonary tuberculosis eleven died.

Lepra Reaction.—A total of 197 cases were treated in hospital. Lepra reaction is on the increase here due to the increased treatment which appears to induce this condition. The cases have tended to fall into two main types. (1) An acute exacerbation of leprosy with the appearance of raised spreading erythematous lesions accompanied by low fever. (2) A febrile eruptive type commencing with localised nerve pains and going

on to fever and a rose spot eruption. We have observed during the year a number of points in the differential diagnosis from other types of fever.

That there is a definite tendency for a double rise of temperature during the day the chart showing two peaks in the twenty-four hours (such a distinctive chart is also observed in subtertian malaria). The pulse keeps in close relation to the temperature.

In about 30 per cent. of cases there is a tendency to diminution of the output of urinary calcium. This is easily tested by adding a little ammonium oxalate to an acid urine when the presence of urinary calcium is easily detected by the formation of a cloud of insoluble calcium oxalate. A definite percentage of reaction urines remain clear showing that the calcium is being retained. A large control series in non lepers carried out by Dr. Diamond of the District Hospital, Kuala Lumpur, showed that this calcium retention is seldom found in other fevers.

In about 35 per cent. of cases of skin reaction the knee jerks were found to be exaggerated and either unilateral or bilateral knee clonus elicited. It is hoped to incorporate some of these points in later reports.

Out-patients.—A clinic for ambulatory patients within the settlement has been conducted daily and minor maladies attended to. This clinic has become increasingly important throughout the year, an average of 60-70 patients attending daily.

Surgical.—Fourteen major operations were performed, ten amputations, two laparotomies and two appendectomies. All the amputations were conducted under spinal anaesthesia and there were no untoward effects. We had previously found the administration of a general anaesthetic to be a considerable strain on the metabolism of a leper and the cases this year are evidence that spinal anaesthesia is the method of choice wherever practicable in a leper settlement. There were 808 minor operations—abscess, circumcisions and the like. Besides this there were some 4,400 scrapings of ulcers, 3,300 minor operations for removal of dead tissue and 2,600 for removal of necrotic bone. This makes a formidable total of 11,108 minor surgical events or over 38 for each working day of the year. The figures give sufficient indication of the amount of time, energy and surgical material that require to be expended in thwarting the constant tendency to advancing and repulsive open sores.

Summary of Medical and Surgical Statistics.—Six hundred and seventy-one patients received full course of intramuscular ethyl esters and another 199 received intradermal injections as well.

Three hundred and ninety-three received course of Tai Foong Chee.

One hundred and ninety-seven cases of lepra reaction were treated and some original studies of the conditions made.

Fourteen major and 808 minor operations were performed.

The treatment of minor septic conditions forms a very large part of the work in the Settlement.

The death-rate is 36 per mille as compared with 45 per mille for 1932.

EXPERIMENTAL WORK.

Dyes.—The work on aniline dyes has been continued and a number of difficulties overcome. By the beginning of 1933 it had been observed that certain dyes injected intravenously appeared to have an effect on the leprotic process in a percentage of cases. Later observations showed (a) a definite tendency for these cases to relapse and (b) a lesser relapse rate in those treated with fluorescein. Further experiments seemed to show that different brands of fluorescein varied in their therapeutic effect. A series of cases of lepra reaction showed 20 per cent. favourable results with the use of Mercks fluorescein while a similar series showed over 70 per cent. good results with fluorescein made by Gurr & Co. An experiment was then made by putting three batches of patients on to injections of fluorescein from Gurr & Co., British Drug Houses and Dakin respectively. This experiment failed however to show a demonstrable difference in the quality of these samples. We were able however through this experiment to form the following opinions:

- (1) That fluorescein given intravenously in 20 cc. doses of a 2 per cent. solution twice weekly seems to have a beneficial effect in about 50 per cent. of cases.
- (2) That the treatment appears to be useless in the majority of advanced cases of leprosy.
- (3) That the optimum period of treatment is about six weeks. After that a few patients seem to benefit and a number seem to relapse again if treatment is continued.

Following this a number of experiments have been made with fluorescein derivatives such as eosin and erythrosin. A further series of cases were treated by injections of fluorescein and then exposed to sunlight and a number of others by injections of fluorescein to which other drugs were added—alkalis, acids, calcium and potassium permanganate. None of these gave any significant indication of a fresh avenue.

As fluorescein is an anhydride of resorcin and phthalic acid a further series of cases were then treated with resorcin. This presented considerable difficulties in actual practice and nothing of clinical promise was obtained. To avoid the toxic effects of resorcin I prepared a dye resorcin blue made by heating resorcin with sodium nitrite and purifying the resultant blue solution. This was water soluble and appeared to be well

tolerated. Ten patients were given 25 cc. doses of a 2 per cent. solution intravenously for five weeks. At the end of that time no change was found in the lesions and the experiment was stopped.

A series of fifteen cases are now being treated by intravenous injections of phthalic acid the remaining component of fluorescein. It is too early to form an opinion on the effects of this drug but so far the effects are of definite interest and justify the continued close observation of these cases.

Thallum Acetate.—Eight cases were treated with thallum acetate, four resistant ring worm cases and four for observation of its effects on leprosy. The ring worm results were satisfactory. No change was observed in the leprotic lesions.

Electric Vibro Massage.—This has been used throughout the year for the treatment of post reaction pains and as a means of inunction on special skin cases. It is a popular treatment and seems satisfactory.

Seven cases of herpes were treated with intra-muscular injections of Cylophyllum oil every second day in 2 cc. doses. In five of these the pain seemed to be definitely relieved—particularly so in a case of herpes occipitalis with severe pain and tenderness. Cylophyllum oil does not appear to act as a general narcotic and we have not observed any effect on pains of septic origin. Cases of leprosy with neural pain however have responded well throughout the year.

A study of the relative prevalence of positive nasal smears has been undertaken. Of 2,000 examinations of which we have accurate records:

Nose and ear were both positive in 40.8 per cent.

Nose and ear were both negative in 44.8 per cent.

Nose was negative, ear positive in 11.3 per cent.

Nose was positive, ear negative in 3 per cent.

In 44.8 per cent. of cases the diagnosis was purely clinical. In only 3 per cent. of early cases was the nasal smear positive. The suggestion is that examinations of nasal smears are much less important than they are generally considered to be.

Microscopic.—Viamein modification of the Zeil Neelson stain (using a back ground of $\frac{1}{4}$ — $\frac{1}{4}$ Trypaflame) was tried with fifty positive smears. The lepra bacilli appear the ordinary fuchsin colour but against a yellow back ground. The method might be useful for demonstration purposes but otherwise we did not consider it to be of benefit.

Aoki and Aoki's method of distinguishing dead from living bacilli by staining with erythron picric acid and counter-staining with alkaline methylene blue was tried in a number of cases. The difficulty lies in the lack of any control means of telling whether a lepra bacillus is alive or dead. The results were indefinite.

Defibrinated thick films from the circulating blood of cases of lepra reaction have been examined for lepra bacilli. Three hundred and twenty-one films have been examined and bacilli found in 51 per cent. of cases. These bacilli were quite often inside the large lymphocytes.

Seven guinea-pigs have been inoculated with sputum from doubtful cases of pulmonary tuberculosis. Three guinea pigs died of tuberculosis. Three other guinea-pigs have been injected with dyes and other drugs before injecting patients. These three remained healthy.

In the first half of the year an effort was made to estimate the blood fibrinogen in varying stages of leprosy. Twenty-five cases were examined. In practice we found considerable difficulty in getting sharp readings of the precipitates and it was not possible to prove the general impression we obtained—that the blood of an advanced leper clotted more quickly.

The blood of 26 patients was examined for their diastatic enzyme content and 38 examinations of blood were made in all. Eight advanced cases failed to show an enzyme content—the early cases were positive in varying degrees to diastase. The experiment was however inconclusive.

In the leprosy work of other countries throughout the year there has been an increasing interest taken in serological reactions. A number of both lepers and non-lepers were subjected to Mitsuda's skin test. This consists of raising an intradermal weal by the injection of a sterilised vaccine made from a nodule. Early cases and non-lepers are supposed to give a positive reaction while nodular cases give a negative one. The test like others of its kind would only be of value in classification or as an indication of resistance. Thirty non-leper inmates of the decrepit settlement were positive (i.e., were not lepers). One of these only became positive after three weeks. As it was perfectly obvious clinically that they were not lepers the information obtained was not considered to be of great value. Leper controls showed the most varying results which could not be systematised.

Following work done by Dr. Kingsbury, I.M.R., in 1932 a number of reaction cases was treated with injection of autogenous urinary protease. This protease is injected intradermally in a single wear in a starting dilution of 1—10,000,000. Ten patients were treated by weekly injections. Two of these developed lepra reaction. A third, a case of asthma apparently has cleared up completely after two injections. A fourth case of severe and prolonged nerve pains who had been confined to bed for over three months was greatly relieved after one injection and was able to walk about without pain after the second. The other six were cases of lepra reaction and showed no definite response. Further work is being done on this.

Syphilis.—A total of 162 cases were given anti-syphilitic treatment. In a previous report it was stated that more and more reliance was being placed in the administration of bismuth owing to the number of cases who were reacting badly to the injection of arsenicals. It has been found this year however that the bad effects have disappeared on a rigid revival of technique. Ambulatory cases have been given normal courses of N.A.B. and bismustab.

A curious feature was discovered in the estimation of Wassermann and Kahn results. In fifty cases of lepra reaction where the Wassermann and Kahn was taken weekly it was found that the results tended to be inhibited during reaction. This is an interesting finding in view of the general belief that acute phases of leprosy will cause a positive result in these reactions.

Leprosy of the Eye.—Fourteen cases with leprotic affections of the eyes were treated with solganol oleosum. Leprotic iritis appears to respond very well to the treatment. Twelve cases with eye involvement (three iritis and nine with chronic conjunctivitis or with "leprous eye") were treated with sub-conjunctival injections of 1—1,000 trypan blue. This was done following the work of Muir who claims very good results. The injection is an unpleasant one. The cases with chronic conjunctivitis appeared to benefit and also a percentage of eye reactions. In a number of cases in each group no improvement was observed.

2.—Leper Asylum, Kuala Lumpur.

This asylum was re-opened in March, 1931, for the accommodation of lepers from all the Settlements in Malaya and is reserved for chronic incurable cases.

The number remaining at the end of 1932 was 373. During the year there were 40 deaths, and the number remaining at the end of the year was 330.

The inmates are Chinese excepting one Malay and one Eurasian.

The asylum is under the control of the Medical Superintendent of the Sungei Buloh Settlements.

3.—Leper Settlement for Malays, Pulau Pangkor Laut.

There were 11 deaths during the year; 14 were transferred to the Sungei Buloh Settlements and 10 were discharged, the number remaining at the end of the year was 46.

Tai Foong Chee with Foh Mah Yean and Chaulmoogra oil treatment was continued, and injections of anti-leprol were given.

The immediate control of the Settlement is under the Deputy Medical Officer, Lumut, acting under the supervision of the Medical Superintendent, Sungei Buloh Leper Settlements.

VIII.—PRISONS, CRIMINAL VAGRANT WARDS AND DECREPIT SETTLEMENTS.

A.—GAOL HOSPITALS AND CRIMINAL VAGRANT WARDS.

	1932.			1933.		
	Admis- sions.	Deaths.	Case mortality per cent.	Admis- sions.	Deaths.	Case mortality per cent.
PERAK.						
Taiping Gaol	110	4	3.63	157	8	5.10
Decrepit Settlement, Taiping ...	72	2	2.78	45		
Batu Gajah Gaol	229	2	0.87	252		
SELANGOR.						
Kuala Lumpur Gaol and Cri- minal Vagrant Ward	136	2	1.55	227	6	2.64
NEGRI SEMBILAN.						
Seremban Gaol and Criminal Vagrant Ward	179	3	1.67	124		
PAHANG.						
Kuala Lipis Gaol and Criminal Vagrant Ward	9	...	...	8		
Kuantan Gaol and Criminal Vagrant Ward	37	...	...	26		
Total ...	772	13	1.68	839	14	1.67

B.—DECREPIT SETTLEMENTS.

The majority of the decrepits in the Federated Malay States are accommodated at the Decrepit Settlement, Sungei Buloh, which is situated about three-quarters of a mile from the new Leper Settlement. It consists of 28 wards, each ward containing 24 beds, all the wards being connected by covered passages. Other buildings include an administration block, containing offices and a dispensary, a large dining hall, with a well-equipped kitchen, and two large workshops where the inmates carry on their trades.

The Settlement is provided throughout with electric lighting, and a complete water supply. There are baths to every ward and water-flushed latrines, with a septic tank installation.

There were 584 inmates at the beginning of the year and 624 at the end. The system of admission was changed during the year. In place of admission by a Magistrate's order, a recommendation from the Protector of Chinese was accepted. By that arrangement it was found easier to make the rate of admission and type of applicant conform to the capacity, and the policy of the Government. The discipline of the Settlement has been good, and employment has been found for the inmates in basket making, clog making and vegetable cultivation.

Dr. G. A. Ryrie, Medical Superintendent, Sungei Buloh Leper Settlement, was in charge throughout the year.

RETURN OF ADMISSIONS AND CASUALTIES, DECREPIT SETTLEMENT,
SUNGEI BULOH, 1933.

State.	Remained.	Admitted.	Discharged.	Transferred.	Absconded.	Died.	Remaining.
Perak	55	36	4	2	...	6	79
Selangor	455	112	33	8	37	28	461
Negri Sembilan	71	13	9	...	11	4	60
Pahang	3	...	...	...	...	...	3
Total ...	584	161	46	10	48	38	603

Discharges.—The total were 46, out of which 17 were repatriated to China, 13 to India and 16 were discharged as fit to work.

Transfers.—The total transfers were 10, out of which 3 were transferred to the District Hospital, Kuala Lumpur, 1 to the Central Mental Hospital, Tanjong Rambutan, and 6 to the Federal Leper Settlement, Sungei Buloh.

IX.—INSTITUTE FOR MEDICAL RESEARCH.

The activities of the Institute were undisturbed by any outbreak of serious epidemic disease during the year. The staff was therefore free to attend to the calls made upon it for routine examinations and reports, and to devote much of its energies to research.

There was a steady increase in the number of water samples submitted for examination and a good deal of investigation was carried out relating to contacts of infectious disease more especially in connection with the search for carriers of diphtheria and enteric fevers.

Some special piece of research has been carried out by each individual section of the Institute. Particular attention is invited to the investigations of Dr. R. Green (Institute for Medical Research) on Malaria and to the work of Dr. R. Lewthwaite (Institute for Medical Research) and Dr. S. R. Savoor (Institute for Medical Research) on tropical typhus and Japanese river fever. It is not possible here to do more than refer briefly to some of the points of general interest. Full details will be found in the Report of the Institute for Medical Research which is printed separately.

Malaria Research.

Atebrin.—The treatment of hospital patients with atebrin was continued throughout the year and the work has been followed by an extensive study of the advisability of substituting atebrin for quinine in the treatment of malaria on rubber estates amongst ambulatory out-door patients. The experiments demonstrated the good effects on the spleen and parasite rates following curative doses of atebrin as opposed to the common practice of giving ten grains of quinine daily for long and indefinite periods. The analysis of the treatment by atebrin shows that the group so treated required only about one quarter of the number of "day treatments" compared with the number that was required by the control group which was treated with quinine. The costs of treatment in both instances were found to coincide.

In a second series of experiments, all individuals, including new-comers, were given a preliminary five-day course of atebrin, and all cases subsequently showing any kind of fever were re-treated with atebrin. The investigation was undertaken to stimulate health measures on estates which do not possess a microscope. In spite of nearly half the labourers being attacked with malaria during the seven months of the experiment, the working efficiency of the group was maintained at a high level. The cost of atebrin per month per unit of population proved to be seventy-five per cent. greater than the corresponding cost of the previous experiment.

Concerning the relative cost of treatment, Dr. Green concludes that if a patient has to receive in-patient hospital treatment, the difference in cost between atebrin and quinine becomes insignificant since the expenditure on either drug forms such a small part of the total hospital charges. Atebrin possesses the advantages that it can be given in a daily curative dose at one muster, and is willingly taken by the labourers without fear of cinchonism.

Tebreten.—Dr. Green has been enabled through the courtesy of the manufacturers to treat one hundred cases of malaria with tebreten. His observations tend to show that tebreten is efficient in direct proportion to its hydro quinine content which is about eighty per cent. No special advantage in its use has been discovered which will outweigh the present high price of this drug.

Experiments were also carried out with "C. 77". The drug was found to be well tolerated by the twenty-three patients tested and its clinical action appeared to be similar to, though slower than that of, quinine.

A series of over four hundred cases of malaria has been treated either with tota quina or with quinine as a control. Dr. Field who conducted the experiments finds that tota quina is an effective anti-malarial drug slightly, but not significantly, less efficient in the immediate treatment of acute malaria than quinine.

Experimental work on the natural infection of Malayan anopheline mosquitoes was undertaken by the Malaria Research Division, details of which will be found in the report of the Institute. The interesting discovery that two local mammals, namely the flying fox and the common red-bellied squirrel, are subject to infection with parasites of a malarial type was made by Dr. Green during the course of these experiments.

Tropical Typhus and Japanese River Fever.—Dr. R. Lewthwaite and Dr. S. R. Savor have continued their studies of the tropical typhus—Japanese river fever group of diseases full details of which will be found in the report of the Institute.

Two unsuccessful attempts have been made to vaccinate guinea-pigs against the virus of scrub-typhus. Experiments to discover the existence of any relationship between either of the two viruses of tropical typhus with the virus of Rocky Mountain spotted fever were in progress at the end of the year.

Yellow Fever.—Blood from fifty Malays was sent to New York at the end of 1932 for determination of the presence of protective substances for yellow fever. Reports state that in no instance was any evidence found of such protective substances, a finding that supports the view of the Rockefeller International Health Division that yellow fever has not existed in the Far East.

Entomological Research.

A large number of adult mosquitoes have been identified and dissected. The results of precepsin tests again indicate that *A. maculatus* prefers human to animal blood, while *A. karawari* and other anophelines in the same area were found to have taken animal blood much oftener than human. A great deal of time was devoted to experiments on the use in lowland areas of the sluicing method of larvae control. Results at the close of the year were inconclusive but difficulty was encountered in controlling and maintaining the sluice gates in the friable soil encountered in the ravines under investigation.

Vaccine Lymph.—The Lymph Station, under the care of Dr. J. W. Field continued to meet all demands for lymph. The repeated routine testing of potency of each batch of lymph ensures that at any moment there is evidence of the degree of efficacy of all batches. Vaccination by multiple pressure technique has been under investigation, and certain advantages noted.

Blood Transfusion Services.—In the past, the Institute has prepared and supplied small quantities of sera for blood-grouping purposes. During 1933 there were increased demands for such sera and also for the supply of information on various relevant points.

R. D. FITZGERALD,

Adviser, Medical and Health Services,
Malay States.

TABLE I.
STAFF OF THE MEDICAL AND HEALTH DEPARTMENT ON
31st DECEMBER, 1933.

- 1 Adviser, Medical and Health Services
- 1 Secretary to Adviser

MEDICAL BRANCH.

- 4 State Medical and Health Officers
- 2 Deputy State Medical and Health Officers
- 2 Surgeons
- 1 Anaesthetist
- 23 Medical Officers
 - 4 Lady Medical Officers
 - 2 Pharmaceutical Chemists
 - 2 Senior Deputy Medical Officers
 - 6 Deputy Medical Officers
 - 41 Assistant Medical Officers
 - 3 Hospital Assistants, Special Grade
 - 1 Staff Assistant, Bungsar Hospital, Kuala Lumpur
 - 38 Hospital Assistants, Grade I
 - 297 Dressers, Grade II
 - 2 X-Ray Assistants, Grade II
 - 92 Dressers, Grade III
 - 2 X-Ray Assistants, Grade III
 - 2 Probationer Dressers
 - 5 Matrons, Grade I
 - 6 Matrons, Grade II
 - 51 European Nursing Sisters (including 7 at Infant Welfare Centres)
 - 1 Lady Assistant to Radiologist
 - 178 Asiatic Nurses (including 21 at Infant Welfare Centres)
 - 29 Asiatic Midwives

HEALTH BRANCH.

- 17 Health Officers (including one in Railway Department)
- 4 Lady Medical Officers
- 1 Lady Assistant Medical Officer, Infant Welfare Branch
- 1 Dental Surgeon
- 1 European Steward at Quarantine Camp, Port Swettenham
- 3 Assistant Health Officers
- 1 Hospital Assistant, Special Grade
- 4 Senior Health Inspectors, Grade I

- 2 Senior Health Inspectors, Grade II (including one in Railway Department)
- 11 Health Inspectors, Grade I (including one in Railway Department)
- 31 Health Inspectors, Grade II
- 4 Vaccinators
- 1 Dental Mechanic

INSTITUTE FOR MEDICAL RESEARCH.

- 1 Director
- 1 Bacteriologist
- 2 Pathologists
- 2 Malaria Research Officers
- 1 Entomologist
- 1 Chief Chemist
- 3 Chemists
- 3 Assistant Medical Officers
- 4 Laboratory Assistants, Grade I
- 10 Laboratory Assistants, Grade II
- 8 Laboratory Assistants, Grade III
- 1 Probationer
- 1 Shorthand Typist
- 1 Storekeeper

CENTRAL MENTAL HOSPITAL.

- 1 Medical Superintendent
- 2 European Male Nurses
- 1 Senior Assistant Physician (Senior Deputy Medical Officer)
- 2 Assistant Physicians (Assistant Medical Officers)
- 1 Inspector
- 1 Assistant Inspector
- 3 Dressers, Grade II
- 1 Dresser, Grade III
- 3 Nurses
- 1 Work Mistress
- 1 Farm Overseer

SUNGEI BULOH SETTLEMENTS.

- 1 Medical Superintendent
- 1 Assistant Medical Officer
- 1 Matron, Grade II
- 1 Hospital Assistant, Grade I
- 4 Dressers, Grade II
- 2 Dressers, Grade III

TABLE II.

STATEMENT OF REVENUE AND EXPENDITURE UNDER
"PERSONAL EMOLUMENTS" AND "OTHER CHARGES", 1933.

Expenditure Detailed.	Personal Emoluments.	Other Charges.	
		Annually Recurrent.	Special Expenditure.
	\$ c.	\$ c.	\$ c.
1. Adviser, Medical and Health Services, Malay States	21,579 11	8,132 29	
2. Director, Institute for Medical Research, F.M.S.	143,912 75	42,658 73	548 50
3. College of Medicine, Singapore	82,312 41	33,714 71	
4. Medical Superintendent, Central Mental Hospital, Tanjong Rambutan ...	68,280 41	234,865 91	391 00
5. State Medical and Health Officer, Perak	742,750 11	454,974 92	660 00
6. State Medical and Health Officer, Selangor	607,034 00	378,961 00	8,315 00
7. State Medical and Health Officer, Negri Sembilan ...	311,551 00	203,548 00	
8. State Medical and Health Officer, Pahang	209,726 07	145,249 69	423 58
9. Medical Superintendent, Sungei Buloh Settlements, Sungei Buloh	30,082 19	227,683 89	577 79
Total ...	* 2,217,228 05	1,729,789 14	10,915 87

* Does not include leave salaries of European officers who were paid from Miscellaneous Services, Treasury.

	Revenue for 1933, hospital fees, licences, etc.
	\$ c.
1. Adviser, Medical and Health Services, Malay States ...	1,775 00
2. Director, Institute for Medical Research, Federated Malay States	18,957 73
3. College of Medicine, Singapore	1,203 75
4. Medical Superintendent, Central Mental Hospital, Tanjong Rambutan	53,708 24
5. State Medical and Health Officer, Perak	81,583 21
6. State Medical and Health Officer, Selangor	74,707 00
7. State Medical and Health Officer, Negri Sembilan ...	25,031 81
8. State Medical and Health Officer, Pahang	10,473 01
9. Medical Superintendent, Sungei Buloh Settlements, Sungei Buloh	15,134 06

TABLE III.

RETURN OF DISEASES AND DEATHS (IN-PATIENTS)
FOR THE YEAR 1933.

Diseases.	Remaining in hospital at end of 1932.	Yearly total.		Total cases treated.	Remaining in hospital at end of 1933.
		Admissions.	Deaths.		
I.—EPIDEMIC, ENDEMIC AND INFECTIOUS DISEASES.					
1. Enteric group—					
(a) Typhoid fever	28	217	43	245	13
(b) Paratyphoid A.	1	23	...	24	...
(c) Paratyphoid B.	...	6	...	6	1
(d) Paratyphoid C.	...	9	1	9	...
(e) Type not defined	1	7	1	8	...
2. Typhus (Tropical)	10	181	14	191	12
3. Relapsing fever	...	...	...	...	...
4. Undulant fever (Malta fever)	...	...	...	...	...
5. Malaria—					
(a) Tertian	75	3,261	58	3,336	75
(b) Quartan	8	429	6	437	12
(c) Aestivo-autumnal	159	8,831	446	8,990	151
(d) Mixed infection	19	511	29	530	11
(e) Undefined microscopically	54	1,768	71	1,822	31
(f) Cachexia	62	2,327	69	2,389	53
(g) Black-water fever	1	19	7	20	...
6. A.—Smallpox	...	...	...	...	...
B.—Alastrim	...	...	...	...	...
7. Measles	5	139	3	144	7
8. Scarlet fever	...	...	...	...	...
9. Whooping cough	1	118	7	119	4
10. Diphtheria	4	211	49	215	8
11. Influenza	41	3,788	8	3,829	62
12. Miliary fever	...	5	...	5	...
13. Mumps	1	69	...	70	5
14. Cholera	...	...	...	...	...
15. Epidemic diarrhoea	...	...	...	...	...
16. Dysentery—					
(a) Amœbic	18	653	80	671	29
(b) Bacillary	20	325	97	345	13
(c) Undefined or due to other causes	5	118	20	123	9
17. Plague—					
(a) Bubonic	...	...	...	...	...
(b) Pneumonic	...	...	...	...	...
(c) Septicæmic	...	...	...	...	...
(d) Undefined	...	...	...	...	...
18. Yellow fever	...	...	...	...	...
19. Leptospirosis... ..	...	18	7	18	1
20. Leprosy	8	297	3	305	2
21. Erysipelas	2	75	16	77	1
22. Acute poliomyelitis	2	9	2	11	...
23. Encephalitis lethargica	2	3	3	5	1
24. Epidemic cerebro-spinal fever	1	3	3	4	...
25. Other epidemic diseases—					
(a) Rubella (German measles)	...	2	...	2	...
(b) Varicella (chicken-pox)	6	125	...	131	1

TABLE III—(cont.)
 RETURN OF DISEASES AND DEATHS (IN-PATIENTS)
 FOR THE YEAR 1933—(cont.)

Diseases.	Remaining in hospital at end of 1932.	Yearly total.		Total cases treated.	Remaining in hospital at end of 1933.
		Admissions.	Deaths.		
I.—EPIDEMIC, ENDEMIC AND INFECTIOUS DISEASES—(cont.)					
Other epidemic diseases—(cont.)					
(c) Kala-azar	...	...	...	...	...
(d) Phlebotomus fever	...	...	...	...	...
(e) Dengue... ..	...	49	...	49	2
(f) Epidemic dropsy	...	...	...	...	...
(g) Yaws	17	229	...	246	5
(h) Trypanosomiasis	...	...	...	...	...
26. Glanders	...	...	...	...	...
27. Anthrax	...	...	...	...	...
28. Rabies	...	...	...	...	...
29. Tetanus	1	118	91	119	...
30. Mycosis	...	4	...	4	...
31. Tuberculosis, pulmonary and laryngeal	217	1,848	821	2,065	209
32. Tuberculosis of the meninges or central nervous system	1	18	14	19	...
33. Tuberculosis of the intestines or peritoneum	...	26	16	26	1
34. Tuberculosis of the vertebral column	7	28	3	35	6
35. Tuberculosis of bones and joints	16	52	4	68	6
36. Tuberculosis of other organs—					
(a) Skin or subcutaneous tissue (lupus)	1	4	1	5	1
(b) Lymphatic system	1	23	2	24	1
(c) Genito-urinary	...	1	...	1	...
(d) Other organs	2	17	2	19	...
37. Tuberculosis disseminated—					
(a) Acute	1	9	8	10	...
(b) Chronic	...	3	3	3	...
38. Syphilis—					
(a) Primary	28	467	...	495	26
(b) Secondary	56	592	5	648	56
(c) Tertiary	35	332	26	367	31
(d) Hereditary	3	75	41	78	1
(e) Period not indicated	2	33	1	35	2
39. Soft chancre	20	506	...	526	16
40. A.—Gonorrhœa and its complications	60	1,437	2	1,497	63
B.—Gonorrhœal ophthalmia	4	89	1	93	4
C.—Gonorrhœal arthritis	24	228	1	252	16
D.—Granuloma venereum	...	10	...	10	2
41. Septicæmia	5	86	74	91	1
42. Other infectious diseases—					
Filariasis	...	11	...	11	4
Tsutsugamushi fever (Japanese river fever)	...	5	1	5	...
42A. Infectious disease carriers (diphtheria)	...	1	...	1	...

TABLE III—(cont.)

RETURN OF DISEASES AND DEATHS (IN-PATIENTS)
FOR THE YEAR 1933—(cont.)

Diseases.	Remaining in hospital at end of 1932.	Yearly total.		Total cases treated.	Remaining in hospital at end of 1933.
		Admissions.	Deaths.		
II.—GENERAL DISEASES NOT MENTIONED ABOVE.					
43. Cancer or other malignant tumours of the buccal cavity	4	38	9	42	3
44. Cancer or other malignant tumours of the stomach or liver	3	117	67	120	3
45. Cancer or other malignant tumours of the peritoneum, intestines, rectum	1	13	8	14	1
46. Cancer or other malignant tumours of the female genital organs	1	60	15	61	2
47. Cancer or other malignant tumours of the breast	1	23	7	24	3
48. Cancer or other malignant tumours of the skin	6	24	10	30	3
49. Cancer or other malignant tumours of organs not specified	11	133	54	144	8
50. Tumours non-malignant	5	148	2	153	4
51. Acute rheumatism	1	40	1	41	3
52. Chronic rheumatism	7	148	...	155	6
53. Scurvy (including Barlow's disease)	...	...	...	...	...
54. Pellagra	...	1	...	1	...
55. Beri-beri	71	384	45	455	38
56. Rickets	...	11	1	11	...
56A. Other deficiency diseases	...	17	4	17	...
57. Diabetes mellitus	9	113	16	122	6
58. Anæmia—					
(a) Pernicious	3	23	2	26	3
(b) Other anæmias and chlorosis	56	1,005	198	1,061	54
59. Diseases of the pituitary body	...	...	...	...	...
60. Diseases of the thyroid gland—					
(a) Exophthalmic goitre	1	3	...	4	...
(b) Other diseases of the thyroid gland, myxœdema, etc.	...	10	...	10	...
61. Diseases of the para-thyroid glands	...	2	...	2	...
62. Diseases of the thymus	...	1	1	1	...
63. Diseases of the supra-renal glands	...	...	...	...	...
64. Diseases of the spleen	1	39	6	40	1
65. Leukæmia—					
(a) Myelogenous	...	6	3	6	...
(b) Lymphatic	...	4	2	4	...
(c) Undefined	...	1	...	1	...
65A. Hodgkin's disease (lymphadenoma)	...	2	1	2	...
66. Alcoholism	...	39	...	39	...
67. Chronic poisoning by mineral substances (lead, mercury, etc.)	1	14	4	15	1
67A. Arsenical poisoning	1	11	...	12	...
68. Chronic poisoning by organic substances (morphia, cocaine, etc.)	2	162	1	164	6
69. Other general diseases—					
(a) Auto-intoxication	...	1	1	1	...
(b) Purpura hæmorrhagica	...	4	2	4	...
(c) Hæmophilia	...	2	...	2	...
(d) Diabetes insipidus	...	3	1	3	...
(e) Other	1	54	7	55	3

TABLE III—(cont.)

RETURN OF DISEASES AND DEATHS (IN-PATIENTS)
FOR THE YEAR 1933—(cont.)

Diseases.	Remaining in hospital at end of 1932.	Yearly total.		Total cases treated.	Remaining in hospital at end of 1933.
		Admissions.	Deaths.		
III.—AFFECTIONS OF THE NERVOUS SYSTEM AND ORGANS OF THE SENSES.					
70. Encephalitis (not including encephalitis lethargica) ...	...	6	2	6	1
71. Meningitis (not including tuberculous meningitis or cerebro-spinal meningitis) ...	1	50	43	51	2
72. Locomotor ataxia ...	9	14	3	23	4
73. Other affections of the spinal cord	8	33	4	41	2
74. Apoplexy—					
(a) Hæmorrhage ...	2	60	49	62	...
(b) Embolism ...	...	2	2	2	...
(c) Thrombosis ...	...	12	4	12	1
75. Paralysis—					
(a) Hemiplegia ...	34	106	21	140	19
(b) Other paralyses ...	21	82	9	103	13
76. General paralysis of the insane ...	...	2	...	2	...
77. Other forms of mental alienation ...	7	644	...	651	18
78. Epilepsy ...	5	93	10	98	7
79. Convulsions (non-puerperal) 5 years or over ...	...	5	2	5	...
80. Infantile convulsions (see XII Diseases of Infancy) ...	...	...	...	...	...
81. Chorea ...	...	1	...	1	...
Sciatica ...	...	2	...	2	...
82. A.—Hysteria ...	...	22	...	22	...
B.—Neuritis ...	14	126	...	140	11
C.—Neurasthenia ...	2	64	...	66	1
D.—Neuralgia ...	1	125	...	126	5
83. Cerebral softening ...	...	4	3	4	...
84. Other affections of the nervous system ...	8	109	10	117	4
85. Affections of the organs of vision—					
(a) Conjunctivitis ...	8	394	...	402	2
(b) Trachoma ...	16	148	...	164	12
(c) Tumours of the eye ...	1	29	...	30	...
(d) Other affections of the eye ...	75	990	3	1,065	84
86. Affections of the ear or mastoid sinus	13	287	1	300	9
IV.—AFFECTIONS OF THE CIRCULATORY SYSTEM.					
87. Pericarditis ...	1	25	19	26	...
88. Acute endocarditis or myocarditis	1	17	11	18	...
89. Angina pectoris ...	...	5	1	5	...
90. Other diseases of the heart—					
(a) Valvular—					
Mitral ...	7	184	60	191	14
Aortic... ..	1	68	29	69	1
Tricuspid ...	...	...	...	...	...
Pulmonary ...	...	1	...	1	...
Undefined ...	2	29	16	31	2
(b) Myocarditis ...	13	253	129	266	18
(c) Functional ...	3	11	1	14	...
(d) Other ...	2	70	30	72	1

TABLE III—(cont.)

RETURN OF DISEASES AND DEATHS (IN-PATIENTS)
FOR THE YEAR 1933—(cont.)

Diseases.	Remaining in hospital at end of 1932.	Yearly total.		Total cases treated.	Remaining in hospital at end of 1933.
		Admissions.	Deaths.		
IV.—AFFECTIONS OF THE CIRCULATORY SYSTEM—(cont.)					
91. Diseases of the arteries—					
(a) Aneurism	...	20	11	20	1
(b) Arterio-sclerosis	2	18	5	20	...
(c) Other diseases... ..	1	10	4	11	...
92. Embolism or thrombosis (non-cerebral)	1	12	7	13	2
93. Diseases of the veins—					
(a) Hæmorrhoids	8	184	...	192	7
(b) Varicose veins... ..	...	15	...	15	1
(c) Phlebitis	...	19	1	19	3
94. Diseases of the lymphatic system—					
Lymphangitis	...	23	...	33	1
Lymphadenitis, bubo (non-specific)	17	328	2	345	18
95. Hæmorrhage of undetermined cause	...	10	...	10	...
96. Other affections of the circulatory system	1	7	2	8	...
V.—AFFECTIONS OF THE RESPIRATORY SYSTEM.					
97. Diseases of the nasal passages—					
(a) Adenoids	...	8	...	8	...
(b) Polypus	...	20	...	20	...
(c) Rhinitis	...	61	...	61	...
(d) Coryza	...	103	...	103	...
(e) Other	4	56	...	60	1
98. Affections of the larynx—					
Laryngitis	2	29	1	31	1
99. Bronchitis—					
(a) Acute	22	1,585	15	1,807	53
(b) Chronic	43	833	42	876	43
100. Broncho-pneumonia	23	807	388	830	21
101. Pneumonia—					
(a) Lobar	16	1,010	506	1,026	33
(b) Unclassified	2	56	14	58	1
102. Pleurisy—					
(a) Dry pleurisy	7	133	1	140	3
(b) Pleural effusion	4	90	8	94	5
(c) Empyema	5	23	11	28	3
103. Congestion of the lungs	1	4	3	5	...
104. Gangrene of the lungs	...	18	16	18	...
105. Asthma	31	667	4	698	22
106. Pulmonary emphysema	2	5	1	7	...
107. Other affections of the lungs—					
(a) Pulmonary spirochaetosis	...	2	1	2	...
(b) Other	2	42	15	44	...

TABLE III—(cont.)

RETURN OF DISEASES AND DEATHS (IN-PATIENTS)
FOR THE YEAR 1933—(cont.)

Diseases.	Remaining in hospital at end of 1932.	Yearly total.		Total cases treated.	Remaining in hospital at end of 1933.
		Admissions.	Deaths.		
VI.—DISEASES OF THE DIGESTIVE SYSTEM.					
108. A.—Diseases of teeth or gums— Caries, pyorrhœa, etc.	4	270	2	274	4
B.—Other affections of the mouth— (a) Stomatitis	3	78	...	81	6
(b) Cancrum oris	...	19	16	19	...
(c) Glossitis	...	4	...	4	...
(d) Other	...	44	...	44	...
109. Affections of the pharynx or tonsils— (a) Tonsillitis	2	256	1	258	2
(b) Pharyngitis	4	161	...	165	2
(c) Other	1	34	3	35	...
110. Affections of the œsophagus ...	3	28	5	31	1
111. A.—Ulcer of the stomach ...	15	226	24	241	11
B.— „ duodenum ...	4	86	2	90	4
112. Other affections of the stomach— (a) Gastritis	12	517	4	529	13
(b) Dyspepsia, etc.	7	260	...	267	...
(c) Other	3	65	3	68	3
113. Diarrhœa and enteritis (in children under two years of age) ...	5	350	110	355	4
114. A.—Diarrhœa and enteritis (in patients over two years of age) ...	31	956	110	987	26
B.—Colitis	...	88	4	88	2
C.—Sprue	5	83	10	88	6
115. Ankylostomiasis	29	883	2	912	25
116. Diseases due to intestinal parasites— (a) Cestoda (tænia)	...	...	...	...	...
(b) Trematoda (flukes)	...	1	1	1	...
(c) Nematoda (other than ankylostoma)— Ascaris	19	1,482	5	1,501	17
Trichocephalus dispar ...	1	1	...	2	...
Trichina	...	...	...	...	...
Dracunculus	...	...	...	...	...
Strongylus	...	1	...	1	...
Oxyuris	...	1	...	1	1
(d) Coccidia	...	...	...	...	...
(e) Other parasites	...	9	...	9	...
(f) Unclassified	...	1	...	1	...
117. Appendicitis	8	248	11	256	10
118. Hernia	7	229	12	236	12
119. A.—Affections of the anus, fistula, etc.	7	207	2	214	10
B.—Other affections of the intestines— (a) Enteroptosis	...	2	1	2	...
(b) Constipation	5	380	1	385	5
(c) Colic	4	324	1	328	4
(d) Other	5	90	28	95	3

TABLE III—(cont.)

RETURN OF DISEASES AND DEATHS (IN-PATIENTS)
FOR THE YEAR 1933—(cont.)

Diseases.	Remaining in hospital at end of 1932.	Yearly total.		Total cases treated.	Remaining in hospital at end of 1933.
		Admissions.	Deaths.		
VI.—DISEASES OF THE DIGESTIVE SYSTEM—(cont.)					
120. Acute yellow atrophy of the liver	...	...	...	...	...
121. Hydatid of the liver	...	...	...	...	...
122. Cirrhosis of the liver—					
(a) Alcoholic	...	5	3	5	...
(b) Other forms	21	340	155	361	17
123. Biliary calculus	...	9	2	9	2
124. Other affections of the liver—					
(a) Abscess	1	68	23	69	2
(b) Hepatitis	6	159	...	165	7
(c) Cholecystitis	2	65	8	67	2
(d) Jaundice	6	168	10	174	7
(e) Other	...	42	12	42	1
125. Diseases of the pancreas	...	3	1	3	...
126. Peritonitis (of unknown cause)	2	76	49	78	1
127. Other affections of the digestive system	...	26	6	26	...
VII.—DISEASES OF THE GENITO-URINARY SYSTEM (NON-VENEREAL).					
128. Acute nephritis	17	217	59	234	10
129. Chronic nephritis	37	388	123	425	36
130. A.—Chyluria	...	3	...	3	...
B.—Schistosomiasis	...	...	...	...	...
131. Other affections of the kidneys (pyelitis, etc.)	9	270	28	279	10
132. Urinary calculus	3	73	5	76	3
133. Diseases of the bladder (cystitis, etc.)	6	163	18	169	4
134. Diseases of the urethra—					
(a) Stricture	3	99	2	102	8
(b) Other	7	138	1	145	4
135. Diseases of the prostate—					
(a) Hypertrophy	...	3	...	3	...
(b) Prostatitis	2	8	...	10	...
136. Diseases (non-venereal) of the genital organs of man—					
(a) Epididymitis	...	52	...	52	...
(b) Orchitis	1	49	...	50	...
(c) Hydrocele	1	60	...	61	5
(d) Other	7	134	...	141	13
137. Cysts or other non-malignant tumours of the ovaries	4	35	2	39	1
138. A.—Salpingitis	1	79	...	80	5
B.—Abscess of the pelvis	1	7	1	8	1
139. Uterine tumours (non-malignant)	...	30	1	30	...
140. Uterine hæmorrhage (non-puerperal)	1	7	3	8	...

TABLE III—(cont.)

RETURN OF DISEASES AND DEATHS (IN-PATIENTS)
FOR THE YEAR 1933—(cont.)

Diseases.	Remaining in hospital at end of 1932.	Yearly total.		Total cases treated.	Remaining in hospital at end of 1933.
		Admissions.	Deaths.		
VII.—DISEASES OF THE GENITO-URINARY SYSTEM (NON-VENEREAL)—(cont.)					
141. A.—Metritis	1	33	...	34	
B.—Other affections of the female genital organs—					
(a) Displacements of uterus	...	62	...	62	...
(b) Amenorrhœa	...	10	...	10	1
(c) Dysmenorrhœa	...	53	...	53	...
(d) Leucorrhœa	4	98	...	102	9
(e) Other	10	253	2	263	1
142. Diseases of the breast (non-puerperal)—					
(a) Mastitis	...	27	...	27	...
(b) Abscess of breast	2	34	...	36	1
VIII.—PUERPERAL STATE.					
143. A.—Admitted for ante-natal observation	111	935	...	1,046	106
B.—Normal labour... ..	99	4,473	...	4,572	104
C.—Difficult labour	13	234	19	247	8
D.—Accidents of pregnancy—					
(a) Abortion	6	240	1	246	7
(b) Ectopic gestation	...	18	2	18	1
(c) Anæmia of pregnancy	3	67	42	70	4
(d) Other accidents of pregnancy	4	232	18	236	9
144. Puerperal hæmorrhage	2	21	11	23	...
145. Other accidents of parturition	7	92	17	99	2
146. Puerperal septicæmia	6	86	36	92	1
147. Phlegmasia dolens	...	3	...	3	...
148. Puerperal eclampsia	1	64	19	65	...
149. Sequelæ of labour	2	27	...	29	1
150. Puerperal affections of the breast	...	2	...	2	...
IX.—AFFECTIONS OF THE SKIN AND CELLULAR TISSUES.					
151. Gangrene	5	46	14	51	4
152. A.—Boil	5	107	...	112	3
B.—Carbuncle	1	57	4	58	3
153. A.—Abscess	70	1,464	4	1,534	45
B.—Whitlow	2	35	...	37	...
C.—Cellulitis	39	584	39	623	31
154. A.—Tinea	6	130	...	136	2
B.—Scabies	7	240	...	247	5
155. Other diseases of the skin—					
(a) Erythema	1	6	..	7	...
(b) Urticaria	...	47	...	47	2
(c) Eczema	16	416	...	432	9
(d) Herpes	1	58	...	59	3
(e) Psoriasis	...	8	...	8	...
(f) Elephantiasis... ..	1	18	...	19	...
(g) Dermatitis	1	21	...	22	1
(h) Singapore foot	...	3	...	3	...

TABLE III—(cont.)

RETURN OF DISEASES AND DEATHS (IN-PATIENTS)
FOR THE YEAR 1933—(cont.)

Diseases.	Remaining in hospital at end of 1932.	Yearly total.		Total cases treated.	Remaining in hospital at end of 1933.
		Admissions.	Deaths.		
IX.—AFFECTIONS OF THE SKIN AND CELLULAR TISSUES—(cont.)					
Other diseases of the skin—(cont.)					
(i) Cutaneous leishmaniasis ...	...	...	...	...	...
(j) Other ...	20	287	1	307	23
155A. Chronic ulcer ...	216	3,486	9	3,702	172
X.—DISEASES OF BONES AND ORGANS OF LOCOMOTION (OTHER THAN TUBERCULOUS).					
156. Diseases of bones (Osteitis, etc.)...	6	109	7	115	11
157. Diseases of joints—					
(a) Arthritis ...	20	311	3	331	17
(b) Synovitis ...	4	124	...	128	5
158. Other diseases of bones or organs of locomotion ...	18	280	3	298	11
Spinal caries ...	1	...	...	1	...
XI.—MALFORMATIONS.					
159. Malformations—					
(a) Hydrocephalus ...	...	6	1	6	1
(b) Hypospadias ...	...	1	...	1	1
(c) Spina bifida ...	...	3	...	3	...
(d) Other ...	2	30	7	32	...
XII.—DISEASES OF INFANCY.					
160. Congenital debility ...	1	80	62	81	...
161. Premature birth ...	4	290	190	294	5
162. A.—Infantile convulsions...	...	110	53	110	...
B.—Other affections of infancy ...	9	200	116	209	...
163. Infant neglect (infants of three months or over)...	...	14	2	14	...
XIII.—AFFECTIONS OF OLD AGE.					
164. Senility—					
(a) Senile dementia ...	1	6	...	7	...
(b) Senile debility ...	88	347	105	435	46
XIV.—AFFECTIONS PRODUCED BY EXTERNAL CAUSES.					
165. Suicide by poisoning ...	...	6	4	6	...
166. Corrosive poisoning (intentional) ...	...	28	13	28	...
167. Suicide by gas poisoning ...	...	...	...	...	...
168. Suicide by hanging or strangulation ...	...	1	1	1	...
169. Suicide by drowning ...	...	3	...	3	...
170. Suicide by firearms ...	...	...	...	...	...
171. Suicide by cutting or stabbing instruments ...	1	7	2	8	1
172. Suicide by jumping from a height ...	...	...	...	...	...
173. Suicide by crushing ...	...	...	...	...	...

TABLE III—(cont.)

RETURN OF DISEASES AND DEATHS (IN-PATIENTS)
FOR THE YEAR 1933—(cont.)

Diseases.	Remaining in hospital at end of 1932.	Yearly total.		Total cases treated.	Remaining in hospital at end of 1933.
		Admissions.	Deaths.		
XIV.—AFFECTIONS PRODUCED BY EXTERNAL CAUSES—(cont.)					
174. Other suicides	...	2	...	2	...
175. A.—Food poisoning	...	30	2	30	...
B.—Botulism	...	...	...	...	...
176. Attacks of poisonous animals—					
(a) Snake bite	1	31	2	32	1
(b) Insect bite	1	50	1	51	2
177. Other poisonings	3	76	8	79	2
A.—Datura poisoning	...	6	...	6	...
178. Burns (by fire)	10	153	22	163	8
179. Burns (other than by fire) ...	8	227	9	235	7
180. Suffocation (accidental) ...	...	1	1	1	...
181. Poisoning by gas (accidental) ...	...	...	...	...	...
182. Drowning (accidental)	...	4	...	4	...
183. Wounds by firearms (war ex- cepted)	1	37	2	38	2
184. Wounds by cutting or stabbing instruments	51	1,359	24	1,410	50
185. Wounds by fall	44	1,326	3	1,370	33
186. Wounds in mines or quarries ...	5	95	...	100	10
187. Wounds by machinery	4	85	1	89	6
188. Wounds by crushing (e.g., railway accidents, etc.)	7	66	3	73	6
189. Injuries inflicted by animals, bites, kicks, etc.	6	148	2	154	3
190. Wounds inflicted on active service	...	2	...	2	...
191. Executions of civilians by bel- ligerents	...	3	...	3	...
192. A.—Over fatigue	...	...	...	...	...
B.—Hunger or thirst	...	1	1	1	...
193. Exposure to cold, frost bite, etc....	...	...	...	...	...
194. Exposure to heat—					
(a) Heatstroke	...	...	...	...	...
(b) Sunstroke	...	2	...	2	...
195. Lightning stroke	...	2	...	2	...
196. Electric shock	...	6	1	6	...
197. Murder by firearms	...	3	3	3	...
198. Murder by cutting or stabbing instruments	...	4	1	4	...
199. Murder by other means	...	...	...	...	...
200. Infanticide (murder of an infant under one year)	...	...	...	...	...
201. A.—Dislocation	3	67	1	70	4
B.—Sprain	2	205	...	207	4
C.—Fracture	92	911	71	1,003	72
202. Other external injuries	32	1,422	...	1,454	37
202A. Concussion	3	67	2	70	3
203. Deaths by violence of unknown cause	...	...	...	...	...

TABLE III—(cont.)

RETURN OF DISEASES AND DEATHS (IN-PATIENTS)
FOR THE YEAR 1933—(cont.)

Diseases.	Remaining in hospital at end of 1932.	Yearly total.		Total cases treated.	Remaining in hospital at end of 1933.
		Admissions.	Deaths.		
XV.—ILL-DEFINED DISEASES.					
204. Sudden death (cause unknown) ...	...	...	...	...	...
205. A.—Diseases not already specified or ill-defined—					
(a) Ascites	4	29	2	33	...
(b) Edema	...	50	...	50	1
(c) Asthenia	6	103	7	109	1
(d) Shock	...	8	5	8	...
(e) Hyperpyrexia	...	9	6	9	...
B.—Malingering	...	24	...	24	...
C.—Pyrexia of uncertain origin ...	12	251	19	263	4
D.—Diagnosis undetermined ...	46	454	...	500	44
Total ...	3,150	76,297	6,024	79,447	2,820
NATIONALITIES.					
Europeans	28	864	9	892	29
Eurasians	8	362	14	370	4
Chinese	1,556	26,459	3,271	28,015	1,193
Indians	1,317	39,939	2,488	41,256	1,306
Malays	202	7,752	176	7,954	236
Javanese	27	426	46	453	36
Japanese	1	45	1	46	4
Others	11	450	19	461	12
Total ...	3,150	76,297	6,024	79,447	2,820

TABLE IV.

The Annual Return of Diseases (out-patients) at all Government hospitals, stationary dispensaries, and travelling dispensaries (excluding Infant Welfare Centres, and Social Hygiene and other Special clinics).

Diseases.	Male.	Female.	Total.
I.—Epidemic, endemic and infectious diseases	108,623 ...	33,520 ...	142,143
II.—General diseases not mentioned above	13,867 ...	6,217 ...	20,084
III.—Affections of the nervous system and organs of the senses	28,682 ...	11,084 ...	39,766
IV.—Affections of the circulatory system ...	1,517 ...	381 ...	1,898
V.—Affections of the respiratory system ...	46,190 ...	16,484 ...	62,674
VI.—Diseases of the digestive system ...	120,167 ...	49,319 ...	169,486
VII.—Diseases of the genito-urinary system (non-venereal)	1,843 ...	3,588 ...	5,431
VIII.—Puerperal state	— ...	3,297 ...	3,297
IX.—Affections of the skin and cellular tissues	111,441 ...	26,007 ...	137,448
X.—Diseases of the bones and organs of locomotion (other than pulmonary tuberculosis)	7,434 ...	2,186 ...	9,620
XI.—Malformations	4 ...	2 ...	6
XII.—Diseases of infancy	109 ...	85 ...	194
XIII.—Affections of old age	1,272 ...	477 ...	1,749
XIV.—Affections produced by external causes	40,436 ...	7,057 ...	47,493
XV.—Ill-defined diseases	3,533 ...	1,152 ...	4,685
Total ...	485,118 ...	160,856 ...	645,974

