Report of the Director of Medical and Sanitary Services / [Ceylon].

CEYLON.

PART IV.—EDUCATION, SCIENCE, AND ART (C).

Administration Report of the Director of Medical and Sanitary Services for 1928.

(*Dr. J. F. E. BRIDGER.*)

SEPTEMBER, 1929.

Ordered by His Excellency the Governor to be Printed, August 29, 1929.

COLOMBO:
A. C. RICHARDS, ACTING GOVERNMENT PRINTER, CEYLON.
To be purchased at the GOVERNMENT RECORD OFFICE, COLOMBO; *price Rs. 2·75.*

1929.

[M 126/29]—13(38)29-IV-375

With the compliments of the Director of

Medical & Sanitary Services, Colombo, Ceylon.

Department of Medical and Sanitary Services,
Colombo, May 29, 1929.

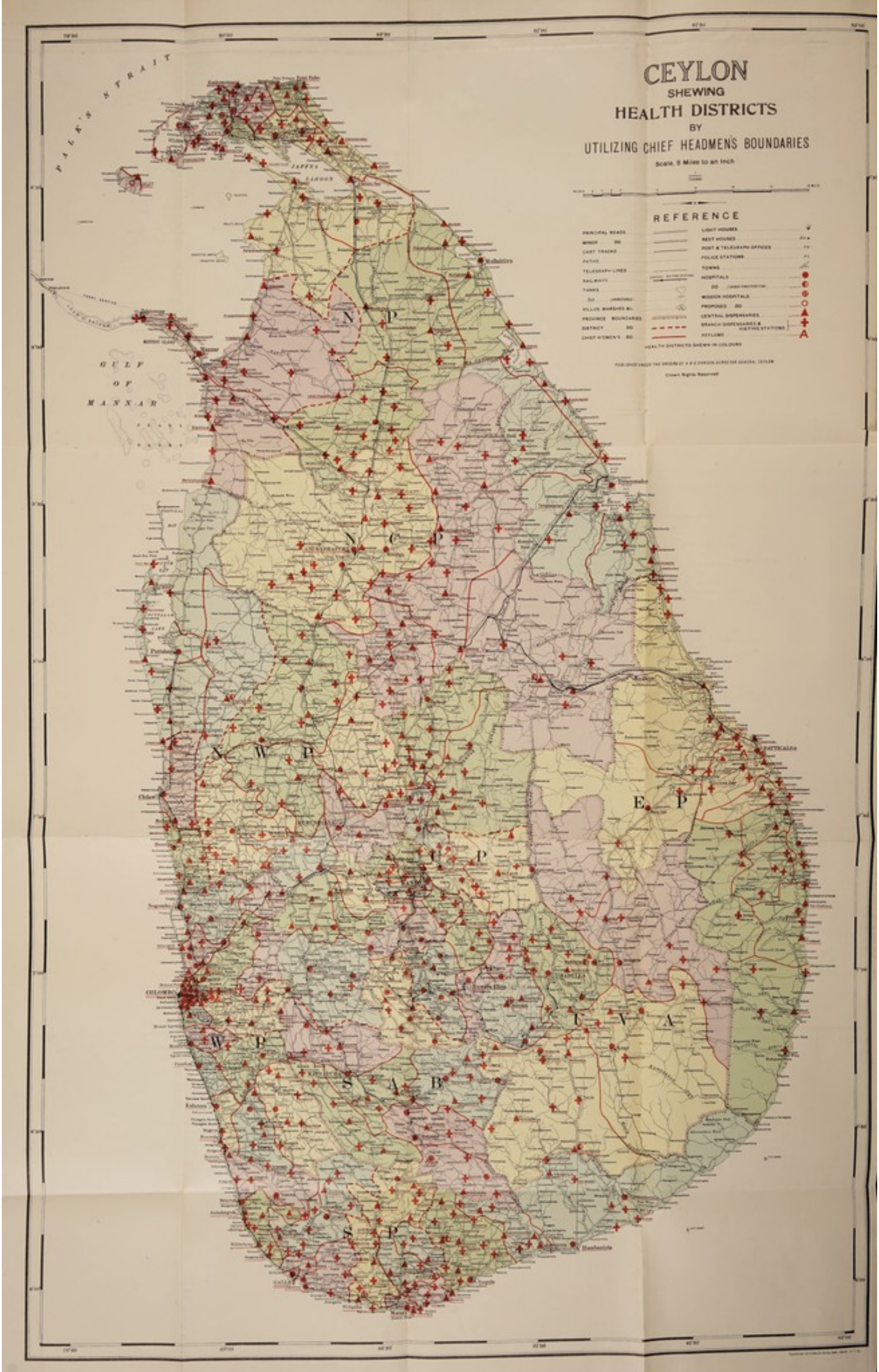
MEDICAL AND SANITARY REPORT, 1928.

SIR,—I HAVE the honour to submit for the information of His Excellency the Governor, and for transmission to the Right Honourable the Secretary of State, the medical report on the health and sanitary conditions of Ceylon for the year ending December 31, 1928, together with the returns, &c., appended thereto.

I have the honour to be, Sir,
Your obedient Servant,

J. F. E. BRIDGER,
Director of Medical and Sanitary Services.

The Honourable
The Colonial Secretary.


CEYLON
SHEWING
HEALTH DISTRICTS
BY
UTILIZING CHIEF HEADMEN'S BOUNDARIES
Scale, 8 Miles to an Inch
REFERENCE
PALK'S STRAIT
GULF OF MANNAR
JAFFNA LAGOON
Mullaitivu
Batticaloa
Chilaw
Kalutara
Hambantota
N P
N C P
N W P
E P
C P
W P
S A B
U V A
S P

DEPARTMENT OF MEDICAL AND SANITARY SERVICES.

REPORT OF THE DIRECTOR OF MEDICAL AND SANITARY SERVICES FOR THE YEAR 1928.

TABLE OF CONTENTS.

I.—ADMINISTRATION.

(*a*) (1) *Staff on December 31, 1928.*

1 Director of Medical and Sanitary Services.
1 Deputy Director of Medical and Sanitary Services.
1 Assistant Director of Medical Services.
1 Assistant Director of Sanitary Services.
1 Administrative Secretary.
1 Accountant.
1 Assistant Accountant.

Medical Side.

1 Medical Superintendent, General Hospital, Colombo.
1 Medical Superintendent, Lunatic Asylum, Angoda.
1 Medical Superintendent, Leper Asylum, Hendala.
1 Medical Superintendent, Civil Hospital, Kandy.
1 Medical Superintendent, Civil Hospital, Galle.
9 Provincial Surgeons.
1 Medical Officer in Charge, Anti-Tuberculosis Institute, Colombo.
1 Medical Officer in Charge, Lady Havelock and Lady Ridgeway Hospitals, Colombo.
1 Radiologist, General Hospital, Colombo.
1 Pathologist, General Hospital, Colombo.
1 Medical Officer in Charge, Dental Institute, Colombo.
65 Medical Officers in Grade I. (1 of these is a woman).
246 Medical Officers in Grade II. (8 of these are women).

Sanitary Side.

3 Inspecting Medical Officers of Estates.
3 Assistants to Inspecting Medical Officers of Estates (Medical Officers in Grade II.).
2 Senior Medical Officers of Health.
6 Medical Officers of Health, Grade I.
20 Medical Officers of Health, Grade II.
1 Superintendent, Anchylostomiasis Campaign (Medical Officer, Grade I.).
8 Medical Officers, Anchylostomiasis Campaign (Medical Officers, Grade II.).
1 Superintendent, Anti-Malaria Campaign.
4 Medical Officers, Anti-Malaria Campaign (Medical Officers, Grade II.).
5 School Medical Officers (4 in Grade I. of Medical Officers and 1 in Grade II.).
1 Superintendent, Health Education Division.
1 Medical Officer (a woman) for Maternity and Child Welfare Work.
*4 Sanitary Engineers.
1 Sanitary Superintendent.
31 Sanitary Inspectors, Class I.
217 Sanitary Inspectors, Class II.
3 Draughtsmen (Sanitary Engineering Division).

Research.

1 Director of Bacteriological and Pasteur Institute.
1 Assistant Bacteriologist.
27 Laboratory Assistants.
1 Medical Entomologist.
8 Entomological Assistants.
9 Laboratory Attendants.

Nursing Staff.

European—

8 Matrons.
1 Assistant Matron.
34 Sisters.

Religious (European)—

7 Mothers.
117 Sisters.

Ceylonese—

11 Public Health Nurses.
91 Matrons.
214 Nurses.
86 Pupil Nurses.
76 Hospital and Health Unit Midwives.
24 Pupil Midwives.

Clerical Staff.

General Branch, Head Office—

1 Chief Clerk, Special Class.
2 Clerks, Class I.
35 Clerks in Class II. and III.
1 Stenographer.
1 Telephone Clerk.

Financial Branch, Head Office—

2 Clerks, Class I.
44 Clerks in Class II. and III.

Branch Offices—

10 Clerks of the Provincial Surgeons (2 in the Office of the Provincial Surgeon, Western Province).
15 Clerks of the Medical Officers of Health.
3 Clerks, General Hospital, Colombo.
19 Clerks, Medical Stores.
3 Clerks, Lunatic Asylum, Angoda.
3 Clerks of the Inspecting Medical Officers of Estates.
1 Clerk, Office of the Medical Entomologist.
4 Clerks, Health Unit Offices.
1 Clerk, Dental Institute.
2 Clerks, Bacteriological Institute.
2 Clerks, Sanitary Engineer's Office.
1 Clerk, Office of the Senior Medical Officer of Health.
1 Clerk, Kandy Hospital.
1 Clerk, Office of the Superintendent, Anti-Malaria Campaign.

Apothecaries.

20 Apothecaries in Special Class.
100 Apothecaries in Class I.
280 Apothecaries in Class II.
3 Acting Officers.

Vaccination.

1 Officer in Charge, Vaccine Establishment.
2 Laboratory Assistants (Vaccine Establishment).
7 Depôt Assistants and Cleaners.
9 Inspectors of Vaccination.
33 Male Vaccinators, Class I.
108 Male Vaccinators, Class II.
16 Female Vaccinators.

Medical Stores.

1 Superintendent and Chief Storekeeper.
1 Assistant Superintendent.
1 Temporary Additional Storekeeper.
5 Overseers.

* Mr. B. R. Dyer, one of the Sanitary Engineers, has been lent to this Government by the International Health Board of the Rockefeller Foundation for a term of three years.

Opium Branch.

1 Opium Storekeeper.
12 Opium Clerks.
23 Opium Sellers.

Miscellaneous.

3 Hospital Stewards in Special Class.
6 Hospital Stewards in Class I.
36 Hospital Stewards in Class II.
1 Hospital Assistant, Prison Hospital, Colombo.
2 X'ray Probationary Assistants, General Hospital.
3 Hospital Stores Clerks.
5 Hospital Admitting Clerks.
4 Bookbinders.
5 Hospital Overseers.
1 Agricultural Overseer, Lunatic Asylum.

Minor Employees.

Chauffeurs, Laboratory Cleaners, Packers, Peons, Overseers, Dispensary Orderlies, Caretakers, Male Attendants, Female Attendants, Disinfecting Orderlies, Tappal Coolies, Itinerating Coolies, Latrine Coolies, Garden Coolies, Burial Coolies, Nurses' Ayahs, Barbers, Dhobies, &c. — about 3,400.

(2) *Promotions, Appointments, &c.*

Drs. S. P. Joseph, M. Jinadasa, A. A. M. Weeraperumal, and C. H. K. Scharenguivel were promoted to the Grade of Provincial Surgeon, with effect from April 26, 1927, November 4, 1927, November 4, 1927, and August 7, 1928, respectively. Dr. W. E. de Silva was appointed Medical Superintendent, Kandy Hospital, with effect from January 1, 1928, and Dr. Paul H. Perera, Medical Superintendent, Galle Hospital, with effect from December 1, 1928. Drs. W. Samarasinghe, C. D. Wickremasinghe, I. E. Meir, V. B. Vandort, S. Chelliah, C. F. Deutrom, and A. N. Coomarasamy were promoted from Grade II. to Grade I. of Medical Officers, with effect from May 2, 1927, November 4, 1927, November 4, 1927, January 1, 1928, June 20, 1928, June 29, 1928, and August 7, 1928, respectively. Drs. C. T. Williams, L. J. Kahawita, and W. T. de Silva were promoted from Grade II. to Grade I. of Medical Officers of Health, with effect from June 1, 1928, June 15, 1928, and November 26, 1928, respectively. Drs. D. D. N. Selvadurai and E. L. F. de Mel were appointed Medical Officers of Health, Grade II., with effect from February 2, 1928, and October 1, 1928, respectively. Dr. (Mrs.) L. N. Verasinghe Chinnappa was appointed Lady Doctor for Maternity and Child Welfare work on June 1, 1928. Rev. C. E. V. Nathanielsz was appointed Superintendent, Health Education Division, on October 24, 1928, and resigned on December 15, 1928. Mr. H. R. Thomas, Member of Pharmaceutical Society, was appointed Superintendent, Civil Medical Stores, on April 1, 1928.

Dr. E. N. Jan, Provincial Surgeon, and Dr. C. Sittampalam, Medical Officer, retired from the service on pension on August 7, 1928, and December 27, 1928, respectively. Dr. W. W. J. Fernando, Medical Officer, and Rev. C. E. V. Nathanielsz, Superintendent, Health Education Division, resigned from the service on August 30, 1928, and December 15, 1928, respectively. The deaths of 3 Medical Officers—Drs. Hinton de Silva, V. Vaithialingam, and A. G. Punchihewa—on June 28, 1928, June 20, 1928, and February 25, 1928, respectively, are recorded with regret.

Ten European Nursing Sisters and 6 European Religious Sisters resigned from the service, and 8 European Nursing Sisters and 11 European Religious Sisters arrived in the Island during the year and assumed duties.

(3) *Officers on Leave.*

The writer of this report was on long leave from May 23, 1928, to December 22, 1928, and Dr. V. van Langenberg, Deputy Director of Medical and Sanitary Services, acted as Director of Medical and Sanitary Services during that period.

Dr. E. P. Aserappa, Provincial Surgeon, Western Province, was on long leave during the last eight months of the year.

Twenty Medical Officers were on leave in Europe at the beginning of the year; 21 Medical Officers and 1 Medical Officer of Health proceeded to Europe on leave during the year. Mr. H. N. Worth, Deputy Sanitary Engineer, proceeded to America in April, 1928, on a Rockefeller Foundation Fellowship to study Sanitary Engineering. Dr. Das Gupta, Medical Officer of Health, Grade I., left for America in September on a Government Fellowship to study Health Unit work, epidemiology, and vital statistics. Fourteen Medical Officers returned to the Island during the year.

Two European Nursing Sisters and 4 European Religious Sisters were on leave in Europe at the beginning of the year, 2 European Nursing Sisters proceeded on leave to Europe during the year, and 4 European Nursing Sisters and 2 European Religious Sisters returned to the Island during the year. Six Ceylonese Nurses proceeded to Europe during the year at Government expense for training in certain hospitals in England.

(*b*) *List of Ordinances affecting Public Health enacted during the Year.*

An Ordinance to amend and consolidate the law relating to Poisons, Opium, and Dangerous Drugs is at present before the Legislative Council, and it is hoped that it will be proclaimed in 1929.

A Draft Ordinance to amend the Ordinance for the better Preservation of Public Health and Suppression of Nuisances in Rural areas is at present under the consideration of Government. This amending Ordinance will enable this Department to enforce the Nuisances Ordinance in rural areas with the legal authority which has hitherto been absent.

An Ordinance for the Prevention of the Breeding and Harbouring of Mosquitoes was drafted and presented to the Legislative Council at the end of the year 1928.

Ordinance No. 26 of 1927, an Ordinance to amend and consolidate the Law relating to the Department of Medical and Sanitary Services, the Ceylon Medical College, the Ceylon Medical Council, Medical Practitioners, Dentists, Midwives, Pharmachists, which was passed in 1927 and mentioned in last year's report came into operation from October 5, 1928, on Proclamation by the Governor.

(c) Financial.

Revenue and expenditure in 1927-28 financial year (*i.e.*, October 1, 1927, to September 30, 1928):—

	EXPENDITURE.	Rs.	c.
1.	Personal Emoluments	5,095,956	4
2.	Diets	1,875,493	35
3.	Equipment and contingencies	530,585	19
4...	Special equipment	137,824	55
5	Medicines and instruments	1,288,311	27
6	Travelling	602,096	55
7	Transport of stores, &c.	66,853	7
8.	Rents	79,521	4
9.	Grants	40,910	50
10.	Epidemics	53,083	20
11.	Rebates payable under the Medical Wants Ordinance	157,841	0
12.	Purchase of opium, &c.	180,733	89
13.	—	—	
14.	Incidental expenses	9,881	61
15.	Public Health Scholarships	5,198	68
16.	Anti-Malaria campaign	67,386	24
17.	Health units	7,028	22
18.	Cultivation of land attached to the Lunatic Asylum, Angoda	3,815	0
19.	Investigation of snake and other possible reptile poison	292	90
	Hookworm treatment at Mandapam Camp	2,807	52
	Investigation of Melioidosis in cattle	552	50
	Outfit allowance to nurses proceeding to England	4,932	0
	Total	10,211,104	32

	REVENUE.	Rs.	c.
1.	Hospital and dispensary receipts	366,664	21
2.	Sale of drugs and medical requisites	9,587	80
3.	Sale of drugs under the Medical Wants Ordinance	21,090	60
4.	Medical aid dues, maintenance and visits	163,087	18
5.	Sale of opium	376,433	31
6.	Medical aid dues, export duties	1,236,625	37
		2,173,488	47

The following table shows the expenditure for each of the past six years:—

	Rs.	c.		Rs.	c.
1922–23 ..	5,524,453	70	1925–26 ..	8,598,923	3
1923–24 ..	7,250,657	20	1926–27 ..	9,104,455	33
1924–25 ..	7,798,824	24	1927–28 ..	10,211,104	32

II.—PUBLIC HEALTH.

A.—GENERAL REMARKS.

During the year the health of the Island was satisfactory on the whole.

In the Western Province malaria broke out in epidemic form during the early part of the year in the lower part of the Kelani Valley. Enteric fever prevailed throughout the year, and was most evident along the sea coast. The general health of the Province was good.

In the Central Province there were severe epidemics of malaria in the Matale District in July and in the Dumbara Valley in October, November, and December. Six cases of plague were treated in the Infectious Diseases Hospital at Kandy. These came from the Municipality of Kandy.

In the North-Western Province malarial fever prevailed during the early months of the year, the epidemic being the worst that has been known for several years.

In the Province of Uva the incidence of malaria during the year was the highest on record for many years. There were no cases of smallpox or plague. There was an outbreak of cholera at Alutnuwara towards the end of the year. Influenza was rife at several centres during the year.

The general health of the Province of Sabaragamuwa was not so satisfactory as in 1927. Plague appeared at Dehiowita, smallpox at Kahawatta, and 1 case of cholera at Kegalla. Malarial fever was rampant in the Kegalla District especially, where the outbreak which began in the latter half of 1927 continued with great severity till past the middle of 1928. The number of people treated for malaria in hospitals and at dispensaries was very large.

The health of the Eastern Province was satisfactory. There was no epidemic outbreak of any infectious diseases. As usual, malaria was the most prevalent disease.

In the Southern Province a severe epidemic of malaria occurred in December, 1928, in the Tangalla and Hambantota Districts. Enteric fever is practically endemic in Galle town, and an improved water supply and drainage scheme are necessary.

The health of the Northern Province was satisfactory on the whole. Malaria did not break out in epidemic form as it generally does during the early months of the year. The failure of the north-east monsoon in 1927 was probably the cause of this. There were no cases of cholera during the year, but there were 6 cases of plague, all introduced from Colombo.

Malaria prevailed in the North-Central Province to an even greater extent than usual, and there was an increase in the number of cases treated at hospitals and dispensaries.

Prevalence of Sickness in the Different Seasons of the Year.—The wet months during which the south-west and north-east monsoons prevailed were again the unhealthy months. During the early part of the year and during the latter part of the year malaria was particularly bad in almost every Province. Particulars of the outbreaks are given under " Communicable Diseases " in this section.

Relative Mortality of the Different Seasons.—The figures given in this section under " Vital Statistics " again show that January, February, November, and December have a very high death rate. The comparatively dry months of April and May again show fewer deaths.

1.—General Diseases.

Of the diseases treated among in-patients at hospitals the most prevalent general diseases are rheumatism, ulcers, intestinal disorders (diarrhoea and enteritis), bronchitis, and pneumonia. Malignant growths prevail to some extent and year by year the number of patients who seek hospital treatment for cancer is increasing.

The following table shows the most noteworthy contrasts in the morbidity and mortality of the general diseases treated among in-patients at the hospitals in the whole Island during the years 1924, 1925, 1926, 1927, and 1928:—

	1924.	1925.	1926.	1927.	1928.
Rheumatism—					
Cases	4,377	4,535	4,398	4,365	5,043
Deaths	34	39	20	20	22
Ulcers—					
Cases	9,233	10,778	17,925	13,260	11,852
Deaths	76	59	114	56	155
Intestinal Disorders—					
Cases	4,716	4,919	4,991	4,764	4,664
Deaths	1,137	1,186	1,149	1,015	972
Bronchitis—*					
Cases	3,806	4,032	4,189	4,615	5,220
Deaths	119	187	192	175	190
Pneumonia—					
Cases	5,344	5,357	5,650	6,168	6,509
Deaths	1,902	1,887	2,011	1,900	2,548
Malignant growths—					
Cases	442	400	407	478	687
Deaths	57	63	106	89	87

The total number of deaths from " cancer or malignant diseases " reported by the Registrar-General in respect of the whole Island was 551 during the year under review, as compared with 540 in 1927, 509 in 1926, 406 in 1925, and 473 in 1924.

Most of the operable cases of cancer resort to the General Hospital, Colombo, for treatment; of a total of 687 cases of cancer dealt with in all the hospitals 376 were treated at the General Hospital, Colombo.

It will be evident from the analysis of cases treated, given on page 11, that the site of the disease in the majority of cases was in the region of the buccal cavity, the commonest site being the cheek. The male genital organ and the uterus were also common sites.

2.—Communicable Diseases.

(a) *Mosquito or Insect-borne.*

(1) *Malaria.*—There were 44,346 cases of malaria admitted as in-patients to hospitals during the year under review and 1,542,025 cases treated at dispensaries and out-patient departments of hospitals. Tertian malaria was most common among the hospital admissions as well as among the dispensary cases. The mortality among the hospital admissions was very low. Malarial cachexia comes next with a higher mortality rate among the hospital admissions. There were also a few cases of aestivo-autumnal and cerebral types, with a very high mortality rate in the latter type.

Malaria is the most prevalent disease in the Island. It is endemic in all the Provinces to a greater or a lesser degree. In all the Provinces there were severe epidemics of malaria, and the incidence of malaria during the year under review has been the highest on record for many years. In some Provinces the number of hospital and dispensary cases treated was more than double the number treated in the previous year. In the Province of Sabaragamuwa especially there was an alarming increase in the number of hospital admissions.

There were several virulent epidemics during the year—1 in the Western Provnce, in the lower part of the Kelani Valley during the early part of the year; 2 in the Central Province, in the Matale District in July and in the Dumbara Valley during the last quarter of the year; throughout the North-Western Province in the early part of the year; in the Province of Uva at Badulla and in the villages around Haliela; in the Kegalla District during the first half of the year; in Tangalla and Hambantota Districts during the latter part of the year. In all these epidemics special medical aid was rendered, in some instances by the appointment of Itinerating Medical Officers, and the opening of temporary dispensaries where there were no hospitals or dispensaries on the spot.

* The figures given under bronchitis in my 1927 report included cases of broncho-pneumonia. Such cases are included under pneumonia this year.

Cancer Returns of In-patients in Hospital for 1928.

SINHALESE.

Age.	Sex.	Cheek.		Tongue.		Penis.		Breast.		Uterus.		Palate, Jaw, and Floor of Mouth.		Skin and Extremities.		Stomach.		Caecum.		Rectum.		Liver.		Intestines.		Ovary.		Oesophagus.		Lymph Glands.		Other Sites.		Sites not specified on Notes.		Total.	
		C.	D.	C.	D.	C.	D.	C.	D.	C.	D.	C.	D.	C.	D.	C.	D.	C.	D.	C.	D.	C.	D.	C.	D.	C.	D.	C.	D.	C.	D.	C.	D.	C.	D.
20–30	Male	5	—	5	1	7	—	—	—	—	—	—	—	3	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	8	1	1	—	29	2
	Female	1	—	1	—	—	—	12	1	14	3	2	—	2	—	2	1	—	—	—	—	—	—	—	—	1	—	—	—	1	—	1	—	37	5
31–40	Male	14	2	10	—	9	—	—	—	—	—	3	—	3	—	2	1	—	—	—	—	2	1	—	—	—	—	1	—	5	—	—	—	51	4
	Female	3	—	1	—	—	—	10	—	18	3	2	—	—	—	—	—	—	—	—	—	1	—	1	1	—	—	1	—	7	1	—	—	44	5
41–50	Male	27	2	8	—	11	1	—	—	—	—	3	—	7	—	1	—	1	1	—	—	—	—	—	—	—	—	—	—	4	2	—	—	62	6
	Female	11	1	3	1	—	—	7	1	25	—	7	1	3	—	—	—	—	—	—	—	1	1	—	—	—	—	—	—	8	2	—	—	65	7
51–60	Male	13	2	7	2	25	1	—	—	—	—	2	—	2	—	—	—	—	—	1	—	2	—	—	—	—	—	2	—	7	3	—	—	83	8
	Female	14	1	1	—	—	—	8	1	20	3	1	—	1	—	—	—	—	—	1	—	1	—	—	—	2	—	1	—	7	2	—	—	57	7
61 and upwards	Male	22	3	3	—	12	—	—	—	—	—	6	2	2	—	4	2	—	—	1	—	—	—	—	—	—	—	—	—	4	—	—	—	54	7
	Female	8	1	—	—	—	—	2	—	4	2	1	—	—	—	—	—	—	—	1	—	1	—	1	1	—	—	—	—	2	—	—	—	20	4
	Total	138	12	39	4	64	2	39	3	81	11	27	3	23	—	9	4	1	1	4	—	8	2	2	2	3	—	5	—	4	—	53	11	2	—	502	55

TAMILS.

Age.	Sex.	Cheek.		Tongue.		Penis.		Breast.		Uterus.		Palate, Jaw, and Floor of Mouth.		Skin and Extremities.		Stomach.		Caecum.		Rectum.		Liver.		Intestines.		Ovary.		Oesophagus.		Lymph Glands.		Other Sites.		Sites not specified on Notes.		Total.	
		C.	D.	C.	D.	C.	D.	C.	D.	C.	D.	C.	D.	C.	D.	C.	D.	C.	D.	C.	D.	C.	D.	C.	D.	C.	D.	C.	D.	C.	D.	C.	D.	C.	D.
20–30	Male	4	—	1	—	—	—	—	—	—	—	1	—	—	—	—	—	—	—	—	—	1	1	—	—	—	—	—	—	—	—	1	—	—	—	8	1
	Female	5	—	3	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1	—	—	—	4	—	—	—	—	—	2	1	—	—	15	1
31–40	Male	18	2	1	—	7	2	—	—	—	—	2	—	—	—	—	—	—	—	1	—	—	—	1	—	—	—	—	—	—	—	1	1	—	—	31	5
	Female	2	—	2	—	—	—	2	1	11	1	2	1	—	—	—	—	—	—	1	1	—	—	—	—	—	—	—	—	—	—	1	—	—	—	21	4
41–50	Male	10	1	3	1	2	—	—	—	—	—	3	—	1	—	1	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	2	1	—	—	22	4
	Female	2	—	—	—	—	—	4	—	4	2	3	—	1	—	1	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1	—	—	—	16	3
51–60	Male	4	—	3	—	2	—	—	—	—	—	2	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	11	1
	Female	5	3	2	—	—	—	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1	—	—	—	9	3
61 and upwards	Male	6	—	1	—	1	—	—	—	—	—	—	—	—	—	—	—	—	—	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	9	—
	Female	—	—	—	—	—	—	1	—	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	2	—
	Total	56	6	16	1	12	2	8	1	16	3	13	2	2	—	2	2	—	—	3	1	2	1	1	—	4	—	—	—	—	—	9	3	—	—	144	22

OTHER RACES.

Age.	Sex.	Cheek.		Tongue.		Penis.		Breast.		Uterus.		Palate, Jaw, and Floor of Mouth.		Skin and Extremities.		Stomach.		Caecum.		Rectum.		Liver.		Intestines.		Ovary.		Oesophagus.		Lymph Glands.		Other Sites.		Sites not specified on Notes.		Total.	
		C.	D.	C.	D.	C.	D.	C.	D.	C.	D.	C.	D.	C.	D.	C.	D.	C.	D.	C.	D.	C.	D.	C.	D.	C.	D.	C.	D.	C.	D.	C.	D.	C.	D.
20–30	Male	—	—	—	—	—	—	—	—	—	—	2	1	2	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	4	1
	Female	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	2	1	—	—	2	1
31–40	Male	1	—	2	—	—	—	—	—	—	—	—	—	1	—	—	—	2	1	—	—	—	—	1	1	—	—	—	—	—	—	—	—	—	—	7	2
	Female	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	2	1	—	—	2	1
41–50	Male	3	—	—	—	—	—	—	—	—	—	—	—	—	—	1	1	—	—	—	—	—	—	—	—	—	—	1	—	—	—	5	2	—	—	10	3
	Female	4	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	4	1
51–60	Male	—	—	—	—	—	—	—	—	—	—	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1	—	—	—	2	—
	Female	1	—	—	—	—	—	—	—	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	2	—
61 and upwards	Male	6	—	—	—	—	—	—	—	—	—	—	—	—	—	1	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	7	1
	Female	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1	—	—	—	—	—	1	—
	Total	15	1	2	—	—	—	—	—	1	—	3	1	3	—	2	2	2	1	—	—	—	—	1	1	—	—	1	—	1	—	10	4	—	—	41	10

C = cases. D = deaths.

The following table shows a comparison of 1928 figures with the figures of 1924, 1925, 1926, and 1927:—

	1924.	1925.	1926.	1927.	1928.
Number of cases treated at dispensaries	925,476	785,903	1,061,457	865,594	1,542,029
Cases admitted to hospitals	26,865	22,600	29,334	25,146	44,356
Total number of deaths in hospitals	504	392	632	488	882
Total number of deaths registered for the Island	1,388	1,063	1,331	1,331	2,239

It may be stated that many deaths due to malaria are registered under pyrexia of unknown origin.

The following table shows the hospital admissions on account of malaria in the different Provinces for the past three years:—

	1926.		1927.		1928.	
	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.
General Hospital, Colombo	2,324	37	2,501	35	4,462	129
Western Province	3,492	60	2,121	34	5,088	97
Central Province	3,759	64	2,954	78	6,309	125
Northern Province	2,554	55	2,721	35	2,552	39
Eastern Province	1,219	33	1,000	29	1,240	17
Southern Province	2,110	55	1,693	35	1,790	31
North-Western Province	4,053	130	3,189	92	5,486	198
North-Central Province	2,361	88	1,916	40	2,095	39
Province of Uva	3,125	46	3,047	52	5,057	82
Province of Sabaragamuwa	3,985	58	3,871	58	10,157	121
Railway Extensions	204	5	—	—	—	—
Lunatic Asylum	148	1	73	—	120	4
	29,334	632	25,146	488	44,356	882

Further, a number of cases of malaria in villages remote from hospitals and dispensaries were treated by Itinerating Medical Officers of the Parangi Campaign whose scope of work had been extended in 1927 by providing them with drugs, &c., for the treatment of the more prevalent diseases.

14,787 lb. and 2,593,450 tablets of quinine, which cost Rs. 334,651.75, were issued free through various agencies for curative and preventive purposes.

The reports of the Superintendent, Anti-Malaria Campaign, and the Medical Entomologist appear in the Appendix to this Report. The work done in this connection by the Sanitary Branch of this Department is given in Section III. of this Report.

(2) *Dengue.*—There was no severe epidemic of dengue in any part of the Island during the year 1928. There were only 37 hospital cases and 313 cases treated as out-patients during the year, as against 395 and 2,549 the previous year. The actual prevalence of the disease, however, cannot be judged from the above figures as only a small percentage of those suffering from dengue attend a medical institution for treatment.

(*b*) *Infectious Diseases.*

(1) *Enteric.*—The following table shows the number of cases and deaths for the past five years:—

	1924.	1925.	1926.	1927.	1928.
Hospital cases	1,600	1,520	1,352	1,488	1,687
Hospital deaths	408	392	361	304	368
Total number of deaths registered for the Island	816	721	544	510	577

The diagnosis of the disease in each of the hospital cases was confirmed by Widal's test. The actual prevalence of the disease cannot be judged from hospital admissions as some cases resort to Ayurvedic treatment, and the number of the registered deaths does not indicate the actual mortality from this disease as some deaths from enteric are undoubtedly included amongst those reported as due to "pyrexia." There were 22,616 deaths due to pyrexia in 1928, as against 17,798 in 1927.

There were no epidemics of enteric during the year. The Western Province contributed more than one-third of the total cases treated in hospitals.

(2) *Smallpox.*—The following table shows the number of cases and deaths in the past five years:—

	1924.	1925.	1926.	1927.	1928.
Cases	45	28	65	27	18
Deaths	9	3	4	5	1

Of the total cases reported 2 were imported in ships into Colombo, and the rest were local cases where the infection was mostly given by arrivals from India. The distribution of the cases is as follows:—Two cases in the Colombo Port, 10 cases in Colombo town, 2 cases with 1 death in the Central Province, and 4 cases in the Province of Sabaragamuwa.

The steps taken by the Sanitary Branch of this Department to deal with the cases reported to it are given in Section III. and the details of cases treated at the Infectious Diseases Hospital, Angoda, in Section VI. of this Report.

(3) *Diphtheria.*—The following table shows the number of cases and deaths in the past five years:—

	1924.	1925.	1926.	1927.	1928.
Hospital cases ..	19 ..	18 ..	20 ..	36 ..	40
Hospital deaths ..	7 ..	6 ..	6 ..	9 ..	13
Total number of deaths for the Island ..	17 ..	8 ..	13 ..	11 ..	20

Of the 40 cases treated 23 were at the Infectious Diseases Hospital, Angoda. Most of these cases were faucal, a few were nasal, and 1 conjectival. All cases except 3 were among children between the ages of 1 and 6.

(4) *Influenza.*—The following table shows the number of cases and deaths in the past five years:—

	1924.	1925.	1926.	1927.	1928.
Number of cases treated at dispensaries ..	30,719 ..	38,519 ..	44,179 ..	55,589 ..	79,785
Hospital cases ..	3,888 ..	5,711 ..	5,345 ..	6,147 ..	7,237
Hospital deaths ..	115 ..	91 ..	96 ..	112 ..	101
Total number of deaths for the Island ..	1,726 ..	1,532 ..	1,590 ..	1,756 ..	1,958

As was reported in my previous report, there has been a steady decrease in the number of deaths from influenza in the Island from 1920 to 1925 and thereafter a slight increase.

(5) *Cholera.*—The following table shows the number of cases and deaths in the past five years:—

	1924.	1925.	1926.	1927.	1928.
Cases ..	17 ..	305 ..	56 ..	11 ..	5
Deaths ..	14 ..	186 ..	47 ..	6* ..	4*
Total number of deaths registered for the Island	20 ..	189 ..	54 ..	3* ..	3*

Of the 5 cases, 1 occurred in the Colombo town, 1 in an estate in the Western Province, 1 in an estate in the Central Province, and 2 at Alutnuwara in the Province of Uva where an epidemic of cholera broke out on December 29, 1928. Steps taken by this Department to deal with outbreaks are given in Section III. of this Report.

(6) *Dysentery.*—The following table shows the number of cases and deaths in the past five years:—

	1924.	1925.	1926.	1927.	1928.
Hospital cases ..	6,165 ..	5,478 ..	5,004 ..	5,202 ..	6,190
Hospital deaths ..	1,217 ..	1,079 ..	862 ..	792 ..	1,034
Total number of deaths registered for the Island	4,080 ..	3,723 ..	3,514 ..	3,144 ..	3,446

Amoebic dysentery was the most prevalent type. Nearly 70 per cent. of the total dysentery cases were of this type. The percentage of baccillary cases was only 12.5. The mortality from bacillary type was slightly higher than from amoebic, the mortality rates being 18.5 per cent. and 16.2 per cent., respectively.

Of the in-patients (hospital cases) the following Provinces contributed the majority of the cases:—Western, 1,012 cases with 131 deaths; Central, 981 cases with 217 deaths; Sabaragamuwa, 825 cases with 157 deaths; North-Central, 600 cases with 44 deaths; and Southern, 523 cases with 97 deaths. 29,084 out-patients were treated for this disease during the year, as against 25,256 the previous year. The distribution of out-patient cases shows that this disease was prevalent in sporadic form in all the Provinces in a greater or lesser degree. The necessity for improved and protected water supplies is urgent in many districts and towns. Of the 3,446 deaths registered for the whole Island exactly 50 per cent. were among the Indian immigrant population on estates; the percentage for the previous year was 61.25. It is very encouraging to record that more estate proprietors are realizing the value of a protected and good water supply, as can be seen from the information given in Section III.-4 (2)—Medical Wants on Estates.

(7) *Leprosy.*—During the year 1,054 cases with 69 deaths, as against 1,047 cases with 57 deaths the previous year, were treated at the Government hospitals, including the 2 Asylums which are maintained in the Island for the segregation of lepers under the Leper Ordinance, No. 4 of 1901, 1 at Hendala in the Western Province and the other on the Island of Mantivu in the Eastern Province. A report on these 2 Leper Asylums, and on the results of the E.C.C.O. treatment on the leper patients, is given in Section VII.—Prisons and Asylums.

As regards the question of the establishment of a Leper Settlement, to which reference was made in last year's report, the question of water supply at one suggested site is still being investigated and also the possibility of a second site.

(8) *Parangi (Yaws).*—The following table shows the number of cases and deaths in the past five years:—

	1924.	1925.	1926.	1927.	1928.
Hospital cases ..	6,149 ..	4,897 ..	4,386 ..	3,482 ..	2,667
Hospital deaths ..	18 ..	19 ..	14 ..	11 ..	2
Number of cases treated at dispensaries ..	50,236 ..	42,320 ..	39,782 ..	36,131 ..	34,171
Total number of deaths for the Island ..	27 ..	15 ..	12 ..	12 ..	9

The steady decrease in the number of admissions to hospitals and of out-patients at dispensaries and of the mortality from the disease is directly due to the success of the intensive campaigns carried out by the Itinerating Medical Officers appointed primarily for the treatment of parangi.

* Some deaths may have been registered under acute diarrhoea before the disease was bacteriologically diagnosed.

The distribution of the disease judged from hospital returns of cases treated is shown in the following table:—

	1925.	1926.	1927.	1928.
General Hospital, Colombo	312	305	222	54
Lunatic Asylum, Angoda	1	—	1	2
Western Province	486	456	352	302
Central Province	646	525	499	493
Northern Province	281	213	195	133
Eastern Province	446	228	199	122
Southern Province	591	633	514	301
North-Central Province	483	556	257	258
North-Western Province	367	414	299	225
Province of Uva	433	395	431	294
Province of Sabaragamuwa	851	661	503	483
	4,897	4,386	3,482	2,667

The dispensary cases as regards Provinces were as follows:—

	1927.	1928.		1927.	1928
Western	2,631	1,708	North-Western	10,007	10,231
Central	1,820	1,515	North-Central	11,755	8,927
Northern	421	252	Uva	1,008	793
Eastern	2,465	1,998	Sabaragamuwa	1,517	2,685
Southern	4,507	6,062			

During the year under review 22,547 injections were given to 11,663 patients, as against 30,276 injections and 18,101 patients the previous year. Most of the patients attended a second and a third time for injections, but some, perhaps satisfied and contented with the immediate relief effected by the first injections, did not attend for subsequent injections essential to obtain a radical cure. The decrease in the number of cases treated is partly due to the marked decrease in the incidence of the disease now and also to the fact that some Itinerating Medical Officers had to be temporarily engaged to deal with epidemics of malaria. In most of the parangi stricken districts too little importance is attached to the use of pure and wholesome water for drinking purposes and far too little is done to keep the wells free from pollution. In other districts stagnant pools used for bathing purposes act as agents for spreading the disease. The presence of swarms of flies in villages also contributes to the spread of the disease.

Comment must be made on the continued assistance rendered by the Government Agents and their Assistants and on the interest displayed by the minor headmen.

During 1928 the number of Itinerating Medical Officers was increased from 10 to 12.

(9) *Plague.*—The following table shows the number of cases and deaths in the past five years:—

	1924.	1925.	1926.	1927.	1928.
Cases	153	68	16	117	67
Deaths	143	63	15	106	60

Of the 67 cases reported for the year under review, 40 were from Colombo town, 6 from the Western Province, 8 from the Central Province, 5 from the Northern Province, 2 from the Southern Province, and 6 from the Province of Sabaragamuwa. Of the cases in Colombo town and the Western Province, 21 cases, all bubonic, were admitted to the Infectious Diseases Hospital, Angoda. The details of these cases are given in Section VI. of this Report.

The source of infection in all the cases, except those that occurred in the Central Province and the 1 at Beruwala in the Western Province, was traced to Colombo.

It is noteworthy that the septicaemic form of plague which used to be most common in Ceylon is fast decreasing.

The measures taken by this Department to deal with outbreaks reported to it are given in Section III. of this Report.

(10) *Tubercular Diseases of the Lungs.*—The following table shows a comparison between the figures for 1928 and the figures for the previous five years:—

	1923.	1924.	1925.	1926.	1927.	1928.
Hospital cases	4,099	3,656	4,155	4,363	4,247	4,120
Hospital deaths	990	860	1,000	1,074	1,027	1,110
Total number of deaths registered for the Island	3,332	3,235	3,241	3,309	3,353	3,380

Three special institutions—the Anti-Tuberculosis Institute, Colombo (out-door), the Kandana Sanatorium, Western Province, for early cases, and the Ragama Tuberculosis Hospital, Western Province, for advanced and chronic cases—are maintained to deal with this disease. A large number of cases are also treated in the Tuberculosis Wards of the General Hospital, Colombo.

The report of the Secretary of the King Edward VII. (Memorial) Anti-Tuberculosis Fund is given in Section X. of this Report. The Anti-Tuberculosis Institute, Colombo, and the Kandana Sanatorium were built from money provided by that fund.

(c) *Helminthic Diseases.*

Anchylostomiasis.—The following table shows a comparison of 1928 figures with the figures for the previous five years:—

	1923.	1924.	1925.	1926.	1927.	1928
Number of cases treated at dispensaries	114,157	153,488	147,528	152,195	170,818	177,372
Cases admitted to hospitals	11,344	11,720	12,618	13,040	12,600	12,921
Total number of deaths in hospitals	1,030	865	923	897	789	941
Total number of deaths registered for the Island	1,857	1,853	2,119	2,121	1,943	2,161

A reference to the report of the Superintendent, Anchylostomiasis Campaign, given in the Appendix to this Report, will show that the campaign officers have covered the greater portion of the Island, so far as the treatment of school children and estate labourers is concerned. The treatment of villagers is shown in the dispensary and hospital figures given above. In some districts treatment was afforded to the villagers at their own doors by the Itinerating Medical Officers.

The results of the Anchylostomiasis Campaign are now beginning to show themselves. It is very encouraging to record that in some districts of the Central Province the treatment has been so successful that overcrowding of hospitals no longer exists, and in fact some of the wards in Dikoya, Dimbula, Lindula, Maskeliya, Bogawantalawa, and Agrapatna hospitals are almost empty for the greater part of the year.

B.—VITAL STATISTICS.

	1926.	1927.	1928.
I.—Ceylonese Population (*i.e.*, the total population of the Island, less the European population and the Indian immigrant population on estates)—			
Estimated population on December 31	4,475,311	4,585,490	4,695,580
Total births	179,180	181,223	188,377
Birth rate per thousand	40.04	39.52	40.9
Total deaths	105,632	93,454	112,426
Death rate per thousand	23.60	20.38	24.4
Infant mortality (rate per thousand births registered)	169	142	173
II.—European Population (including officials)—			
Estimated population on December 31	10,834	11,447	8,801
Total births	193	168	167
Birth rate per thousand	16.9	13.99	19.1
Total deaths	85	75	88
Death rate per thousand	7.4	6.25	10.1
Infant mortality (rate per thousand births registered)	26	24	12
III.—Indian Immigrant Population on Estates—			
Estimated population on December 31	638,847	691 855	717,480
Total births	27,515	24,079	24,767
Birth rate per thousand	43.1	34.8	34.5
Total deaths	19,168	19,478	19,823
Death rate per thousand	30.0	28.2	27.6
Infant mortality (rate per thousand births registered)	209	228	211

IV.—Total number of Infant deaths under one year and infantile mortality rate—

	Total Deaths.	Mortality Rate per 1,000 Births registered.
(*a*) for the whole Island	37,792	177
(*b*) in the 35 principal towns	4,649	197
(*c*) in the rural areas	33,143	175

The registration of births and deaths is compulsory throughout the Island, but the registration of the causes of deaths cannot be totally relied on as the majority of the registering officers are non-medical men. The Registrar-General supplies figures concerning the vital statistics of the 35 principal towns in Ceylon, and these figures may be considered more reliable as regards the causes of death, as the larger proportion of them are certified to by Registered Medical Practitioners.

From the tables given above it will be noted that the death rate in 1928 as compared with 1927 has increased among the first two sections of the Island's population, viz., Ceylonese and Europeans, and that the death rate among Indian immigrant labourers, although smaller in 1928 than in 1927, continues to be greater than the rate among the Ceylonese population. The birth rate among Indian immigrant labourers is still lower than that among the Ceylonese population, 34.5 as compared with 40.9. It is regretted that the infantile mortality rate among the Ceylonese population is much higher in 1928 than in 1927, 173 as compared with 142, but it is satisfactory that the infantile mortality rate has dropped from 228 in 1927 to 211 in 1928 among the Indian immigrant labourers. The low infantile mortality rate, viz., 12, among Europeans is very satisfactory.

Causation of Deaths.—The following table shows the number of deaths registered amongst all classes (Ceylonese, European, and Indian immigrant populations) during the years 1926, 1927, and 1928 under the several classes of diseases:—

	1926.	1927.	1928.
I.—General Diseases—			
(*a*) Epidemic diseases	7,599	7,036	8,550
(*b*) Septic diseases	140	147	95
(*c*) Tuberculous diseases	3,583	3,595	3,667
(*d*) Venereal diseases	193	195	235
(*e*) Cancer or malignant diseases	509	540	551
(*f*) Other general diseases	8,842	9,194	10,950
II.—Diseases of the nervous system and organs of special sense	17,392	16,203	18,762
III.—Diseases of the circulatory system	1,080	1,131	1,220
IV.—Diseases of the respiratory system	12,300	11,947	13,394
V.—Diseases of the digestive system	18,057	14,607	16,863
VI.—Non-venereal diseases of the genito-urinary system and annexa	1,686	1,535	1,745
VII.—The puerperal state	3,951	3,595	4,091
VIII.—Diseases of the skin and cellular tissues	10,409	9,179	11,353

	1926.	1927.	1928.
IX.—Diseases of bones and organs of locomotion	23	22	18
X.—Malformations	15	26	33
XI.—Diseases of early infancy	9,420	9,579	9,894
XII.—Old age	4,877	5,154	5,599
XIII.—Affections produced by external causes	2,577	2,529	2,701
XIV.—Ill-defined diseases (including pyrexia)	22,236	16,793	22,616

The more notable causes of deaths amongst all classes (Ceylonese, European, and Indian immigrant populations) were the following diseases:—

	1926.	1927.	1928.		1926.	1927.	1928.
(1) Dysentery	3,514	3,144	3,446	(14) Tetanus	305	293	324
(2) Pulmonary tuberculosis	3,309	3,353	3,380	(15) Rabies	58	67	76
(3) Infantile convulsions	14,996	13,686	16,042	(16) Cholera	54	3	3
(4) Diarrhoea	8,595	8,308	8,831	(17) Influenza	1,590	1,756	1,958
(5) Pneumonia	7,627	8,004	8,846	(18) Leprosy	96	58	80
(6) Anchylostomiasis	2,121	1,943	2,161	(19) Plague	16	100	60
(7) Dropsy	1,879	1,580	1,952	(20) Scarlet fever	—	1	—
(8) Anaemia	2,317	2,349	2,363	(21) Anthrax	—	1	2
(9) Intestinal parasites	3,541	3,070	4,621	(22) Smallpox	4	5	4
(10) Puerperal septicaemia	1,533	1,331	1,409	(23) Diphtheria	21	11	20
(11) Malaria	1,331	1,331	2,239	(24) Parangi	12	12	9
(12) Enteric fever	544	510	577	(25) Pyrexia	17,798	13,502	18,954
(13) Rickets	4,192	3,736	4,477				

The above figures show that pyrexia and infantile convulsions continue to be the two principal causes of death, followed by pneumonia and diarrhoea. Malaria has claimed 908 victims more than last year.

The following table shows the principal causes of deaths amongst Indian immigrant population on estates:—

	1926.	1927.	1928.		1926.	1927.	1928.
(1) Dysentery	2,132	1,926	1,723	(6) Infantile convulsions	1,749	1,503	1,601
(2) Debility	4,108	2,845	2,795	(7) Dropsy	137	129	119
(3) Diarrhoea and enteritis	1,440	1,703	1,597	(8) Pulmonary tuberculosis	388	398	382
(4) Pneumonia	2,310	2,732	2,816	(9) Anaemia	45	41	42
(5) Anchylostomiasis	1,474	1,269	1,299	(10) Other diseases	6,961	6,931	7,450

From the above figures it is evident that pneumonia, debility, dysentery, diarrhoea, and infantile convulsions are the chief causes of death amongst Indian immigrant labour.

Monthly Mortality Figures.—The following table shows the number of deaths registered in the Island in each of the years 1926, 1927, and 1928 according to months:—

Month.	Number of Deaths. 1926.	1927.	1928.	Month.	Number of Deaths. 1926.	1927.	1928.
January	14,290	10,542	15,421	September	9,074	8,774	10,134
February	12,778	9,312	12,023	October	9,036	9,578	10,752
March	11,004	8,711	10,396	November	9,635	10,282	10,981
April	9,273	7,579	8,520	December	9,024	11,632	11,765
May	9,383	8,518	9,879				
June	9,852	8,885	10,060		124,884	113,003	132,335
July	10,461	9,311	10,991				
August	11,074	9,879	11,413				

III.—HYGIENE AND SANITATION.

A.—General Review of Work done and Progress Made.

The fact that the work of the Public Health Branch is increasing in volume and importance yearly has to be emphasized again, and during the year under review much progress has been achieved.

Dr. B. C. Das Gupta was awarded the Public Health Fellowship by Government for the year 1928. He left the Island on September 29, 1928. Dr. R. W. C. Thambiah was on leave during the year, studying for the diploma in Public Health.

The following officers were appointed during the year:—Drs. D. D. N. Selvadurai and E. L. F. de Mel as Medical Officers of Health; Dr. (Mrs.) L. N. Virasinghe-Chinnappa as Lady Doctor for Maternity and Child Welfare work. Rev. C. E. V. Nathanielsz was appointed Superintendent, Health Education Division, on October 24, 1928; he resigned on December 15, 1928, to take up another appointment.

Drs. C. T. Williams, L. J. Kahawita, and W. T. de Silva were promoted from Grade II. to Grade I.

Mr. H. N. Worth, Deputy Sanitary Engineer, was awarded a Rockefeller Foundation Fellowship, and he left for America in April, 1928.

Mr. W. G. McCarthy passed the A.M.I.C.E. examination and secured an appointment as District Engineer in the Public Works Department, and was seconded for service in the Department of Medical and Sanitary Services as Chief Assistant Sanitary Engineer, as from April 11, 1928. Mr. J. W. de Alwis was appointed Assistant Sanitary Engineer, with effect from February 1, 1928.

The Kalutarabadde Health Unit was extended so as to include the whole of Kalutara totamune on July 1.

Anti-malaria operations were started in the towns of Kurunegala and Chilaw in January.

Anti-malaria work was continued at Anuradhapura and at Trincomalee.

The Departmental Committee on Malaria held 17 meetings during the year, 12 being monthly meetings and the rest special meetings. At these meetings all routine matters connected with the work and progress of the Anti-Malaria Campaign were dealt with and also matters referred to it by the Anti-Malaria Advisory Board, dealing with malaria prevention in general.

I.—Preventive Measures.

(*a*) *Mosquito and Insect-borne Diseases.*

Malaria.—(*a*) The report of the Superintendent, Anti-Malaria Campaign, giving a full account of the work done by the anti-malaria division is found in the Appendix to this Report.

(*b*) An account of the anti-malaria drainage work carried out by the Sanitary Engineer is given in his report in the Appendix.

(*c*) The Medical Entomologist's report in the Appendix gives an account of anti-malaria work done by his division.

(*d*) The following is an account of the anti-malaria work done by the Sanitary Branch of this Department:—

(1) *Tenmaratchi (Northern Province).*—Systematic quinine distribution in school by 3 pupil vaccinators was carried out at Tenmaratchi which is the hotbed of malaria in this Province. The work was started for the first time in this year and was carried out during the fever seasons which last from January to May and from September to March. It may be pointed out that wholesale distribution of quinine for prophylactic purposes is carried out throughout the Island by the Department through school teachers, headmen, and other Government officers.

In areas other than those in which Anti-Malaria Campaigns are in progress only minor anti-mosquito measures have been carried out by the Sanitary Inspectors, such as filling up hollows in compounds, draining stagnant pools, clearing rank vegetation, &c.

Lantern lectures on the mode of spread and prevention of malaria have been given by the Medical Officers of Health in malarious areas.

(2) *Railway Anti-Malaria Work.*—This work was done by Sanitary Inspectors under the supervision of the Medical Officers of Health till October, 1928, when it was transferred to the anti-malarial division.

(*b*) *Epidemic Diseases.*

The incidence of these diseases has already been dealt with under Section II.—Public Health. The following paragraphs deal with the activities of the Sanitary Branch of this Department in connection with cases and outbreaks of disease reported to it:—

Enteric Fever.—No epidemics were reported during the year. The disease occurs endemically in the Western, Northern, and Southern Provinces, and sporadically throughout the Island.

The Provinces in which the disease is endemic have naturally contributed the largest number of cases. Contact infection has as usual been the mode of spread of the disease in the majority of cases. The housing conditions in the rural areas and the ignorance of the villager are the factors in the spread of infection in this way. Polluted water is probably the source of infection in a small number of cases.

The prompt adoption of the usual preventive measures, including anti-typhoid inoculation, on the occurrence of isolated cases, prevented the further spread of the disease and its appearance in epidemic form.

Anti-typhoid inoculation, against which there was considerable prejudice in former years, is becoming popular, and there is no doubt that this measure will be adopted to a greater extent when the experience of those who have had the inoculation becomes known.

Smallpox.—At Nilagama estate, Kahawatta (Province of Sabaragamuwa), 4 cases occurred in February. The first was a recent arrival from India. The other 3 cases were contacts of this case. All recovered and no further cases occurred.

At Kennekumbura (Central Province) 2 cases occurred in May and June, respectively. The first case proved fatal and the other recovered. The source of infection was traced to India.

Vaccination.—The total number of primary vaccinations performed during the year under review was 146,889; of these 130,567 were successful and 3,345 were failures. In 12,977 cases the results were not determined. The percentage of successful primary vaccinations was 96.18 per cent. in 1926, 99.11 in 1927, and 97.5 in 1928.

Vaccination is carried out throughout the year by trained male and female vaccinators. The former vaccinate in the towns, villages, and estates periodically according to a fixed programme, the latter work in the towns and villages and vaccinate Muslim women and children.

A vaccine establishment for the preparation of calf lymph is maintained by Government (*vide* report of the Officer in Charge, Vaccine Establishment, in Section X. of this Report).

Cholera.—Western Province. At Raigama estate, Ingiriya, 1 fatal case occurred. The patient came from India on November 11 and died on 15. No fresh cases occurred.

Central Province. At Vellioya estate, Hatton, a positive case occurred on November 1 in a recent arrival from India. The patient died on November 3. No further cases developed.

Province of Uva. Two cases of cholera occurred at Alutnuwara in December, both of which proved fatal. The outbreak continued till January, 1929.

Plague.—Western Province. At Beruwala 1 case occurred in January. The patient recovered. The source of infection could not be definitely traced.

No further cases occurred. There was no rat plague in the area and no previous cases of human plague in the vicinity.

At Peliyagoda a case of plague occurred in November and the patient died on December 2. No further cases occurred.

At Sedawatta 3 cases occurred in October and 1 proved fatal. The infection was thought to have been brought from Grandpass where there had been several cases during September. No further cases developed.

Central Province. At Eriyagama near Kandy a fatal case occurred in February; the source of infection was not certain. The house in which the patient lived was in close proximity to a provision boutique which obtained its supplies from a bazaar area in Kandy where plague was prevalent at the time. The conclusion arrived at was that some infected fleas had been transported with provisions from Kandy.

Northern Province. In Jaffna 4 cases occurred in October. Three of these were imported from Grandpass, Colombo. The other case was in a post-mortem cooly who was directly infected. All proved fatal.

Southern Province. At Ahangama a fatal case occurred in December. No further cases arose. The source of infection was Colombo.

At Dondra a fatal case occurred in May. The source of infection was Colombo. No further cases occurred.

Province of Sabaragamuwa. At Dehiowita 5 fatal cases occurred in October. There had been a plague among rats in the area for about a fortnight previous to this. The source of infection was suspected to be infected fleas from Colombo transported in rice bags. No further cases occurred.

In all these outbreaks, necessary precautionary measures, such as isolation of patients, segregation of contacts, disinfection, rat destruction, &c., were promptly adopted.

There was an increase of smallpox and cholera during the year under review as compared with 1927. This is due to the fact that there had been severe epidemics of these diseases in South India, and in the outbreaks that occurred in Ceylon the first cases were recent arrivals from India. Further it may be mentioned that the quicker mode of travelling afforded to the public by the phenomenal development of motor bus service throughout the Island facilitated the spread of infection to remote rural areas.

Dysentery.—This disease occurs chiefly in sporadic form, but when it appears in epidemic form the spread of infection is usually due to the pollution of unprotected surface wells after rain.

Outbreaks occurred at Wellaboda pattu and Bentota (Galle District), Kehelpannala, Dorwaka, and Madawela (Kegalla District).

The cases reported were chiefly from rural areas. The sporadic cases were generally started by carriers who give rise to other cases. Flies, filth, and contact infection were responsible for the spread of the disease in the milder outbreaks.

Contagious and infectious diseases are being reported to a greater extent than hitherto, as householders are beginning to recognize the necessity for it and that advice and help regarding prevention of their spread can be obtained by reporting cases to the proper authority.

There is no doubt that all the cases are not reported as some persons are yet under the impression that their houses and chattels will be damaged in the process of disinfection, while others do not wish to be inconvenienced by being placed under quarantine. Prosecutions for failing to notify cases have played their part in bringing wisdom to several people of this latter type.

Chickenpox.—Of the notifiable diseases, this disease has contributed the largest number of cases. However, the number of fatalities was negligible, and death whenever it occurred was due to debility and old age. The disease as usual was most prevalent among school children.

Measles.—Schools were responsible in the majority of the case for the spread of this disease. In every case prompt measures were adopted, and the schools concerned closed for such periods as were considered necessary.

In the rural areas, the poor housing conditions and the inadequate arrangements for the isolation of patients are responsible for the spread of the disease in the pre-eruptive stage when it is most infective.

(c) *Helminthic Diseases.*

Anchylostomiasis Campaign.—This work was carried out this year for the first time under the supervision of the Sanitary Branch as a part of its routine activities. The officers of the campaign were under the immediate control of a Superintendent, who directed the work from Colombo, and paid visits of inspection to areas where the campaign was in progress.

A full report of the work will be found in the Appendix.

2.—General Measures of Sanitation.

Conservancy: (1) *Public Latrines.*—During the financial year 1927-28 53 public latrines were built by the Sanitary Boards and Village Committees throughout the Island as tabulated below:—

Province.	Number of Latrines.	Province.	Number of Latrines.
Western ..	3	Sabaragamuwa ..	10
Central ..	12	North-Western ..	6
Southern ..	1	Uva ..	5
Northern ..	12		
North-Central ..	3		53
Eastern ..	1		

Government allowed a grant of Rs. 75,000 to the Government Agents towards the cost of the above for the financial year 1927-28.

(2) *Private Latrines.*—The following is a statement of work done in this connection throughout the Island :—

(*a*) Number of notices served during the year .	31,084	(*b*) Number of latrines—	
(i.) To construct latrines ..	24,424		Pit Latrines. / Dry Earth Latrines.
(ii.) To repair latrines	6,415	(i.) Completed ..	15,504 .. 1,032
(iii.) To convert pit latrines into dry earth latrines	245	(ii.) Repaired ..	3,985 .. 201
		(iii.) Pit latrines converted into dry earth latrines	— .. 165
		(*c*) Number of persons who failed to comply with the requirements of the notices ..	9,483
		(*d*) Number of prosecutions entered ..	5,251
		(*e*) Number of convictions obtained ..	3,086

The figures tabulated below show the distribution of latrines in the various Provinces :—

Province.	During 1928. Latrines completed.		Latrines repaired.		Pit Latrines converted into Dry Earth Latrines.
	Pits.	Dry Earth.	Pits.	Dry Earth.	
Western ..	7,213	393	2,693	151	95
Southern ..	1,653	145	421	5	6
Central	2,241	248	422	13	51
Northern ..	51	61	—	—	5
North-Western ..	1,127	153	15	11	1
Uva	529	7	20	—	—
Sabaragamuwa ..	2,690	25	414	21	7
	15,504	1,032	3,985	201	165

There has been a marked progress in the education of the villagers in health matters, and much activity in the completion and repairs of latrines was shown everywhere. It is gratifying to note that the villagers are gradually getting into the habit of using latrines, thereby reducing the amount of soil pollution in rural areas and with it the possibility of the spread of infection of bowel diseases and bowel parasites.

Disposal of Night-soil.—In towns where the dry earth system of conservancy exists the night-soil after collection is disposed of by trenching on sites specially selected for the purpose. Trenching grounds are regularly supervised and maintained in good order.

A communal system of conservancy was started at Haliela in Province of Uva in 1927 and was completed the next year. It is being worked successfully.

Scavenging and Disposal of Refuse.—The following methods have been employed in different areas :—(1) Dumping on the banks of a river; (2) spreading over grass fields; (3) burial in trenches around coconut trees; (4) burying in selected areas; (5) incineration.

Of the above, such unsatisfactory methods as dumping, spreading over grass fields, trenching around coconut trees (the two latter for manuring purposes) led invariably to the breeding of flies and vermin. This, in turn, gave rise to the persistence of fly-borne diseases which are common in Ceylon. Disposal of refuse by incineration is therefore to be preferred. This system of disposal of refuse is being introduced to the Sanitary Board towns where funds permit and other circumstances are favourable.

Communal scavenging has been organized in the bazaar areas at Alawwa, Nikaweratiya, Kaduwela, Ambepussa, Nambadaluwa, and Weliweriya, and is working satisfactorily. This system had to be adopted owing to the lack of a local Sanitary Authority in rural areas.

Drainage.—Most of the Sanitary Board towns are provided with cement drains which have been regularly cleaned, repaired, and kept in a satisfactory condition.

Water Supplies.—It has to be emphasized that one of the most pressing needs in Ceylon at present is a pure and sufficient water supply, and the demand for it is insistent in most of the towns. The only town in the Island which has an adequate supply of wholesome water is Colombo.

The Sanitary Engineering Division has been receiving a large number of applications for the preparation of water schemes, and the steps that were taken by that division in 1928 are given in the report of the Sanitary Engineer in the Appendix to this Report.

(2) Public Wells.—172 public wells were built during the year throughout the Island as shown below :—

Province.	Number built.	Province.	Number built.
Western ..	4	North-Central	6
Southern ..	14	Sabaragamuwa	27
Central ..	72	Uva	14
Northern ..	19		
Eastern ..	10	Total ..	172
North-Western ..	6		

(3) Private Wells.—

(*a*) Number of inspections made ..	93,775	(*d*) Number of wells improved ..	2,236
(*b*) Number of wells found unprotected ..	65,766	(*e*) Number of persons prosecuted ..	126
(*c*) Number of notices served for improvement	512	(*f*) Number convicted	94

(4) Examination of Water Supplies.—

Number of samples sent for—		Number of samples found unfit for drinking purposes—	
(i.) Bacteriological Examination ..	60	(i.) Bacteriologically	30
(ii.) Chemical Examination ..	76	(ii.) Chemically	55

Necessary action has been taken to improve some sources of unsuitable supplies. Generally speaking, in the mountainous parts of the country water for human consumption is available from hill streams. In the plains water is taken from streams, rivers, and from wells when available.

Public wells were constructed in the following villages:—Imbulgoda, Hambegamuwa, Meegaswewa, Nape, Mariarawa, Buddama, Aluketiyawa, and Walapana.

A pipe-borne water supply was installed in the small Sanitary Board towns of Tillicoultry and Punduluoya.

Investigations have been carried out by the Sanitary Engineer for improving the water supplies at Ragama for the Anti-Tuberculosis Hospital, Camp of Observation, and Mahara Jail.

Estimates have been framed for an enlarged water supply for Ragala and Talawakele.

Licensed Trades.—The following is a statement of the applications for licensed trades dealt with:—

(1) *Food and Drink handling Trades.*

Name of Trade.	Number of Applications. Received.	Recommended.	Not Recommended.	Name of Trade.	Number of Applications. Received.	Recommended.	Not Recommended.
(1) Bakeries	562	501	61	(5) Butcher stalls	177	168	9
(2) Tea and coffee boutiques	1,488	1,371	117	(6) Fish stalls	70	63	7
(3) Eating-houses	499	459	40	(7) Pork stalls	5	4	1
(4) Dairies	200	181	19	(8) Aerated water manufactories	11	11	—

(2) *Offensive Trades.*

(1) Public galas	76	64	12	(11) Public bathing places	2	2	—
(2) Manure stores	27	24	3	(12) Pits for soaking coconut husks	22	22	—
(3) Soap manufactories	4	4	—	(13) Fibre mills	10	10	—
(4) Hide stores	9	8	1	(14) Desiccating mills	11	11	—
(5) Lime kilns	47	40	7	(15) Tanneries	4	4	—
(6) Brick kilns	42	35	7	(16) Gravel quarries	4	4	—
(7) Laundries	147	133	14	(17) Storage of raw bones	3	2	1
(8) Cabook quarries	5	5	—	(18) Fat melting	2	2	—
(9) Plumbago sheds	15	15	—				
(10) Metal quarries	13	13	—				

Maintenance of sanitary condition of licensed trade premises:—

(*a*) Number of premises inspected	6,852	(*d*) Number of persons prosecuted	463
(*b*) Number of notices served for breach of rules	952	(*e*) Number convicted	409
(*c*) Number of notices voluntarily complied with	791	(*f*) Number warned and discharged	26

Licensed trades within Sanitary Board towns are controlled by regulations. All applications for conducting licensed trades are, in the first instance, referred to the Sanitary Inspectors, who have been instructed not to be too stringent in the enforcing of the by-laws, but at the same time to use tact and persuasion in obtaining an improvement in the premises where trades are carried on, so that the sanitary defects may be gradually remedied without crippling such trades, which are usually carried on by men of small means.

The licensed premises were regularly visited by the Inspectors throughout the year, and whenever necessary minor defects or breaches of the by-laws have been rectified.

Puttalam and Chilaw Districts.—Since by-laws were passed for the control of bakeries, tea boutiques, meat stalls, &c., in 1927, vast improvements in the trades in question have been effected.

Sanitary Inspections.—The following is a statement of inspections done:—

(*a*) *Private Premises.*

Number of inspections made during the year	624,232	Number voluntarily complied with	12,58
Number found insanitary	145,185	Number of persons prosecuted	1,54
Number of mosquito breeding places detected	14,436	Number convicted	1,35
Number of notices served to abate nuisance	10,959	Number warned and discharged	27

(*b*) *Railway Premises.*

(1) Of Stations.

	Inspected.	Defective.	Defects Remedied.		Inspected.	Defective.	Defects Remedied.
Premises	7,938	765	491	Water supply	2,252	151	77
Drains	4,021	466	303	Scavenging	2,369	438	256
Latrines	4,915	792	402	Conservancy	3,299	359	114
Mosquito breeding places	482	244	230				

(2) Of Bungalows.

Premises	6,125	428	324	Water supply	3,594	211	39
Drains	6,146	356	274	Scavenging	3,547	274	187
Latrines	5,731	380	272	Conservancy	4,488	82	66
Mosquito breeding places	411	306	301				

(3) Of Cooly Lines.

Premises	4,991	1,659	1,416	Water supply	2,499	235	65
Drains	4,115	1,047	807	Scavenging	4,134	546	111
Latrines	3,880	777	529	Conservancy	3,294	366	355
Mosquito breeding places	310	273	266				

Sanitary Inspectors are repeatedly reminded that they should get house premises cleaned up in their presence, whenever possible, and that they should utilize every opportunity that presents itself for explaining to the villager the necessity for keeping his premises clean.

A statement of offences against sanitary regulations other than those detailed above is given below:—

Offences.	Prosecuted.	Convicted.
Unauthorized buildings	164	135
Failing to demolish temporary sheds	37	32
Occupying buildings after closing	26	20
Occupying buildings without certificate of conformity	64	52
Failing to repair house	31	25
Deviating from approved plan	47	39
Failing to provide drains	6	5
Faecal pollution	146	130
Unlicensed trades	317	262
Exposing for sale food unfit for human consumption	199	170
Depositing rubbish on drain	77	57
Throwing rubbish on public road	71	40
Sinking wells without the permission of Chairman, Sanitary Board	6	3
Failing to clear rank vegetation	4	4
Failing to notify cases of infectious disease	37	30
Failing to provide dust bins	9	8
Burying corpse outside proclaimed cemetery	4	4
Alterations to buildings without permits	5	5
Failing to close up insanitary pit	1	1
Exposing for sale food on roadside	24	22

3.—School Hygiene.

There are at present 5 School Medical Officers working in 4 centres, 2 in Colombo (one of these a lady doctor) and 3 in outstations, *i.e.*, Kandy, Jaffna, and Galle, and 5 school nurses, 2 for Colombo, 1 each for Kandy, Jaffna, and Galle. Steps are being taken to appoint an extra nurse for Colombo.

The results have been encouraging in many ways. The school authorities have given whole-hearted support to the officers, and the children themselves have not shown any repugnance. The greatest difficulty has lain in the lack of response from the parents, especially in rural areas, owing to ignorance and prejudice. As the sanitary education of the people of Ceylon improves owing to the efforts of the Sanitation Branch of this Department, especially through the Health Units, there should be less cause for complaint in this respect. During the course of the year a series of 12 lectures during a period of three months was given by the Medical Officers of Health to teachers of vernacular and Anglo-vernacular schools at the following centres:—Colombo, Gampaha, Kalutara, Panadure, Padukka, and Galle. Nearly 500 teachers attended these lectures. The value of these courses in spreading the facts of hygiene among the rising generation is obvious, and endeavour will be made to extend them to other centres in the Island.

Work in 1928.—During the year 1928 the—

Total number of schools inspected was	825
Total number of pupils inspected was	76,791
Total number of defects noted was	37,901

From these figures it appears that just over 45 per cent. of the children inspected suffer from defects of one kind or another, this percentage being the same as last year.

The following table furnishes full details in respect of each of the 4 Inspectorates:—

	Colombo.	Galle.	Kandy.	Jaffna.	Total.
Schools inspected	183	196	109	337	825
Pupils examined	11,162	30,633	12,441	22,555	76,791
Defects—					
Dental caries	816	3,153	2,216	3,150	9,335
Defective vision	393	299	553	250	1,495
Enlarged tonsils and adenoids	306	2,616	428	1,998	5,348
Anchylostomiasis	132	6,734	2,555	2,690	12,111
Malnutrition	124	7	—	735	866
Skin diseases	87	526	207	3	823
Malaria	13	241	—	3,197	3,451
Defective hearing	—	78	32	211	321
Other defects	226	1,088	2,126	711	4,151
Total defects noted	2,097	14,742	8,117	12,945	37,901

Of the 4,151 "other defects," 2,557 were in the case of unclean children and 725 were in the case of unvaccinated children.

Defects: Hookworm.—Hookworm is more prevalent in the schools in rural areas than in urban schools. Its percentage is about 33 of the total defects noted. Year by year there is a growing appreciation of the results of treatment on the part of teachers, parents, and pupils. With the rapid advancement made in village sanitation, especially in the provision of latrines, much more satisfactory results will be noticed in the near future. In the Central Inspectorate treatment by the officers of the Anchylostomiasis Campaign led to the cure of more than 50 per cent. of the cases noted during the year 1927, and the consequent improvement in the health of the children has been very encouraging. Full details of the work done by the officers of the School Units of the Anchylostomiasis Campaign are given in the Appendix to this Report. Here it may be noted that 87,687 children in 1,692 schools were treated by these officers in 1928.

Dental Caries.—Dental caries forms about one-quarter of the total defects noticeable among the children attending schools in urban areas, and is chiefly attributable to their diet. The School Medical Officer, Jaffna Inspectorate, reports that this is specially marked among children of the well-to-do in the Jaffna District and also in Mannar. It is hoped that parents of this status will in time realize the necessity for conservative dentistry in the interest of the young generation.

Malaria.—Out of 3,451 cases of malaria in all the schools inspected 3,197 were from the Jaffna Inspectorate. Good results have been obtained by the prophylactic administration of quinine in all schools in the malarial districts. The School Medical Officer, Jaffna, reports that there was considerable opposition to this treatment, not only on the part of some of the parents, but of the teachers as well.

Correction of Defects.—School Clinics were maintained for the Colombo schools at the Eye Hospital, the Dental Institute, and at the Anti-Tuberculosis Institute during the year. The figures regarding attendance are as follows:—

Eye Hospital—	
Eye	.. 289 pupils paid 591 visits
Ear, nose, and throat ..	.. 78 pupils paid 118 visits
Dental Institute ..	.. 865 pupils paid an average of 3 visits
Anti-Tuberculosis Institute ..	.. 193 pupils paid 417 visits

In the Provinces there are Eye Clinics at Kandy, Galle, Jaffna, and Batticaloa. The scope of school medical work in Ceylon is considerably limited by the lack of facilities now available for correctional work and by the lack of response on the part of the parents. In the higher grade schools the defects are receiving more attention at the hands both of parents and teachers so that a fair proportion of defective children have received adequate treatment. It is in the vernacular schools that the service is confronted with difficulties owing to the ignorance and poverty of the parents, whose social conditions will have to improve if the campaign is to be more successful.

Follow-up Work.—This is a very important item in the work of the School Medical Officer. In the majority of schools this has to be carried out by the school nurse. There has been much better co-operation on the part of teachers. The number of nurses employed for this service is too small at present and will have to be increased in the near future, if efficient work is to be carried out, as the hygienic education of the Ceylon mother is deplorably low.

Nutritional Needs.—After everything has been done in the way of medical supervision and treatment for the school child, the fundamental problem regarding his physical welfare reasserts itself, viz., the question of nutrition. Where it is not a question of quantity there is doubt about the quality of the food. In the majority of cases both difficulties exist. An attempt on a very small scale has been made by the Colombo Municipality to meet this problem, but if the object of the School Medical Service, which is the improvement of the physical standard of the school-going child, is to be attained, local authorities should take steps to meet this pressing problem. The question lends itself to easier solution in urban areas, where there is no doubt it is more urgent. School authorities should be required to make full inquiries regarding the midday meal arrangements of every school child. Where these are obviously unsatisfactory a school canteen should be organized where adequate meals and guaranteed milk would be available to every child at a reasonable cost. It is distressing to see this vital matter so badly neglected by school authorities.

School Buildings.—There is room for considerable improvement in the buildings that are used for schools. Although there has been no serious overcrowding in the English schools, some of the vernacular schools were uncomfortably overcrowded and some were seriously overcrowded. This was noticed especially in the Kandy Inspectorate. In the Northern Province buildings range from up-to-date two-storeyed ones to mere cadjan sheds with sandy floors and no sanitary arrangements whatever.

Water Supply.—In many schools the water supply is not yet adequate. The School Medical Officer, Jaffna Inspectorate, reports that only 136 of the schools inspected were provided with an adequate water supply; no arrangements whatever were made in the remaining 201 institutions. In the Kandy Inspectorate 86 out of 109 institutions inspected had some sort of water supply, the others had no satisfactory arrangement at all. The provision of water for both drinking and washing purposes should be made compulsory in all the schools and the practice of sending children, especially in schools in rural areas, to the nearest well to quench their thirst should be prohibited.

Furniture.—Suitable school furniture is provided in most of the English schools, but in the vernacular schools the provision is much less satisfactory. In only a very few schools are the essential hygienic requirements of seats and desks being sufficiently observed.

4.—Labour Conditions.

As was stated in last year's report, manual labour in Ceylon may be considered under two main heads—immigrant and indigenous labour. For the most part immigrant labour is unskilled labour, supplying the workers for the estates in Ceylon; whereas indigenous labour includes both skilled and unskilled workers. This Department is more directly concerned with the sanitary conditions of immigrant labourers on estates than of indigenous labourers as such, because the medical wants of estates are governed by Ordinance No. 9 of 1912, whereas there is no Ordinance dealing with the medical wants of indigenous labour as such. The care of the sanitary environment of indigenous labourers is a matter that comes within the purview of the sanitary authorities of the locality in which they reside, and the hospital and dispensary facilities provided by Government for the people of the Island are at their disposal.

At present there is no legislation, analogous to the Medical Wants Ordinance, dealing with the sanitary and medical care of industrial labour, which includes, not only indigenous labour, but a large portion of imported labour, skilled and unskilled. No doubt in the future this matter will receive attention.

Before immigrant labourers come to Ceylon they are detained in quarantine at Mandapam Camp. The following reports—(1) Report on Mandapam Camp for the year 1928 and (2) Medical Wants on Estates in 1928—show that immigrant labourers are very well looked after, both at Mandapam and on estates in Ceylon.

(1) REPORT OF THE SUPERINTENDENT, MANDAPAM CAMP, FOR 1928.

(Dr. H. J. de Saram.)

I.—IMMIGRATION.

200,630 immigrants were passed during the year under review, consisting of—

Estate labourers	133,712
Miscellaneous passengers	66,918
Total ..	200,630

A decrease of 25,687 estate labourers from that of the previous year.

The strike on the South Indian Railway which lasted for about a fortnight during the latter part of July did not affect in any way either the arrivals in, or departures from, camp of estate labourers and passengers.

II.—WORKS.

All buildings and roads were kept in good order. A number of new works were completed during the year.

III.—WATER SUPPLY.

The supply of fresh water was fairly satisfactory. Owing to the poor rainfall during 1927, 6 water coolies were employed for ten months and a half in the year and 4 more from the latter part of June to middle of November. It is hoped that when the new fresh water scheme is completed the supply will be more satisfactory.

The supply of sea water used for flushing the latrines was as usual satisfactory.

IV.—ELECTRIC LIGHTING.

The lighting in camp continues to be maintained in excellent order. An additional high power plant has been sanctioned.

V.—SEWAGE DISPOSAL.

The water carriage system worked satisfactorily.

VI.—SANITATION.

The sanitation of the camp has been maintained at its usual efficient level under the supervision of the Sanitary Inspector and 2 overseers.

VII.—FEEDING.

Messrs. Spencer & Co. continue to be catering contractors, and the food supply was always ample and of good quality.

VIII.—RAINFALL.

42.31 inches of rain were recorded during the year, November alone contributing 22.87 inches. There was an increase of 12.94 inches over the previous year's record.

IX.—ASSISTED EMIGRANTS REJECTED.

1,986 persons were rejected during the year, as against 2,499 in the previous year.

Rejection on medical grounds	144
Rejection by Protector of Emigrants, including claimed and refused cases	1,842
Total ..	1,986

X.—STEAMER CREWS.

1,644 members of crews for 61 steamers, who arrived from Bombay and Calcutta, were passed after vaccination and disinfection.

XI.—GENERAL.

(*a*) *School.*—This was inspected thrice by the Madras Government Educational Authorities, who, as usual, recorded a very good opinion of the institution. The number of pupils at the end of the year was 144. A sum of Rs. 799.75 was received from the Madras Educational Department as a grant for the school.

The Boy Scouts and Girl Guides are showing satisfactory progress.

(*b*) *Reading Room, Library, and Sports Club.*—These continue to be kept in good working order. The reading room has been removed to a more spacious building.

(*c*) *Planting.*—The casuarina and coconut trees, &c., are growing well.

(*d*) *Benevolent Fund.*—Seventeen stranded Ceylonese at a cost of Rs. 76.12 were helped from this fund.

Payment of an allowance of Rs. 35 per mensem to the widow of Mr. C. Narayanasamy Naidu has been sanctioned for three years from December, 1928.

(*e*) *Expenditure.*—Nineteen cents per head per diem was the cost incurred by Government and 56 cents per head per diem was the cost incurred by the Immigration Fund on 200,630 immigrants passed to Ceylon. Twenty-three cents per head per diem was the cost incurred on 49,928 passengers passed after quarantine.

XII.—Visitors.

The following visited the camp during the year. The Chairman, Board of Immigration and Quarantine, visited thrice, and the Hon. the Director of Medical and Sanitary Services twice. Seventeen members of the Health Interchange visited in February. A few extracts from their remarks are given in Annexure No. 1. There was one visit by a non-official visitor appointed by the Madras Government:—

(a) From Ceylon.

(1) The Chairman, Board of Immigration and Quarantine.
(2) The Director of Medical and Sanitary Services.
(3) The Controller of Indian Immigrant Labour.
(4) The Chairman, Planters' Association of Ceylon.
(5) Mr. H. L. de Mel, Representative of the Low-country Products Association of Ceylon.
(6) The Chairman, Ceylon Chamber of Commerce.
(7) The Hon. Mr. I. X. Pereira, Member, Legislative Council.
(8) The Government Agent, Northern Province.
(9) The Assistant Government Agent, Mannar.
(10) Provincial Engineer, Northern Province.
(11) Assistant Director of Electrical Undertakings.
(12) The Sanitary Engineer.
(13) The Government Analyst.

(b) From India.

(1) The Commissioner of Labour, Madras.
(2) The Director of Public Health, Madras.
(3) Dr. L. W. Hackett, Rockefeller Foundation, Rome.
(4) Dr. H. M. Harrison, Medical Officer, Avadi.
(5) Dr. M. H. Hussain, Medical Officer of Health, Public Health Department, Egypt.
(6) The Ceylon Emigration Commissioner.
(7) The District Medical Officer, Ramnad.
(8) The Protector of Emigrants, Madras Government.
(9) The Medical Inspector of Emigrants, Madras Government.

XIII.—Medical Report.

The report of Dr. T. K. Jayaram, Quarantine Medical Officer, is annexed. The general Health of the camp was very satisfactory, and also the treatment of labourers for anchylostomiasis.

XIV.—Staff.

Dr. A. Suppiah, Assistant Medical Officer, left here on transfer to Chavakachcheri on April 4, having been relieved by Dr. A. R. Arulpragasam.

Owing to the increased work in the Medical Department, Dr. M. Chelladore has been appointed as Additional Medical Officer (permanently) from June 28.

An Assistant for the Bacteriological Laboratory is expected to assume duties in February, 1929.

The Indian Police Force in camp was abolished from April.

The whole staff continue to work loyally and strenuously.

I wish to place on record my appreciation of the kindness with which the Medical Officers helped me in the administration of the camp, the Engineer-in-charge for the upkeep of the buildings, &c., in camp to the required standard, and the Electrical Foreman for keeping the electrical plant in perfect working order, especially during the time of strike on the South Indian Railway.

Annexure No. 1.—Extracts from Visitors' Book.

I visited the camp in company with the Emigration Commissioner, who kindly showed me every detail. Owing to the Pongal holidays there were very few emigrants in the camp, but I saw the various stages in their treatment on arrival and departure.

I can only repeat the unanimous verdict that the organization and régime of this camp are beyond criticism.

January 19, 1928. G. SLATER,
Labour Commissioner, Madras.

On the 27th and 29th instant I visited the camp in company with four other members of the Board of Immigrant Labour and the Ceylon Labour Commissioner. In common with all other visitors we have nothing but praise for the whole organization, and we much appreciated the courtesy of the Camp Superintendent, Dr. de Saram, and all the other staff officers. We were able to acquaint ourselves with all the aspects of the work here, and efficiency with which everything is done, down to the smallest detail, reflects the greatest credit on all those responsible for the many activities of the camp.

January 29, 1928. H. A. BURDEN,
Controller, Indian Immigrant Labour, Ceylon.

I am extremely fortunate to have had an opportunity of visiting this model immigration camp, whose like does not exist, as far as I am aware, in any other country. Every sanitarian must be impressed with the order and efficiency of this plant.

February 2, 1928. L. W. HACKETT,
Rockefeller Foundation, Rome, Italy.

The following 17 participants of the Health Interchange of the League of Nations had the good fortune to be shown over this Institution on February 5, 1928, by kind permission of Mr. Wait and Dr. Bridger.

Those of the participants who are directly connected with similar work in other parts of the Far East were particularly struck with the efficiency of the work. During the short time at disposal all the working was shown and in a most methodical manner. We wish to express our thanks to Mr. Wait and Dr. Bridger and his staff for their courtesy on this occasion.

J. R. WEBB, Major, I.M.S., and Party.

February 5, 1928.

I visited the camp this morning along with the League of Nations Interchange Health Officers. I have had the privilege of seeing the whole place on previous occasions, and all I need say is that all conditions now prevailing are so excellent that they are almost above criticism.

A. G. H. RUSSEL, Lieut.-Col., I.M.S.,
Director of Public Health, Madras Presidency.

February 5, 1928.

Annexure No. 2.—Medical Report for 1928.

The number of labourers and passengers medically examined and passed:—

	1927.	1928.
Estate labourers	159,399	133,712
Passengers	60,507	66,918
Total ..	219,906	200,630

A large number of passengers were allowed to go through to Ceylon, provided they gave medical officers stationed here their definite addresses in the Island. The recently introduced system of writing the passes on the platform and handing them over to the passengers has been found to be working quite satisfactorily.

2. *Rejections.*—144 estate labourers and 29 passengers were rejected on medical grounds. The rejections were on account of leprosy, tuberculosis, debility, cancer, and acute venereal diseases.

3. *Hospital:* (*a*) *General Hospital.*—Twenty beds are provided (12 for males and 8 for females).

Number admitted to hospital ..	977	Number of deaths ..	61

(*b*) *Smallpox Hospital (8 for Males and 4 for Females).*—There was no case of smallpox during the year.

(*c*) *Cholera Hospital.*—Accommodation is provided for 10 male and 6 female patients. There were 6 cases of cholera as compared with the 2 in the previous year. Out of 6 cases, 5 were among the estate labourers and 1 among the passengers.

Plague.—There was no case of plague.

Chickenpox.—There were 38 cases, of these 36 occurred among estate labourers with no deaths and 2 among passengers. Camp staff nil.

Measles.—There were 72 cases, of which 71 occurred among estate labourers and 1 among passengers. Camp staff nil.

Mumps.—There were 8 cases among estate labourers and no cases either among passengers or among camp staff.

Influenza.—There were 397 cases, and out of these there were 2 deaths.

4. *General Diseases.*—In the outdoor dispensary the largest number treated was for scabies, eye affections, and digestive troubles.

Total number of first visits	7,583
Total number of subsequent visits	1,143
Total ..	8,726

5. *Mortality.*—The number of deaths in the camp is 73. The number of cases treated at the hospital was 977 with 61 deaths, as compared with 1,016 cases and 41 deaths in the previous year. Out of the deaths in the hospital, 14 occurred within 48 hours of admission, and out of 12 deaths which occurred in the camp outside the hospital 8 were due to infant mortality.

6. *Births.*—There were 43 births during the year: out of these 2 were among estate labourers and 41 among camp staff.

7. *Vaccination.*—The total number vacinnated during the year was 167,092, as compared with 189,767 of the previous year; of this number 43,912 were miscellaneous passengers and 123,180 estate labourers. Vaccination was carried out under the direct supervision of the medical officers and great care was taken to see that the estate labourers and passengers were not unnecessarily revaccinated. The supply of lymph was regular and of good quality.

8. *Disinfection.*—This was carried out regularly throughout the year.

9. *Anchylostomiasis Campaign.*—Out of 127,035 estate labourers examined for anchylostomiasis during the year, 115,601 cases which amount to 91 per cent. of the total number were treated. Persons suffering from heart disease and epilepsy, nursing mothers, pregnant women, and old debilitated subjects, and also the direct and indirect contacts of cholera cases which occurred in the camp (11,434) were exempted. Drugs used were oil of Chenapodium for children below ten years of age and mixture of Carbon Terachloride and oil of Chenapodium for adults.

(2) MEDICAL WANTS ON ESTATES IN 1928.

The medical wants of estates are provided for by Ordinances Nos. 9 and 10 of 1912.

Hospitals and Dispensaries.—In 1928 there were 65 Government hospitals and 104 Government dispensaries scheduled to estates, as compared with 60 Government hospitals and 100 Government dispensaries scheduled in 1927. The number of estate hospitals increased from 80 in 1927 to 81 in 1928 and estate dispensaries increased from 659 in 1927 to 684 in 1928. Estate hospitals, as a general rule, are well built and well maintained. Estate dispensaries, on the other hand, are badly housed and badly equipped, and it is to be regretted that the Government type-plan of estate dispensaries is not adhered to more closely.

Dispensaries.—As pointed out in last year's report there still exists a great need for improvement in the professional qualifications of persons employed on estates as dispensers. The Inspecting Medical Officer, Colombo, states that of the 71 officers in charge of the 28 estate hospitals and 43 estate dispensaries in his inspectorate, 7 may be regarded as qualified while the rest are not properly trained but are merely " approved " dispensers. With a few exceptions these " approved " dispensers have very little knowledge of the rudiments of diagnosis, causation of disease, treatment, and sanitation, and it is not proper that such men should have the medical care of a large labour force. Before matters can be improved, however, estates must be prepared to pay higher salaries to the officers they place in charge of their hospitals and dispensaries. Only in that way can they attract properly qualified officers to these posts.

Inspecting Officers.—The number of Inspecting Medical Officers remained the same, viz., 3 Inspecting Medical Officers and 3 Assistants. The total number of estates visited by the 6 Inspecting Medical Officers in 1928 was 743, 258 estates being visited by the 2 Inspecting Medical Officers in the Colombo Inspectorate, 222 estates being visited by the 2 Inspecting Medical Officers in the Uva Inspectorate, and 263 estates, 87 of which were visited only in an advisory capacity for selection of sites for lines, &c., being visited by the Inspecting Medical Officer, Central Province, and his assistant.

Sanitary Conditions on Estates.—On the whole, good progress was made during the year in the improvement of the sanitary conditions of the majority of the estates visited, especially in the case of those estates which had been inspected in previous years and revisited in 1928. Most of the estates carried out a programme for the amelioration of the conditions under which the estate labourers lived. New line construction was pushed on and new latrines were built. It is a matter for regret, however, that the rubber slump that occurred about the middle of the year resulted in a decrease in the efforts that estates were making, estimates being cut down to such an extent as to prevent the completion of line building programmes, especially in private estates. It is hoped that in spite of the depression in the rubber market an effort will be made by those estates which have old and obsolete lines to bring them up to Government standard.

Structure of Lines.—The Inspecting Medical Officer, Colombo, reports that the type of lines that is becoming popular in his Inspectorate is the one constructed of cement concrete bricks with iron supports. The Inspecting Medical Officer, Kandy, reports that most of the new lines were built of rubble masonry with cut stone end walls pointed in cement. In a few instances the entire building was of cut stone, and such lines were excellent. Lines built of concrete were excellent in every way, being neither cold nor damp, and they were appreciated by the coolies. Sun-dried bricks for the main walls were satisfactory only in districts where long spells of fine weather enabled the bricks to be thoroughly dried before use. Damp sun-dried bricks mean defective walls, and such bricks should not be used in wet districts. The roofing material used in the Kandy District was chiefly iron. Shingles have now been practically given up as a roofing material.

Maintenance of Lines.—The Inspecting Medical Officer, Colombo, comments on the fact that the maintenance of lines is often unsatisfactory. He points out that the early detection of damage and early repair play an important part in the cheap maintenance of buildings. To carry out repairs only once a year results in a greater expenditure on repairs in the long run. Superintendents should employ a mason and a carpenter to go round the lines once a month and do minor repairs, and the Inspecting Medical Officer, Colombo, suggests that lines should be " spring cleaned " once in three months with a long handled ekel broom to remove soot and cob webs, and that in double room lines lime-washing should be carried out at least once in three months, as it is very depressing for labourers to live in a room with blackened walls year in and year out.

Water Supplies.—Considerable improvement is noticed in the water supplies on estates, especially on those owned by companies. The following table shows the conditions of the water supplies of the estates inspected during the year:—

Inspectorate.	Entirely protected.	Partly protected.	Unprotected Supplies.
Colombo	189 ..	— ..	69
Central	75 ..	27 ..	74
Uva	123 ..	61 ..	38
	387	88	181

The percentage of unprotected water supplies is still much too large, and it is hoped that all estates will take steps to see that their water supplies are adequately protected, in view of the danger to health that arises from unprotected supplies, and the occurrence of cases of diarrhoea and dysentery among labourers from the use of polluted water.

Latrines.—The Inspecting Medical Officers report that estate labourers are certainly forming the habit of using latrines, and it is much to be regretted that in many of the estates inspected there was an insufficient supply of latrines and in far too many estates no latrines at all. The following table shows the latrine accommodation on the estates inspected:—

Inspectorate.	Provided a sufficient Number of Latrines.	Provided an insufficient Number of Latrines.	Provided no Latrines.
Colombo	171	60	27
Central	60	86	30
Uva	123	99	—
	354	245	57

It was again found during the year that latrines were often kept in an unclean and insanitary condition. In such cases no one in authority on the estate appeared to think it his duty to visit and inspect them, with the result that the maintenance of the latrines was often left to the will and pleasure of the latrine cooly. It was no uncommon occurrence to find latrines unapproachable on account of faecal soiling round the entrances, in the passage ways, and on the platforms, and often the pollution was several days old. It is not to be expected that coolies will get into the habit of using latrines unless latrines are kept in a clean and sanitary condition. To advance the proper use of latrines the following points should be stressed:—(1) The proper position of latrines, (2) the supervision of latrines to ensure that they are clean and sanitary, (3) an adequate supply of water and ablution rooms, (4) the provision of good raised paths, (5) the lighting of latrines, (6) the training of children in crêches and schools.

Accommodation.—Improvement in the provision of adequate accommodation for estate labourers was continued in 1928. The following table shows the position as regards overcrowding on the estates visited:—

Inspectorate.	Not Overcrowded.	Slightly Overcrowded.	Overcrowded.
Colombo	239	—	19
Central	117	37	22
Uva	159	63	—
	515	100	41

It will be observed that overcrowding still exists to a considerable extent on estates in the Central Inspectorate and in the Colombo Inspectorate, and the estates concerned should take early steps to remedy this defect.

New Rules regarding Cooly Lines.—Reference was made in last year's report to the proposed new rules regarding cooly lines. These rules were finally proclaimed in *Gazette* No. 7,658 dated August 10, 1928, but instructions were almost immediately received by this Department from Government that Rule 1A regarding back-to-back cooly lines was to remain in abeyance until further orders. As a result of these instructions approval has had to be given by this Department to the construction of back-to-back lines, and at the time of writing, viz., April, 1929, Rule 1A still remains in abeyance and a proposed new Rule 1A is under the consideration of Government.

Vital Statistics.—There has been an improvement in the infantile mortality rate in 1928, the figure being 211, as compared with 228 in 1927. In 1928, 2,728 male infants and 2,477 female infants died on estates, a total of 5,215, as against a total of 5,489 in 1927. The infant death rate of the different estate districts for 1926, 1927, and 1928 is given below:—

	1926.	1927.	1928.		1926.	1927.	1928.
Kandy ..	224	250	219	Colombo ..	158	221	205
Matale ..	225	231	230	Kalutara ..	149	150	140
Nuwara Eliya .	225	259	220	Galle ..	225	228	172
Badulla ..	212	216	228	Matara ..	242	250	152
Ratnapura ..	192	208	185	Kurunegala ..	258	256	363
Kegalla ..	151	177	172				

The chief causes of death were as follows:—

Causes.	Infant Deaths under one Year.	Percentage of Deaths to Total Infant Deaths on Estates.	Corresponding Percentage for the Island.	Causes.	Infant Deaths under one Year.	Percentage of Deaths to Total Infant Deaths on Estates.	Corresponding Percentage for the Island.
Convulsions ..	945	18.1	28.3	Enteritis ..	14	.3	.7
Tetanus ..	3	.06	.2	Debility ..	2,795	53.6	19.7
Diarrhoea ..	69	1.3	1.3	Prematurity ..	748	14.34	5.8
Bronchitis ..	121	2.3	.7	Other causes ..	324	6.2	41.0
Pneumonia ..	196	3.8	2.3				

It is to be noted that convulsions and debility are again the chief causes of death. The Inspecting Medical Officer, Colombo, advances the theory that mortality amongst infants on estates is mainly amongst infants of new arrivals and shifting gangs, and that where labour is fairly stationary the rate is not so high. A high infantile mortality rate on estates is no doubt due, to a considerable extent, to the fact that women on estates work up to very near the time of their confinement and have not much leisure to prepare for the child that is shortly to be born. Midwives are being employed on some estates, but a good estate midwife is not too easily obtained. Sinhalese midwives do not like working in estates in which they have to walk long

distance to attend on cases, and Tamil midwives who can read and write Tamil are not too easily found. On some estates a maternity ward is attached to the hospital, but often it is little used. As pointed out in last year's Report, an excellent opportunity is presented to ladies in planting districts to do valuable social service work. By forming maternity and child welfare organizations they could do much to ameliorate the condition of the Indian immigrant mother and child on estates and so reduce the high infantile mortality rate. Government Medical Officers will always give what assistance they can in this direction, and it is hoped that estates will do their utmost to induce mothers to attend clinics in district hospitals and dispensaries. Figures showing the principal causes of deaths amongst Indian immigrant labourers on estates are given in Section II., Vital Statistics. As will be seen from these statistics, the chief causes of death are again dysentery and pneumonia.

Epidemic Diseases.—The estates visited were with one exception free from cholera and smallpox, but a few cases of chickenpox and measles were reported amongst labourers in the Central Province. Malaria was bad in the Matale, Galagedara, and Dumbara Valley Districts. In the Colombo Inspectorate the incidence of malaria was comparatively small.

Anchylostomiasis.—An account of the work done on estates by the Anchylostomiasis Campaign officers is given in the report of the Superintendent, Anchylostomiasis Campaign, in the Appendix to this Report. 124,336 labourers were treated by the campaign officers on estates in the Uva, Central, Southern, Sabaragamuwa, and Western Provinces, and 135,588 labourers were treated by the estate staffs in 1928. The effect of the Anchylostomiasis Campaign is now becoming evident in certain estate districts in the Island. In one particular district the hospital which was formerly overcrowded, chiefly on account of anchylostomiasis cases, has now so few in-patients that two wards have had to be closed. Now that latrines are being used more freely on estates and there is less faecal pollution surrounding the lines, the chances of reinfection are considerably less than they were.

5.—Housing and Town Planning.

The procedure adopted for enforcing the provisions of the Housing Ordinance, No. 19 of 1915, as described in my report for 1926, was carried out during the year under review, and the following is a statement of work done under the Housing Ordinance:—

(1) *New and Reconstructed Buildings.*

	New.	Reconstruction and Repairs.
Number of applications received and dealt with in respect of—		
(*a*) Dwelling houses	1,395	625
(*b*) Other buildings	1,157	151

(2) *Insanitary Buildings.*

	Reconstruction and Repairs.
(*a*) Number of insanitary buildings reported upon during the year	324
(*b*) Number of closing orders obtained	157
(*c*) Number improved	63
(*d*) Number of demolition orders obtained	50
(*e*) Number demolished	94*

6.—Food in Relation to Health and Disease.

There is a general provision in the law by which food unfit for human consumption can be seized and dealt with, but for the efficient control of food, a specific Pure Food Act is needed, and it is one of the most pressing needs in Ceylon at present.

All food handling establishments in areas controlled by local authorities have to be licensed, and such licences are granted on the recommendation of the Medical Officers of Health, whose duty it is to see that they conform with the requirements of the appropriate by-laws. A statement relating to the work done in this connection is given under licensed trades.

Milk Supply.—In the absence of a Pure Food Act, no standards are in existence in the Island. However, when milk is found to be grossly adulterated, action is taken under existing by-laws and the vendors are prosecuted. Prosecutions entered under the existing Ordinance have not been very successful owing to defects in the provisions of the Ordinance. Several prosecutions have failed, and a Pure Food Act should be introduced as soon as possible. Milk forms the most important article of food in an infant's diet.

At present analysis of milk is carried out only in Colombo. Considerable difficulty has been encountered in despatching to Colombo samples taken in distant places.

The controlling of the milk supply in rural areas is an equally urgent necessity, but owing to the lack of suitable legislation nothing can be done.

The following is a statement of work done in connection with milk control:—

(*a*) Number of samples taken and sent for analysis	329
(*b*) Number of samples found adulterated	188
(*c*) Percentage of water added varied from	6 to 77 per cent.
(*d*) Average adulteration	41.5
(*e*) Number prosecuted	169
(*f*) Number convicted	134
(*g*) Number warned and discharged	9
(*h*) Amount of fines realized	Rs. 2,276·25

Meat Inspection.—All cattle slaughtered in areas controlled by local bodies are inspected before slaughter, which takes place in slaughter-houses provided by local bodies. The meat is sold in licensed stalls.

A fair number of slaughter-houses has been built in rural areas as the result of persuasion.

For sale of meat, fish, vegetables, and fruits, markets are generally provided in areas under local bodies. The sanitary condition of these markets has been supervised and maintained by the Inspectors in charge of the towns where they exist.

All food stuffs exposed for sale were regularly inspected and prompt action was taken where necessary under the provisions of the general law dealing with food unfit for human consumption.

The storage of rice and other grains is controlled by specific regulations in certain towns as a precautionary measure against plague.

* 44 were voluntarily demolished.

B.—MEASURES TAKEN TO SPREAD THE KNOWLEDGE OF HYGIENE AND SANITATION.

(1) *Health Lectures.*—A series of 12 lectures on Rural Sanitation was delivered during the year to the teachers of the Anglo-vernacular and Vernacular schools in the following towns:—Colombo, Panadure, Padukka, Kalutara, Gampaha, and Galle. The course was arranged in consultation with, and with the active co-operation of, the Education Department.

The classes commenced in September and continued for three months. An examination was held in January, 1929, and a certificate signed by the Head of the Department of Medical and Sanitary Services and the Education Department will be given to those who pass it.

Lectures were also delivered to school children in Nuwara Eliya, Galle, Matara, Hambantota, and Ratnapura Districts.

Lectures illustrated with lantern slides were delivered at many centres throughout the Island as a part of the routine work of Medical Officers of Health.

Lectures illustrated with cinema films on malaria and hookworm were delivered in several towns and attracted a large audience.

(2) *Articles on Health to the Press.*—Fifty-two articles on Health subjects were published weekly in the local newspapers, both English and vernacular.

(3) *Radio Talks.*—The 52 articles that appeared in the English papers were weekly released from the Broadcasting Studio.

(4) *Health Units.*—A Health Unit was established at Matara.

A summary of work done at the Health Units during the year is included in the Appendix.

(5) *Special Reports.*—During the year under review 39 special reports were submitted by officers of the Department on the following subjects:—Epidemics, Water Supplies, Festivals, Pilgrimages, Housing, Cemeteries, &c.

C.—TRAINING OF SANITARY PERSONNEL.

A training class for Sanitary Inspectors was started in May with 50 students. The course of instruction lasted six months. At the close of the course 42 students sat for the examination (8 having dropped out during the course for various reasons). Thirty-eight passed, and thus qualified for appointment as Sanitary Inspectors on probation.

D.—RECOMMENDATIONS FOR FUTURE WORK.

The appointment of 4 Additional Medical Officers of Health was sanctioned by Government in the 1928-29 Estimates, and it is hoped to start Health Units in two new centres.

For the successful working of Health Units the services of trained Public Health Nurses are essential. The work of these nurses demands the possession of a good education, character, tact, initiative, and a sound constitution. It is felt that women with the above qualifications will have to be attracted to the Public Health Service and given an adequate training if maternity and infant welfare work in Health Units is to be efficiently done.

Many of the ranges of Rural Sanitary Inspectors are at present too large and they are unable to devote as much time as they should to improve the sanitary condition of the villages comprising their areas. There are also many areas without any sort of sanitary control, and sanitation is at present entirely neglected in them. The appointment yearly of at least 25 Sanitary Inspectors will, therefore, be necessary for a number of years in order to improve the sanitary condition of rural areas and take prompt action on the occurrence of infectious disease.

The extension of the Anti-Malarial Campaign to three additional areas is under consideration.

Continued attention will be paid to health education, as the necessary material for propaganda has been obtained.

The course of lectures in Rural Sanitation to vernacular school teachers will be extended to the Kandy and Matale Districts in the Central Province and the Matara and Tangalla Districts in the Southern Province. The course will be repeated in the six original centres as well, 100 teachers being trained at each centre.

IV.—PORT HEALTH WORK AND ADMINISTRATION.

Colombo Port.—During the year 3,002 British and foreign vessels and 274 Indian sailing craft called at the Port of Colombo, as against 2,923 and 266, respectively, in 1927.

Infected Vessels.—Of the vessels that arrived infected, 2 vessels were infected with smallpox, 2 with scarlet fever, 1 with plague, and another with cholera. They were placed in strict quarantine until the usual control measures were carried out.

The following tabular statement gives particulars regarding the infectious diseases which occurred on board vessels in port:—

	Smallpox.	Plague.	Cholera.	Scarlet Fever.	Chicken-pox.	Measles.	Mumps.	Whooping Cough.
Number of cases ..	2	—	1	2	51	46	11	1
Number of infected vessels ..	2	1	1	2	16	18	7	1
Number of patients sent to Infectious Diseases Hospital, Angoda	2	—	1	1	11	3	3	—
Number of patients isolated on board	—	—	—	1	40	43	8	1

Cholera.—Only 1 vessel, viz., ss. "City of Harvard," arrived infected with cholera. It arrived here on April 30, 1928, from Calcutta. The one infected person, who was apparently convalescing at the time of her arrival, was sent to the Infectious Diseases Hospital immediately. Subsequently the case proved to be one of cholera.

Plague.—ss. "Automedon" arrived on December 22, 1928, from Penang having landed a case of plague at Penang on 11th idem. The patient was an Asiatic member of the crew who fell ill on December 16, and was sent to the General Hospital at Penang.

Smallpox.—A lascar on board ss. "City of Canterbury" which arrived here on January 31, 1928, from Calcutta was found to be suffering from modified smallpox, and was sent to the Infectious Diseases Hospital.

An Electrician on board ss. "Karmala" which arrived in port on December 14, 1928, from Penang was also found to be suffering from modified smallpox, and was sent to the Infectious Diseases Hospital.

Water Boats.—These are regularly cleaned and cement-washed every three months and are put into use only after inspection by the Port Surgeon's staff.

Quarantine Measures.—Under the Quarantine Ordinance, No. 3 of 1897, seven prosecutions were entered against boats kept in an insanitary condition.

6,144 cargo boats were fumigated and 919 rats destroyed during the year, as against 7,365 and 877, respectively, in 1927.

Vaccination.—The number vaccinated by the Port Surgeon's staff during the year was 433, as against 851 in the previous year. Those vaccinated were mostly arrivals from India *viâ* Tuticorin and Mandapam. The reduction in the number of those vaccinated is due to the systematic vaccination of passengers at Mandapam and Tuticorin.

Bills of Health.—2,201 Bills of Health were issued during the year.

Disinfection.—The disinfection of 209,233 persons and their clothing was carried out during the year at the Port Disinfecting Station, as against 192,324 in 1927. The disinfection of soiled linen during the year realized Rs. 1,792.

The persons disinfected were mostly 3rd class passengers, cargo and coal coolies working on ships, tally clerks, ships crews, and dhobies.

Port Venereal Clinic.—The report on the work done at the Port Venereal Clinic for Seamen is given in Section VI.—Venereal Clinics, of this Report.

Galle Port.—During the year 91 steamers and 25 sailing vessels called at the port and were inspected by the Port Surgeon, as compared with 130 and 23, respectively, in 1927. Of these, 1 steamer, viz., ss. "Haliartus," arrived from Cochin on April 1, 1928, infected with smallpox. There was only 1 case, which was sent to the Infectious Diseases Hospital. The vessel was placed in strict quarantine. No fresh cases occurred. Twenty steamers and the 25 sailing vessels were granted free partique, 70 steamers were placed in simple quarantine.

Disinfection.—9,144 persons and their clothing were disinfected during the year, as against 9,036 the previous year.

272 cradles of soiled linen from quarantined vessels were also disinfected at the Disinfection Station.

Water Boats.—Inspection of these boats was regularly carried out during the year.

V.—MATERNITY AND CHILD WELFARE.

The statistics of the Island relating to infant mortality are as follows:—

Table showing Infant Deaths and Infant Mortality Rates for the whole Island for Eleven Years 1918-1928.

	Infant Deaths.	Mortality Rates.		Infant Deaths.	Mortality Rates.
1918 ..	34,461 ..	188	1924 ..	33,350 ..	186
1919 ..	35,941 ..	223	1925 ..	33,221 ..	172
1920 ..	29,792 ..	182	1926 ..	36,024 ..	174
1921 ..	35,325 ..	192	1927 ..	32,959 ..	160
1922 ..	33,803 ..	188	1928 ..	37,792 ..	177
1923 ..	38,467 ..	212	Median ..	34,461 ..	186

The above table shows that the year 1927 has to its credit the lowest infant mortality rate on record in the Island, viz., 160. In the year 1928 the rate has gone up to 177, which is still below the average for the last eleven years, which is 186.

The lowest number of infant deaths recorded during the last eleven years has been in 1920 with 29,792 and the next lowest has been in 1927 with 32,959. The average for the last eleven years is 34,461. In 1928 the number of infant deaths has exceeded the number for 1927 by 4,833 and the average by 3,331.

Table showing Infant Deaths and Infant Mortality Rates in the Urban Areas (Proclaimed Towns) of the Island for Eleven Years 1918-1928.

	Infant Deaths.	Infant Mortality Rates.		Infant Deaths.	Infant Mortality Rates.
1918 ..	4,330 ..	252	1924 ..	4,385 ..	235
1919 ..	4,263 ..	259	1925 ..	4,401 ..	216
1920 ..	4,285 ..	228	1926 ..	4,544 ..	208
1921 ..	5,324 ..	238	1927 ..	4,159 ..	191
1922 ..	4,574 ..	240	1928 ..	4,649 ..	197
1923 ..	5,073 ..	258	Median ..	4,401 ..	235

The above table shows that in the urban areas the infant deaths of 1928 exceed those of 1927 by 490 and the average by 248. Of the 490 deaths 43 are due to the inclusion during 1928 of two additional towns in the urban areas. Although there is an increase in the urban rate over that of the previous year, it nevertheless is below the average for the eleven years.

Table showing the Infant Deaths and Infant Mortality Rates in the Rural Areas (exclusive of the Proclaimed Towns) compared with those of the Urban Areas for Three Years 1926-1928.

Year.	Infant Deaths.		Infant Mortality Rates.	
	Urban.	Rural.	Urban.	Rural.
1926	4,544	31,480	208	162
1927	4,159	28,802	191	157
1928	4,649	33,145	197	175

The above table shows that in the rural area the 1928 infant deaths exceed those of the previous year by 4,343 while in the urban area the excess is 490, the rates of increase being 15 per cent. for the rural area and 11.7 per cent. for the urban area.

The urban rate (197) is higher than the rural rate (175) by 22, but the 1928 increase over the 1927 figures is higher in the rural area than in the urban.

Table comparing the Infant Mortality Rates of the Ceylonese (*i.e.*, the whole Population of the Island less the Indian Immigrants on Estates and Europeans), Indian Immigrant (Estate) and the European Population for Three Years 1926-1928.

Year.	Ceylonese.	Indian Immigrant.	European.
1926	169	209	26
1927	142	228	24
1928	173	211	12

The above figures show a reduction in the Indian immigrant and European rates and a decided increase in the Ceylonese rate.

From the foregoing table it will be evident that—

(1) there is an increase in the infant mortality rate for 1928 both in the urban and rural areas;
(2) this increase is more in the rural population than in the urban ;
(3) the Ceylonese rate has increased, while the Indian immigrant and European rates have fallen.

Table showing Causes of Infant Mortality according to Age Groups and the Percentage each Cause forms of the Total for the Year 1928 compared with the Percentage for 1927.

Causes.	Under Three Months.	Three Months and under One Year.	Total.	Percentage each of Total.	Percentage each of Total, 1927.
Convulsions	7,188	3,486	10,674	28.3	29.3
Tetanus	59	6	65	0.2	0.1
Diarrhoea	125	366	491	1.3	1.4
Bronchitis	115	160	275	0.7	0.7
Pneumonia	176	679	855	2.3	2.7
Enteritis	86	172	258	0.7	0.7
Debility	—	—	7,516	19.7	22.3
Prematurity	—	—	2,202	5.8	6.4
Other causes	—	—	15,456	41.0	36.4

Convulsions and debility as in previous years have continued to be the chief causes of infant deaths.

The number of deaths from convulsions in 1928 has exceeded the number for 1927 by 1,030.

There has also been an increase in the other causes by 3,466.

The year 1928 has been an exceptionally severe year for malaria all through the malarious parts of the Island, as revealed by the following :—

	1926.	1927.	1928.
Total deaths	124,884	113,003	132,337
Deaths due to malaria	1,624	1,331	2,239
Deaths due to pyrexia	17,797	13,502	18,954

In the absence of any other disturbing factor it is reasonable to assume that this increase in the infant deaths rate, chiefly among the rural Ceylonese population due largely to convulsions and other causes, has been caused by the epidemics of malaria that occurred during the year.

Details relating to infant mortality on estates are shown under the section dealing with Medical Wants on Estates.

The Statistics of the Island relating to Maternal Mortality.

Table showing Maternal Deaths and Maternal Death Rates for the whole Island for Eleven Years 1918-1928.

	Maternal Deaths.	Live Births.	Maternal Death Rate.		Maternal Deaths.	Live Births.	Maternal Death Rate.
1918	4,010	183,384	21.9	1924	3,417	178,867	19.2
1919	3,664	161,403	22.7	1925	3,576	193,261	18.5
1920	2,893	163,719	17.7	1926	3,951	206,888	19
1921	3,862	183,917	21.0	1927	3,595	205,469	17
1922	3,650	179,856	20.3	1928	4,091	213,311	19.2
1923	3,912	181,437	21.6	Median	3,664	183,384	19.9

The above table shows that the year 1927 has to its credit the lowest maternal mortality rate for the last eleven years, viz., 17 per 1,000 living births. The same year also recorded the lowest infant mortality rate. In 1928 the rate has gone up to 19.2 approximating to the average (19.9) for past eleven years. The average annual number of maternal deaths during the past eleven years is 3,664. There has been a rise in the number from 3,595 in 1927 to 4,091 in 1928. This is no doubt due to the epidemics of malaria that occurred during the year.

Table showing Maternal Deaths and Maternal Death Rates in the Urban Area (Proclaimed Towns) for Eleven Years 1918-1928

	Maternal Deaths.	Live Births.	Maternal Death Rate.		Maternal Deaths.	Live Births.	Maternal Death Rate.
1918	496	17,167	28.9	1924	478	18,674	25.6
1919	406	16,479	24.6	1925	540	20,400	26.5
1920	385	18,762	20.0	1926	663	21,830	30
1921	625	21,908	28.5	1927	606	21,773	28
1922	498	19,022	26.2	1928	693	28,675	24.2
1923	498	19,664	25.3	Median	498	19,664	25.3

The above table shows that (1) the median maternal death rate in the urban areas (25.3) is higher than the average for the whole Island, which is 19.9; (2) the rate for 1928 shows a drop from the rate for 1927.

Table showing Maternal Deaths and Maternal Death Rate in Rural Areas (exclusive of the Proclaimed Towns) for Eleven Years 1918-1928.

	Maternal Deaths.	Live Births.	Maternal Death Rate.		Maternal Deaths.	Live Births.	Maternal Death Rate.
1918	3,514	166,217	21.1	1924	2,939	160,193	18.3
1919	3,258	144,994	25.3	1925	3,036	172,861	17.6
1920	2,508	144,957	17.3	1926	3,288	185,058	17.8
1921	3,237	162,009	19.3	1927	2,989	183,696	16.3
1922	3,152	160,834	19.6	1928	3,393	184,636	18.4
1923	3,414	161,773	21.1	Median	3,237	162,009	19.3

The above table shows that the median rural maternal death rate is 19.3, which is lower than the urban rate of 25.3, and approximating nearly to the rate for the whole Island, which is 19.9. The lower rural rate is no doubt due to incorrect certification of the causes of death. The rural rate for 1928 is 18.4, which is higher than the rate for 1927 (16.3).

From the foregoing three tables it will be apparent that—

(1) the average figures are as follows for eleven years 1918-1928—

	Whole Island.	Urban.	Rural.
Maternal deaths	3,664	498	3,239
Maternal death rates	19.9	25.3	19.3

(2) the figures for 1928 are—

	Whole Island.	Urban.	Rural.
Maternal	4,091	693	3,393
Maternal death rates	19.2	24.2	18.4

(3) the maternal death rate in the urban area is higher than that in the rural area.

Table showing Causes of Maternal Mortality and the Percentages that each Cause forms of the Total.

	Number.	Percentage.		Number.	Percentage.
Accidents of Pregnancy	69	1.69	Puerperal Convulsions	2,016	49.28
Puerperal Haemorrhage	132	3.23	Puerperal Albumenorria	2	.05
Puerperal Septicaemia	1,409	34.44	Other Accidents of Child-birth	453	11.07
Phlegmasia Alba Dolens	10	.24			

Nearly half the deaths are due to puerperal convulsions. Puerperal septicaemia is another high cause of deaths.

A statement of stillbirths is available only for the Urban Areas.

Table showing Stillbirths, Live Births, and the Ratio that Stillbirths form of the Live Births for Eleven Years 1918-1928.

	Stillbirths.	Live Births.	Ratio of Stillbirths to Live Births.		Stillbirths.	Live Births.	Ratio of Stillbirths to Live Births.
1918	1,086	17,167	6.3	1924	1,274	18,674	6.8
1919	955	16,479	5.8	1925	1,443	20,400	7.0
1920	1,182	18,762	6.3	1926	1,574	21,830	7.2
1921	1,493	21,908	6.8	1927	1,631	21,773	7.5
1922	1,433	19,022	7.5	1928	1,770	28,676	6.1
1923	1,444	19,664	7.3	Median	1,443	19,664	7.3

On an average there are 1,443 stillbirths to 19,664 live births, which is 7 stillbirths to every 100 live births.

The progress of Maternity and Child Welfare work is being watched with interest throughout the Island. In furtherance of this work, Government during the year has appointed 5 women Medical Officers: 1 of whom has been placed in charge of the Maternity and Child Welfare work of the Department and the training of Public Health Nurses. While the other 4 have been stationed respectively at Batticaloa, Trincomalee, Beruwala, and Weligama, centres of Muslim population, for medical relief to women and Maternity and Child Welfare work.

Ante-Natal and Baby Clinics.—Ante-natal care has been provided at the clinics held at the De Soysa Lying-in Home in Colombo to a larger number of expectant mothers than in previous years as shown by the following figures:—

	1925.	1926.	1927.	1928.
Mothers ..	707	948	1,589	1,702
Visits ..	713	1,038	1,741	1,760

Combined ante-natal and baby clinics have been held weekly at Badulla, Nuwara Eliya, Batticaloa, Trincomalee, and at 15 centres in Health Units. The work done by Medical Officers at outstation hospitals has been much the same as in past years. Endeavours to hold regular clinics in such hospitals have not met with success that was anticipated.

The work at the Health Units consists, in addition to clinic work, of home visiting by the Public Health Nurse. Figures relating to the work done in this connection are shown in the Appendix under Health Units.

The majority of these clinics are held in association with Social Service Leagues and other similar organizations which provide such necessaries as food and clothing and in some places the buildings in which the clinics are held.

Trained Assistance at Labour and the Training and Control of Midwives.—A good many deaths at childbirth are caused by untrained and ignorant women who act as midwives. That women in labour appreciate trained attendance is clearly shown by the work of the midwives attached to Health Units.

Trained midwives are provided at Government hospitals, in Health Units, and in areas under local authorities. In the first mentioned place they work only in the hospitals while at the other two they work in the homes of the people.

The following is a statement of the trained midwives employed by Government:—

	1926.	1927.	1928.
Government hospitals	38	58	64
Health Units	3	3	13

The training of midwives continues to be carried out at the De Soysa Lying-in Home, Colombo, and the course is for a period of six months. The type of woman taken for training as midwives is one who can read and write her own language and be intelligent enough to benefit by the tuition imparted. From the experience gained at Health Units it is felt that women with some education and a more intelligent outlook are needed.

Under the present arrangement facilities are afforded for the training of 50 midwives annually, but the demand is greater than the supply. When the Lying-in Home is extended it will then be possible to train more.

A larger supply is needed by Government for its hospitals and Health Units and by local authorities for their areas. It is the intention of the Department to provide every hospital with a midwife.

Government has had a scheme in operation for some time past whereby its senior nurses are given a six months' training in midwifery before they passed into the grade of Matrons.

The number of midwives passed out from the Lying-in Home during the past three years is as follows:—

Year.	Stipend and Paying Midwives.	Nurses given Midwifery Training.	Total.
1926	51	9	60
1927	51	12	63
1928	47	13	60

Ordinance No. 26 of 1927 provides for the registration and control of midwives in the Island. It was proclaimed during the year 1928, but the sections dealing with midwives have not been put into operation as yet.

Maternity Beds in Hospitals.—The policy of the Department has been to provide all its hospitals with beds for maternity cases, and it has been continued during the year. Maternity annexures have been provided during the year under review at Matale, Pimbura, Gampola, Dolosbage, Kalmunai, Puttalam, Badulla, Avissawella, Undugoda, and Balangoda, totalling in all 57 beds. At Balangoda the ward has been built at the expense of a munificient local resident. In 1927 6 new maternity annexures were built with a total of 22 beds.

Training of Public Health Nurses.—When Health Unit work was started in 1926 it was soon felt that adequate arrangements for the training of Public Health Nurses to handle the child welfare phase of it should be made. Details of the action taken are stated in the Appendix under Health work.

An association for promoting nursing as a profession in Ceylon was formed in August, 1928, under the distinguished leadership of Lady Stanley. This association is taking steps to carry out its object and to arouse the interest of educated Ceylonese women in matters pertaining to the health and welfare of the people.

Social Service Leagues.—Social Service Leagues, Health Associations, and Ladies' Leagues continue to do good and useful work in connection with child welfare, both in Colombo and in the provincial towns. Such associations are to be found in Colombo, Kandy, Kurunegala, Kalutara, Beruwala, Jaffna, Nuwara Eliya, and Peradeniya carrying on Child Welfare Clinics in association with the Medical Officers of Health or Medical Officer of the station.

Although last year (1928) there is a drop in the infant mortality rate of the Indian immigrant population, it still continues to be the highest in the Island. Even on estates where hospitals and midwives are provided the Indian mothers do not avail themselves of either. They prefer to have their confinments conducted in their own way in their lines. A good deal of educational work needs to be carried out among them, and the hope is once again expressed that the ladies in planting districts may see their way to forming Maternity and Child Welfare organizations to ameliorate the lot of the Indian mothers on estates and so reduce the high infant mortality.

The Future.—The future is full of hope. Ignorance, poverty, and the lack of trained assistance at labour are the principal causes of the high infant and maternal mortality. Education of the public is needed and much is being done in this direction. A great deal of interest is being shown in the Child Welfare movement, and Health and Baby weeks are being organized. The great need of the work is trained personnel with the proper view point. Steps in this direction are being taken. Women of the proper type are needed, and till they come forward to shoulder the responsibility that is theirs progress will not be so satisfactory as it might be.

VI.—HOSPITALS, DISPENSARIES, AND VENEREAL CLINICS.

General Remarks.—There are few countries in the world in which medical aid is more generously distributed by the State than Ceylon. In 1928 there were 88 Government hospitals in the outstations with provision for 6,689 beds. Two new hospitals, 1 at Watawala (41 beds) in Central Province and the other at Kaltota (8 beds) in the Province of Sabaragamuwa, were opened on October 1, 1928, and July 1, 1928, respectively. In addition to these 88 hospitals the following special hospitals were maintained:—A General Hospital, Colombo, with 850 beds, a Lying-in Home with 100 beds, an Eye Hospital with 58 beds, a Women's Hospital with 45 beds, a Children's Hospital with 81 beds, a Female Venereal Hospital with 29 beds, a Police Hospital with 31 beds, a Tuberculosis Hospital (for chronic cases) with 349 beds, a Tuberculosis Sanatorium with 72 beds, and an Infectious Diseases Hospital with 122 beds.

There were 575 Central and Branch Dispensaries and Visiting Stations provided and maintained by Government in different parts of the Island in 1928, and in addition to these the following special institutions were maintained for the treatment of out-patients:—King Edward VII. (Memorial) Anti-Tuberculosis Institute, Colombo; Grenier Eye, Ear, Nose and Throat Infirmary, Colombo; Dental Institute, Colombo; and special dispensaries at Kandy, Galle, Jaffna, and Batticaloa for the treatment of eye diseases.

In addition to the Government hospitals and dispensaries 81 estate hospitals and 684 estate dispensaries were maintained by the proprietors of estates.

With the object of providing better medical facilities at outstations and at the same time of lessening the ever-increasing demand on the General Hospital, Colombo, it has been the policy of the Department to appoint year by year highly qualified Surgeons and Physicians to hospitals in provincial towns. During the year under review good progress was made in this direction and the following new appointments were made:—Surgeons for the hospitals at Jaffna, Badulla, and Galle, Physicians for Galle and Kandy hospitals, and a qualified Surgeon as the District Medical Officer, Ratnapura.

The total number of in-patients treated in the various Government hospitals was 224,850 with 14,066 deaths, giving a mortality rate of 6.26 per cent., as compared with 200,770, 12,158, and 6.05, respectively, the previous year. In the Government dispensaries and the out-patient departments of Government hospitals 3,482,691 patients who paid 5,169,488 visits received treatment, as against 2,759,403 patients and 4,205,220 visits the previous year.

The following are some of the more important buildings that were completed during the year under review:—A hospital of 41 beds at Watawala; a hospital of 8 beds at Kaltota; 3 wards providing a total of 126 beds (in one three-storey block) at the General Hospital, Colombo; 1 male and 1 female ward of 40 beds each at the Anti-Tuberculosis Hospital, Ragama; an Infectious Diseases Hospital of 4 beds, Dolosbage; a ward of 16 beds and an Operating Theatre, Mannar hospital; a female ward of 10 beds, Mihintale hospital; 2 new wards of 16 beds, Anuradhapura hospital; a ward of 12 beds, Balangoda hospital; reconstruction of a ward of 40 beds, Matale hospital; maternity wards for the hospitals at Pimbura 6 beds, Matale 7 beds, Gampola 6 beds, Dolosbage 6 beds, Kalmunai 2 beds, Puttalam 4 beds, Badulla 4 beds, Avissawella 4 beds, and Undugoda 6 beds; dispensary and Apothecary's quarters at Kunchikulam, Kebitigollawa, Puwarasankulam, Irani Illupaikulam, Ratmalgahawewa, Nindoor, Mandoor, Udappu, and Deraniyagala; dispensary buildings at Parasangahawewa and Potuvil; quarters for:—Medical Officer, Hiniduma; District Medical Officer and District Medical Assistant, Batticaloa; Religious Sisters, Ragama hospital; Matron and Nurses, additional Apothecary and Steward, Puttalam hospital; Medical Officer, Anamaduwa; District Medical Officer and Apothecary, Giriulla; District Medical Officer, Koslanda; House Surgeon and Nurses, Badulla hospital; additional Apothecary, Balangoda hospital; Apothecary and Steward, Rakwana hospital; Nurses, Avissawella hospital; Medical Officer, Rambukkana; and a Branch Health Laboratory at Badulla.

The following were some of the major improvements that were also carried out:—Extension to administration block, Elpitiya hospital; additions and improvements to Uda Pussellawa hospital; District Medical Officer's quarters, Maskeliya; midwife's quarters and labour room, Apothecary's and District Medical Assistant's quarters, Deniyaya hospital; male surgical ward, Monaragala hospital; Bibile dispensary; Apothecary's quarters, Haputale hospital; Apothecary's quarters, Medagama hospital; maternity ward, Karawanella hospital; District Medical Officer's quarters, Aranayaka.

Many other buildings were begun during the year but were not completed.

Report on Colombo Hospitals.

A brief summary of the work done in the chief Colombo hospitals is given hereafter:—

General Hospital.—The following is a summary of the chief features of the report of the Medical Superintendent, General Hospital, Colombo:—

912 patients remained in hospital on December 31, 1927, 65 in the paying section and 848 in the non-paying section. During the year under review 20,360 patients were admitted, 1,716 to the paying section and 18,644 to the non-paying section. At the out-patient department 33,990 patients who paid 143,300 visits were treated during the year.

Of the 1,781 patients under treatment in the paying wards, 1,612 were discharged, 111 died, and 58 remained at the end of the year.

Of the 19,492 patients under treatment in the non-paying wards, 16,603 were discharged, 2,125 died, and 764 remained under treatment at the end of the year.

The daily average sick in hospital was 82.8 in the paying section and 854.65 in the non-paying section. The daily average attendance at the out-patient department was 392.5.

The maximum and minimum numbers of patients in hospital on any one day during the year were as under:—

Paying Section.

Maximum	93 on March 6, and July 27
Minimum	62 on April 13

Non-Paying Section.

Maximum	950 on April 27
Minimum	716 on April 7

Of the 21,273 total in-patients treated, 16,438 were medical cases and 4,835 were surgical cases. The total number of operations performed in 1928 was 2,477, exclusive of 272 minor operations performed on out-patients at the Out-patients Department. 375 operations were on paying patients with 9 deaths, giving a mortality rate of 2.4 per cent., and 2,102 operations were on non-paying patients with 144 deaths, giving a mortality rate of 6.85 per cent.

The following table gives comparative figures for the past three years of the cases under treatment in hospital in paying and non-paying sections, respectively:—

Paying Section.

Year.	Cases under Treatment.	Daily average Sick.	Deaths.	Mortality Percentage.
1926	1,649	77.35	109	6.6
1927	1,691	81.64	117	6.9
1928	1,781	82.8	111	6.2

Non-Paying Section.

1926	20,792	875.98	1,996	9.63
1927	18,952	863.42	1,973	10.41
1928	19,492	854.65	2,125	10.89

As regards particular diseases the following figures show their prevalence and mortality during the past three years:—

	1926.	1927.	1928.
Anchylostomiasis—			
Cases	574	533	1,046
Deaths	106	71	172
Appendicitis—			
Cases	162	189	181
Deaths	3	3	9
Dysentery—			
Cases	312	343	445
Deaths	90	55	83
Enteric—			
Cases	356	330	385
Deaths	116	79	77

	1926.	1927.	1928.
Malaria—			
Cases	2,220	2,445	4,162
Deaths	34	27	90
Parangi—			
Cases	295	232	54
Deaths	—	—	—
Pneumonia—			
Cases	893	1,055	979
Deaths	325	300	380
Pulmonary Tuberculosis—			
Cases	630	750	698
Deaths	278	276	250

From the above figures it will be evident that there has been a great increase in the number of cases of malaria, the 1928 figures being nearly double the figures of 1926. Many of the cases were of a malignant type. In the majority of cases the type of infection was ascertained by microscopic examination. Although there had been a slight decrease in the number of cases of anchylostomiasis in 1927, as compared with the figures for 1926, the number of cases in 1928 was nearly double the number of cases in 1927 with a more than proportionate increase in mortality. In marked contrast to these 2 diseases, the cases of parangi have dropped to less than a fourth of what they were in 1927.

Pulmonary tuberculosis shows a decrease of 52 cases compared with 1927 and a slightly lower death rate, viz., 35.8 per cent., as compared with 36.8 per cent. Owing to the continual overcrowding in the tuberculosis hospitals it was found imperative to detain these cases in the General Hospital, though that was detrimental to the interest of the other patients. There has been an increase in the number of cases of dysentery, an increase in the number of cases of enteric, and a decrease in the number of cases of pneumonia, with a higher death rate.

Particulars of the venereal diseases treated appear under Venereal Clinics at the end of this section.

Buildings.—The new three-storeyed block with provision for 126 beds (the first of a series of similar blocks which are contemplated) was completed and the ground floor and a part of the second floor, accommodating a total of 63 beds, were used to house the patients of 2 old wards which were demolished to build a new kitchen block. A six-bedded ward in the new block was allotted solely for the use of Buddhist priests.

General.—During the last thirty years this institution has grown up from a hospital of about 250 beds with a medical staff of 1 Surgeon, 3 Physicians, and a similar number of house officers to nearly four times in size. In 1929 when the new wards are fully occupied the 30 wards in hospital will give accommodation to nearly 1,000 patients. The staff has grown to 37 qualified Medical Officers, including a whole-time Medical Superintendent.

X Ray Department, General Hospital, Colombo.—During the year 2,192 patients in the non-paying section and 297 patients in the paying section, a total of 2,489, underwent X'ray examination, as against a total of 2,164 cases in 1927. On the electro-therapeutic side 3,521 sittings were given to non-paying patients and 181 sittings to paying patients, making a total of 3,702, as compared with a total of 2,662 the previous year. There has been a substantial increase in the number of non-paying patients in the X'ray as well as in the electro-therapeutic sections. There has been a marked dimunition in the number of paying patients in the electro-therapeutic section, due no doubt to the existence of private installations for similar treatment.

There has been available for patients practically every kind of electrical treatment, namely, galvanism, faradism, diathermy, high frequency, ultra-violet light, and radiant heat.

Almost every conceivable type of injury or disease has come up for examination to the X'ray section.

Every endeavour is being made to make this Department thorough and up-to-date, providing every kind of facility and appliance for treatment. During the year Radium and many kinds of apparatus required for the adequate equipment of this Department were indented for. The staff was increased by the addition of 2 X'ray assistants and a nurse assistant in the electro-therapeutic section.

Dental Institute, Colombo.—This institute was in its second year of existence in 1928. The poor patients for whom it is intended are now seeking treatment in large numbers, and an endeavour is made to prevent the abuse of the free treatment provided at this Institute by the classes who ought to seek treatment from private dentists.

11,893 patients were treated during the year under review, as against 9,591 in 1927. The average number of visits per patient was four. This represents approximately 47,572 visits in 1928. Of the total cases treated, 865 were school children who attended the School Clinic, and 420 were cases admitted to the General Hospital as in-patients and referred to this Institute for dental attention.

De Soysa Lying-in Home.—There has been a steady increase year by year in the number of those who seek treatment at this hospital.

The question of providing increased accommodation is under consideration.

The number of cases under treatment in 1928 was 5,125, as against 4,349 the previous year and 3,976 in 1926. The daily average for the year under review was 129.97 and the mortality rate was 2.65, as compared with 115.96 and 2.55, respectively, the previous year. There were 139 maternal deaths during the year, and of these 72 were due to accidents of childbirth, 25 to puerperal causes, and 42 to inter-current diseases, such as anchylostomiasis, pneumonia, pulmonary thrombosis and tuberculosis, diarrhoea, enteritis, cerebral malaria, &c.

The number of live births was 3,403. Of these infants, 3,255 left the hospital alive while 148 died after delivery, as against 2,749, 2,601, and 148, respectively, in 1927. In 1928 there were 2 sets of triplets and 68 pairs of twins among the births. 526 obstetric operations were performed during the year, necessitating the use of forceps in 110 cases, evacuation of uterus in 64 cases, manual extraction in 21 cases, external cephalic version in 5 cases, craniotomy in 40 cases, and decapitation in 1 case. Labour was classified as normal in 4,899 cases. There were 314 cases with other presentations. In 48 cases of placenta praevia 16 infants were born alive, 31 were born dead, and 1 was undelivered; 42 mothers recovered and 6 died. In 80 cases of puerperal eclampsia 57 mothers recovered and 23 died; 35 infants were born alive, 24 were born dead, 15 died undelivered, and 6 were cases of miscarriage.

The training of midwives was carried on as usual during the year. Sixty-four women were admitted for training and 60 passed the examination held at the end of a six months' course of training. Of the 60 who passed 13 were nurses of the Department sent for training in maternity work.

The Victoria Memorial Eye Hospital and the Grenier Ear, Nose, and Throat Infirmary.—26,979 patients who paid 94,198 visits to the Infirmary were treated during the year, as against 25,702 patients and 89,875 visits the previous year. Of the cases treated during the year, 22,673 were eye cases, 3,251 ear, 685 throat, and 370 nose cases.

There were 92 in-patients remaining in hospital at the beginning of the year and 1,581 patients were admitted during the year, as compared with 92 and 1,598, respectively, the previous year. Of the total treated, 1,580 were discharged and 1 died, death being due to extreme debility. The daily average in hospital was 104.99 in 1926, 106.33 in 1927, and 109.49 in 1928.

The chief disease among children continues to be Keratomalacia.

The total number of opthalmic operations performed on in-patients during the year was 630 and on out-patients 1,491, the corresponding figures for the previous year being 753 and 2,049, respectively; 2,043 refraction cases were attended to, as against 1,250 cases in 1927.

The Slit lamp and Red free lamp were installed late in the year 1928, and are working satisfactorily. Arrangements for the purchase of a Giant Magnet have been going on for some time, and its installation is awaited with interest.

During the early part of the year the School Clinic was held only once a week owing to the ill-health of the School Nurse. Towards the end of the year as the attendance increased to as much as 60 per day the clinic was held twice a week.

The Lady Havelock Hospital for Women and Lady Ridgeway Hospital for Children.—The total number of admissions during the year under review was 3,448, and with 114 cases remaining over from the previous year 3,562 cases were treated in 1928. The corresponding figures for 1927 were 3,034, 90, and 3,124, respectively. The total treated for the year was the largest number ever treated in any one year. The daily average sick in hospital was 124.63, as against 113.8 in 1927. The number of paying patients treated was 106, of whom 19 were maternity cases. The total number of deaths was 621, 525 children and 86 women. The mortality rate was 17.43, as against 16.2 the previous year. The high death rate was due to the fact that many children were brought to the hospital in a moribund condition and died within a few hours of admission; 43 cases of typhoid fever with 12 deaths, 188 cases of advanced anchylostomiasis with 38 deaths, 116 cases

of ascaris with 27 deaths (children), 287 cases of malaria (including cerebral) with 12 deaths, 42 cases of congenital syphilis with 28 deaths, 288 cases of pneumonia with 151 deaths, and 116 cases of puerperal septicaemia with 23 deaths were treated during the year. The treatment of all non-paying patients with oil of chenopodium and carbon tetrachloride as a matter of routine before they were discharged was continued during this year also. The deaths from pneumonia were among cases admitted in an advanced stage of the disease, and these cases lived for only a few hours after admission. All pneumonia cases were treated in the open verandah and received injections of permanganate of potash per rectum in addition to the usual medicinal treatment. The results with the early cases treated were excellent. The worst cases of puerperal septicaemia were also suffering from advanced anchylostomiasis. Judging from the condition of these patients on admission there does not appear to be any improvement in the methods adopted by the untrained midwives.

The number of surgical operations performed was 713. Of these 564 were major and 149 minor operations. The operation mortality was 20 deaths or 2.8 per cent., as against 3.3 per cent. the previous year.

In the training school for nurses there were 54 pupils in training; 35 pupils were admitted for training during the year. Of these 4 were discontinued, 9 resigned, 3 were transferred to Kandy hospital, and 9 to other hospitals. Ten pupils passed the examination and 4 were unsuccessful. The number of pupils in training at the end of the year was 58. Three of the passed nurses were among those who were sent to England for further training.

Dr. (Miss) C. E. Anderson, Medical Officer-in-Charge, was away on long leave from August 16 to November 17, 1928, and Dr. J. H. F. Jayasuriya acted.

The Police Hospital, Borella.—The total number of in-patients treated during the year was 1,801, as against 1,744 in 1927. During the year only 1 death occurred—from pneumonia. The daily average in hospital was 29.38, as against 29.90 in 1927. The principal diseases treated were; influenza 451 cases and malaria 227 cases.

During the year under review 9,082 patients who paid 10,985 visits were treated at the out-patients department of the hospital and by the Assistant Police Surgeon at the City Police Stations on his visits. Influenza, diseases of the digestive system, rheumatic affections, malaria, and skin diseases were the more prevalent ailments treated.

Infectious Diseases Hospital (Angoda), Colombo.—This hospital is available for cases of infectious diseases from the city of Colombo, its suburbs, and from ships arriving at the Colombo Port.

The total number treated during the year was 2,136 with 80 deaths or a mortality rate of 3.74 per cent., as against 1,271 cases, 77 deaths, and a mortality rate of 6.4 per cent. the previous year.

Smallpox.—Twelve cases of smallpox were treated during the year, 11 were local cases, and 1 was an imported case sent by the Port Surgeon. Of these, 4 were confluent, 4 discrete, and 4 modified. Two of the confluent cases proved fatal.

Plague.—Twenty-two cases of plague, all bubonic, with 17 deaths were treated during the year. Five cases recovered and were discharged, the recovery percentage being 22.7 in 1928, as against 17.7 the previous year. Of the 22 cases, 16 were from the city of Colombo and 6 were from outside the city; 16 were males and 6 females. Of the total cases, 14 had groin, 5 axillary, and 3 cervical buboes. Of the recovered cases, 3 had axillary and 2 groin buboes. It is noteworthy that the septicaemic form of plague which used to preponderate is fast disappearing and almost all the cases are bubonic.

Cholera.—Two cases of cholera were treated during the year with 1 death, one was an imported case and the other was a boatman in Colombo Harbour. Both cases were diagnosed bacteriologically and found to be positive.

Other Infectious Diseases.—Of the infectious diseases treated, there were 147 cases of enteric with 29 deaths, 23 cases of diphtheria with 4 deaths, 1,273 cases of chickenpox with no death, 197 cases of measles with 3 deaths, 84 cases of influenza with 9 deaths, 28 cases of whooping cough with 2 deaths, and 10 cases of pneumonia with 2 deaths. Of the enteric cases 33 were from the Municipal limits and 95 were from outside the town. Twenty-two of the cases sought voluntary admissions. Of the diphtheria cases treated, the faucial type preponderated, a few cases were nasal and one was conjuntival. The incidence of chickenpox was heavier in the first half of the year, while mumps and measles were more prevalent towards the close of the year.

Contacts.—105 plague contacts and 93 smallpox contacts were segregated in the Contact Camp. Of the smallpox contacts 5 developed the disease during the period of surveillance.

A sum of Rs. 4,666 was recovered from 75 paying patients and credited to the revenue.

It is very encouraging to note that the Infectious Diseases Hospital is steadily gaining popularity among the villagers. They used to dread the treatment at the Infectious Diseases Hospital, but now they voluntarily come or bring patients for treatment even from a considerable distance.

Kandy Hospital.

The following is a summary of the report of the Medical Superintendent, Kandy hospital:—

A noteworthy event in the history of this important provincial hospital was the appointment of a Medical Superintendent to be in administrative charge of it. Dr. W. E. de Silva assumed duties as Medical Superintendent, Kandy hospital, on January 1, 1928, replacing Dr. L. C. Wijesinghe, who was then Medical Officer in Charge. Dr. S. Somasunderam, M.R.C.P., also assumed duties as Visiting Physician on the same day. In addition to the above-mentioned officers there were 6 others on the medical staff, viz., a Visiting Surgeon, an Eye Surgeon, 2 House Surgeons, and 2 House Physicians.

Admissions.—During the year under review 11,125 cases were admitted as compared with 10,007 cases the previous year. Of these, 10,362 were cured and discharged, 665 died; the corresponding figures for 1927 were 9,378 and 606, respectively. The daily average sick in hospital was 454.2 in 1928, as against 415.65 in 1927.

Diseases treated.—Of the diseases treated, malaria comes easily first. There were 1,684 cases with 31 deaths. These were mostly cases from outside districts. A large proportion was of the malignant type from the Matale and Dambulla Districts. The remaining cases were of the benign tertian type, with a few quartan and cerebral forms.

681 cases of anchylostomiasis with 60 deaths were treated during the year. The disease was found in decreasing numbers among the estate labourers while it seems to be increasing in incidence amongst Sinhalese villagers. 181 cases of dysentery with 10 deaths were treated. Almost all the cases were of the amoebic type when not of helminth infection. Admissions were mostly from villages where mild epidemics seem to occur. 134 cases of pneumonia with 20 deaths were treated. The incidence of the disease was seasonal and the disease prevailed during the first quarter in almost epidemic proportions. The infection was of a mixed type and not entirely influenzial. There were 81 cases of entric, of which 25 proved fatal. Only a few were of the para-typhoid type. Most of the cases were from the town and seemed to be from distinct areas where the disease had been endemic. Of the other diseases treated there were 7 cases of diphtheria with 2 deaths, 220 cases of influenza with 1 death, 1 case of smallpox which proved fatal, and 6 cases of plague with 1 death. These cases of plague were the last cases of the epidemic which broke out at the close of the previous year.

Buildings.—To relieve the existing state of overcrowding a scheme for the rebuilding of the hospital is under consideration. The question of site has been the chief obstacle in the way of progress.

The Eye Institute.—This institution is steadily gaining popularity judging from the number that resort to it for treatment from all parts of the Central Province and even from outside the Province. The eye wards were always crowded, mostly with cases from outstation hospitals. During the year under review 1,117 in-patients and 6,939 out-patients who paid 15,320 visits were treated for eye diseases.

In the Ear Department 1,516 out-patients who paid 2,814 visits were treated in 1928.

Nursing School.—There were 68 pupils under training during the year. Weekly lectures were given in the various subjects. During the year a regular course of lectures by the Physician, Surgeon, Eye Surgeon, and the Medical Superintendent was established and a defined syllabus followed. The results were very gratifying. At the two examinations held in 1928 the number of successful pupils was 26 out of a possible 29.

Galle Hospital.

This hospital is situated in Mahamodera, a suburb of Galle, and is near the sea.

Provision was made in the 1928-29 Estimates for the first time for the appointment of a Medical Superintendent to Galle hospital. Dr. Paul H. Perera was appointed to that post on December 1, 1928. A Visiting Physician was also appointed on December 8, 1928. The rest of the medical staff consists of a Visiting Surgeon, an Eye Surgeon, and three house officers. A European nursing staff of 1 Matron and 2 Sisters assumed duties in April, 1928, and augmented the former nursing staff of 11 Ceylonese nurses.

The water supply is very insufficient. About 1,800 gallons are collected at night and carefully distributed to the wards during the day. Drainage was improved. All the rain and waste water is carried away into the sea by a system of underground pipes.

The total number of in-patients treated during the year was 10,113 with a daily average of 287.69. Of these 464 died, giving a mortality rate of 4.59. The above figures include 523 paying patients and 232 estate labourers.

In the Casualty Room attached to the hospital 396 casualty cases were attended to and 1,053 injections were given for parangi and syphilis.

In the Eye Clinic 7,059 cases who paid 13,939 visits were treated. 164 opthalmic operations were performed.

The following were among the chief cases treated:—191 cases of typoid fever with 44 deaths, 178 cases of dysentery with 43 deaths, 125 cases of pulmonary tuberculosis with 9 deaths, 526 cases of anchylostomiasis with 12 deaths, and 340 cases of malarial fever with 1 death.

Medical Institutions aided by Government.

The following institutions were aided by Government during the year:—(1) The Victoria Home for Incurables, Colombo; (2) Wiseman Hospital, Welimada; (3) McLeod Hospital, Inuvil; (4) Green Hospital, Manipay; (5) Jevon's Dispensary, Puttur; (6) The Wesleyan Medical Mission Hospital, Batticaloa; (7) The Wesleyan Medical Mission Branch Dispensary at Kattankudy; and (8) The Denepitiya Medical Mission Hospital, Southern Province. Nos. (1) and (8) are for males and females; Nos. (2) to (6) for females and children only. Details of the work carried out at these institutions during the year may be obtained at this office, if desired.

Venereal Clinics.

There are three Veneral Clinics in the town of Colombo, viz., one at the General Hospital (out-door); one at the Port Surgeon's Office (out-door); and the other at the Female Branch hospital (out-door).

Venereal Diseases Clinic, General Hospital, Colombo.—The following table provides comparative figures of the cases treated at the clinic for the past three years :—

Cases.	1926.	1927.	1928.
Syphilis	781	877	852
Soft sores	28	43	37
Gonorrhoea	530	423	619
Yaws	67	29	7
	1,406	1,372	1,515

From the above figures it will be seen that syphilis cases have slightly decreased since last year while the number of cases of gonorrhoea have considerably increased. The cases of yaws are steadily decreasing year by year.

It is again noted that many patients suffering from syphilis did not attend regularly enough to complete a course of treatment, despite the advice given to them. Many patients absent themselves as soon as all or some of the visible signs of the disease disappear.

Port Venereal Clinic for Seamen....Eighty-one cases of syphilis were treated by intravenous injections of salvarsan in 1928, as against 69 in 1927 and 106 in 1926; and also 13 cases of gonorrhoea were treated by injections and irrigation.

Propaganda was satisfactorily carried out by the distribution of leaflets. These leaflets were distributed by the Port Surgeon's staff as well as by the Pilots.

The clinic will be more accessible to seamen when the Port Surgeon's Office is quartered in the new Customs building.

Female Branch Hospital.—The cases treated in the clinic for the past three years were as follows :—

Cases.	1926.	1927.	1928.
Syphilis	244	233	242
Gonorrhoea	244	327	536
Rheumatism (gonorrhoeal) ..	8	3	—
Other venereal diseases	6	9	7
	502	572	785

Most of the cases of venereal diseases come originally to the out-patients department of the hospital either frankly as such or as some obscure gynaecological ailment. 522 such cases of syphilis and 617 cases of gonorrhoea were seen and referred to the clinic.

The nature and infectivity of venereal diseases are well understood by the general run of patients, except perhaps by the cooly classes who seem to accept the disease as inevitable. Congenital syphilis is seldom recognized in its true form by the parents of children on account of the fact that it is being classified in Sinhalese with a variety of skin diseases as the " Red Disease " (Ratha Rogaya). Usually the cases that were brought for treatment were from Colombo town and were in a low marasmic condition. These were referred for admission to the children's hospital.

Some " Follow up " work was done by the Probation Officer and by the Salvation Army. Their services are much appreciated.

Besides the particulars given above in respect of the 3 clinics, 7,267 in-patients (with 111 deaths) in the various hospitals and 15,780 out-patients at dispensaries and out-patient departments of hospitals in the Island were treated for venereal diseases during the year, as against 8,204, 92, and 17,144, respectively, the previous year.

Charts, Hospital Returns, &c.

Charts.—The following charts are given at the end of this Report, *vide* Table IV. (*a*)-(*d*) :—

(*a*) Chart showing the general systemic and preventable diseases treated at the Government hospitals during the year 1928.

(*b*) Chart showing deaths from general systemic and preventable diseases treated at the Government hospitals during the year 1928.

(*c*) Chart showing cases of infectious diseases treated at the Government hospitals during the year 1928.

(*d*) Chart showing deaths from infectious diseases treated at the Government hospitals during the year 1928.

Hospital Returns.—The following Hospital Returns, extracts from the Ceylon Blue Book for 1928, are given at the end of this Report :—

(1) Details regarding hospitals (patients, attendants, &c.) in each Province.

(2*a*) Return of Diseases—Cases treated, according to districts.

(2*b*) Return of Diseases—Cases treated, according to diseases.

(3) Special Diseases.

(4) Water supply, &c., at hospitals.

Table.—Table III. gives a return of diseases (out-patients).

VII.—PRISONS AND ASYLUMS.

PRISONS.

Eleven prisons were maintained by Government at the following places during the year 1928:—Central prisons at Welikada (Colombo), Bogambra (Kandy), Mahara, and Jaffna; local prisons at Anuradhapura, Badulla, Batticaloa, Galle, and Negombo; remand prisons at Hulftsdorp (Colombo) and Kandy (old prison).

The number of convicted prisoners in those prisons on December 31, 1927, was 2,243 (2,168 males and 75 females). During the year under review 8,403 males and 286 females were admitted, 8,312 males and 279 females were discharged, and 72 males and 2 females died during the year. On December 31, 1928, there were 3,057 males and 68 females remaining in the prisons.

In 1928 there were 10 hospitals for prisoners, viz.:—

The Prison hospital at Welikada	180 beds (for males)
Do.	12 beds (for females)
The Mahara Prison hospital	59 beds
The Negombo Prison hospital	16 beds
The Bogambra (Kandy) Prison hospital	35 beds
The Jaffna Prison hospital	12 beds
The Galle Prison hospital	12 beds
The Anuradhapura Prison hospital	12 beds
The Badulla Prison hospital	4 beds
The Batticaloa Prison hospital	5 beds
Total ..	347 beds

With the following exceptions the health of the prisoners was good—a slight epidemic of dysentery in the Welikada Prison, a mild epidemic of dysentery in the Negombo Prison, and an outbreak of enteritis in the Galle Prison. In the Anuradhapura Prison there were two outbreaks of dysentery which affected 146 prisoners, out of whom 10 died.

The sanitary condition of all the prisons was satisfactory.

562 prisoners in the Galle Prison, all the prisoners admitted to Mahara Prison, and 100 prisoners in the Batticaloa Prison received treatment for anchylostomiasis. Quinine was administered to almost all the prisoners in Batticaloa Prison as a prophylactic against malaria.

Psychological Examination of Prisoners.—A new feature in the prison work during the year was the systematic examination of prisoners of Welikada Prison to ascertain their mental condition, on the theory that all crime can be traced to some particular mental state of the offender. 3,535 prisoners were thus examined, of whom 225 were kept under observation in a special ward for extended investigation, which ultimately revealed that 85 of them were of abnormal mentality. These 85 cases were fully and carefully investigated, and the following results were obtained:—

Insane	44
Feeble minded	29
Borderland cases	12
	85

The 44 insane prisoners were transferred to the Lunatic Asylum, Angoda, and the feeble-minded and borderland cases were specially treated in prison.

The following is a brief statement concerning each prison:—

Name of Prison.	Daily Average in Prison.	Daily Average Sick in Hospital.	Total Number of In-Patients treated	Total Number of Out-Patients treated.	Total Number of Deaths.	Death Rate Per Cent. of Persons treated in Hospital.	Chief Disease treated (for meaning of Figures please see Table X).
Prison Hospital, Welikada ..	1,063.14 ..	75.65 ..	2,543 }	9,615 {	41 ..	1.65 ..	1, 2, 3, 5, 6, 8, 10 11, 12, and 13
Female Jail Hospital, Welikada ..	50.86 ..	2.45 ..	46 }		1 ..	2.17 ..	1, 5, and 7
Mahara	767.75 ..	12.56 ..	610 ..	1,240 ..	8 ..	1.31 ..	1, 2, 3, and 5
Bogambra	485.97 ..	16.80 ..	622 ..	11,184 ..	1 ..	.16 ..	1, 2, 3, 4, 8, 10, and 13
Jaffna	295.44 ..	8.86 ..	300 ..	3,689 ..	4 ..	1.33 ..	1, 2, 3, and 12
Negombo	88.90 ..	10.94 ..	190 ..	705 ..	3 ..	1.57 ..	1, 3, and 6
Galle	67.91 ..	2.03 ..	122 ..	932 ..	— ..	— ..	1, 5, and 7
Anuradhapura	121.12 ..	12.00 ..	428 ..	729 ..	10 ..	2.33 ..	1, 2, and 3
Badulla	36.89 ..	.15 ..	7 ..	1,400 ..	— ..	— ..	1, 3, and 9
Batticaloa	57.96 ..	.74 ..	35 ..	— ..	— ..	— ..	1, 3, 4, and 13
Total ..	3,035.94	142.18	4,903	29,494	68	1.38	

Table X.

1. Malaria	5. Influenza	8. Conjunctivitis	11. Enteric
2. Diarrhoea	6. Bronchitis	9. Chickenpox	12. Mumps
3. Dysentery	7. Enteritis	10. Skin diseases	13. Abscess
4. Eye diseases			

A tabulated statement showing the cause of each death is given hereafter:—

Statement showing Causes of Death.

Name of Prison Hospital.	Malaria.	Dysentery.	Diarrhœa	Pulmonary Tuberculosis.	Typhoid Fever.	Pneumonia.	Nephritis.	Meningitis.	Peritonitis.	Enteritis.	Total.	Death Rate Per Cent. of Persons Treated in Hospital.
Prison Hospital, Welikada ..	5	17	4	1	3	7	1	2	1	—	41	1.65
Female Jail Hospital, Welikada .	—	—	1	—	—	—	—	—	—	—	1	2.17
Mahara ..	1	2	3	—	—	2	—	—	—	—	8	1.31
Bogambra ..	—	—	—	—	—	1	—	—	—	—	1	.16
Jaffna ..	—	—	2	—	—	2	—	—	—	—	4	1.33
Negombo ..	1	—	—	—	—	—	1	—	—	1	3	1.57
Anuradhapura ..	—	10	—	—	—	—	—	—	—	—	10	2.33
Galle, Badulla, Batticaloa	—	—	—	—	—	—	—	—	—	—	—	—
Total ..	7	29	10	1	3	12	2	2	1	1	68	1.38

ASYLUMS.

(a) *Lunatic Asylum, Angoda.*

There is one Lunatic Asylum in the Island, at Angoda, some six miles from Colombo. The Asylum and the House of Observation contain 1,728 beds and are provided with quarters for the majority of the staff.

Asylum.—The year opened with 1,133 males and 619 females, as compared with 1,090 males and 567 females in the previous year, showing an increase of 43 males and 52 females. This large increase in the number of females is unusual. During the year 596 males and 259 females were admitted, as against 430 males and 212 females in the previous year. The total number treated during the year was 1,729 males and 878 females against a total of 1,520 males and 779 females in 1927. During the year 250 males and 148 females were discharged, as compared with 254 males and 95 females last year. Of these 161 males and 91 females were "recoveries," giving a rate of 27 per cent. for males and 35 per cent. for females, as against rates of 34.4 and 33.5 for the year 1927. The average recovery rate of both sexes was 29 per cent., as compared with 31 per cent. in 1927. There were 141 deaths among males and 62 deaths among females, as compared with 84 among males and 40 among females in 1927. The percentage of deaths to the total number treated was 8.15 for males and 7.06 for females, against 5.7 and 5.3, respectively, for males and females in 1927.

Causes of Death.—The chief causes of death among patients in the Asylum were as follows:—

	Number of Deaths.	
	Males.	Females.
Phthisis ..	35	16
General debility ..	10	6
Diarrhœa ..	13	1
Dysentery ..	35	22

	Number of Deaths.	
	Males.	Females.
Heart failure ..	8	3
Influenza ..	2	3
Senile debility ..	5	1
Pneumonia ..	7	2

House of Observation.—The year opened with 88 males and 32 females, as compared with 51 males and 23 females in 1927. During the year 888 males (being 984 cases) and 377 females (being 414 cases) were admitted, as compared with 543 males (589 cases) and 247 females (260 cases) admitted during 1927. Of the persons observed 518 males and 250 females were transferred to the Asylum (213 males and 85 females in 1927); 355 males and 97 females were discharged (281 males and 146 females in 1927); 19 males and 11 females died (12 males and 7 females died in 1927). There were 30 deaths in the House of Observation in 1928, as compared with 19 during 1927. The chief causes of death are given below:—

	Number of Deaths.	
	Males.	Females.
Pneumonia ..	5	—
Senile debility ..	1	1
Phthisis ..	—	2

	Number of Deaths.	
	Males.	Females.
General debility ..	3	4
Debility and acute mania	2	1
Dysentery ..	1	3

There were 84 males and 51 females remaining in the House of Observation at the end of the year.

The figures for both institutions together are shown below:—

	Asylum.		House of Observation.	
	Males.	Females.	Males.	Females.
Remained on December 31, 1927 ..	1,133	619	88	32
Admitted during 1928	596	259	888	377
Total treated during 1928 ..	1,729	878	976	409
Discharged during 1928	250	148	873	347
Died during 1928	141	62	19	11
Remaining on December 31, 1928 ..	1,338	668	84	51

The largest number simultaneously resident in the Asylum was 2,013, compared with 1,769 in the year 1927; and the lowest number was 1,718, compared with 1,572 in 1927. The largest number for both institutions was 2,142, compared with 1,870 last year; and the lowest for both institutions was 1,859, compared with 1,647 last year. The daily average number

resident was 1,227.21 for males (1,093.45 last year) and 657 for females (576.58 last year). For the House of Observation the average number resident was 89.87 for males (50.49 last year) and 43.48 for females (23.43 last year). The daily average for both institutions was 1,317.08 for males (1,116.52 last year) and 700.48 for females (600.24 last year).

Infectious Diseases.—The following table shows the number of cases of infectious diseases occurring during the year:—

	Inmates.		Attendants.	
	Males.	Females.	Males.	Females.
Phthisis	56	62	—	3
Measles	17	—	—	—
Influenza	49	65	11	16
Leprosy	1	—	—	—
Erysipelas	1	—	—	—
Chickenpox	16	—	4	—
Dysentery	185	115	2	4
Mumps	1	1	—	—

Accidents.—The number of cases of injury to patients by themselves was 87, by other patients 69, and by attendants nil.

Restraint and Seclusion.—The patients were restrained for surgical reason on two occasions. Seclusion was resorted to on one occasion for women and none for men.

Official Visitors.—The following were the official visitors for the year:—Messrs. L. Macrae, Director of Education; C. Coomaraswamy, Registrar-General; R. N. Thaine, Government Agent, Western Province; W. T. Stace, Mayor of Colombo; E. R. de Silva, Assistant Registrar-General; H. E. Newnham, Mayor of Colombo; D. V. Altendorf, Deputy Inspector-General of Police; C. C. Schokman, Acting Inspector-General of Prisons; G. F. Roberts, Registrar-General; W. Ludovici, Deputy Inspector-General of Police. They visited in rotation on 13 occasions and submitted 13 reports on 386 males and 73 females, the reports being duly forwarded to Government.

Occupations and Amusements.—An average of 127.83 males were employed in gardening, 19.92 in trade, and 175.54 in household work. Of the women 49.32 were employed in weeding and outdoor work, 22.91 in sewing and rope making, and 92.25 in house work. The following garments were made during the year:—

For Lady Havelock Hospital	1,675	For this Institution	2,098
For Eye Hospital	612		

Cricket matches were played on five occasions, all the matches being won by the Asylum team. Tennis and volley ball are played by a few of the inmates. A wireless apparatus is installed in the building, but the programmes being at unsuitable hours patients do not receive the full benefit of this installation. A special effort is being made by the public to supply all hospitals with wireless facilities, and the Asylum has been put on the list of hospitals for early consideration.

Newspapers.—Newspapers and magazines were supplied by Government for the staff and inmates, and the publishers of the "Ceylon Observer" very kindly continued to supply their paper free.

Requirements.—The Medical Superintendent, Lunatic Asylum, stresses the need for (1) a court for lunacy cases to be held at Angoda, (2) the revision of the lunacy laws, and (3) increased accommodation. He points out that the necessity for giving attention to these matters has become more and more apparent. The cost of transporting suspects to and from the courts and the payment of travelling expenses to the Medical Officers and others has, he considers, much exceeded the cost of providing a special court. It may be noted that the need for such a court at Angoda was brought to the notice of Government several years ago and Government decided against the proposal.

Special Committee.—A Special "Wants" Committee was appointed by His Excellency the Governor consisting of the Director of Education, the Chief Architect, and the Medical Superintendent, Lunatic Asylum. The Medical Superintendent reports that he has drawn up a special list of urgent requirements and in the forefront he has placed the necessity for increased accommodation. The Asylum is now full to overflowing and overcrowding is apparent everywhere. This overcrowding will be relieved to some extent when the "noisy" ward at present under construction is completed. That ward will provide accommodation for 102 patients, and the total number of beds in the Asylum and the House of Observation will thereby be brought up to 1,830. As, however, the daily average in both institutions was 2,017 in 1928, it will be observed that even with the occupation of the "noisy" block there is still bound to be considerable overcrowding.

Annual Treat.—The annual treat was held this year on December 8, the funds being subscribed by the public. This treat was much appreciated by all the inmates of the Asylum.

(*b*) *Leper Asylums.*

There are 2 Leper Asylums in the Island—1 at Hendala, some ten miles from Colombo, and the other on the Island of Mantivu, some three miles from Batticaloa in the Eastern Province.

Hendala.

The following are the statistics for Hendala for the year under review:—

	Males.	Females.	Total.
Remaining on December 31, 1927 ..	462 ..	129 ..	591
Admissions during the year 1928	152 ..	28 ..	180
Discharged during the year 1928	105 ..	16 ..	121
Died during the year	52 ..	8 ..	60
Remaining on December 31, 1928 ..	457 ..	133 ..	590

Of the 180 admissions 116 were new cases and were in the following stages of the disease:—Tubercular 57, anaesthetic 56, mixed 67. The new admissions were from the following Provinces:—Western 50, Central 20, Southern 14, Northern 6, North-Central 3, North-Western 9, Sabaragamuwa 13, and Uva 1.

121 patients were discharged from the Asylum in 1928. Of these 7 were granted home isolation, 16 were discharged as non-infective after bacteriological examination, and 2 were repatriated to India. The remaining 96 are included in the 139 absconders, 98 of whom returned of their own accord or were brought back by the police. Forty-one are still at large.

The number of deaths was 60 (males 52 and females 8). The percentage of deaths to the total of patients treated was 7.78, as against 6.04 last year.

Special Treatment of Leprosy: Drugs used.—The drug E.C.C.O. which is a mixture of the Ethyl Ester of Hydnocarpus Oil, Olive Oil, and Creosote was largely used. Towards the latter part of the year pure Hydnocarpus Oil was given a trial.

Technique of Treatment.—The method of subcutaneous infiltration was adopted, as advocated by the Calcutta School of Tropical Medicine. Injections were mainly given in the Deltoid and Gluteal regions, twice a week, commencing with ½ c.c. and going up to 5 c.c. increasing by ½ c.c. each time.

Treatments.—Of the 600 inmates in this institution only 263 (173 males and 90 females) received special treatment during the year. The treatment is not compulsory. Only those who volunteer are so treated. The total number of days on which injections were given was 63 E.C.C.O. and 23 Hydnocarpus Oil.

Untoward Symptoms.—During treatment and after, a careful watch is kept on any reactions which may occur. The E.C.C.O. mixture sometimes causes severe reactions. The following symptoms mainly due to the drug entering a vein were noticed:—Fits of cough sometimes with slight haemoptysis, dizziness, tight feeling in the chest and choking. A woman and a boy had dizziness followed by epileptiform convulsions. Indurations and abscesses have occurred in a few cases at the site of the injections.

No complications either local or general were noticed in those who had the pure Hydnocarpus Oil. This oil being a cheaper drug, a careful watch is being kept on its effects on the patients.

The tables given below show the progress of treatment:—

Table A.—*Males 173.*

Number of Injections.	Number of Patients.	Marked Improvement.	Slight Improvement.	No Improvement.
Over 50	23 ..	2 ..	13 ..	8
25 to 50	68 ..	5 ..	22 ..	41
1 to 24	82 ..	2 ..	4 ..	76

Table B.—*Females 90.*

Over 50	20 ..	3 ..	9 ..	8
25 to 50	49 ..	2 ..	12 ..	35
1 to 24	21 ..	— ..	— ..	21
	263	14	60	189

From the above figures it will be seen that the patients are not regular in taking injections, but on the whole it is encouraging to note that the patients are more hopeful and seem to take more interest in the injections treatment. There has been an increase of 70 patients receiving injections, as compared with last year's figures.

Those who have been more regular in receiving the treatment have shown better results, that is, the results are in proportion to the number of injections. It is impossible to get startlingly good results in an institution like this, where most of the patients are admitted after the disease has progressed for several years.

Appreciable improvement has been always noticed in early cases and in young individuals.

Number discharged from Asylum.—Patients who have shown improvement were examined three times by the Assistant Bacteriologist of the Bacteriological Institute, Colombo, and of these 19 were found to be free from Bacillus Leprae on three successive examinations. These 19 will be discharged on condition that they agree to report themselves every three months to the nearest Medical Officer.

Of the 17 discharged in 1927, 2 have returned to the Asylum with a fresh outbreak of ulcers.

Newspapers.—The patients are indebted to the Editors of the Ceylon daily papers, both morning and evening, for the free copies sent for the use of the patients.

Mantivu.

The following particulars are given for Mantivu Leper Asylum for the year under review:—

Number admitted during the year	..	..	27
Number died during the year	..	..	8
Number discharged or absconded during the year	..	..	19
Number remaining on December 31, 1928—			
Males	103		
Females	33		
Total ..			141
Number of new cases admitted—			
Males	20		
Females	4		
Total ..			24
Number of readmissions	..	..	3
Daily average	..	..	146.01
Percentage of deaths	..	..	5.47

Special Treatment.—In addition to the administration of oil chaulmugra, both orally and by enunction, the only drug of specific value that is used in this Asylum is E.C.C.O. which is administered intra-cellularly.

At the commencement of the year 1928 there were 22 males and 4 females who were undergoing this treatment.

Since May, 1928, 96 males and 27 females are under treatment with E.C.C.O. making a total of 123. No compulsion is made to undergo treatment, but persuasion and tact have resulted in this large number volunteering to undergo what is, after all, a very tedious and uncomfortable form of treatment.

The initial dose in all cases is .5 c.c., rising by .5 c.c. each week to a maximum of 5 c.c. This dosage is given twice a week. The dosage is regulated by regular weighing of the patients and by watching the general health.

It has been found by experience that the best results are obtained in those patients whose habits are clean and who have an abundance of physical exercise. The sufficiency of water available and the abundance of firewood for heating water help to keep the patients clean. The only drawback is that the patients very soon get into lazy and indolent habits and spend most of their time lying in bed, in spite of every facility given for keeping themselves occupied. The experiment is, therefore, being tried of finding manual labour for them for which they are being paid at the rate of 30 cents per day. Patients willing to work and capable of working are given turns at acting for attendants and garden coolies.

During the course of the year under review there have been 16 discharges of patients as non-infective, viz., 12 males and 4 females. There are about a dozen more that will be fit for discharge in the near future. The patients are fairly regular in attendance for treatment and have confidence in its efficacy as a cure. With regularity and persistence in the carrying on of the treatment the Medical Officer of the Asylum is confident of ever improving results.

Newspapers.—The patients are indebted to the Editors of the "Times of Ceylon," "Ceylon Morning Leader," "Ceylon Independent," "Ceylon Chronicle," and "Hindu Organ" for free copies of their respective papers.

VIII.—METEOROLOGY.

The following report was prepared by the Superintendent, Colombo Observatory:—

Rainfall.—The highest total was 246.3 inches at Kenilworth. Carney came next with 236.8, and still holds the highest average (233.6) among stations with over ten years' figures. Others with over 225 in 1928 were Ingoya and Maliboda.

The lowest figures were 25.80 at Puvarasankulam and 27.88 at Yala. Marichchukkaddi still holds the lowest average (34.61) from which its total for this year differed by less than a tenth of an inch. Other gauges with averages of less than 40 are the three on Mannar Island and Pomparippu.

The chief features of this year's rainfall were freedom from cyclonic activity (except for an interesting exception in July), a weak south-west monsoon, and well developed inter-monsoon local thunderstorms. The last named made the distribution of rain rather uneven, and difficult to summarize briefly. The average was passed at most stations in the Kelani Valley, the North-Western Province, the Jaffna Peninsula, and along the north-east coast and at about half those in the remaining low-country areas. Deficits predominated in the North-Central Province, in the up-country areas, and immediately south of the main hills. The most marked deficits were in the Rangala and Horton Plains districts.

Temperature.—The temperature in 1928 was on the whole slightly above average. The offsets in Table II. are comparable between one station and another although some observations were made in sheds and others in screens, as in the latter cases the old shed averages have been adjusted to equivalent screen averages by means of simultaneous readings in sheds and screens before the former were discontinued.

The station showing the highest mean shade temperature for the year was Mannar 83.1° F., and the lowest Nuwara Eliya with 59.9° F. The figures for Colombo and Kandy were 80.8° F. and 77.2° F., respectively.

The highest shade temperature in air recorded during the year was 99.3° F. at Anuradhapura on March 26. The highest on record is 103.7° F. at Trincomalee on May 12, 1890. The lowest this year was 31.2 at Nuwara Eliya (6,000 feet above sea level) on February 20, at which station 27.1° F. was recorded in 1914. The highest shade temperature in Colombo in 1928 was 92.0° F. on March 10, and the lowest 65.9° F. on February 27.

The mean daily range, *i.e.*, the difference between the mean of the maximum and the mean of the minimum, was highest at Badulla 18.2° F., and lowest at Galle 7.8° F. At Colombo and Kandy it was 11.1° F. and 15.0° F., respectively. The absolute range for the year, *i.e.*, the difference between the highest and the lowest readings actually recorded at any one station, was greatest at Nuwara Eliya 46.1° F. and lowest at Galle 20.4° F.

Returns.—Meteorological returns are given at the end of this report for the towns of Colombo, Jaffna, Galle, Nuwara Eliya, Kandy, and Batticaloa.

IX.—SCIENTIFIC.

(1) *Government Bacteriological and Pasteur Institutes.*

The report of the Director, Dr. L. Nicholls, for the year 1928 is as follows:—

A.—*BACTERIOLOGICAL INSTITUTE: Routine Work.*—The number of specimens examined (including the number of vaccines prepared) during the year 1928 was 16,649 and the fees received totalled Rs. 5,379. The character of the examinations carried out is shown in the following table:—

Specimens.	Official.	Private.	Positive.	Negative.	Total.
"Widal" reaction typhoid	2,007	38	530	1,515	2,045
"Widal" reaction paratyphoid A	899	19	14	904	918
"Widal" reaction paratyphoid B	898	11	—	909	909
Blood for Wassermann test	2,103	145	716	1,283	2,248
Blood for malarial parasites	31	24	15	40	55
Specimens for *B. leprae*	80	1	23	58	81
Sputa for tubercle bacilli	127	20	31	116	147
Sputa for pneumococci	6	—	3	3	6
Human material for *B. pestis*	65	—	21	44	65
Rats for *B. pestis*	2,921	—	9	2,912	2,921
Scrapings for spirochaetes	—	10	2	8	10
Secretions for gonococci	52	3	11	44	55
Secretions for diphtheriae bacilli	107	22	28	101	129
Faeces for amoebae	12	43	10	45	55
Faeces for *B. dysenteriae*	10	4	1	13	14
Faeces for ova of intestinal parasites	2	8	1	9	10
Evacuations for cholera vibrio	30	—	7	23	30
Urine for chemical examination	23	11	—	—	34
Urine for bacteriological examination	92	10	—	—	102
Water (full examination)	44	15	—	—	59
Miscellaneous	132	7	—	—	139
Auto vaccine supplied	47	11	—	—	58
Anti-typhoid vaccine doses	3,199	1,021	—	—	4,220
Gonococcal vaccine doses	2,230	—	—	—	2,230
Anti-plague vaccine doses	50	—	—	—	50
Staphylococcal vaccine doses	25	22	—	—	47
Streptococcal vaccine doses	—	12	—	—	12
Total	15,192	1,457	—	—	16,649

Research Work.—During the year 1928 research work was done on:—(1) Snake and snake bites, (2) meliodiosis in cattle, (3) the detoxication of vaccines.

(1) A small treatise on snakes has been written for publication in the Ceylon Journal of Science. The publication will be copiously illustrated, and it is hoped that it will be of value to doctors and others to enable them to identify the poisonous and the commoner snakes of Ceylon. The manuscript and the plates are with the printers and the publication should be available in a few weeks.

(2) A specimen of pus from a cow which had died suddenly was sent to the laboratory by the Government Veterinary Surgeon. Bacillus whitmori was present in the pus in pure culture. This is the first record of a death in cattle from meliodiosis.

Experiments have been carried out to decide the degree of virulence of this organism to local cattle. Two calves and a cow have been inoculated, but except for abscesses at the sites of inoculation they have remained in good health. The milk from the cow has been repeatedly examined since it was inoculated but it has been negative for B. Whitmori.

When these experiments are completed the results will be published.

(3) Experiments on new methods for the detoxication of vaccine will be published in due course.

B.—*PASTEUR INSTITUTE.*—The number of patients who were treated at the Pasteur Institute during 1928 was 1,448, this being an increase of 365 over the previous year. The number of dogs examined for rabies during 1928 was 386, which is an increase of 132 over the previous year. The amount of fees received during the year 1928 totalled Rs. 5,385.80.

There can be no doubt that rabies has been greatly on the increase during the last year. Table I. shows the Provinces from which the patients came for treatment, and Table II. shows the results of the examination of the brains of dogs sent to the Institute.

Table I.

Province.	Number.	Province.	Number.
Western	805	Eastern	2
Central	298	North-Central	—
Southern	157	South India (Mandapam Camp)	1
Sabaragamuwa	86		
Northern	57	Total	1,448
North-Western	36		
Uva	6		

Table II.

Province.	Positive.	Negative.	Unfit for Examination.	Total.
Western	113	40	14	167
Central	67	43	19	129
Southern	16	11	1	28
Sabaragamuwa	17	11	6	34
North-Western	6	4	6	16
Uva	—	2	2	4
Northern	—	1	6	7
Eastern	—	—	1	1
Total	219	112	55	386

(1) *Failures of Pasteur Treatment.*—The incubation period of hydrophobia is seldom less than one month, and it often extends to six months or more; the principle of treatment consists of immunizing patients by injections containing the attenuated or killed virus of the disease, so that the patients may develop immunity during the long incubation period. It is necessary that patients shall be well housed, well fed, and guarded against undue stresses during the course of treatment, or they may fail to acquire the necessary degree of immunity to ward off the disease.

In most Eastern countries there is a low standard of living among a large proportion of the population. Sixty to 100 per cent. of the poorer classes are infected with hookworm, and malaria is rife. Consequently it is not surprising that failures of treatment are more common than in most European countries, where the natives enjoy a higher standard of living and are subjected to fewer stresses from chronic infections.

In the following table is an analysis of 4,532 consecutive cases treated at the Pasteur Institute from 1919 to the end of 1927 :—

Class of Patients.	Number Treated.	Died of Hydrophobia. Age of Patients. Under 15.	15 to 70.	Over 70	Percentage of Failures.
Non-paying patients	2,817	14	12	3	1.03
Estate coolies	529	5	3	—	1.51
Paying patients—					
Sinhalese	196	—	—	—	—
Tamils	37	—	—	—	—
Europeans	211	—	—	—	—
Burghers	107	—	—	—	—
Others	10	1	—	—	—
Total ..	561	1	—	—	0.18
Government Servants—					
Burghers	147	1	—	—	—
Europeans	41	—	—	—	—
Others	437	1	3	—	—
Total ..	625	2	3	—	0.8

It will be seen from this table that the failures among non-paying patients and estate coolies are far more numerous than among paying patients who obviously enjoy a much higher standard of living. The one failure that occurred among the paying patients was a small Eurasian boy, who was more or less a servant, and whose employer decided to pay the minimum fee.

There are no paupers in the true sense in the European community of Ceylon and consequently as a class they have a high standard of living, and among the 252 Europeans who have received treatment there has not been a single failure. There has not been a failure among the 340 Sinhalese, Tamils, and Burghers who have paid fees and therefore who presumably are of the better paid class. This gives a total of 592 consecutive paying patients who have been treated without a failure

The Government servants are a very mixed group; and five failures were—

(1) A Burgher child.
(2) A Sinhalese child.
(3) Two coolies.
(4) A Government employee (whose salary was about Rs 50 per month and who was alcoholic).

More than half the failures have been children, and the majority of these have been the badly-cared-for progeny of the poorest classes.

When a properly equipped Pasteur Institute is eventually built it will be advisable to supply the in-patients with a very generous diet.

(2) *The Diagnosis of Fatal Cases of Hydrophobia.*—There have been a few cases where the deaths of patients after Pasteur treatment have been reported as due to hydrophobia, in which the correctness of the diagnosis appears doubtful. The following are three instances :—

(*a*) A child received treatment and died with cerebral symptoms twelve days afterwards. A diagnosis of hydrophobia had been made. A post-mortem was held and a portion of the brain was sent to this laboratory. It was exhaustively tested both microscopically and by animal inoculation but was negative for hydrophobia.

(*b*) A child aged nine died five days after Pasteur treatment, a diagnosis of rabies had been made, and a post-mortem was held; a portion of the brain was received at this laboratory; it was in a preserving fluid which rendered it suitable only for microscopical examination. Thorough and repeated examinations were made but it was negative for hydrophobia.

(*c*) An aged man in a comatose condition was picked up in the road and taken to a provincial hospital, he died the next day. He had received treatment at the Pasteur Institute. The cause of his death was returned as due to hydrophobia. But as far as could be ascertained, he had shown no symptoms which were characteristic of hydrophobia.

More than 1,000 patients are now treated annually at the Pasteur Institute, and as the death rate for Ceylon is approximately 25 per thousand, it is to be expected that about 25 of the treated patients will die from various causes during the year following the treatment.

If any of these die after showing cerebral symptoms there appears to be a tendency for their relatives to conclude that the deaths are due to hydrophobia; and occasionally where the cause of the symptoms is obscure the conclusion may receive the support of a doctor.

Wherever possible a post-mortem examination should be made when a patient is suspected to have died of hydrophobia, and portions of the brain should be forwarded to this laboratory.

(3) *Cases of Interest.*—The following cases of interest are briefly reported :—

(*a*) Two fairly well-to-do men and a carter one after the other attempted to secure a stray puppy.

Each of the three was bitten but the bites were very trivial. All eventually received native treatment. They died of hydrophobia in forty, forty-nine, and fifty-two days, respectively.

(*b*) Four persons were bitten by a dog, which was stated to have died later. Three of them were treated at the Pasteur Institute and are alive and well. The fourth, who was the last to be bitten, was not treated and died of hydrophobia.

(*c*) Seven persons were bitten by a dog. The brain of the dog was examined in this laboratory, it was positive for rabies. Three took Pasteur treatment immediately, and are alive and well. Two of the four untreated persons have died of hydrophobia. These two were the second and third persons bitten by this dog.

There appears to be a popular fallacy that only the first person bitten by a rabid dog can acquire the infection.

(*d*) Five persons were bitten by a dog. The brain of the dog was examined in this laboratory, it was positive for rabies. Four underwent Pasteur treatment immediately, and are alive and well. The fifth took native treatment and has died of hydrophobia.

C.—*BRANCH LABORATORIES.*—The number of specimens examined at each of the branch laboratories in the Island during the year 1928 is given in the following table :—

Kandy	12,220	Anuradhapura	4,501
Kurunegala ..	14,153	Jaffna	4,319
Galle	8,653	Batticaloa	3,365
Ratnapura	7,101	Chilaw	1,800
Badulla	5,536	Lying-in Home	1,066

(2) *Interesting Hospital Cases, &c.*

General Hospital, Colombo.—(i.) Dr. Lucian de Zilwa reports:—I. Several striking cases of cures by Yatren treatment, in chronic diarrhoeas not yielding to other forms of treatment. He gives his technique as follows:—

(1) Yatren pills 0.25 gm, 2 to 4, three times a day. Yatren irrigations, preceded by a wash-out, for nine days.

1st day. 1 gm in 200 cc. warm water.
2nd day. 2 gm in 400 cc. warm water.
3rd to 9th day. 3 gm in 600 cc. warm water.
If there is any difficulty in retaining the irrigations six hours, 20 min. of tinct. opii is added.

(2) Five days rest from the irrigations, the pills being continued.
(3) Nine days irrigations as above, with pills.
(4) Five days rest. Pills continued.
(5) Nine days irrigations. Pills continued.

II. That a very large number of advanced cases of cancer of the cervix, now admitted to the Gynaecological ward, could probably be treated by the application of radium. He cites a case where Wertheims' operation was performed, but the cancer recurred again after four years, killing the patient.

(ii.) Dr. Garvin Mack reports:—The increase in the incidence of malaria in Colombo. Invariably the benign or the malignant tertian parasites had been found in the blood, but never the quartan. In cases where the quartan parasite had been found, the patients could be shown to have been infected in Badulla and its environs.

The quickest method of treatment was to give an intra-muscular injection followed by oral administration of quinine, with an initial calomel purge. Plasmoquin was not suitable for hospital cases as the drug was slow in action and expensive.

Following the recommendation of Dr. Urchs of Dutch Guiana, Dr. Mack had obtained excellent results from Rivanol in the treatment of amoebic dysentery and other forms of colitis. He now combined it with another drug—Spirocid—which was said to enhance the efficacy of Rivanol.

(iii.) Dr. Milroy Paul, Surgical Registrar, reports:—(1) A female patient age 6 was admitted for the investigation of an unsightly facial hollow, below the right orbital margin, which was of four and a half years' duration.

On examination this hollow was found to be caused by a loss of the subcutaneous tissue in this region, there being no bony abnormality or muscular paralysis. This case illustrates the early stage of the Parry Romberg Syndrome or Facial Hemiatrophy.

(2) The rare survival of a patient with an Occipital Meningocele was met with in a male patient aged 23, who had a swelling of the size of a foetal head.

He suffered no inconvenience from this, and sought admission to hospital for the treatment of an alveolar abscess.

(3) A male patient aged 80 complained of a facial tumour which was first noticed twenty-eight years ago. He had smooth, bony, hard bosses growing from the nasal and external surfaces of the right superior maxilla and a similar boss growing from the hard palate and extending well to the left of the middle line. The right maxillary antrum showed clinical evidence of chronic sinusitis. An X'ray picture showed small stippled shadows scattered through the body of the tumours. The length of the history, with a clinical and X'ray characteristics of the tumours, point to a diagnosis of Leontiasis Ossea of the creeping Periostitis type.

(4) A male patient aged 21 was stabbed in the back of the neck. He showed the Brown-Sequard Syndrome from a hemisection of the spinal cord, having a hemiplegra on the side of the stab wound with a contra lateral loss of the sensations of pain, heat, and cold below the level of the wound.

(iv.) Dr. G. Cooke reports:—(1) Advanced cases of anchylostomiasis, even with kidney lesions, treated successfully with carbon tetrachloride alone instead of combining it with oil of chenapodium. The latter drug had proved disastrous in his hands.

He gave 40 minims of carbon tetrachloride in crushed ice at 7 A.M., and at 9 A.M. the drug acted as a vermifuge as well as a purgative. The carbon tetrachloride should be pure and colourless.

(2) Cases of malarial cachexia with enlarged spleens treated with a new drug called Basogen, manufactured by Messrs. Carnick & Co., N.Y., the makers guarantee a diminution in the size of the spleen. The spleens certainly contracted after the use of the drug, but never reached half the original size.

(3) Anchylostomiasis produced a secondary anaemia very similar to pernicious anaemia. The blood condition in such cases greatly improved with Evan's Hepatex, a liver extract preparation, and liver soups and curries prepared in hospital from fresh liver.

(v.) Dr. R. L. Spittel reports:—(1) Favourable results from aspiration of liver abscess instead of the open operation. He emptied out the abscess cavity at one sitting by attaching a Cathcart's suction apparatus for a few hours until all the pus had come away. Emetin, Yatren, Stovarsol, and/or other amoebicides were given at the same time. He had only 6 deaths out of 40 cases thus treated—a very favourable mortality rate compared with that of the open operation.

(2) In the case of betel-chewer's cancer of the tongue, he had given up operating except in very early cases, as the growth invariably recurred. In such cases diathermy destroyed the fungating mass and left a firm scar; but here too the growth reappeared. He looks forward to obtaining better results from radium when it becomes available.

(3) An open operation was necessary in 2 cases of dislocation of the metacarpo-phalangeal joints of the thumb and index finger caused by a net ball. The obstacle to reduction was the flexor tendon of the digit which slipped behind and hitched against the head of matacarpal and base of the first phalanx.

(4) A case of rupture of the tunica albuginia caused by a blow from a hockey stick. Patient complained of pain in the testicle and swelling for months. Operation revealed a blood-stained hydrocele and a fleshy excresence on the testicle where the parenchyma had been squeezed through the tunica albuginia and granulated over.

(5) Two cases of " acute abdomen " due to perforation, one in a case of amoebic dysentery, and the other bacillary dysentery.

(6) A case of Elephantiasis neuromatosa of Virchow, where amputation was performed under spinal anaesthesia. The amputated limb weighed 35 lb., and the rest of the patient 65 lb. The patient stood the operation very well.

(vi.) Dr. Cyril F. Fernando, Medical Registrar, reports:—(1) A case of " Camphor Habit " in a young man admitted to hospital with intense neurasthenia and symptoms of an acute duodenal ulcer.

Five years ago patient had been treated for typhoid fever, in the course of which he had injections of camphor and ether. He liked the effect of camphor so much that he got a piece of camphor and enjoyed nibbling at it frequently.

After leaving hospital he always kept a stock of camphor and consumed on an average a square inch slab every three days. He had also taken camphor dissolved in spirits of wine and in oil of eucalyptus. Of the latter he took as much as five drops in tea about eight to ten times daily. When he improved in health the craving passed off, but whenever he was run down he felt miserable without a piece of camphor to soothe him.

(2) A case of Jacksonian fits in a boy of 14, said to be suffering from " Epilepsy " of four months' duration. The patient was said to have had about ten attacks within this period, and each attack had been characterized by a typical history of sensory and motor disturbances starting from the right lower limb and gradually passing on to the upper limb. There was usually also a transient loss of consiousness.

The patient was found to be mentally below normal. There was wasting of muscles of the right hand and forearm said to have followed an attack of anterior polyomyalitis six years ago.

The reflexes were exaggerated on the R. side and there was hyperaesthesia over that side.

The Wassermann reaction was positive.

The sensory disturbances during the attacks point to a cortical lesion in the region of the post-central gyrus, probably gummatous in origin.

(3) A case of " Cerebral Cyst " communicating with the lateral ventricle in an elderly man.

The patient was found unconscious by the police and brought to hospital. Immediately after admission patient had a series of epileptiform fits, one occurring every five minutes.

The following day he developed a right sided hemiplegia with exaggeration of reflexes and a positive Babinsky on that side.

The Wassermann reaction was reported positive.

On the third day after admission patient became comatose and died suddenly.

Post-mortem—a large cyst was found below the frontal and temperosphenoidal lobes of the brain. The cyst communicated with the left lateral ventricle.

(4) A case of Erythema Nodosum in a young woman, who complained of sore throat, stiffness of the neck, fever lasting seven days, and swelling of both legs.

Several nodules were found in the lower parts of both legs. The nodules were pink in colour, raised over the surface, hot and tender to touch, and varied in size from a centimetre to an inch. The patient made a complete recovery on a salicylate mixture and left hospital in a fortnight.

(5) A case of aneurysm of Thoracic Aorta rupturing into the pleural cavity in a girl eighteen years of age. The patient showed an epigastric swelling, dull on percussion, and which did not move with respiration. The swelling was quite distinct from the area of liver dullness. Though she gave no history of dysentery liver abscess was suspected and patient put on a course of emetine. A month later patient developed dullness over left base of lung, with diminished breath sounds and crepitations. The upper portions of the recti became rigid. Exploratory puncture yielded a flow of blood. Patient gradually sank and died in a few days.

Post-mortem—a large aneuriam was found in the lower part of the thoracic aorta. It had ruptured into the left pleural cavity.

(vii.) Dr. W. A. E. Karunaratne, Pathologist, reports:—(1) A case of pulmonary embolism in a patient admitted to hospital for the treatment of malaria. Both spleen and liver enlarged. On the tenth day after admission he complained of pain over the left lung, dyspnoea, and coughed up a few ounces of blood.

Post-mortem—a thrombus was found in the left pulmonary artery.

(2) A case of Sarcoma of the Omentum in a patient admitted to hospital for the treatment of debility and ascites. He had been ill for about six months previous to admission. There was moderate ascites and " spleen " was enlarged.

Post-mortem—a large fleshy tumour of the size of an unhusked coconut was found growing from the omentum. Microscopically it was a spindle celled sarcoma.

Kandy Hospital.—(1) Dr. F. N. Spittel, Surgeon, reports a case of Ectopic Gestation in Interstitial part of fallopian tube with rupture of tube and uterus. Patient, a primipara, aged twenty years, was admitted to hospital on May 7, 1928, with a history of pain in the abdomen of two months' duration with occasional vomiting and amenorrhoea of three months. She had tenderness, distension, and slight rigidity of lower abdomen. P.V.A. lump was felt in left fornix.

On operation blood was found in the peritoneal cavity. The uterus was found ruptured at the fundus, chiefly on left side, together with the left tube near the uterine end. The placents was found partly separated and a three months' foetus was lying in the peritoneal cavity. The ruptured tube was removed but the rupture of the uterus was trimmed up and sutured. The patient made an uninterrupted recovery.

The particular interest of the case lies in the rarity of this type of tubal gestation which grows into the musculature of the uterus eventually leading to rupture of part of the uterus and the tube.

(2) Left sided Inguinal Hernia with caecum and appendix in sac. The patient was a boy of six years of age who was admitted with congenital phimosis and a left sided inguinal hernia. On operation a very mobile caecum and appendix were found in the sac. There was no transposition of viscera to be detected.

De Soysa Lying-in Home, Colombo.—Dr. S. L. Navaratnam reports:—(1) A case of Carneous mole in a women with a history of ten months' amenorrhoea.

(2) A case of Precipitate labour in a women eighteen years of age. The cervix on admission was three fingers dilated. Membranes ruptured 45 minutes later, and in another quarter of an hour the child was born. There was a small tear in the cervix and the perineum, which was repaired.

(3) A case of concealed accidental haemorrhage in a multiparous woman.

Lady Havelock Hospital.—Dr. (Miss) Catherine Anderson, Medical Officer in Charge, reports:—(1) A case of great enlargement of the spleen removed by operation. The spleen extended towards the right below the umbilicus to within an inch of Poupart's ligament. The patient was a very anaemic woman and her general condition was therefore treated first. Two months after admission splenectomy was performed. The spleen weighed 4¾ lb. After operation patient had a rise of temperature to 101° which gradually settled down in a week. The wound healed by first intention and patient left hospital a month after operation.

(2) A case of cervical rib in a girl twenty-two years of age. The patient complained of aching pain and numbness all over her left arm for two months. Being a thin subject, a prominence could be felt just above the middle of the clavicle. X'ray confirmed the diagnosis of cervical rib on both sides. The one on the right did not give rise to any symptoms.

An incision was made along the necklet-line, 4 inches long, and after deep dissection the Scalenus medius muscle was found attached to the extra rib. This muscle together with the Brachial plexus was pushed forward exposing the extra rib, and the anterior 1½ inches was resected away.

The wound healed up perfectly; the pain and numbness were no longer present; and three months after operation patient was very well.

(3) A Fimbrial cyst weighing 34 lb. in a women *aet.* 19. The patient had a cystic swelling filling the whole of the abdominal cavity, widening out the lower ribs, and exerting pressure on the diaphragm and the lungs.

The enlargement was said to have commenced only six months previous to admission and had rapidly increased in size. The abdomen was opened by an incision 8 inches long through the rectus muscle, and the cyst had to be tapped before removal. It contained a clear serous fluid. The cyst was found attached to the broad ligament. The cyst and fluid weighed 34 lb. Three weeks after operation patient left hospital, feeling very well and able to walk comfortably.

(4) A case of extra-uterine pregnancy of the posterior intra-ligamentous variety in a 2nd-para. The patient complained of severe abdominal pain and bleeding per vaginam for fifteen days. There was a history of amenorrhoea for six months.

The pulse was 130, small and soft. Temperature 101.4, and patient was very anaemic. A hard lump about the size of an orange and very tender to the touch was felt just above left Poupart's ligament. On examination P.V. cervix was left high up behind the symphisis, and the pelvis was filled with a tense hard swelling. An ectopic was suspected.

On opening the abdomen, the hard tender swelling felt above Poupart's ligament was found to be the uterus, and to the right of this was a hard tense fixed tumour, with the isthmus of the Fallopian tube running across the top of it. Incision was made into this and there was an escape of blood-clots and sanguinous fluid. An incarcerated foetus of six months was removed. The placenta, which was found attached to the pelvic floor, was removed and the cavity packed with gauze to arrest haemorrhage. As it was impossible to remove the sac it was marsupialized to the abdominal incision, and the rest of the wound closed. On removing the pack 48 hours after operation it was found to have the odour of urine. Evidently the ureter had been torn while removing the placenta. On the ninth day the pack had no smell of urine, and so the wound on the ureter had evidently healed. Patient was still in hospital at the end of the year and was doing very well.

Female Branch Hospital, Borella.—Dr. May Ratnayake, Medical Officer in Charge, reports:—(1) A case showing persistence of the Gonococcus long after the subsidence of the severe initial symptoms.

The patient complained of frequency of micturition, and on examination was found to have extensive vulvo-vaginitis with warty out-growts and excoriations of the labia.

The Wassermann reaction, at first reported "doubtful," remained negative on subsequent examinations. A course of N.A.B. injections resulted in a severe arsenical dermatitis when a total quantity of only 2.25 gm. were given. Smears for Gonococci, at first reported negative, remained persistently positive in spite of intense local therapy, off and on, for a period of over nine months.

(2) A case of Gonorrhoeal Arthritis responding to "Proteinshock" therapy.

The patient was practically crippled with multiple arthritis, and was emaciated and mentally defective. A purulent discharge from the vagina was reported positive for Gonococci.

After two months' intense local treatment and a course of Gonoc. vaccine, the vaginal discharge cleared up and become free of Gonococci. There was, however, no improvement in the joints though local applications and fomentations were carried out during that period.

Intra-venous injections of sterile milk (2-3 cc. at a time) were then tried. There was at first a slight reaction after each injection, but after the third injection there appeared symptoms of anaphylactic shock. This passed off in a few minutes with an injection of m.v. of adrenalin. Local applications and the Gonococcal vaccine were carried on for another fortnight.

The pain and swelling of the joints gradually improved and patient was able to walk and returned home practically cured.

McLeod Hospital, Inuvil (Medical aided).—Dr. Isabel M. Curr reports:—(1) An interesting case of delivery of a full term living child and a mummified full term foetus of a previous ectopic.

Patient, a 2nd-para, was brought into hospital after being in labour for three days. Membranes had ruptured. Cervix was fully dilated. Both feet were presenting anteriorly, while a hard mass, resembling a full term foetal skull, covered with thin elastic tissue, presented posteriorly. The history showed that two years ago patient had a period of ten months' amennorrhoea. About her sixth month of that period patient had been admitted to hospital and a ectopic pregnancy was diagnosed. The patient, however, refused to stay in hospital as a Tamil " physician " had told her that she was not pregnant and gave her some medicine. After that she had regular menses for one year followed by the present pregnancy; but she had all along felt a tumor in the abdomen.

The mass was pushed up and a full term living male child was delivered by traction. The hard mass was now felt on the left side of the uterus. An incision was made in the vaginal fornix dissecting through the sac surrounding the hard mass, and a mummified full term female foetus was extracted manually. The placenta which was adherent to the broad ligament and omentum was removed after ligaturing the vessels.

Mother and child were discharged quite well, four weeks later.

(3) *Clinical Laboratory (General Hospital, Colombo).*

In the Clinical Laboratory, General Hospital, 30,292 specimens were examined during the year, as compared with 21,027 the previous year and 19,544 in 1926.

(4) *Special Reports.*

The following reports are given in the Appendix:—

(1) Report of Dr. A. T. Kurien, Superintendent, Anchylostomiasis Campaign, for the year 1928.
(2) Report of Mr. H. F. Carter, Medical Entomologist, for the year 1928.
(3) Report of Dr. K. J. Rustomjee, Superintendent, Anti-Malarial Campaign, for the year 1928.
(4) Report on Health Unit work by Dr. S. F. Chellappah, Senior Medical Officer of Health, for the year 1928.
(5) Report of Mr. B. R. Dyer, Sanitary Engineer, for the year 1928.

X.—MISCELLANEOUS.

(1) *Ceylon Medical College.*

The following extracts from the report of the Registrar of the Ceylon Medical College, Dr. F. O'B. Ellison, for the year 1927-28 are given:—

General.

The Registrar and Professor of Physiology, Dr. F. O'B. Ellison, left the College on long leave for nine months on April 11, 1928, and was absent in the United Kingdom until the end of the Academic Year. He returned and took up duty again on January 9, 1929.

During his absence Dr. A. Gordon Smith, Professor of Anatomy, acted as Registrar, and Dr. Lucian de Zilwa acted as Professor of Physiology.

The following appointments on the permanent staff took place during the year:—Dr. Lional de Silva as Lecturer on Medicine; Dr. S. Thiagarajah as Lecturer on Elementary Anatomy and Physiology; Dr. C. I. de Silva as Lecturer on Tuberculosis; Dr. S. Thiagarajah as Lecturer on Practical Pathology; Dr. V. A. Gunatillake as Lecturer in Hospital Forms; Dr. E. C. Alles as Lecturer in Venereal Diseases; Dr. A. M. de Silva as Lecturer on diseases of the Ear, Nose, and Throat.

During the year two students were expelled from the College, one was suspended from studies for one year and one for six months on account of gross breaches of discipline.

An important even which marks this year is the setting up of a Post-licentiate Scholarship by Government, which is granted yearly to the best student of the Final Year who qualifies in the First Class within the statutory period, to enable him to obtain British qualifications and also to pursue studies and research in some special subject. The value of the Scholarship is £300 per annum for special study.

The building of the new three-storey block to accommodate the entire Physiology Department, College Offices, Library, and Students' Common Room is now almost completed.

Academical.

The number of students who joined during the year having passed the Pre-medical examination was 21. The number of students who qualified L.M.S. (Ceylon) was 20. The number of apothecaries qualified was 17. The total number of medical students in the College on October 1, 1927, was 105. The total number of medical students in the College on September 30, 1928, was 99. The total number of apothecary students in the College on October 1, 1927, was 74. The total number of apothecary students in the College on September 30, 1928, was 60. A small number of students generally discontinue study in the Ceylon Medical College and go to the United Kingdom to complete their studies.

Results of Examinations (Medical).

	December, 1927.		March, 1928.		July, 1928		Total.	
	Sat.	Passed.	Sat.	Passed.	Sat.	Passed.	Sat.	Passed.
Final	21	8	21	7	19	5	61	20
Second Professional	—	—	18	13	11	7	29	20
First Professional	—	—	11	5	12	8	23	13
	September, 1927.							
Pre-medical	23	7	40	14	—	—	63	21

Results of Examinations (Apothecary Students).

	December, 1927.		March, 1928.		July, 1928.		Total.	
	Sat.	Passed.	Sat.	Passed.	Sat.	Passed.	Sat.	Passed.
Second Apothecaries ..	3 ..	2 ..	15 ..	10 ..	9 ..	5 ..	27 ..	17
First Apothecaries ..	— ..	— ..	21 ..	17 ..	31 ..	20 ..	52 ..	37

(2) *King Edward VII. (Memorial) Anti-Tuberculosis Fund.*

The report of the Secretary of the Fund for the year 1928 is as follows:—

Propaganda Work.—The series of seven health lectures dealing with the incidence, spread, and prevention of tuberculosis, which have been published annually in the English and vernacular newspapers in Colombo and Jaffna, were re-written during the year 1928 by the Medical Department, and were published in the same newspapers as in previous years. The Sub-Committee of the King Edward VII. (Memorial) Anti-Tuberculosis Fund thanks the Colombo and Jaffna Press for the space allowed in their newspapers for these letters.

A set of seven leaflets issued by the National Association for the Prevention of Tuberculosis, London, which have been revised by the Medical Officer of the King Edward VII. (Memorial) Anti-Tuberculosis Institute, Colombo, to suit local conditions, have been translated into Sinhalese and Tamil, and quotations are now being invited for printing and supplying these leaflets in English, Sinhalese, and Tamil for propaganda use.

The question of obtaining from the National Association for the Prevention of Tuberculosis in London twelve sets of posters, cinema films, and lantern slides regarding tuberculosis received the consideration of the Sub-Committee during the year, but, as some members are of opinion that the posters and cinema films will not be suitable for use in Ceylon, even if they are altered to suit local conditions, the Sub-Committee is now considering whether the lantern slides only should be obtained.

New Sanatorium at Kankesanturai.—Twelve tenders were received for the construction of the new sanatorium at Kankesanturai. All the tenderers were from the Jaffna District. The tenders, together with a report thereon by the Director of Public Works, was carefully considered by the Sub-Committee, and the tender submitted by Mr. M. Muttiah of Fourth Cross street, Jaffna, was accepted.* The Provincial Engineer, Northern Province, has entered into the necessary contract with the successful tenderer, and a start has been made with the construction of the sanatorium, which, it is expected, will be completed about the middle of 1930. The new sanatorium will provide accommodation for 12 paying patients (6 males and 6 females) and 32 non-paying patients (16 males and 16 females).

The Government has under consideration a proposal to add a special wing at Government expense to the new sanatorium at Kankesanturai for tubercular prisoner patients, and the question of allocating a site for this purpose on the premises of the sanatorium is being considered by the Sub-Committee.

Works proposed.—The following proposals, which had been postponed for consideration until the tenders for the construction of the new sanatorium at Kankesanturai had been considered, were brought up again during the year 1928, and the Sub-Committee was of the opinion that these proposed works should be carried out from maintenance funds, and not from the King Edward VII. (Memorial) Anti-Tuberculosis Fund:—

(*a*) Provision of electric light at Ragama hospital.
(*b*) Provision of conservancy arrangements (on the water carriage system) at Ragama hospital.
(*c*) Provision of an ambulance for the transmission of patients between Colombo, Ragama, and Kandana.

The Director of Medical and Sanitary Services has been informed accordingly.

The question of providing a special children's ward at Kandana sanatorium has been left over for consideration at a later date.

Finance.—The accounts of the Fund have been audited by the Colonial Auditor's Department, and a certified statement of receipts and payments, showing the working of the Fund during the year 1928, together with a statement of receipts and payments from the inception of the Fund up to December 31, 1928, is attached.

It will be seen from the former statement that a sum of Rs. 53.01 has been donated, through the Hon. the Colonial Treasurer, to the Fund by Mrs. I. Charles Perera, Gonakelle, Passara, and three others. This sum represents the amount due to them in respect of a refund of 50 per cent. of the contributions of the late Mr. C. A. Perera under the Widows' and Orphans' Pension Scheme. The Sub-Committee thanks the donors for their philanthropic act.

KING EDWARD VII. ANTI-TUBERCULOSIS FUND.

Statement of Receipts and Payments for the Year ended December 31, 1928.

RECEIPTS.	Rs. c.	PAYMENTS.	Rs. c.	Rs. c.
Balance on December 31, 1927 ..	118,319 36	Mr. M. Vairavapillai being bonus for auditing the accounts of the Fund ..		15 0
Donation from Mrs. I. Charles Perera, Gonakelle, Passara, and three others ..	53 1		Rs. c.	
Interest on current account ..	187 59	Mr. W. A. de Silva for clerical assistance ..	19 25	
Interest on fixed deposits ..	3,635 49	Mr. J. H. Perera for clerical assistance ..	15 75	
		Mr. G. D. C. Dias from May 1, 1925, to December 15, 1928	105 53	
		Peon A. R. Abbas ..	1 53	
		Messenger S. M. Usoof ..	0 90	
		K. Simon Pieris ..	8 82	
		Bicycle Orderly M. Hamim	4 0	
				155 78
		Mr. H. A. de Almeida and Mr. S. Murugasoe for translating health letters into the vernacular		40 0
		Cheque book		1 25
		Messrs. F. J. and G. de Saram—fee for executing deed of gift in respect of land donated by Mr. A. E. de Silva ..		42 0
		Advertisement charges *re* new sanatorium to be erected at Kankesanthurai ..		20 0
		Balance—Cash at Bank—	Rs. c.	
		Current account ..	21,617 44	
		Fixed deposits ..	100,303 98	
				121,921 42
	122,195 45			122,195 45

Audited and found correct:

F. G. MOBLEY,
Colonial Auditor.

C. W. COLE,
Honorary Treasurer.

* The total amount of the tender is Rs. 107,671. This leaves a balance of Rs. 14,250.42 to the credit of the King Edward VII. (Memorial) Anti-Tuberculosis Fund, as at December 31, 1928.

King Edward VII. Anti-Tuberculosis Fund.

Statement of Receipts and Payments up to December 31, 1928.

Receipts.	Rs.	c.	Payments.	Rs.	c.
Donations, subscriptions, and sundry collections	392,194	12	Erection of Hospital Sanatorium, apparatus, fittings, &c.	412,389	51
Interest on—			Honorarium to secretary, bonuses to clerks for auditing, and clerical work ..	4,398	62
Rs. c.			Advertising, printing, stationery, travelling expenses, &c.	2,424	21
Current account .. 7,803 5			Balance—Cash at Bank— Rs. c.		
Fixed deposits .. 63,426 93			Current account .. 21,617 44		
Donation by the late J. M. and Mrs. Campbell .. 77,657 24			Fixed deposits .. 100,303 98		
On advance to contractor 52 42				121,921	42
	148,939	64			
	541,133	76		541,133	76

Audit Office,
Colombo, February 25, 1929.

F. G. Morley,
Colonial Auditor.

(3) *Civil Medical Stores.*

Reorganization.—Reference was made in last year's Report to the Committee appointed by Government to investigate the organization and control of the Civil Medical Stores, and it was stated that as a result of the recommendations made by this Committee Mr. H. R. Thomas, M.P.S., was appointed Superintendent, Civil Medical Stores, on April 1, 1928. It was realized that after the long absence on sick leave in 1927 of the former Superintendent, Mr. A. D. Cotton, Mr. Thomas would have a very busy time reorganizing matters at the Civil Medical Stores. His report for the year 1928 shows that that was the case. On his assumption of duties he found the stock rooms in a state of disorder and greatly congested. He found a large amount of unserviceable materials, such as dirty bottles, old tins, and rubbish occupying valuable space in some of the stock rooms and in the yard, and his first efforts were directed towards the removal of that unserviceable material and to the systematic arrangement of the stock which was lying unopened in the stores. He paid early attention to the despatch section to ensure that requisitions both civil and estate were complied with more expeditiously, and he points out that in October, 1928, which is about the busiest month in the year, about 60 tons of goods were despatched, as compared with 27 tons in the previous October. During the year the stock was rearranged, the drugs being divided into three sections—wet, dry, and small items—and a separate section was set up for instruments and equipment. Arrangements were made whereby the supply of drugs from England would arrive in four shipments during the year instead of in two shipments as hitherto. This would prevent the disorganization that occurs when large quantities of goods arrive at one time.

Preparation Room.—Arrangements have been made to prepare from extracts some of the tinctures that are at present issued in large quantities. These will be prepared in 50-gallon casks and bottled at the Civil Medical Stores. This will result in a considerable saving to Government, the cost of preparing some of the tinctures being half the imported cost. It will also save space in stores.

Underground Storage for Rectified Spirit.—As a result of the recommendations of the Committee already referred to, plans and estimates were prepared for the construction of tanks for the underground storage of rectified spirit. The tanks will have a capacity of 3,000 gallons, and this method of storing rectified spirit will be a great improvement on the present very unsatisfactory method.

Requisitions.—The number of requisitions received during the year was 8,789 civil and 6,516 estate requisitions, as compared with 5,556 and 3,204, respectively, in the previous year. In the stationery section 4,626 requisitions were dealt with during 1928, as compared with 4,285 requisitions in the previous year.

Quinine.—14,787 pounds of quinine powder and 2,593,450 tablets were issued during the year, as compared with 8,478 pounds and 1,602,824 tablets in 1927, at a cost of Rs. 334,651.75.

Staff.—The staff was increased during the year by 1 overseer, 6 packers, and 3 coolies. The Assistant Superintendent, Mr. James Fernando, retired on October 31, 1928, and a successor was not appointed during the year.

Naval Stores.—The Naval Stores were inspected by Naval authorities and a few unserviceable articles were condemned.

Opium Stores.—The quantity of opium in stock on September 30, 1928, was 4,521 pounds. The amount issued during the year was 3,470 pounds, as compared with 3,829 pounds during the previous year. Opium and its preparations were purchased during the year at a cost of Rs. 172,198. The amount recovered by the sale of opium preparations amounted to Rs. 4,189.05.

Cannabis Indica.—No *cannabis indica* was purchased during the year. Sales amounted to Rs. 27.

Accommodation.—Despite the rearrangement of the stock in the stores and the better use made of the available accommodation, increased accommodation is very badly needed, and, if the requirements of the Department increase in the next few years as they have done in the past few years, a considerable increase in accommodation will be necessary. A more expeditious despatch of stores and drugs could be carried out if there were more accommodation in the despatch department, but the site on which the Civil Medical Stores is built is at present so crowded with buildings that it is impossible to find room for any further additions. Either more land must be acquired or the present stores must be rebuilt.

Results.—The chief results of the year's working can therefore be summarized as follows:—The issue of drugs to institutions has been speeded up and the output increased; the stock has been rearranged and congestion has been to some extent relieved; the surgical instruments section has been reorganized; and a bottling and preparation room has been established.

(4) *Government Vaccine Establishment.*

The following is a summary of the report of the officer in charge:—

The number of calves received on hire from the contractor amounted to 422. During the twelve months 417 calves were used for vaccination, and of these 406 were returned to the contractor. As in previous years, considerable difficulty was experienced in obtaining calves of a quality suitable for vaccination.

Seed lymph for the vaccination of calves was obtained at intervals from the Lister Institute of Preventive Medicine, London. A certain amount was also prepared in this establishment.

Owing to some cases of rinderpest occurring in the close vicinity, this establishment was proclaimed an infected area from December 11. The cases of rinderpest occurred among the cattle belonging to the coolies who reside on the grass land adjoining this establishment, and also among the cattle owned by the numerous families who have recently settled on the site of the old Infectious Diseases Hospital. The position seriously interfered with the working of this establishment.

The total number of capillary tubes of calf lymph issued during the year amounted to 169,634, *i.e.*, sufficient for the vaccination of (approximately) 508,902 persons. Of this number 1,353 tubes were sold, realizing a sum of Rs. 1,180. A large quantity of lymph was also stored in bulk as a reserve supply.

The weekly returns of vaccinators received at this office show that a successful case percentage of 98.3 (primary vaccinations) was obtained with the lymph issued during the year.

(5) *Sale of Opium to Registered Consumers and Vedaralas.*

One opium depôt was closed during the year under review, thereby reducing the number of depôts to 52.

There were no new consumers registered during 1928 (1 had been registered during the previous year) in pursuance of the policy of restricting new registration. The total number of registered consumers served from the depôts in the Island during the year was 6,061, as against 6,591 in 1927 and 7,165 in 1926. 5,552 of the consumers obtained eating opium and 509 obtained smoking opium, as against 6,042 and 549, respectively, in 1927, and 6,583 and 582, respectively, in 1926. 3,101 vedaralas purchased eating opium, as compared with 3,064 in 1927 and 2,890 in 1926. It will be evident from the above figures that year by year the number of consumers is steadily decreasing owing to deaths among them. There is an increase in the number of vedaralas to whom opium is issued for purely medical purposes.

2,992 pounds of eating opium and 345 pounds of smoking opium, which realized Rs. 314,381.81 and Rs. 48,312.14, respectively, were sold to consumers and vedaralas during the year, as compared with 3,356 pounds of eating and 386¼ pounds of smoking opium, which realized Rs. 352,747 and Rs. 54,091.35, respectively, in 1927. The total amount realized by the sale of eating and smoking opium was Rs. 363,693.95, as against Rs. 406,838.35 in 1927. The large decrease in the sales is mainly due to the 5 per cent. reduction (referred to hereafter) in the opium allowed to consumers and to deaths among consumers during the year under review.

The selling price of opium remained unchanged. Eating opium was sold at 1½ cents per grain and smoking opium at 2 cents per grain.

As a result of the steps taken by the Indian Government to reduce annually by 10 per cent. the raw opium exported from India (mention was made of this matter in my 1927 report), the Ceylon Government received only 31 chests of opium during the year, as against 35 chests in 1927. This reduction was met by an annual 5 per cent. reduction on the quantities allowed to registered consumers, with effect from March 1, 1928. Deaths among consumers, it is anticipated, will result in a further 5 per cent. reduction annually in the amount of opium used.

(6) *Medical Requirements.*

In my last annual report reference was made to five important constructional schemes. These were (1) the rebuilding of the non-paying section of the General Hospital; (2) the building of a new Casualty Department; (3) a Nurses' Home and Training School; (4) the extension of the Lying-in Home; (5) Public Health Laboratories.

For various reasons the progress made with regard to these schemes has been either slow or non-existent.

The first three-storey block of the reconstruction scheme, the completion of which in 1928 was anticipated in my last report, is at time of writing almost completed. The compulsory acquisition of land for the purpose of the Nurses' Home involved lengthy legal procedure, but Government was able to enter into possession at the end of 1928 and the way is now clear for the commencement of building operations.

As pointed out in my last report, the beginning of the construction of a Casualty Department is dependent on the setting free of the site now occupied by the inadequate quarters for Ceylonese nurses. The importance of such a development is obvious, for at present much difficulty is experienced in endeavouring to carry on, in the very cramped quarters available, an Out-Patient Department and a Casualty Department.

The plans prepared for the extension of the Lying-in Home have been found to involve the further acquisition of land, and the question of the absolute necessity for such expenditure, as part of the scheme, is, in view of the finances of the Colony, a matter for further consideration.

No conclusion has yet been come to as the most suitable site for the Public Health Laboratories, the importance of which for the purpose of adequate routine work as well as medical research has been stressed in previous reports.

It is pleasing, however, to record that there is now adequate accommodation for the Medical Entomologist which has been provided for him in a portion of the old Lunatic Asylum buildings.

During the year an Official Committee was appointed by Government to consider what the hospital policy of the Government should be in respect of hospital construction in the Provinces. The Committee recommended that the general policy in the future should be the building of large well equipped and well staffed hospitals in the capitals of Provinces rather than the multiplication of small hospitals scattered about the country. On the publication of the report of the Official Committee a Select Committee of the Unofficial Members of the Legislative Council was appointed to consider that report. This Select Committee has not yet submitted its report.

(7) *General Remarks.*

(1) During the year under review definite advance has been made in the Colony in matters medical and sanitary.

(2) Progress in the improvement of the Public Health must in any country be of necessity slow. In a democratic country it cannot travel faster than the rate of public opinion in favour of the measures necessary for its insurance. In an autocratic country its progress would depend on the knowledge and vision possessed by its rulers. Students of Public Health progress in England, the country most advanced in democratic principles and in the care for the sanitary well being of its people, will observe that Government has never legislated in advance of public opinion. The urge for improvement has come from the people, and in some cases it may truly be said that Government has been forced to act by the pressure of public opinion. A recent example is the legislative action to prevent the addition of chemical preservatives to milk cream and other foods.

(3) No true perspective of the state of the Public Health in Ceylon and of its advancement can be obtained without an intimate knowledge of its inhabitants, indigenous and otherwise, and of their environment, and a comparative study of the changes that are taking place year by year as a result of education and other factors productive of mental and physical uplift, broader outlook, and consciousness of inter-dependent relationship.

(4) A retrospective survey of the last few years reveals definite sanitary progress. Signs are not wanting that a realization that Public Health is a live issue has developed and is taking hold of the minds of the people. Less than ten years ago it was not considered necessary to provide schools with latrines or to include provision for these sanitary accessories in the estimates of Government departments for cooly lines. The Budgets of recent years disclose that lakhs of rupees have been voted for school and public latrines and the provision of latrines for Government employees. Sanitary bye-laws dealing with a variety of matters have been drafted by the Department and made applicable by local authorities to their areas with resultant beneficial effects. It is regretted however that a comprehensive Public Health Ordinance, to the lack of which attention has been directed in previous reports, still remains merely in draft form. The personnel of the Sanitary Branch of this Department consisted in 1920-21 of 7 Medical Officers of Health and 88 Sanitary Inspectors and in the year under review there were 28 Medical Officers of Health and 248 Sanitary Inspectors.

(5) It is estimated that the amount spent in the last few years on tea and rubber estates for the improvement of housing and sanitation of cooly lines is well over Rs. 60,000,000. It is noted with satisfaction that the planting community acknowledge the beneficial results on the health of their labour force occasioned by these improvements. It is also noted that the Planters' Associations in Ceylon and the Ceylon Association in London have recently pointed with legitimate pride to this vast expenditure. The Department of Medical and Sanitary Services has under "The Medical Wants Ordinance" (No. 9 of 1912) and "The Diseases (Labourers) Ordinance" (No. 10 of 1912) the statutory duty of insisting on these sanitary improvements being carried out. Under these circumstances I feel sure that the planting community, whose characteristics of generosity and sportsmanship are so well known, will not grudge the Department some small share of the credit for these sanitary achievements.

(6) Anchylostomiasis or hookworm disease—one of the two greatest enemies of the Public Health in Ceylon, the other is malaria—is being effectively fought. This disease is solely due to soil pollution, and it is only when soil pollution becomes a thing of the past that the disease will entirely disappear. That this day is within sight I am convinced, for the habits of the people are changing, and education and the force of public opinion will result in the rising generation no longer polluting the soil. In the meanwhile, however, the Department has by direct action by mass treatment in specific areas, in schools, on estates, at dispensaries, by its policy of public and private latrine construction, and by propaganda reduced considerably the incidence of this disease. The writer has often stressed the economic wisdom of preventing disease rather than making provision for its treatment. The reduction of anchylostomiasis in planting districts by mass treatment of coolies, and improved sanitary conditions on estates and its effect on hospital admissions are shown by the present-day experience of Government hospitals in these districts. I give an outstanding example. The records of the Lindula hospital show that not so long ago it was overcrowded with cases of anchylostomiasis. To-day this hospital has three wards closed.

(7) The particulars of the anti-malaria work carried out are detailed in the reports of the Medical Entomologist, the Superintendent, Anti-Malarial Campaign, and the Sanitary Engineer, which are included in the Appendix to my Report. To the scientific reader these Appendices will convey a record of researeh, a tale of things achieved, of discouragements, of hopes and fears. For the general reader it may be useful to recall the fact that the Malaria Section of the Congress of the Far Eastern Association of Tropical Medicine held at Calcutta in December, 1927, declared that man-made malaria was the greatest menace to the eradication of this disease. This was the considered opinion of malaria experts of all nations who were present at this Congress. It has been a factor of no small importance in the creation of the malaria problem in Ceylon. It is of no use to cry over spilt milk, but the wise policy is to ensure that no engineering project, large or small, will in the future be creative of the conditions that make for malaria propagation. Something more than a declaration of such a policy is needed. What may be termed the "malaria sense" is required of all engineers and others responsible for construction work. There must be the ever-present query in the mind—"What effect on malaria is this work going to cause?" Two essentials are necessary to the successful carrying out of Anti-Malaria Campaigns, the co-operation of the public and the support of the law. As long ago as 1922 the writer took some small part in endeavouring to bring into existence a Mosquito Ordinance, which however was stillborn before it reached the Legislative Council. The Bill dealing with this subject which was introduced in the Council during the year under review will, it is hoped, be passed into law. The absence of statutory powers has so much hampered the work of the Department in its Anti-Malaria Campaign that unless this Ordinance is passed without emasculation it may be necessary for the Anti-Malaria Advisory Board to modify its programme and policy.

(8) I would direct attention to the paramount importance, as a matter of policy, of the provision of pure water supplies. The tendency of local bodies to indulge in luxuries, such as electric light installations which at the most benefit the few, rather than in the provision of pure water supplies which benefit the many, is to be deprecated.

(9) Special attention is directed to the report of the Sanitary Engineer. A great deal of useful work had in the past been done by the Department in the direction of drawing up type plans of public latrines, laundries, galas, dairies, &c., and all over the country may be seen construction work based on these plans. The inauguration, however, in 1927 of a Sanitary Engineering Division of the Department marked a definite forward step, thus falling into line with other progressive countries in the appreciation of the importance of this branch of engineering. The volume of work, consultative as well as executive, that is already pouring in on this division indicates that it has met an existent need and that its usefulness is being realized. I am convinced that the services that the Sanitary Engineering Division is capable of rendering to the country and to other Engineering Departments of Government and of local bodies will be more and more appreciated as the years pass by.

(10) The dissemination of a knowledge of hygiene is one of the important functions of a Health Department. Such a policy has been featured for some years and reference is made in the body of this Report to the various successful efforts carried out in this direction. Not the least important of the results of the scheme of Health Units, the report on which appears in the Appendix, is the co-operative health propaganda effected thereby owing to the close association of the Department and the public in these health activities.

(11) The Medical College of Ceylon possesses a record of which the Colony and the College have reason to be proud. It was founded in 1870. In 1888 the Diploma of the College (L.M.S., Ceylon) was recognized by the General Medical Council of Great Britain and became registrable in England. The professional standard required for the Diploma has been jealously guarded by the College, and the high academic distinctions gained in the United Kingdom by many of its alumni have been won on the foundation laid by the training received in Ceylon. The fact that of the 370 medical officers employed by the Department less than 10 have been recruited from abroad, and the vast majority have passed through the Ceylon Medical College, points to the immense and valuable service that has been rendered to Ceylon by the College. When the University of Ceylon comes into existence its Faculty of Medicine will inherit the prestige of the Ceylon Medical College which will form no small part of the framework of that institution.

J. F. E. BRIDGER,
Director of Medical and Sanitary Services.

Colombo, May 29, 1929.

The following reports are given in the Appendix:—

(1) Report of the Superintendent, Anchylostomiasis Campaign, for the year 1928.
(2) Report of the Medical Entomologist for the year 1928.
(3) Report of the Superintendent, Anti-Malaria Campaign, for the year 1928.
(4) Report of the Health Unit Work for the year 1928.
(5) Report of the Sanitary Engineer for the year 1928.

APPENDIX.

1.—Report of the Superintendent, Anchylostomiasis Campaign, for the Year 1928.

Brief History.—The year 1928 opened a new page in the history of the Anchylostomiasis Campaign in Ceylon as the control of the work was taken over by the Department of Medical and Sanitary Services and carried on as one of the routine activities of the Sanitary Branch.

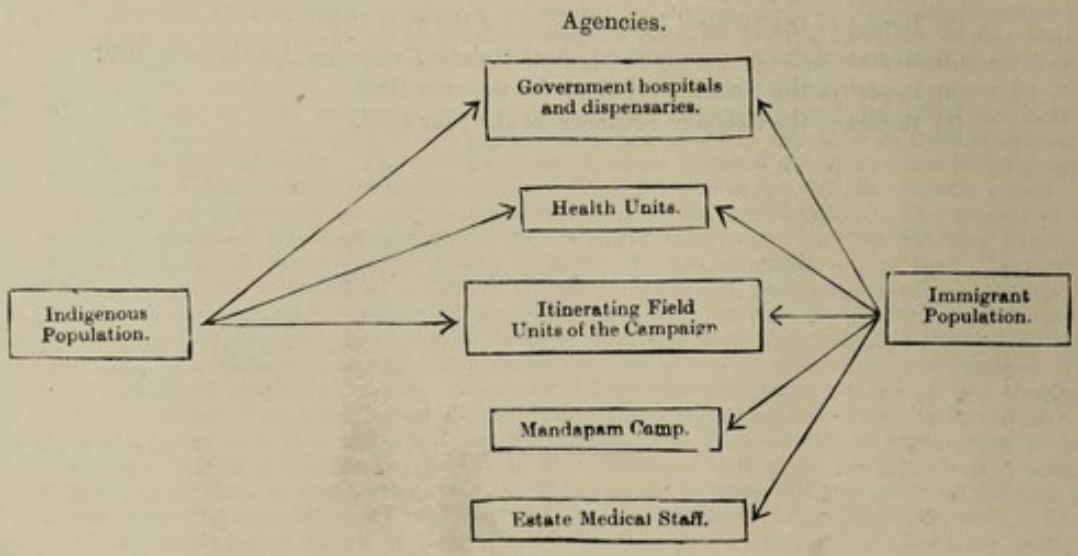
The International Health Board of the Rockefeller Foundation included Ceylon in its philanthropic activities and started work for the control of hookworm disease in the Island in December, 1915, in co-operation with the Government of Ceylon and continued its co-operative work till the end of 1927. During these twelve years the work consisted mainly of treatment campaigns on estates and in villages in localized areas of the Island for the purpose of demonstration of methods, a general hookworm survey of the Island in 1924-25, the drawing up in 1926 of a programme based on the experience of previous years to embrace the whole Island and the working of this programme in 1926 and 1927.

An Anchylostomiasis Committee of Control was in existence to discuss and settle the plan of the campaign for each year with the Colonial Secretary as Chairman. In December, 1926, it sanctioned the present programme of operations and ceased to function in 1928 with the unanimous approval of all its members.

Scope of the Present Campaign Programme.—The above-mentioned programme provided (1) through itinerating field units, for periodic lectures and treatment in all schools and for periodic treatment on estates; (2) for treatment of villagers and immigrants visiting Government hospitals and dispensaries by the officers connected with these institutions; and (3) for the treatment of immigrants passing through Mandapam Camp by the Quarantine Medical Officers there.

In addition, the Health Units carried out treatment of the school children, villagers, and labourers as part of their health activities, and certain estates conducted treatment of immigrant labourers with their own staff.

The facilities provided for anchylostomiasis treatment in the Island may be represented in this manner:—



Administrative Organization: Personnel.—At the beginning of the year under review the campaigns were placed under the direct control of the Assistant Director of Sanitary Services, and Dr. W. P. Jacocks, the representative of the International Health Division of the Rockefeller Foundation, severed his connection with them as State Director. Dr. A. T. Kuriyan, whose designation was changed during the course of the year from Assistant Director to the Superintendent, Anchylostomiasis Campaigns, remained at the Head Office during the whole year.

Table 1.—Total Anchylostomiasis Treatment by all Agencies in 1928.

Agencies.	Census.	Treatments. First.	Subsequent.	Total.
Campaign Staff.				
School units	202,790(*a*)..	107,435 ..	— ..	107,435
Estate units	196,750(*b*)..	124,336 ..	— ..	124,336
Central office	— ..	368 ..	68 ..	436
Total for campaign	**399,540**	**232,139**	**68**	**232,207**
Other Agencies.				
Government hospitals and dispensaries ..	4,621,999 ..	836,369 ..	192,004 ..	1,028,373
Mandapam Camp	127,035 ..	115,601 ..	— ..	115,601
Health units	9,510 ..	4,510 ..	— ..	4,510
Estate staff	537,839(*b*)..	135,588 ..	30,894 ..	166,482
Total for Other Agencies	**5,296,383**	**1,092,068**	**222,898**	**1,314,966**
Grand Total	**5,695,923**	**1,324,207**	**222,966**	**1,547,173**

(*a*) Census represents average daily attendance during preceding three months.
(*b*) Census figures are duplicated in part.

Treatments by Campaign Staff.—In previous years one unit was assigned to a district, and this unit remained in that area to complete the treatment of schools or estates. During the course of the year this procedure was altered, and more than one unit was concentrated in a district so that the work might be finished in the shortest possible time. Again, in estate campaigns, from the end of the year 1927 the number of estates scheduled for treatment by a Medical Officer for a day was reduced from 3 to 2, and the strength of dispensers in a unit increased from 3 to 4 to ensure proper after-care of those treated, because, under the old arrangement, on the same day the dispensers had both to administer treatments on the scheduled estates and to proceed to the estates fixed for the next day; under the new arrangement, with 4 dispensers in a unit and only 2 estates to treat in a day, the 2 dispensers treating remained behind for 24 hours to attend to any emergencies and to look after the treated, while the other 2 were free to proceed to the next day's work.

In most instances, when the estate programme was ready, the school programme was suspended and all the necessary units were detailed to carry out the treatments on estates. Similarly, during " Deepavali " festival, as no work was possible among Tamil labourers, the units engaged in estate campaigns were put on to school work.

(*a*) *Schools.*

Western Province.—There have been many campaigns in certain selected areas of this Province since 1920, but no programme to cover the whole Province was carried out except in 1927, when the first round of school treatments was started and completed in Hewagam korale and Negombo District.

The work in the rest of the Western Province was continued and completed during 1928. The response to the efforts of the campaign by the inhabitants was unsatisfactory. Even on lecture days some children were withdrawn from the schools by their parents, mild opposition to treatment was met here and there, and in some schools none came forward for treatment.

Number of schools visited ..	345	Number of school children treated ..	13,269
Average egg-count per gram per person	696	Number of others treated ..	4,167
Percentage infected ..	89.4	Total treatments ..	17,436

Central Province.—The second round of treatments in the Central Province was completed in Nuwara Eliya District, except Walapana area, Matale District, Municipality of Kandy, and the major half of the Kandy District.

Number of schools visited ..	192	Number of school children treated ..	14,054
Average egg-count per gram per person ..	697	Number of others treated ..	1,776
Percentage infected	93.2	Total treatments	15,830

Southern Province.—Except for a small area in Tissamaharama region the whole Province was covered in a second round of treatments. Although the infection rate was higher in the coastal regions than in the interior the response to treatment was less satisfactory.

Number of schools visited ..	392	Number of school children treated ..	22,888
Average egg-count per gram per person ..	740	Number of others treated ..	7,389
Percentage infected	91.8	Total treatments ..	30,277

Province of Sabaragamuwa.—One unit started the second round of school treatments in this Province in Balangoda area and after completing this area proceeded to Pelmadulla area. The new procedure of concentrating more than one unit in a Province was now adopted and the unit was transferred to the Southern Province; hence only a small portion of Sabaragamuwa was treated during the year.

Number of schools visited ..	25	Number of school children treated ..	894
Average egg-count per gram per person ..	486	Number of others treated ..	224
Percentage infected	84.6	Total treatments	1,118

North-Western Province.—The second round of treatments in this Province was undertaken by three units. The response to treatments on the part of the Sinhalese inhabitants was very satisfactory, while the Moors, especially in Puttalam District, were reluctant to take advantage of the visits of the campaign officers. It seems that the Moors here as well as elsewhere in the Island are more highly infected than their neighbours of other races. Social customs prevent their women folk from coming forward for treatments.

Number of schools visited ..	240	Number of school children treated ..	13,907
Average egg-count per gram per person ..	695	Number of others treated ..	3,297
Percentage infected	89.0	Total treatments	17,204

Province of Uva.—Three units were responsible for the second round of treatments in the Province of Uva. Considerable difficulty was experienced by the Medical Officers in travelling to remote schools which were placed in the heart of jungles.

Number of schools visited ..	76	Number of school children treated ..	2,653
Average egg-count per gram per person ..	1,088	Number of others treated ..	629
Percentage infected	94.4	Total treatments	3,282

Northern Province: Jaffna Peninsula.—Campaigns in this region were conducted by three units. This portion of the Northern Province is widely opened up by roads. In spite of the numerous schools, temples, and churches here the people are still very conservative and the existing sanitary conditions are primitive.

Number of schools visited ..	372	Number of school children treated ..	18,447
Average egg-count per gram per person ..	455	Number of others treated ..	1,566
Percentage infected	78.2	Total treatments	20,013

Eastern Province: Trincomalee District.—The campaign in this district was carried on by one unit. The response to treatment was satisfactory. At the request of the influential male members of the Moor community the Medical Officer paid house to house visits to treat their women folk, and his efforts were successful.

Number of schools visited ..	50	Number of school children treated ..	1,575
Average egg-count per gram per person ..	557	Number of others treated ..	700
Percentage infected	89.1	Total treatments	2,275

Table 2.—Treatment Work done by School Units during 1928.

Province.	Census.	Treatments.		
		School Children.	Others.	Total.
Western	47,779	13,269	4,167	17,436
Central	20,930	14,054	1,776	15,830
Southern	59,975	22,888	7,389	30,277
Sabaragamuwa	1,914	894	224	1,118
North-Western	26,369	13,907	3,297	17,204
Uva	5,743	2,653	629	3,282
Northern (Jaffna Peninsula) ..	37,693	18,447	1,566	20,013
Eastern (Trincomalee District) ..	2,387	1,575	700	2,275
Total ..	202,790	87,687	19,748	107,435

(*b*) *Estates.*

Province of Uva.—Six Medical Officers were detailed for the treatment of estates in Uva so that the work started on August 11 was brought to a finish on September 8. Some estates did not come in for the good reason that they were carrying on mass treatments by their own staff, but some others evaded treatment by saying that the coolies were infected from the neighbouring villages and therefore there was no use of treating them unless the villagers were treated first.

Number of estates treated ..	181	Percentage infected	82.7
Average egg-count per gram per person	444	Number of labourers treated ..	25,428

Central Province.—The campaign in Central Province began in Maturata and Uda Pussellawa area and progressed through Lindula, Dimbulla, Dikoya, and Hatton till Nawalapitiya District was reached. Deltota district was also treated in addition to the above.

Number of estates treated ..	326	Percentage infected	88.0
Average egg-count per gram per person	543	Number of labourers treated ..	90,610

Southern Province.—There were 2 estate units in Galle and Matara Districts.

Number of estates treated ..	72	Percentage infected	92.7
Average egg-count per gram per person	727	Number of labourers treated ..	7,252

North-Western Province.—On completion of the school treatments in this Province the same units treated the estates in Kurunegala and Chilaw Districts.

Number of estates treated ..	10	Percentage infected	77.1
Average egg-count per gram per person	618	Number of labourers treated ..	1,046

Table 3.—Treatments done by Estate Units in 1928.

Province.	Census.	Number treated.
Uva	41,810 ..	25,428
Central	139,802 ..	90,610
Southern	13,427 ..	7,252
North-Western	1,711 ..	1,046
Total ..	196,750	124,336

(c) Central Office.

The number given below includes those who offered themselves for treatment at the head office in Colombo, the pupils of the Methodist College and St. Michael's school, Kollupitiya, treated at the request of their respective principals, and the prisoners treated at the Welikada Jail in connection with the tests done with the new anthelmintic called Tetrachlorethylene.

Number of treatments given	436

Treatments by other Agencies: (a) Government Hospitals and Dispensaries.—Hookworm infection is as high as 90 per cent. amongst the inhabitants of Ceylon. It is probably higher in the class of people visiting hospitals and dispensaries. There is no doubt that this infection influences directly or indirectly the onset, course, and termination of several of the diseases treated in the above institutions. Thousands visit these institutions and voluntarily place themselves under the treatment afforded there. What a splendid opportunity this presents for direct attack on the parasitic worms! In some institutions treatment for hookworm is given to a large percentage of the total attendance, while in others in the same locality and under the same conditions of prevalent diseases, only a small percentage is treated.

Table 4.—Hookworm Treatments given at Government Hospitals and Dispensaries by Provinces in 1928.

Province.	Total Attendance.	First Treatment.	Subsequent Treatments.	Total.
Northern ..	365,333 ..	50,261 ..	14,918 ..	65,179
North-Central ..	190,670 ..	19,442 ..	6,155 ..	25,597
Eastern ..	355,557 ..	85,626 ..	20,040 ..	105,666
North-Western ..	968,684 ..	169,856 ..	24,406 ..	194,262
Central ..	540,579 ..	126,192 ..	26,393 ..	152,585
Sabaragamuwa ..	501,319 ..	98,662 ..	16,722 ..	115,384
Uva ..	145,476 ..	25,131 ..	3,837 ..	28,968
Western ..	865,392 ..	130,007 ..	38,010 ..	168,017
Southern ..	688,989 ..	131,192 ..	41,523 ..	172,715
Total ..	4,621,999	836,369	192,004	1,028,373

(b) Mandapam Camp.—115,601 persons representing 91 per cent. of the immigrant labour passing through Mandapam Camp were treated by the Quarantine Medical Officers stationed there, assisted by 2 campaign dispensers.

(c) Health Units.—The Health Units at Kalutara and Kurunegala have been carrying out treatments as part of their health activities; the Health Unit areas are, therefore, excluded from the programme of the campaign units.

Table 5.—Treatments administered by Health Units.

	School Children.	Villagers.	Total.
Kalutara Badda	1,899 ..	1,251 ..	3,150
Kurunegala	1,259 ..	101 ..	1,360
Total ..	3,158	1,352	4,510

(*d*) *Estate Staffs.*—It is satisfactory to note that a good number of estates have realized the importance of mass treatments of their labourers and are carrying out treatments by their own staffs.

Survey of Infection.—The North-Central Province and mainland of the Northern Province, below Elephant Pass, had already had two rounds of treatments; therefore it was decided to make a survey of infection in these areas and 2 Medical Officers were detailed to undertake the work. In addition to the collection of specimens they gave lectures in all the schools they visited.

The results of the microscopic examinations made after treatment in 1927 and in the survey of 1928 after an interval of nearly twelve months give an idea of the rate of reinfection in this area. This is given in the following table:—

Table 6.—Effects of Periodic Treatments given in Northern Province (Mainland) and North-Central Province.

Province.	Examined in 1927.						Examined in 1928.		
	Before Treatment.			Fourteen Days after Treatment.			Twelve Months after Treatment.		
	Number examined.	Average Eggs.	Per Cent. Infected.	Number examined.	Average. Eggs.	Per Cent. Infected.	Number examined.	Average. Eggs.	Per Cent. Infected.
Northern Province (mainland) ..	578	456	73.5	97	167	49.5	1,542	315	69.5
North-Central Province ..	498	882	92.9	475	185	56.2	1,366	479	77·0

Educational Work.—This consisted of chart lectures, lantern lectures, microscopic demonstration of the eggs of the intestinal parasites, and the distribution of English and vernacular pamphlets on hookworm.

Every school was visited twice by the Medical Officer, once for chart lecture and the second time for treatment. The lecture emphasized in plain language the cause and prevention of the disease; directions regarding the time and preparation for the treatment were also given at the same time. At suitable places lantern lectures were delivered for the main purpose of educating the adult population. In the evening, after the day's work was over, crowds gathered together to listen to the lantern lectures. At the end of the lectures pamphlets were distributed to the public. In secondary schools on lecture day eggs of intestinal parasites, particularly those of hookworm and round worms, were demonstrated under the microscope to teachers and pupils.

That the propaganda work of the campaign is bearing fruit is shown in a letter received here from the Secretary, Sri Dewanam Piyatissa Patasaladhara Samitiya, Dadalla, Gintota, regarding the importance of latrines in the control of hookworm disease and asserting that the society is determined to get latrines built for each house in the district.

Table 7.—Number of Lectures given by School Units with Attendance and Literature distributed in 1928.

	Number.	Attendance.		Number.	Attendance.
Lantern ..	334	108,023	General ..	73	6,847
School ..	1,714	231,114	Total ..	2,121	345,984

Number of pieces literature distributed: 52,136.

Central Laboratory.—The results of the microscopic examinations of specimens done at the laboratory attached to the central office are given in the table below. Besides the specimens despatched from the field, several other specimens were examined free of charge for private people in Colombo and in outstations.

Specimens from prisoners treated in Welikada Jail were also examined, before and after treatment.

Laboratory Assistants for outstation institutions were trained here in the methods of faecal examinations at the request of the Director of the Bacteriological Institute. Three persons were trained and sent out during 1928.

Table 8.—Intestinal Parasites found in the Course of Microscopical Examinations made in the Central Laboratory during the Year 1928 (Incidental Findings).

	Before Treatment.		After Treatment.	
	Number.	Percentage infected.	Number.	Percentage infected.
Total examinations, 31,679.				
Persons examined	24,992	—	6,687	—
Infected with hookworm ..	21,055	84.2	3,923	58.7
Infected with Ascaris Lumbricoides ..	19,846	79.4	4,583	68.5
Infected with Trichuris Trichuria ..	14,925	60.9	3,805	56.9
Infected with Enterobius Verm: (Oxyuris)	399	1.6	88	1.3
Infected with Taenia ..	39	.2	4	.06

The above table gives the incidence of infection in respect of all the intestinal parasites.

Table 9.—Microscopical Examinations made during 1928, using Stoll's Egg-count Method only; before and Fifteen Days after Treatment.

	Before Treatment.					After Treatment.				
	Number of Persons examined.	Total Egg count.	Average per Gram per Person.	Positives.	Percentage infected.	Number of Persons examined.	Total Egg-count.	Average per Gram per Person.	Positives.	Percentage infected.
School Children.										
Western Province ..	2,721	12,628	696	2,432	89.4	514	728	212	276	53.7
Central Province ..	1,805	8,385	697	1,682	93.2	32	86	330	20	51.3
Southern Province ..	3,056	15,079	740	2,804	91.8	387	694	269	226	58.4
ProvinceofSabaragamuwa	156	506	486	132	84.6	—	—	—	—	—
North-Western Province	2,676	12,407	695	2,382	89.0	274	502	275	163	59.5
Province of Uva ..	391	2,838	1,088	369	94.4	—	—	—	—	—
Jaffna Peninsula ..	3,772	11,453	455	2,950	78.2	1,183	1,267	161	548	46.3
Northern Province (mainland) ..	1,542	3,242	315	1,072	69.5	—	—	—	—	—
Trincomalee District ..	341	1,266	557	304	89.1	89	116	195	47	52.8
North-Central Province ..	1,366	4,369	479	1,052	77.0	—	—	—	—	—
Health Unit, Kalutara ..	1,433	8,038	841	1,277	89.1	421	1,317	469	311	73.9
Health Unit, Kurunegala	552	2,246	610	434	78.6	469	1,271	406	309	65.9
Total ..	19,811	82,457	624	16,890	85.3	3,376	5,981	265	1,900	56.3
Estate Labourers.										
Province of Uva ..	1,085	3,210	444	897	82.7	264	270	133	137	51.9
Central Province ..	2,469	8,936	543	2,173	88.0	363	341	141	199	54.8
Southern Province ..	191	926	727	177	92.7	—	—	—	—	—
North-Western Province.	70	318	618	54	77.1	—	—	—	—	—
ProvinceofSabaragamuwa	—	—	—	—	—	213	232	163	132	62.0
Health Unit, Kalutara ..	288	1,074	559	260	90.6	29	12	62	15	51.7
Total ..	4,103	14,464	529	3,561	86.8	869	855	147	483	55.6
Villagers.										
Scattering ..	319	2,506	1,178	282	88.3	115	113	147	44	38.3
Grand Total ..	24,233	99,427	615	20,733	85.6	4,360	6,949	239	2,427	55.7

In 1927 the average egg-count before treatment in the case of school children was 714, as against 624 in 1928; and in the case of estate labourers 659, as against 529. The improvement in both cases is in all probability due to the treatments given periodically.

Research Work.—During the year, tests were carried out in the Welikada Jail to compare the anthelmintic efficiency of the drugs Tetrachlorethylene and Carbon Tetrachloride.

Results obtained for Tetrachlorethylene and Carbon Tetrachloride given in equal doses, and under similar conditions show that Carbon Tetrachloride is slightly more efficient than Tetrachlorethylene in the treatment of hookworm infection in Ceylon. Carbon Tetrachloride is more effective against female worms than Tetrachlorethylene.

Tetrachlorethylene is more effective in its action against round worm than Carbon Tetrachloride.

As far as toxicity is concerned there is nothing to choose between the two drugs, and from the point of view of anthelmintic efficiency, Tetrachlorethylene offers no advantage over Carbon Tetrachloride.

The species, Necator Americanus, is mainly responsible for hookworm infection in Ceylon.

Methods of Treatment and Drugs used.—There is nothing to add to what has been mentioned in the previous report as the same methods were followed during 1928.

Other Services rendered by the Campaign.—Besides the routine work described in the preceding pages the following services were rendered by the campaign:—

(1) Trained Sanitary Inspectors of the Health Units in the methods of hookworm treatment.
(2) As previously mentioned, trained Laboratory Assistants for service in outstation institutions.
(3) Helped the Medical Officer of Health of the Health Unit, Kurunegala, to start hookworm treatments in schools.
(4) Examined faecal specimens for Health Units and furnished reports.
(5) Provided charts and lantern slides on hookworm for Health Units.
(6) Provided literature on hookworm disease to Medical Officers of Health and School Medical Officers.
(7) Provided literature, charts, posters, and specimens of intestinal parasites to exhibitions.
(8) Instructed estate dispensers in the methods of hookworm treatment.
(9) Provided trained dispensers to estates to carry out their own treatments.
(10) Delivered special lantern lectures on hookworm to certain Social Service Societies in Colombo.
(11) Demonstrated the work of the hookworm campaigns in Ceylon to medical officers sent out from India.

Sanitation.—The only sanitation work that the campaign officers may be said to have done was to furnish reports on school latrines, the Inspecting Medical Officers being responsible for the sanitation of estates and the Medical Officers of Health for that of villages. It is gratifying to note that the numbers of those using latrines on estates and in villages are increasing year by year.

It is expected that the present generation of school children will develop proper sanitary habits, and that in their own age of mature citizenship soil pollution in the country will be a forgotten affair of the past.

Table 10.—Sanitation Information reported by School Units at Schools in various Provinces in 1928.

Province.	Number of Schools visited.	Latrines.		Evidence of Soil Pollution.
		Number.	Maintained.	
Northern	445 ..	214 ..	180 ..	44
North-Central	29 ..	25 ..	25 ..	—
Central	192 ..	151 ..	149 ..	4
North-Western	240 ..	178 ..	144 ..	37
Sabaragamuwa	25 ..	24 ..	23 ..	2
Uva	76 ..	71 ..	68 ..	—
Eastern (Trincomalee District) ..	50 ..	20 ..	20 ..	—
Western	345 ..	311 ..	303 ..	41
Southern	392 ..	349 ..	325 ..	19
Total ..	1,794	1,343	1,237	147

Acknowledgments.—Our thanks are due to Dr. W. P. Jacocks, the representative of the Rockefeller Foundation, for the keen interest he showed in the progress of the campaign and for the valuable advice he gave on many an occasion during the year; to the various Government Agents and Assistant Government Agents for their ready co-operation; to the Director of Education for circularizing the managers of schools regarding the desirability of their co-operation with the campaign staff, for taking steps against non-co-operating teachers and supplying the campaign with school maps; to the Surveyor-General for supplying all the maps required, especially at short notice; to the Controller of Indian Immigrant Labour for his co-operation in the work at Mandapam Camp; to the Provincial Surgeons for furnishing the monthly reports of anchylostomiasis treatments; to various Medical Officers and apothecaries for finding accommodation for the field Medical Officers in remote areas, for loaning drugs on occasions when there were unexpected demands, and for the special attention paid to some of those treated who developed untoward symptoms and had to be removed to hospitals; and finally to the Assistant Director of Sanitary Services for his advice and guidance.

Conclusion.—Where soil pollution is rampant and the effects of treatment in the control of hookworm infection are only transitory, the question arises whether the services of the campaign units could not be utilized in other directions as well, particularly towards the installation of latrines throughout the Island.

Revenue officers may help to form Village Committees in their districts, whose concern it should be to dispose of human excrement properly and to provide for safe water supplies. These Committees should be supervised and advised in such matters by the Central Public Health Organization operating through the itinerating units. The designation of the campaign may be changed to Rural Sanitation Campaign. The programme of such campaigns should be Island-wide and include (1) visiting and reporting to the authorities about the sanitary condition of every village however remote it may be; (2) giving necessary advice to Village Committees in rural sanitary problems such as constructing latrines and co-operating with them in their endeavours; (3) carrying on educational work in health matters so as to develop a public health intelligence in the community; (4) administering treatment for hookworm, malaria, parangi, and other communicable diseases; (5) persuading people to take protective inoculations where typhoid exists; (6) reporting to authorities about the prevalence of leprosy, tuberculosis, typhoid, and dysentery in villages; and (7) advising people concerned about the management of patients suffering from these diseases.

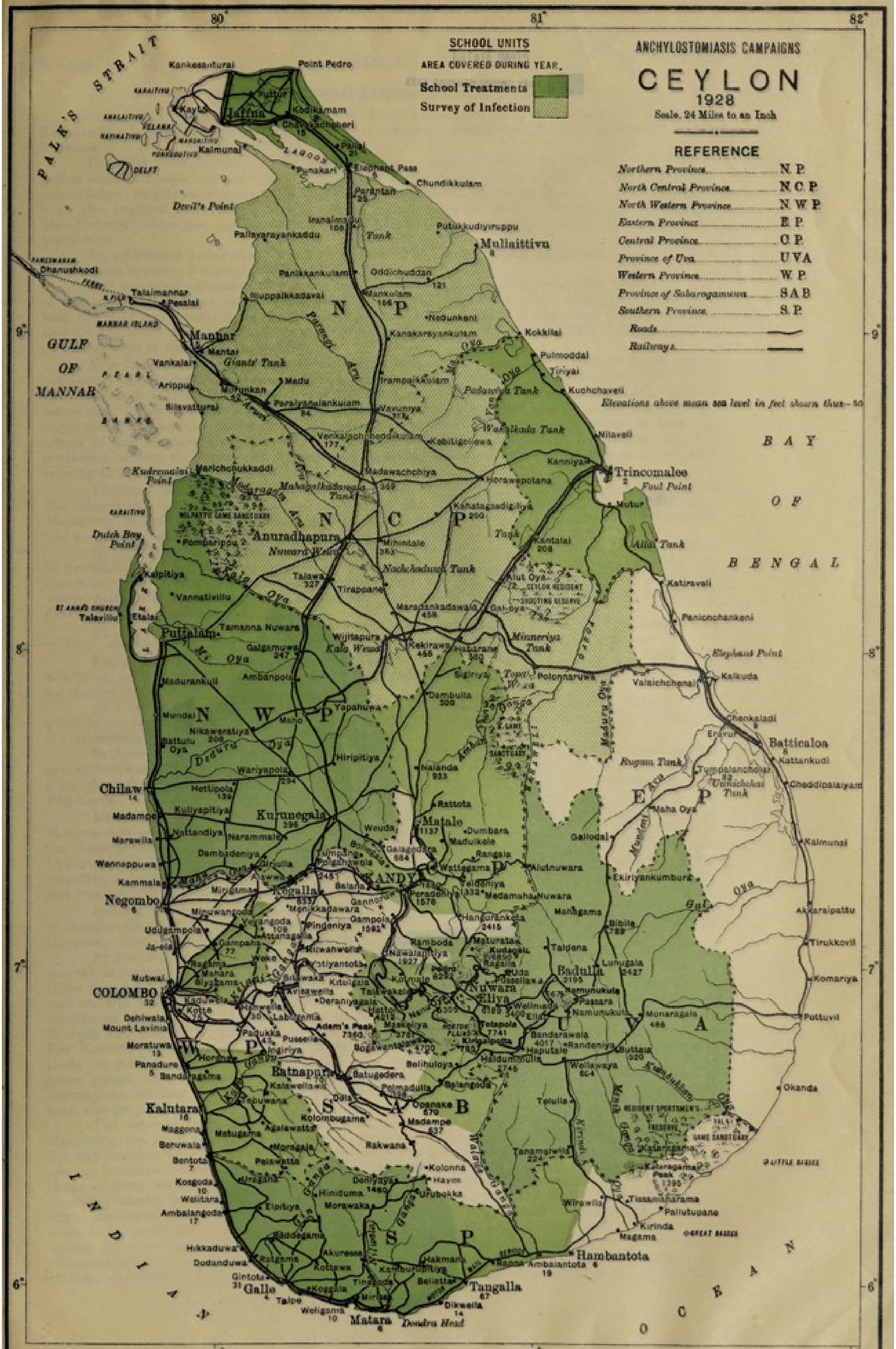
The campaign units carrying on the above programme should be considered as forerunners, preparing the path for the advent of Health Units. With proper adjustment overlapping of work or competition with the other branches of the Medical Department could be avoided.

Reorganization of the present campaign on the lines indicated above would help to bear the torch of public health science to the corners of the remotest hamlets, show the villagers the error of their ways, instil into them the value of fresh air, pure water, and clean soil, teach them how to live, raise the earning capacity of the workers and thereby increase the prosperity of the country as a whole.

It is a pleasure to record that the entire staff work wholeheartedly for the success of the campaign. Far from looking upon it as a duty the work was considered as a service of love for the country. In the above scheme there is enough fuel to feed the fire of patriotism and by its inauguration better results for the permanent control of hookworm disease may be expected in this Island.

March 2, 1929.

A. T. KURIYAN,
Superintendent, Anchylostomiasis Campaign.

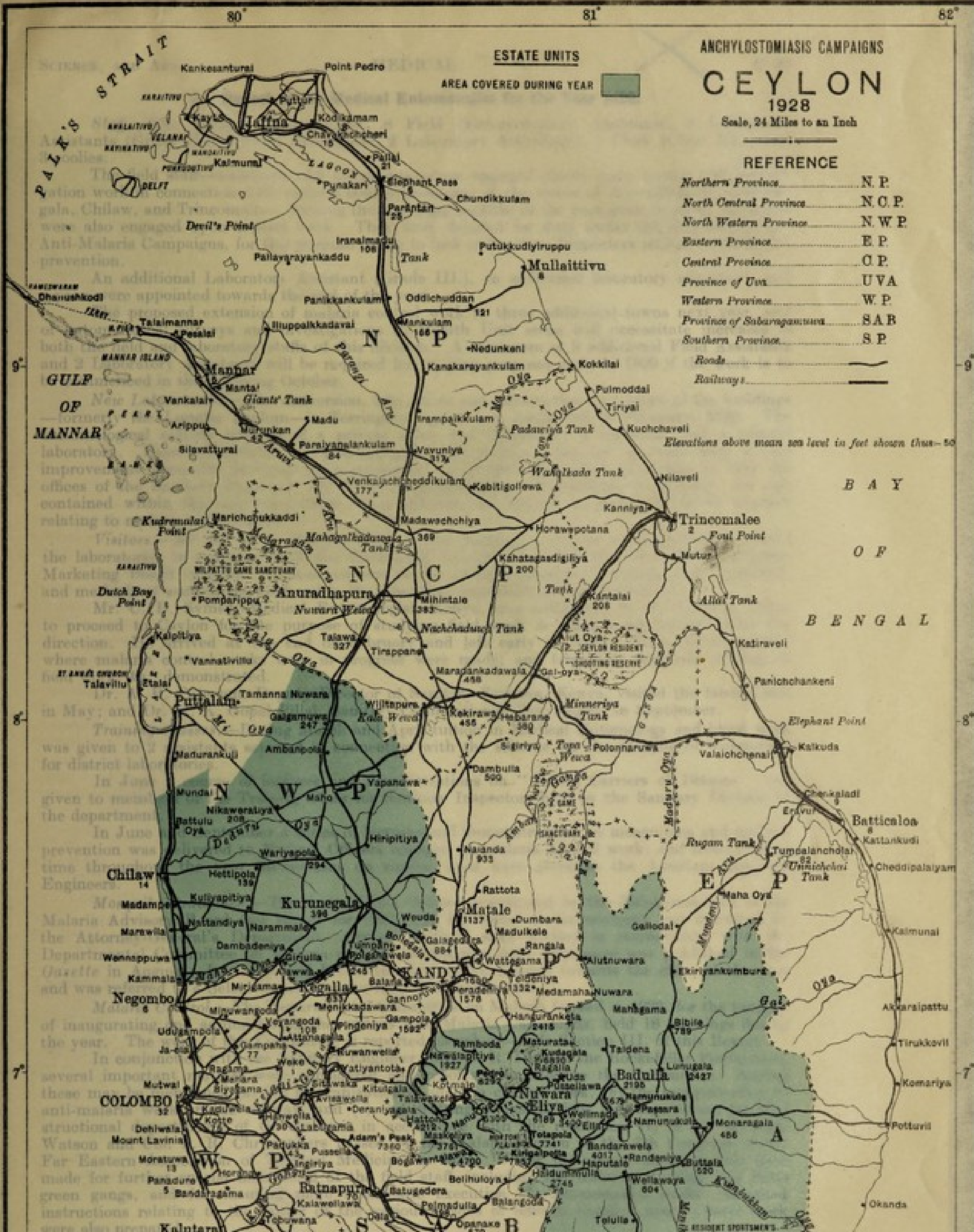


PUBLISHED UNDER THE ORDERS OF A. H. G. DAWSON, SURVEYOR GENERAL, CEYLON.

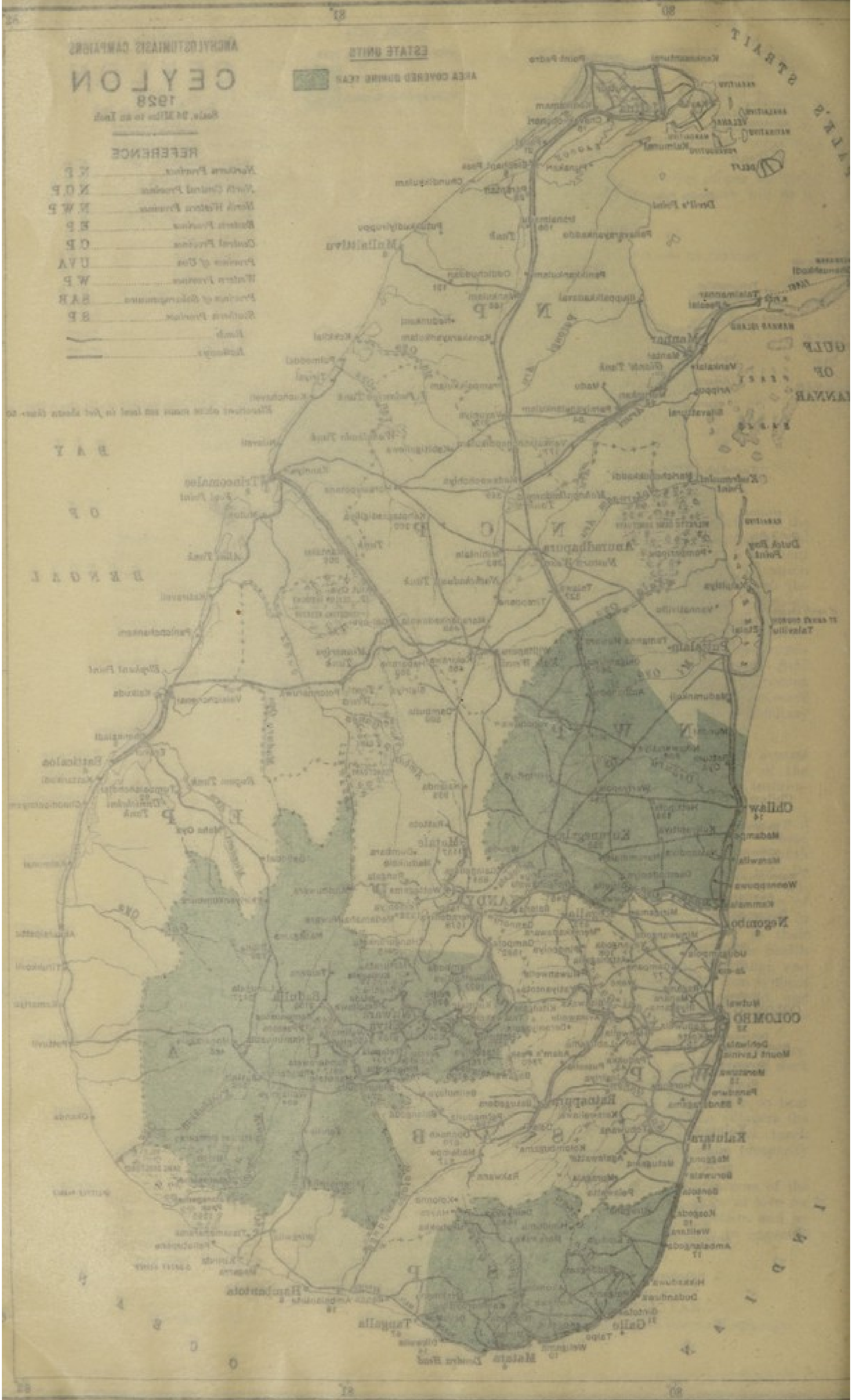
Crown Rights Reserved

Survey Dept: Ceylon.


CEYLON
1928
REFERENCE
SCHOOL UNITS
Survey of Infection
GULF OF MANNAR
PALK STRAIT



PUBLISHED UNDER THE ORDERS OF A. H. G. DAWSON, SURVEYOR GENERAL, CEYLON. Crown Rights Reserved Survey Dept: Ceylon, 27. 6. 29.


ANCHYLOSTOMIASIS CAMPAIGNS
CEYLON
1928
ESTATE UNITS
AREA COVERED DURING YEAR
REFERENCE
COLOMBO
KANDY

2.—Report of the Medical Entomologist for the Year 1928.

Staff.—The Medical Entomologist, 8 Field (Entomological) Assistants, 2 Laboratory Assistants (Grade II.), 6 Field Attendants, 2 Laboratory Attendants, 1 Clerk (Class III.), and 3 coolies.

The field staff—assistants and attendants—were engaged chiefly upon survey and investigation work in connection with malaria control measures at the towns of Anuradhapura, Kurunegala, Chilaw, and Trincomalee. During the first eight months of the year some of these assistants were also engaged upon control work. They were detailed for duty under the Superintendent, Anti-Malaria Campaigns, for this purpose owing to lack of Sanitary Inspectors trained in mosquito prevention.

An additional Laboratory Assistant (Grade III.), an additional laboratory attendant, and a peon were appointed towards the end of the year.

The proposed extension of malaria control work to three additional towns next year, and of entomological surveys and investigations to Health Unit areas will necessitate increases of both the field and laboratory staffs of this division. A minimum of 9 additional Field Assistants and 2 Laboratory Assistants will be required for training purposes early in 1929 if the work is to be commenced in the following October.

New Laboratories.—The conversion, into offices and laboratories, of a block of the buildings —formerly the Lunatic Asylum—in Torrington square was completed in February, 1928. The Entomological section consists of a private office and laboratory, a museum, and a general laboratory. These laboratories are well-appointed and equipped and are, in every way, a vast improvement upon the previous accommodation. A further important advantage is that the offices of the Sanitary Engineer, and of the Superintendent, Anti-Malaria Campaigns, are also contained within the converted block, thus ensuring the closest co-operation on all matters relating to malaria control work.

Visitors.—Mr. W. G. A. Ormsby Gore, Under Secretary of State for the Colonies, visited the laboratories in company with His Excellency the Governor and Mr. Lloyd of the Empire Marketing Board in June. Various aspects of the malaria problem in Ceylon were discussed, and methods of work in the field and in the laboratory explained and demonstrated.

Mr. C. B. Symes, Medical Entomologist, Kenya, was authorized by the Colonial Office to proceed to Ceylon for the purpose of studying field work in malaria prevention under my direction. He arrived at the end of February and left early in April. Visits to all centres where malaria control works were in progress were made, and laboratory methods relating to field work, &c., demonstrated.

Dr. A. R. Paterson, Deputy Director of Sanitary Services, Kenya, visited the laboratories in May; and Dr. M. K. Gopal Pillai, Sanitary Commissioner, Travancore, in September.

Training Classes.—During March and April tuition in Medical Entomology and blood work was given to 2 assistants selected in connection with the scheme for the training of technicians for district laboratories.

In June a course of lectures and demonstrations on " Insect Carriers of Disease " was given to members of the Training Class for Sanitary Inspectors held by the Sanitary Division of the department.

In June and September a series of lectures and demonstrations on mosquitoes and malaria prevention was delivered to Medical Officers engaged on malaria control work; and from time to time throughout the year instructions on similar lines were given to the Assistant Sanitary Engineers.

Mosquito Ordinance.—The draft of this Ordinance prepared by the Sub-Committee of the Malaria Advisory Board (see report for 1927) and forwarded to Government was redrafted by the Attorney-General's Department. Certain sections were revised in consultation with the Departmental Committee on Malaria and the subsequent draft Ordinance was published in the *Gazette* in August. It was placed before the Legislative Council towards the close of the year and was referred to a Select Committee for further consideration.

Malaria Control.—The Departmental Committee on Malaria formed in 1926, for the purpose of inaugurating and administering the various Anti-Malaria Campaigns, held 18 meetings during the year. The work of this Committee is reported elsewhere—*vide* Section III. of this Report.

In conjunction with the Sanitary Engineer (Mr. B. R. Dyer of the Rockefeller Foundation) several important matters were considered and reports submitted to the Committee. Among these may be mentioned (*a*) the reorganization of malaria control work, (*b*) the reorganization of anti-malaria work on the railway, and (*c*) the drafting of instructions and regulations for constructional departments of Government in accordance with the resolution (1) of Sir Malcolm Watson and Col. S. R. Christophers passed by the malaria section of the 7th Congress of the Far Eastern Association of Tropical Medicine in 1927. Under (*a*) above, arrangements were made for further special instruction of the field staff, including the training of oiling and Paris green gangs, and for ensuring more systematic execution of anti-mosquito works. Detailed instructions relating to the duties of the various grades of officers engaged upon control work were also prepared.

The scheme proposed for the reorganization of railway anti-malaria work (*b*) involved classifying the open line into a number of divisions, sections, and sub-sections. Thirty-one of the sub-sections were regarded as malarious and requiring control work. In general, each sub-section included 3 stations and was regarded as a unit working area, the proposal being that these stations should be worked simultaneously. Grouping into sub-sections was considered necessary chiefly in order to provide for efficient maintenance subsequent to the completion of initial measures. Following the necessary entomological surveys, initial and permanent works were to be performed seriatim (commencing with the northern line), the labour force to work strictly to programme and to cover all the sub-sections specified as malarious. Maintenance measures were to be inaugurated immediately upon completion of initial works in the first sub-section, and were to include the application of oil and Paris green to breeding places situated on

lands within a radius of not less than ¼ mile of the station premises. The labour force for maintenance although small at first was estimated to consist ultimately of approximately 100 coolies and 10 overseers—9 or 10 coolies and 1 overseer to every three sub-sections. The control and supervision of the railway work was placed under the Superintendent of Anti-Malaria Campaigns, and a specially trained Sanitary Inspector was detailed to commence the work. It was estimated that the cost of this work during the first year would amount to approximately Rs. 44,000.

The draft instructions and regulations for constructional departments of Government (c) were embodied in three categories. The first contained general information on malaria, and the reduction of mosquito breeding places. The second, regulations applicable to all constructional departments relative to labour, sites for cooly lines, excavatory work, quarrying, &c. The third category referred to regulations applicable to particular departments—the Railway, Public Works, and Irrigation. These draft regulations have been circulated to the departments concerned, and if necessary a conference with the representatives of these departments will be held to further discuss the matter. In drafting these regulations, the practical point of view was given prominence throughout, and it is hoped that they will shortly result in concerted efforts tending to limit malaria production in connection with public works.

In addition to the above work associated with the activities of the Departmental Committee, visits were made every three months throughout the year to all the campaign centres for the purpose of inspecting and reporting upon the control measures in progress.

Entomological surveys and investigations directly connected with malaria control measures are discussed below.

Research.

1. *Natural Infectivity of Indigenous Anophelines.*—These researches were continued on the same lines as in the previous year. Collections of Anophelines were made from huts and cooly lines in various parts of the country, and the specimens dissected either at the local hospital or resthouse, or in Colombo. Part of the work was done in collaboration with Dr. W. P. Jacocks of the Rockefeller Foundation, and a paper on the subject is now in the Press.

During the year a total of 1,627 Anophelines representing 7 different species were dissected; malaria parasites were found in 69 specimens, all of which were *A. culicifacies*. No other species has yet been found naturally infected with malaria in Ceylon, but the great majority of mosquitoes so far examined have been either *A. culicifacies* or *A. subpictus*. These 2 species have always been predominant in the dwelling houses and lines examined, although larvae of other Anophelines (including *A. listoni* and *A. maculatus*) have at times been numerous in breeding places in the vicinity. Search for these other species in likely resting places outside houses (*e.g.*, cattle sheds, undergrowth, tree holes, moist and sheltered spots on the sides of drains, and excavations, &c.) has been made on numerous occasions, but relatively few specimens have been obtained. Organized evening catching on a large scale presents serious difficulties and has not yet been tried, and minor attempts have not given satisfactory results. Direct evidence on the transmission of malaria in nature by the other indigenous Anophelines (especially *A. listoni* and *A. maculatus*) is, however, urgently needed and a serious effort to obtain large numbers of these species will be made in the near future.

The results of these researches are summarized below:—

Natural Infection of Anopheline Mosquitoes, 1928.

Place.	Date.	Dissections.						Infections.		
		All Anopheles.			A. culicifacies.			A. culicifacies.		
		No.	Guts.	Glands	No.	Guts.	Glands	No.	Guts.	Glands
Chilaw (coconut estate)	January–December	1,230	1,185	1,175	988	971	965	27	7	22
Passara District (Karande) ..	July	272	272	269	267	267	264	39	17	26
Colombo District (Madapata, Kottawa) ..	September	17	17	17	17	17	17	2	2	—
Badulla ..	November	6	6	6	2	2	2	—	—	—
Anuradhapura ..	December	129	129	119	45	45	43	1	—	1
Total ..	—	1,627*	1,609	1,586	1,319	1,302	1,291	69†	26	49

* Anophelines other than *A. culicifacies* were: *A. subpictus* (287), *A. listoni* (12), *A. hyracanus* (3), *A. barbirostris* (1), *A. tessellatus* (3), *A. maculatus* (1).

† Infections of both the gut and salivary glands were found in 6 specimens.

The work at Chilaw was carried out regularly each month throughout the year. The same huts were examined and the same period of time spent in searching at each visit. The prevalence of Anophelines in the huts, as indicated by the catching rate per hour per person, varied from approximately 3 in June to nearly 45 in November and December. Infected mosquitoes were found from January to March, and in August, September, November, and December; they were most numerous in January and December, during which months 16 of the total of 27 were obtained.

Larval surveys of the estate were made in January and November, when numerous potential breeding places were in existence. In January *A. culicifacies* and *A. listoni* were breeding prolifically in the river and in a stream, but in November the volume of water and rapidity of flow were too great to allow breeding. Larvae of both species were also numerous in trenches and pools on the estate. Over 2,000 Anopheline larvae were collected during these surveys. Eight

species of Anopheles were present, the most abundant being *A. listoni*, *A. hyreanus*, *A. culicifacies*, *A. subpictus*, and *A. fuliginosus*. The contrast between the results of larval and adult collecting in this instance is most striking, for while the former showed that at least 5 species of Anophelines were prevalent on the estate, the latter proved that 2 species only (*A. culicifacies* and *A. subpictus*) were to be found commonly in houses during the day. Only two adults of *A. listoni* were captured in houses during these two months although larvae of this species were at this time more abundant than those of any other species.

Karande (altitude approximately 1,000 feet) was visited in July, chiefly in the hope of obtaining *A. maculatus*. A serious epidemic was prevailing among the coolies at the time of the visit, and it was thought probable, in view of previous larval work in this type of country, that *A. maculatus* was responsible. The mosquitoes present in the lines were, however, almost exclusively *A. culicifacies*, and a single specimen only of *A. maculatus* was obtained. The average infection rate found at this estate was 14.6 per cent., the oöcyst rate 6.4 per cent., and the sporozite rate 9.8 per cent. Some variation in these rates, however, was observed in different groups of lines; the infection rate varied from 10.8 per cent. to 20.4 per cent. the oöcyst rate from 5.8 per cent. to 11.5 per cent., and the sporozite rate from 3.8 per cent. to 16.5 per cent.

The examinations made at Madapata and Kottawa, although few in number, were of considerable interest. Both these villages are situated within a few miles of Colombo, in an area which normally is almost free from malaria. Previous work had indicated that an important factor in connection with the low endemicity of malaria in this area was the low prevalence of *A. culicifacies* and *A. listoni;* and that epidemics occurring within the district were—in all cases which had been investigated—associated with the existence or creation of conditions favouring the more prolific breeding of one or both of these mosquitoes.

The occurrence of epidemics at Madapata and Kottawa was reported in September, and investigations were commenced immediately. These investigations showed that both epidemics were due to special conditions associated with quarrying operations; and that both were very strictly localized and confined to the vicinity (radius approximately 200-300 yards) of the works in question. The essential causative factor in each case was the artificial provision of a type of breeding place (rock pools in the quarries) which especially favoured the propagation of *A. culicifacies*, and enabled it to increase to an extent greatly above the normal in these particular localities. Examinations of potential breeding places of Anophelines showed that in both villages this mosquito was breeding *only* in the quarry pools; it was not found in other types of breeding places (*e.g.*, wells, paddy fields, streams, borrow pits, pools, &c.), in the vicinity.* Anopheline mosquitoes in houses and cooly lines were scanty. *A. culicifacies* only was found—seventeen specimens being obtained after prolonged searching. Two of these, however, were heavily infected with malaria parasites (oöcysts). At Madapata, the highest spleen and parasite rates occurred among the labour force, but people living in houses in close proximity to the quarries and lines were also severely affected. In the village proper the parasite rates were lower, and the infected persons resided chiefly in those parts of the village nearest to the quarries. At Kottawa the quarries were more scattered than at Madapata. The coolies were few in number and lived in huts similar to those of the poorer villagers; they were not living nearer to the quarries than many of the other persons examined. All forms of malaria were present at Madapata; quartan malaria was not observed at Kottawa. In both localities malignant or subtertian malaria was prevalent, parasites of this form of the disease being found in 39.0 per cent. of infected individuals at Madapata, and in 71.5 per cent. at Kottawa.

2. *Mosquito Surveys.*—During the year mosquito (larval) surveys were made at Diyatalawa and Trincomalee, and at thirteen railway stations. In each case all potential breeding places of Anopheline mosquitoes were examined, the larvae collected being preserved and forwarded with the associated field data to the Colombo laboratory for identification. These surveys involved the examination of 46,592 samples from 2,934 potential breeding places, and the examination (microscopically) of nearly 30,000 larvae. The results of all the surveys were indexed and subsequently plotted on large scale maps.

The survey of Diyatalawa was made during August and September. The chief differences between the results obtained on this occasion and those reported for the same period last year (report for 1927) for selected series of potential breeding places were a reduction in the relative prevalence of *A. maculatus* and *A. jamesi* larvae, and an increase in prevalence of *A. hyrcanus* and *A. listoni* larvae. *A. maculatus* was, however, still the predominant species (47.0 per cent.), *A. hyrcanus* had increased from 6.0 per cent. to 24.5 per cent., and *A. listoni* from 6.0 per cent. to 11.2 per cent. Larvae of the last named species were relatively more abundant in streams, irrigation channels, rice fields, and spring-fed swamps than previously.

The survey at Trincomalee was carried out from October to December, 1928. Nearly 1,200 situations, of which 887 were wells, were examined. Anopheline larvae were found in 43 per cent. of the wells, and in 59.0 per cent. of the ground water collections. *A. listoni* larvae predominated greatly in the wells, although 7 other species of Anophelines (including *A. culicifacies*) were found during the survey. In ground water *A. subpictus* and *A. jamesi* larvae were most prevalent generally, but *A. listoni* and *A. culicifacies* larvae occurred in considerable numbers in certain parts of the town. These results show that the maintenance of anti-larval measures at Trincomalee is not progressing satisfactorily, and emphasize what has already been urged by the Departmental Committee on malaria, viz., that a larger and more efficient labour force is required. It is evident also that much greater care and more systematic methods in regard to the treatment of wells must be exercised if the measures are to be successful.

Surveys in connection with anti-malaria work on the railway were made at the following stations:—Talawa, Tambuttegama, Galagamuwa, Ambanpola, Maho, Ganewatta, Wellawa, Potuhera, Polgahawela, Alawwa, Ambepussa, Rambukkana, and Kadugannawa.

* Anopheline larvae were relatively more abundant in the quarry pools than elsewhere. Of 965 larvae from the quarries, 807 (84.0 per cent.) were *A. culicifacies;* of 343 larvae from other breeding places 270 (81.0 per cent.) were *A. hyrcanus*, *A. jamesi*, and *A. barbirostris*.

3. *Entomological Work at Malaria Campaign Centres.*—The entomological work directly associated with the Anti-Malaria Campaigns at Anuradhapura, Kurunegala, and Chilaw may be classed under two categories, (*a*) the routine examination of potential breeding places of Anophelines after treatment by the anti-malaria labour force and (*b*) investigatory work.

The routine examinations referred to under (*a*) were introduced with a view to checking the efficiency of the treatment adopted. For this purpose not less than 60 per cent. of the situations treated in any one section of the town in question were examined for Anopheline larvae once every two weeks. In the cases of situations treated with oil or Paris green, the examinations were made two days after the last treatment. Detailed records of the findings (*i.e.*, the presence or absence of Anopheline larvae, and if present their size and relative abundance) were kept and summaries submitted to the officer in charge of the station each week. This work has shown that Paris green treatment as carried out at present is not highly efficient, and that improved methods are necessary.

The investigatory work has included systematic observations (fortnightly) upon particular types of breeding places of Anopheline situated both within and outside the towns, and also the examination of mosquito catching stations (both adult and larval) in selected localities within and outside the controlled areas. These investigations were commenced in September when the assistants who had been detailed for work under the Superintendent, Anti-Malaria Campaigns, became available. The period during which the work has been in progress is, therefore, too short to enable the results to be included in this report.

4. *Paris Green Experiments.*—In view of the unsatisfactory reports received from the campaign centres regarding the efficacy of Paris green as a larvicide, a series of field and laboratory experiments was undertaken in collaboration with the Sanitary Engineer. The field experiments are not yet completed, but the results so far obtained indicate definitely that important changes are necessary in order to effect improvement. Briefly these changes involve (*a*) the replacement of coir dust by some other vehicle, (*b*) the employment of more efficient spraying machines, and (*c*) closer supervision and training of the coolies employed, to ensure more systematic distribution of the larvicide. Coir dust is not a satisfactory vehicle for Paris green; it is distinctly spongy in character, and does not allow of the formation of the fine and diffuse cloud which characterizes road dust. The machines employed at present also are cumbersome, and although fairly satisfactory when used with coir dust are not sufficiently powerful to completely force road dust mixture through the spray pipe.

Routine.—The amount of routine examination work associated with the various Anti-Malaria Campaigns and connected investigations has been very considerable and is steadily increasing. Nearly 50,000 examinations of mosquitoes, their larvae, blood films, &c., have been made during the year, and much time has been devoted to registering and mapping the results. A considerable amount of time also has been given to the formation of a museum, and numerous specimens, drawings, and photographs have been prepared.

HENRY F. CARTER,
Medical Entomologist.

March 6, 1929.

3.—Report of the Superintendent, Anti-Malaria Campaigns, for the Year 1928.

IN the Administration Report of the Director of Medical and Sanitary Services for 1927, the history of the commencement of malaria activities in Ceylon, from the standpoint of organization, investigation work, and initial campaign work, has been briefly dealt with. There will, therefore, be no repetition here of such facts and this report will describe briefly the principal lines of investigation and control work performed at centres of anti-malaria activities.

Present Staff.—There were no changes made in the senior staff of the campaign.

During the year under review both investigatory and control work was confined to the towns (Chilaw, Kurunegala, Anuradhapura, and Trincomalee) decided upon for anti-malaria work by the Anti-Malaria Advisory Board. The exceptions were Mahara Jail, where past anti-malaria work is being maintained, and Kataragama, where, during the annual pilgrimage, minor anti-larval measures are adopted prior to and until the completion of the pilgrimage period.

CHILAW.

1. *Investigatory.*—The spleen surveys were limited to the school children attending the various schools in the town and the great majority of children were re-examinations from the previous surveys conducted in February, August, and December, 1927. This continuity of work was made possible and practicable by adopting the system of recording all data obtained on cards perforated at suitable points and indicating certain specific information regarding the subject examined. In all the data discussed below no reckoning—which is very small—has been made of children attending the schools in Chilaw town, but living outside the town limits, in some cases 2-3 miles away. In February, 1928, 884 children, as against 710 in the corresponding month of 1927, were examined. The spleen rate as found in children examined in February, 1927, under twelve years of age was 20.8 per cent, and in February, 1928, a large proportion of the children being re-examinations from February, 1927, a rate of 12.8 per cent. was found. In August, 1927, the same group of children gave a spleen rate of 7.7 per cent., while in June, 1928, the result obtained was 22.8 per cent. In November, 1927, the spleen rate for this same group was 11.2 per cent., while in October, 1928, a rate of 18.2 per cent. was found. Evidence obtained in the field during 1928 indicated it as being a bad year.

Chilaw was not the only town where a greater prevalence of malaria was manifested during 1928. It was unfortunate that the increase of malaria should have occurred simultaneously with the commencement of anti-malaria measures—chiefly, anti-larval in character—in the early part of 1928.

Anti-Malaria Measures adopted at Chilaw Town, 1928.—With the intention of submitting to the reader some of the local problems connected with the proper execution and the future maintenance of minor initial anti-malaria measures, a brief description of the field of work is given in this report.

The area of work is largely below sea level and within the 2 square miles the town is comprised of, there are large areas of water-logged soil. The total acreage of the Urban District Council area is 900 acres, of which 642 acres are privately owned. Crown land totals 258 acres. The area under coconut cultivation is 403 acres and such estates are entirely privately owned. The only redeeming feature and helpful condition, as far as anti-malaria work is concerned, is the absence of paddy cultivation within the town limits. Such cultivation is, however, practised just beyond the town limits. A type of cultivation, not altogether peculiar to Chilaw, is the growing of tobacco. The acreage under tobacco is 85. The area under tobacco cultivation is made to serve the purposes of growing vegetables during May-July or August, and actual tobacco plants are not put in until October and the crop taken in about March. The average annual rainfall in Chilaw is 60 inches and considering that there is a period of drought generally experienced every year, the water supply of the town—drinking and for other purposes—is meagre and at times precarious.

The water supply is entirely by wells, mostly unbuilt. The tobacco plantations are watered by large wells, merely excavations in the ground, termed " gala " wells. These wells are localized in the more or less central portion of the town, and from the data obtained by the Medical Entomologist should be regarded as a very dangerous type of breeding place of Anophelines. It would be out of the question to fill in these gala wells, 113 in number, unless some other means of a constant water supply could be introduced. The gala wells are deepened as the drought increases so that any method, such as tube wells, should be applied only after exhaustive trials which would prove an unfailing supply of water throughout the year. The acreage covered by house premises, gardens, &c., is 154.

The owners of gala wells during the latter half of last year complained that their vegetable crops had been a total failure owing to the application of Paris green to the gala wells which supplied water to their gardens. Opposition was considerable and due cognisance was taken with a view to a full inquiry. Several of the dead plants were examined and samples of soil from several of the gardens were examined. The investigation proved that Paris green was not responsible for the damage done but that it was due to the presence in the soil and around the roots of plants of a large number of beetle larvae. It is not uncommon to find that logical proof or sane argument fails to convince the opposition party that they are wrong. The result of the unfortunate bias is that no " gala " wells have been treated either with Paris green or oil (the latter, however, had never been adopted) for the last six months despite the knowledge that gala wells breed *A. listoni*—a carrier incriminated upon epidemiological grounds—in large numbers. As in most parts where anti-malaria measures are established without any legal support it has not been unusual to find in Chilaw town the results of good work vitiated by unhindered and promiscuous digging of fresh borrow pits.

The year under review is the first year of anti-malaria activities in Chilaw town. During the year 1927, the campaign activities comprised of a preliminary entomological survey of malaria in general in Chilaw. There was considerable difficulty experienced in recruiting a suitable type of labour force, and not until the cooly lines were built was any regular and permanent force

established. The frequent changes in the labour force hindered our work, as the new coolies had to be shown the work which is regarded as skilled labour, particularly the application of Paris green and oil.

The anti-malaria measures carried out during the year were—

(1) Application of oil.
(2) Application of Paris green.
(3) Filling and clearing.
(4) Distribution of Quinine to schools.

As the construction of a fish nursery for larvivorous fish had not been completed, it is proposed to consider this phase of control work during the current year (1929). In connection with the above measures educational methods by means of handbills, pamphlets, posters, demonstrations, and lectures at schools have been adopted. The formation of a Citizens' Anti-Malaria Committee would prove useful in the work, and although the scheme had been suggested to the local authorities no action has been taken in the matter.

General Procedure of Work.—The Medical Entomologist was able to complete an exhaustive survey of Anopheline breeding places prior to the establishment of anti-malaria measures. The breeding places were classified according to the treatment recommended for the control of Anopheline breeding. Small scale maps, &c., were made and used for field work. The amount of work done is recorded on different forms and these are regularly submitted to the Departmental Committee on Malaria, through the Superintendent, Anti-Malaria Campaigns. If any doubt exists as to the necessity for treatment of some breeding places the Medical Entomologist is consulted with a view to obtaining his opinion. Likewise, the Sanitary Engineer is consulted upon the best means of eradicating or controlling breeding in certain breeding grounds.

Oiling Work.—The oil used is kerosine and fuel oil in the proportion of one part kerosine and four parts fuel oil. The mixture and the strength have proved efficacious. The oiling is done by means of Knapsack Sprayers. To the oiling gang are added 2-3 coolies who prepare, by means of clearing, &c., the breeding places prior to oiling.

Paris Green.—This larvicide was used extensively during the year under review. The entire subject of Paris green administration is still under consideration as the results obtained by its use—with coir dust as a diluent and a Four Oaks Powder Distributor as the machine—have been very unsatisfactory. The Paris green in use satisfies the requirements of the arsenical content but little or nothing has yet been done to test its physical properties. The strength of the mixture used is 2 per cent. The machines (Four Oaks Sprayers) have been unsuitable for this type of work. Coir dust as a diluent—after being sifted through sieves of No. 12 and No. 30—has proved itself of very little value. Road dust proves itself the best medium, but the difficulties in obtaining regular and sufficient quantities make its use hazardous. Coolies employed in this special type of work are shown the correct and incorrect methods of usage. There have been no untoward results among these coolies by the use of Paris green except one case of granular conjunctivitis and another of hypertrophic rhinitis. Special pay is afforded to Paris green distributors, as well as to those employed in spraying oil. Paris green is applied to certain prescribed breeding places where oiling would prove to be difficult and only partly efficacious, *e.g.*, large swampy areas and paddy fields. It is the sole method employed in paddy fields where such fields are within the area of work.

Filling and Clearing.—Considerable work has been done under these two heads. During the year under review 22 breeding places had been filled. As far as Chilaw is concerned filling would be a most expensive method of abolishing breeding places, principally because it is below sea level (in most parts) and owing to the lack of co-operation on the part of the local residents. This failure to co-operate is manifested frequently by the new pits dug for purposes of either cultivation or building construction. Filling was, therefore, discontinued about the end of last year. It cannot be laid down with sufficient emphasis that until there is some means of controlling haphazard digging of pits and coconut trenches no progress can be achieved by the campaign in abolishing breeding places. The filling done by the campaign has barely been able to keep pace with the new pits created. By the above statements, it must not be concluded that no provision exists in local bye-laws to punish such offences, but rather that local authorities are reluctant to enforce existing regulations.

The entire cost of filling and clearing in general totalled Rs. 3,546.90½. Cost of labour amounted to Rs. 712.90½. 648¾ cubes of sand were utilized, and its cost was Rs. 2,834. It is not possible to obtain earth for filling as the town is so lowlying that recourse to using sand had to be made. Before this subject of filling can be dismissed, it must be pointed out that there are as many as 335 coconut trenches within the town limits and the number is ever on the increase. It will be to the advantage of the general health of the public if the estate owners will have these trenches filled up when they have served their purpose instead of permitting them to remain indefinitely as receptacles for filth and as breeding places of dangerous Anophelines.

Distribution of Quinine to Schools.—Combined with a request from local school principals and the recognition of the importance of this method of control work, Quinine distribution was effected among the school children attending the schools in Chilaw town and the schools within a radius of 4 miles from Chilaw. Each school child was given Quinine twice weekly, on two consecutive days. Dosage was 5 grains of Quinine Sulphate to every child seven years of age. Three grains of the same salt of Quinine to those under seven years of age. Neither chocolate-coated nor sugar-coated tablets were used. The children displayed eagerness to take it but in some instances objections were raised by parents. Not a single instance of any unpleasantness after oral administration of Quinine was reported. During the early part of the year the work was later assigned to pupil vaccinators appointed temporarily for the purpose. Distribution of Quinine commences in October and usually terminates in April of the following year. The total number of 5-grain tablets used was approximately 9,000, and 3-grain tablets approximately 3,800. Quinine is also distributed to our labour force quartered in our specially built lines.

Drainage.—This matter has been under the observation of the Sanitary Engineer, who has taken the necessary steps to decide upon the practicability of this measure as a means to control Anopheline breeding.

To summarize the main difficulties encountered in Chilaw town, first place should be given to the unfortunate topographical condition it presents. The presence of gala wells and the innumerable coconut trenches afford the next serious obstacles, and finally that want of co-operation by landowners, which is only too prevalent in work of this nature and which has proved discouraging and deserves the severest condemnation.

KURUNEGALA.

The same principle of work as adopted at Chilaw was put in force here.

The spleen survey among school children indicates that there has been no marked disturbance in the prevalence of malaria. As before, the same children were examined and re-examined under identical conditions. If any definite conclusions could possibly be drawn from the data obtained the statement that there was more malaria in 1928 could be made.

Anti-Malaria Work at Kurunegala during the Year 1928.—Kurunegala is the capital town of the North-Western Province with a population of 10,187 as estimated at the last census. The town has suffered severe epidemics of malaria from time to time. The acreage of the town is 2,593, of which 2,112 acres (81.5 per cent.) are to the account of private landowners. Of the 2,112 acres so owned, 23.7 per cent. is under paddy cultivation, 30 per cent. is under coconut planting, and 46.3 per cent. comprises house-gardens, houses, &c. Of the entire area of 2,593 acres, there is Crown land to the extent of 480 acres, of which 301 are rock. It is, therefore, apparent without any further mention that the assurance of co-operation by landowners and others is of paramount importance in the absence of legal support. The coconut estates are usually badly neglected and indiscriminately intersected by trenches left open for many years at a time. The trenches contain a variety of debris. Paddy cultivation is performed on an extensive scale within the town limits and two crops are usually obtained in a year. There are several types of Anopheline breeding grounds, and the one which does not lend itself to satisfactory anti-anopheline treatment is the large number of wells in the town. The town does not as yet possess a pipe-borne water supply. The total number of wells situated in occupied premises is 329. There are several wells which are situated on coconut estates within the town but not taken into account here. Of the 329 wells, 323 are uncovered and 213 without any leadaway drains. The majority of wells contain large fish which have in the past proved inimical to top-minnows introduced for the specific purpose of controlling Anopheline breeding. The wells vary in depth from 8 feet to 50 or 60 feet. No inner surface lining was noticed in 180 wells.

During the year under review no protests have been made by the people against the work done. In many cases where considerable filling had been done free of cost to the owner, the land has been made more productive. There is no doubt that the policy of giving something for nothing should not be applied to cases where a proportionate reimbursement by the estate owner could be reasonably expected.

The distribution of the labour force, &c. is similar to that in Chilaw. The labour force is housed in two well built lines in close proximity to the office.

The measures adopted have been of a minor nature and no drainage work, other than clearing and cleaning of existing water-courses, has been done. The entire subject of the drainage of the town is under the consideration of the Sanitary Engineer.

Oiling.—The entire system of work and type of materials used are the same as at Chilaw.

The number of situations treated with oil during the year was 32,369. Applications of oil are made weekly and the above number indicates the aggregate of such weekly treatments. The total amount of the mixture of kerosine oil and fuel oil used was 3,100 gallons. Oiling was performed where any injury to vegetation could be of no consequence.

Paris Green.—The distribution of Paris green was employed chiefly in treating paddy fields. On the whole the results of treatment with Paris green have been very poor, and this will form a subject to be dealt with by the Medical Entomologist and the Sanitary Engineer.

The number of situation treated with the larvicide was 13,306. The total amount of Paris green and coir dust used was 10,784 pounds.

Filling, Clearing, and Maintenance.—Considerable work has been done under " Filling." 105 breeding places were effectively dealt with by filling and minor drainage. The work is confined to the central area of the town and it is done on private lands as well as on Crown land. There are 141 old drains which are regularly maintained in good condition. 460,865 square feet of drains have been cleared; 270,929 feet of drains have been graded.

Quinine Distribution.—Quinine distribution was performed at the town schools during January, February, March, and December, 1928. No work was done during October and November as the appointment of a pupil vaccinator for the purpose of distributing Quinine was delayed. The labour force was given Quinine throughout the year. In all 128,610 grains of Quinine were administered during the year. An average of 750 pupils was treated twice a week in the town. The schools within a radius of 4 miles from Kurunegala were included in the programme of work.

Educational Lectures, &c.—Briefly, the following steps were taken:—

(1) Two thousand pamphlets on " Malaria Fevers, their cause, Nature and Prevention " were distributed in the town.
(2) A set of hand-bills " Clear your town of Malaria " were distributed in all parts of the town.
(3) Practical demonstrations on mosquito life were given at schools and to the public.
(4) The labour force was given a lantern lecture on malaria control.
(5) The malaria film was exhibited at the Town Hall.
(6) Suitable posters on malaria were distributed in the town.
(7) The establishment of an anti-malaria dispensary where treatment is given free to all suffering from fever was inaugurated during the year. The work is in charge of a Medical Officer attached to the Civil Hospital, Kurunegala.

Larvivorous Fish.—A suitable fish—nursery has been completed and work on this phase of control is contemplated during 1928. The top-minnows, Lebistes reticulatus, are flourishing and should prove useful in inhibiting the growth of Anopheline larvae in the wells of Kurunegala town. This nursery has already supplied other towns and villages with fish.

Conclusions.—Considerable headway has been made in this town. The greatest difficulties met with in the work are (1) the extensive area of paddy cultivation with its concomitant channels, &c., (2) the presence within the town of a large number of wells which are difficult to treat even with larvivorous fish, (3) the large area under coconut cultivation belonging to private owners.

With the initiation of a pipe-borne water supply early next year (1930), it is to be hoped that the greater number, if not all, of the wells will be closed up.

Anuradhapura.

The campaign in this town now reached the sixth year of its activity. The measures adopted in the past have been improved upon. General supervision and discipline among the labour force have been considerably improved. During the year under review the presence of an old and badly kept channel (Tothuwila stream) was disclosed during general clearing operations. The general opinion of the townspeople is that malaria has been reduced considerably. A teacher at a school aptly described the reduction of malaria by stating that the Quinine bottle which was always present on the table during class attendance is now left in the cupboard. Whatever public opinion may be upon the incidence of a disease, independent researches have to be made to gauge, upon definitely accepted principles, the progress of a disease. A spleen census was, therefore, carried out among the school children who were examined in 1927. In 1922, the spleen rate among 328 children was 41.8 per cent., in 1927, 451 children examined yielded a spleen rate of 18.1 per cent., while in 1928 of 450 examined, the gratifying spleen rate of 14.6 per cent. was got.

The spleen rates obtaining in the school children living in the town are very striking and indicate a cessation of hostilities between man and mosquito. In a report of this nature it is impossible to discuss fully the entire significance and value of such findings so that the writer must rest content by merely presenting the data obtained. Of the school children resident in town and under twelve years of age, a total of 342 (as against 333 examined in 1927) gave a spleen rate of 11.4 per cent., as against 18.6 per cent. registered in 1927. The evidence obtained so far goes to show that the campaign has achieved results appreciably felt by the public.

Anti-Malaria Measures at Anuradhapura.—During the year, the main activity of the campaign was an attempt to control the spread of malaria by controlling the breeding places of Anopheline mosquitoes. Further, Quinine was administered to the school children of the town during the first quarter of the year as a prophylactic measure and propaganda work was carried on by distributing printed matter with a view to the education of the public as to the cause, spread, and prevention of malaria.

As mentioned above, the main activity of the campaign was the controlling of the breeding places of anopheles mosquitoes. The methods adopted for this purpose were as follows:—

(1) Elimination of breeding places of mosquitoes by filling or draining where possible.
(2) Oiling of pools and similar collections of water.
(3) Treatment with Paris green of paddy fields, irrigation channels, and swamps.
(4) Clearing of vegetation along the edges of pools and clearing scrub jungle in the neighbourhood of breeding places.
(5) Maintenance in a good and functioning condition of the drains and Halpanu-ela.

It must be mentioned here that several breeding places, such as tanks, drinking and bathing ponds, and the river have to be left without active treatment as the water in such places is used for drinking and bathing purposes. The only treatment that is being given to such places is periodical clearing of their edges of vegetation, &c. The wells have been treated by stocking them with larvivorous fish.

During 1928, 4,372 5-grain Quinine tabloids and 541 3-grain tabloids were distributed.

The Staff.—The staff consisted of the following officers:—

A Medical Officer in charge and 2 Sanitary Inspectors.

Labour Force.—Paid labour as well as prison labour was utilized during the year, the former being engaged chiefly in oiling, Paris green spraying, and general maintenance of drains and Halpanu-ela, the latter in filling pits and pools and clearing vegetation.

Filling and Draining.—Activities under this head were more curtailed than in the previous year pending advice from the Sanitary Engineer for a definite scheme of drainage for the town. During the year 91 places were filled and 30 new drains were opened up.

Oiling.—The oil used for spraying was a mixture of kerosine oil and fuel oil in the proportion of one of the former to four of the latter. The " Diesel fuel oil " which was received from October onwards is a great improvement on the " liquid fuel " previously received in that it gives a better, more even, and more lasting film. The types of breeding places treated by oiling were pools, borrow pits, stone-quarries, drains, disused wells, and trenches. Towards the latter part of the year oiling was extended even to some of the swampy areas, as the efficacy of Paris green treatment was found to be poor.

During the year 17,284 applications of oil were made to such breeding places. The cost of oil used was Rs. 1,073.84. The cost of labour was Rs. 1,182.50.

Paris Green Spraying.—This method was adopted for treating the paddy fields, irrigation channels, and swamps. The results were not very satisfactory.

Clearing.—Initial clearing of scrub jungle along both banks of Malwatu-oya and part of the Basawakkulama tank bed was undertaken and completed. The clearing along the river commenced from about a 100 yards above Dickson road bridge and extended to about 200 yards below Mihintale road bridge. The clearing in Basawakkulama tank bed was along Arippu road. A large number of breeding places was thereby exposed and later filled up.

Further initial clearing along the whole length of the neglected Nuwara Wewa waste water channel was completed to enable the officers of the Sanitary Engineer's Department to take levels and map out the channel. The taking of levels was completed in December. The major part of the above clearings was done by prisoners.

In addition, periodical clearing of vegetation around breeding places and along the banks of Halpanu-ela was continued during the year by the Campaign coolies.

A total area of 190,264 square yards of scrub jungle was cleared during the year.

Filling.—Ninety-one hollows were filled in with 1,955 cubes of earth.

Only Rs. 35 was spent on obtaining earth. The rest of the earth used was obtained from adjacent high ground.

Maintenance Work.—All the earth drains within the controlled area, except those along Public Works Department roads, were maintained in good condition. The maintenance of Public Works Department drains within the controlled area to meet the requirements of an Anti-Malarial Campaign, though undertaken and carried on during the previous years, was discontinued on the orders of the Superintendent, Anti-Malarial Campaigns. The aggregate length of drains maintained was 580,600 yards, and 3,997 borrow pits and pools were maintained by clearing edges, &c. The fish nursery and Halpanu-ela received regular attention and were maintained in good condition.

In November during heavy rains tract I. of Halpanu-ela overflowed its banks, and though the flow of water was strong and rapid, no damage was caused to the banks which now appear to be well consolidated.

The activities of the campaign which covered an area within about 1½ miles radius from Brazen Palace were, during the year, extended outwards and now cover an area within about 2 miles' radius from the Brazen Palace.

TRINCOMALEE.

The year under review saw considerable changes among the labour force in Trincomalee town. All but one of the old coolies left the campaign for higher wages elsewhere. The new labour force was recruited with the help of the Chairman, Local Board, Trincomalee, the supervision work, however, being done by the same officers, until Sanitary Inspector de Silva was replaced by Sanitary Inspector Wanigasekera in October, 1928.

Oiling Work.—The oiling of mosquito-breeding places was carried out systematically by an oiling brigade consisting of 4 coolies and a kangany or head cooly.

The areas cleaned and oiled regularly were—

(*a*) Admiralty flats.
(*b*) Maniaweli swamps and lowlying lands, including quarry pits, borrow pits, pools, &c.
(*c*) Marshy area in Yard cove.
(*d*) Swamps in Division No. 9.
(*e*) Uppuveli area in Division No. 11.
(*f*) Railway station area.
(*g*) Pools, tank, collections, channels, drains, and disused wells in Divisions Nos. 1, 2, 3, 4, 9, and 11.

The quantity of oil used from January to December of this year was as follows:—

Kerosine oil 132 gallons.
Liquid fuel 472 gallons.

Costing Rs. 490.12.

Jungle Clearing.—A little over 4 acres of jungle was cleared in Sivan area, in the Residency, land belonging to the Local Board, patches of jungle in lands where anti-malaria works were done previously, and around the Public Works Department pits in Maniaweli.

Quinine Distribution.—During the months of April and May, 8,130 5-grain and 5,930 3-grain Quinine tabloids were distributed to 16 schools in the town. The teachers in the different institutions mentioned that there was an improvement in the attendance of the children.

Distribution of Leaflets.—About 4,000 anti-malaria leaflets were distributed in the town and in the Dockyard and at China Bay. These leaflets reminded the public of the simple preventive methods that should be adopted to eradicate the mosquito.

Cochineal Introduction.—This insect was introduced into fresh Prickly-pear bushes in the town. Several bushes are now no more, due to the havoc caused by the insect.

Fish Introduction.—792 " Top Minnows " were introduced into 130 wells, 37 had fish in them and these proved negative at the time of examination.

An Entomological Assistant was stationed during the latter part of the year and carried out an examination of all the breeding places in the town.

Railway Anti-Malaria Work.—During the year under review it was considered by the Director of Medical and Sanitary Services that Railway anti-malaria work as performed in the past had not been entirely successful. It was, therefore, decided to reorganize the entire work, which reorganization was to include a new supervisionary staff, mode of campaign work, preliminary mosquito investigation work, &c. This work has been done by the Medical Entomologist and the Sanitary Engineer, and the scheme is as at present being considered by the General Manager, Ceylon Government Railway.

The strength of the labour force in the past has been 9 men and 1 kangany. Until a definite statement on the future Railway anti-malaria work has been made by the General Manager of Railways the labour force will remain the same and work will be confined to the stations of Polgahawela, Pothuhera, and Rambukkana. The work done is supervised by the Medical Officer attached to the Superintendent, Anti-Malaria Campaigns.

The stations where anti-malaria work was carried out during the year were—Anuradhapura, Ambanpola, China Bay, Cheddikulam, Galgamuwa, Galoya, Mankulam, Madawachchi, Polonnaruwa, Polgahawela, Parasangahawewa, Tambuttegama, Talawa, Madhu Road, and Vavuniya.

The work consisted of filling in borrow pits and swampy areas, providing new drains, regrading and weeding existing drains, clearing of rank vegetation, and the cleaning and oiling of all pools.

The following is a summary of the work done:—

Area of premises cleared ..	1,970,747 sq. ft.	Length of above in feet ..	692
Pits dug to bury receptacles capable of holding water ..	31	Cubic feet of earth used to fill above	3,720½
Cubic capacity of above ..	938½	Number of pits closed ..	229
Number of earth drains regraded, cleaned, and weeded ..	51	Cubic capacity of above ..	107,554½ c. ft.
Length of above in feet ..	10,301	Number of water-stagnating pits cleared and oiled ..	163
Cubic feet of earth work removed in clearing and regrading above ..	18,305⅝	Square feet area of above ..	78,859
Number of new drains opened out .	54	Amount of kerosine oil used, gallons	25¾
Length of above in feet ..	2,510½	Amount of liquid fuel ..	54½
Cubic feet of earth work removed	3,137½	Number of trees pruned of overhanging branches ..	176
Number of old drains closed not required	5		

Maintenance of Anti-Malaria Work at Mahara Jail.—Malaria control measures which were established at Mahara Jail towards the end of 1922, following a severe epidemic among the prisoners and staff, were all maintained in good order and regularly inspected by the Superintendent, Anti-Malaria Campaigns. The measures recommended were performed by the prison authorities, the Harbour Engineer's, and Public Works Departments. The Ela and Quarry drains were kept in good condition.

Quinine Distribution.—Arrangements were made by the prison authorities for the compulsory curative and preventive treatment of prisoners and members of the staff. The administration was discontinued in June, 1928, with a view to studying the importance and influence exerted by this form of malaria control upon the local staff and prisoners. The entire work is carried out by the Resident Medical Officer, Mahara Jail. Prisoners and members of the staff suffering from fever are kept in the jail hospital for a period of two weeks until adequate treatment is given.

Of 37 children, living within the jail premises, examined in June, 1928, only 2 (S.R. 5 per cent.) were found with enlargement of the spleen. 303 prisoners were examined and classified according to their length of stay at the jail. Of 164 prisoners who had been resident in the jail under six months enlarged spleens were found in 12 (S.R. 7.3 per cent.). Among 63 who had lived there over six months but not more than a year, only 4 (S.R. 6.2 per cent.) had splenic enlargement. Of 76 examined who had lived in the jail more than one year, not one enlargement of the spleen was found. Of the enlarged spleens found, 66.6 per cent. were among those who had been in jail less than six months.

The results obtained must be regarded broadly, as several of the enlarged spleens, *e.g.*, three finger-breadth could, with sound argument, be said to have been acquired before arrival at the jail. Furthermore, the fact that the older prisoners give no enlargement of the spleen and no history of any frequent attacks of malaria strengthens the conclusion that malaria at Mahara Jail has now reached a stage of little importance.

Miscellaneous.—(*a*) Anti-malaria control measures were performed as usual during the pilgrimage period at Kataragama in Province of Uva. The measures included early Quinine distribution, the control of Anopheline breeding in the river and the few surface-water collections in the village.

(*b*) A course of lectures and demonstrations on malaria and its control was given to the Medical Officers attached to the campaign. A systematic course of lectures was given to the Sanitary Learners during the year.

(*c*) The office was visited by His Excellency the Governor of Ceylon and the Right Hon. W. G. Ormsby Gore, Under-Secretary of States for Colonies, on June 6, 1928.

K. J. RUSTOMJEE,
Superintendent, Anti-Malaria Campaigns.

February 25, 1929.

4.—Report on Health Unit Work for the Year 1928.

CONTENTS.

Introduction.—The Health Unit movement was inaugurated in July, 1926, with the establishment of the Kalutara Totamune Health Unit.

Since this 2 other Health Units have been established, 1 in November, 1927, in Weudawili hatpattu in the North-Western Province, and the other in May, 1928, at Matara Gravets and Wellaboda pattu in the Southern Province. At the end, therefore, of 1928 there were functioning 3 Health Units, viz., those of Kalutara totamune, Weudawili hatpattu, and Matara Gravets and Wellaboda pattu.

For Health Unit work the Island has been tentatively divided into 63 health districts making use of Chief Headmen's divisions. On an average a district will have a population of about 83,000. There are some districts with smaller and others with larger populations.

Plan of Work.—The plan of work that was originally established has been followed:

The work is undertaken by agreement with the local Government authority, if its area is included; and with the chief executive officer of the district, viz., the Government Agent or his Assistant.

For being included within a Health Unit the local authority undertakes to—

(*a*) Hand over its health work and its health personnel to the Medical Officer of Health of the Health Unit.

(*b*) Employ only approved Sanitary Inspectors who would devote their time to health work only.

(*c*) Pass necessary by-laws.

The local Government authority in return receives the services of a whole-time Medical Officer of Health, of Public Health Nurses, and all the facilities of the Department of Medical and Sanitary Services. For the local authority from a business point of view the arrangement is quite sound.

At first only a portion of the health district is dealt with—a portion with a population of about 25,000 to 30,000. After the work has been properly established in this area, the remainder is taken up in one or two further stages.

The cost is chiefly borne by Government, and the local Government authorities that come within the limits of a Health Unit contribute only what they would spend whether a Health Unit were established or not.

The policy of the work has continued to be the same, viz., the doing of preventive work only; curative work being undertaken only on a preventive scale.

In carrying out the work, as one person has to do all of it, the activities are carried out by season after determining the periods when each could be handled to the best advantage. For one period, for example, hookworm treatment will be carried out, the next possibly vaccination against smallpox, next school medical inspection, next a Health and Baby week, next inspection of food handling establishments, &c., while certain activities will be carried on all the time.

According to present arrangements the establishment of future units will be at the rate of 2 per year. All the Provinces will, in the first instance, be provided with a Health Unit each before a second is established in any Province. At present, the Western, the Southern, and the North-Western Provinces have been provided, and during the present financial year 1928-29 Sabaragamuwa and Eastern Provinces will be provided. There will, then, remain the Northern, Central, Uva, and North-Central Provinces.

The work carried out has consisted of the various branches of modern health work, viz., collection and study of the vital statistics, health education, control of the acute communicable diseases, hookworm treatment, immunization against smallpox and typhoid fever, anti-malaria work, maternity and child welfare work, school hygiene, sanitation of private premises, attention to water supplies, sanitary disposal of excreta and other wastes, control of food handling establishments, &c.

Personnel.—The staff of a Health Unit consists of the following:—

Medical Officer of Health.	Midwives.	Peon.
Sanitary Inspectors.	Clerk.	Cooly.
Public Health Nurses.		

The following is a statement of the staff employment up to the end of 1928 at the 3 Health Units:—

Designation.	Kalutara Totamune.	Weudawili Hatpattu.	Matara Gravets and Wellaboda Pattu.	All Units.
Medical Officers of Health in charge	1	1	1	3
Medical Officers of Health in training	1	—	—	1
Medical Officers	—	1	—	1
Sanitary Inspectors	10	5	4	19
Public Health Nurses—				
Trained	1	—	—	1
In training	6	—	—	6
Midwives	7	3	3	13
Clerks	2	1	1	4
Poens	1	1	1	3
Coolies	2	1	1	4

The units were in charge of the following Medical Officers of Health:—

Kalutara totamune—

January to April—Dr. W. G. Wickremasinghe.

May to December—Dr. W. T. de Silva.

New area—Dr. H. A. Direkze.

Weudawili hatpattu—

Dr. A. M. Samarasinghe.

Matara Gravets and Wellaboda pattu—

Dr. W. G. Wickremasinghe.

Salient Points relating to each Unit.

Kaiutara Totamune Health Unit.—This unit is in the Kalutara District of the Western Province, and is the first one to have been established. It includes the Urban District Council area of Kalutara town and 2 Sanitary Board towns besides the rural area.

The whole area under this unit is embraced by the revenue division of Kalutara totamune and is 53 square miles in extent.

The work was inaugurated in July, 1926, in the upper 25 square miles of it with a population of 32,941. In June, 1928, the work was extended to cover the remaining 28 square miles with a population of 48,586.

The population of the whole area estimated for 1928 is 82,110. The birth rate is 39.0 per 1,000 and the death rate 24.2.

The staff consists of—

1 Medical Officer of Health in charge.	7 Midwives.
1 Medical Officer of Health in training.	2 Clerks.
10 Sanitary Inspectors.	1 Peon.
1 Trained Public Health Nurse.	2 Coolies.

The Medical Officer in charge of Maternity and Child Welfare was attached to this unit for the purpose of training the Public Health Nurses, and had under her control the Maternity and Child Welfare phase of the work of the Health Unit.

The total cost of this unit has been Rs. 66,930.85, of which the Government contribution has been Rs. 29,969.95. The *per capita* cost is 81 cents.

The work in the upper half of this unit which had already been established has consisted in carrying out the routine activities. A hookworm campaign was carried out as well as immunization against smallpox. Immunization against typhoid fever was not done to the same extent as was done in the previous year. No school hygiene work was done but training in health habits was introduced. A Health and Baby week was organized. The second anniversary of the Health Unit was celebrated on July 1, and His Excellency the Governor graced the occasion with his presence. On the same day was organized the Kalutara Totamune Medical Society. Towards the end of the year the Kalutara Totamune Public Health Advisory Committee composed of 18 unofficials of the area was organized for the purpose of assisting the Medical Officer of Health in his work, and of keeping the public informed through it of the work of the unit.

In the lower half the work was chiefly concerned with the sanitary survey of the new area and the organization of the work to bring it in line with the upper half. A separate Medical Officer of Health who was in training was in charge of it. The work was started with a hookworm campaign as it was felt that by so doing the Medical Officer of Health and the Sanitary Inspectors would get into intimate contact with the people. A Social Service League was organized for the Beruwala section of the area.

The statistics of the two areas have been kept separate up to end of the year 1928 so that comparisons may be made of the activities of the upper area for the three years 1926, 1927, and 1928. From 1929 the figures of the two areas will be kept together.

The following statement refers to the activities carried on in the upper area of Kalutara badda. A camparison is made of the figures of the three years :—

Vital Statistics.

	1926 Six Months.	1927.	1928.		1926 Six Months.	1927.	1928.
Population	32,941	33,136	33,427	Infant deaths	100	150	166
Number of births	671	1,293	1,338	Infant mortality rate	148	116	119
Birth rate	40.2	39.0	40.0	Maternal deaths	5	20	21
Number of deaths	446	864	878	Maternal death rate	7.4	15.5	15.7
Death rate	26.8	26.0	26.3				

Health Education.

Lectures, &c.	43	50	111	Conferences with staff	22	11	47
Attendance	9,462	5,162	16,673	Attendance	—	83	478
Average attendance	220	103	150	Attendance per conference	—	8	10

Communicable Diseases.

Dysentery :	Cases	57	34	33	Phthisis :	Cases	4	7	13
	Deaths	14	6	8		Deaths	2	7	3
Typhoid fever :	Cases	15	64	31	Influenza :	Cases	2	—	—
	Deaths	4	14	11		Deaths	—	—	—
Measles :	Cases	4	8	49	Chickenpox :	Cases	4	63	81
	Deaths	1	—	—		Deaths	—	—	—
Whooping cough :	Cases	2	—	1					
	Deaths	2	—	—					

Immunization.

Against :—				(*b*) Smallpox—			
(*a*) Typhoid fever—				Vaccinated	726	1,190	1,183
1st dose	—	88	19	Successful	646	989	874
2nd dose	—	41	—	Unsuccessful	13	9	41
				Unknown	93	21	268

Hookworm Treatment.

Number examined :—				Number treated	—	2,959	2,170
Before treatment	370	3,873	2,027				
After treatment	—	382	323				

Laboratory Examinations.

Locally	106	—	76	Colombo	374	—	2,340

Hygiene.

Maternity, Infant, and Pre-school :—				Infants :—			
Clinics held	85	219	297	First visit	—	517	575
Visits to clinics expectant mothers :—				Subsequent	—	1,292	1,627
First visit	176	75	53	Total		1,809	2,202
Subsequent	—	236	146	Pre-school :—			
Total	176	311	199	First visit	858	418	507
Infants :—				Subsequent	544	925	1,303
First visit	151	125	363	Total	1,302	1,343	1,810
Subsequent	—	1,671	2,327	Deliveries by Health Unit midwives :—			
Total	151	1,796	2,690	Number of midwives	4	4	4
Pre-school :—				Number delivered	73	276	388
First visit	98	108	546	School hygiene :—			
Subsequent	—	1,981	3,212	Examined	1,413	1,922	—
Total	98	2,089	3,758	Defective	1,018	947	—
Home visits to expectant mothers :—				Defects	1,698	2,151	—
First visit	471	490	329	Defects corrected	—	105	—
Subsequent	256	932	531				
Total	727	1,422	860				

Sanitation.

Latrines :—				Housing :—			
Number of houses	—	6,193	6,193	Premises inspected	5,975	—	13,366
Latrines existing	—	1,757	1,858	Defective	3,655	—	7,539
Inspections	1,213	2,534	4,414	Improved	601	—	4,045
Newly built	—	101	411	Building applications dealt with for :—			
Rendered sanitary	32	140	92	New buildings	—	94	116
Wells :—				Reconstruction and repairs	156	108	100
Existing	—	1,640	1,647	Certificate of conformity	—	23	8
Inspections	—	1,488	2,547				
Newly built	—	7	8				
Improved	8	46	42				
Licensed trades :—							
Existing	—	—	227				
Inspections	—	—	6,834				
Defects	—	—	562				
Improved	—	—	266				

Expenditure.

	1926. Six Months.	1927.	1928.
	Rs. c.	Rs. c.	Rs. c.
Government funds ..	18,797 39	21,014 51	22,597 91
Local Authority's fund ..	10,625 17	23,564 52	26,010 90
Total ..	29,422 56	44,579 3	48,608 81

Of the foregoing figures those relating to infant mortality are of interest. In 1926 the rate was 148, while in 1927 it was 116 and last year 119. In the figures relating to incidence of typhoid fever and dysentery there is a reduction in the reported cases. Fifteen cases for the six months in 1926, 64 cases and 31 cases, respectively, for typhoid fever for the years 1927 and 1928; and 57 cases, 34 cases and 33, respectively, for dysentery. The figures relating to latrines show that over one-third of the houses are provided with them.

The work in the lower half of the unit was commenced with an inaugural meeting at Beruwala on June 12, 1928, and the activities have been as follows:—

Sanitary Survey.

Homes surveyed ..	2,679

Health Education.

Lectures ..	1
Lantern talks ..	19
Cinema shows ..	3
School talks ..	18
Total ..	41
Attendance ..	7,510

Communicable Diseases.

	Cases.	Deaths.		Cases.	Deaths.
Dysentery ..	32	3	Phthisis ..	6	3
Typhoid fever ..	38	11	Mumps ..	6	—
Measles ..	3	—			
Whooping cough ..	2	1	Total ..	122	18
Chickenpox ..	35	—			

Immunization.

Anti-typhoid:—		Anti-smallpox:—	
1st dose ..	16	Vaccinated ..	—
2nd dose ..	4		

Hookworm Treatment.

Number examined:—		Number treated ..	952
Before treatment ..	1,206		
After treatment ..	579		

Laboratory Examination.

Locally ..	—	In Colombo ..	1,785

Hygiene.

Maternity, Infant, and Pre-school:—		Deliveries by Health Unit midwives:—	
Clinics held ..	42	Number of midwives ..	—
Visits to clinics:—	Total.	Number delivered ..	—
Expectant mothers ..			
Infants	507	School hygiene—	
Pre-school		Examined ..	261
Home visits:—		Defective ..	243
Expectant mothers ..	70	Defects ..	509
Infants	262	Corrections ..	—
Pre-school	436		

Sanitation.

Latrines:—		Licensed trades:—		Building applications for:—	
Inspections ..	2,078	Inspections ..	949	New buildings ..	15
Newly built ..	8	Defective ..	145	Reconstruction and repairs	8
Rendered sanitary ..	28	Improved ..	19	Certificate of conformity ..	4
Wells:—		Housing:—			
Inspections ..	1,623	Premises inspected ..	6,652		
Newly built ..	—	Defective ..	3,101		
Improved ..	6	Improved ..	974		

Expenditure.

	Rs. c.
Government funds ..	7,372 4
Local authority ..	10,950 0
Total ..	18,322 4

Weudawili Hatpattu Health Unit.—The area forming this unit is located in the Kurunegala District of the North-Western Province and includes the Local Board town of Kurunegala. The total area is 174½ square miles and forms one Chief Headman's division. Of this area only 40 square miles comprising Tiragandahaye korale, Kurunegala town, and the villages of Mallawapitiya and Millawa and having a population of 27,594 have been taken up, at present, for work. The inaugural meeting of this unit was held on November 26, 1927, and the work might be considered as in the first year of operation.

The staff here consists of 1 Medical Officer of Health, 1 Medical Officer, 5 Sanitary Inspectors, 3 midwives, 1 nurse, 1 clerk, 1 peon, and 1 cooly. The Medical Officer was appointed for school medical inspection and the midwives were appointed late in the year. The nurse has worked for three and a half months only.

The cost of working this unit for the year 1928 has been Rs. 68,520, of which the Government contribution has been Rs. 18,236 and the local authority's Rs. 50,284. The *per capita* cost is Rs. 2.48 being the highest of the 3 units. This is due to the heavy cost of the scavenging and conservancy services and to a sum of Rs. 10,000 included as interest on the water supply loan. What has to be borne in mind is that these amounts would have been expended whether the Health Unit were established or not. A sum of Rs. 1,300 is also included as payment to the Medical Officer for passing cattle as the Medical Officer of Health for religious reasons would not pass them.

There has been during the year—

1,046 births giving a birth rate of 37.9;
1,246 deaths giving a death rate of 45.1;
386 infant deaths giving a rate of 36.9; and
43 maternal deaths giving a maternal mortality rate of 41.1 per 1,000 living births.

The chief causes of death in this unit are anchylostomiasis, malaria, convulsions, pneumonia, and puerperal septicaemia.

The Health Unit does not handle the malarial problem at Kurunegala town, there being a separate organization for the work.

The work done by this unit has consisted of doing a detailed survey of the whole area, carrying out a hookworm campaign, medical inspection of school children, and organizing the whole routine of the unit. The taking over of the health work of the Local Board before the health survey was completed has hampered the survey somewhat.

The figures relating to the activities of this unit are stated later under compilation of data by Health Units.

Matara Gravets and Wellaboda Pattu Health Unit.—This unit is located in the Matara District of the Southern Province and includes within its area two Mudaliyars' divisions and the Urban District Council town of Matara, the whole being 110 square miles in extent. Of this area 30 square miles composed of Matara Gravets and Dondra, Kapugama, Wauwa, and Gandara in Wellaboda pattu with a population of 30,739, according to the health survey, have been taken up at present for work.

The inaugural meeting was held on May 16, 1928, and the unit, therefore, has been in operation for a period of seven and a half months.

The staff during the period has consisted of—

1 Medical Officer of Health,
4 Sanitary Inspectors,
3 Midwives,
1 Clerk,
1 peon, and
1 cooly.

The cost of this unit is chiefly borne by Government, there being a small amount spent by the Sanitary Board on the town of Dondra. This unit does not include the Urban District Council town of Matara and is therefore entirely rural. The cost for the seven and a half months has been Rs. 14,275.70, the *per capita* cost being 46 cents.

The work done has consisted of a detailed survey of 5,533 houses and the organization of the routine activities.

With regard to Maternity and Child Welfare a Health Centre is in course of construction at Walgama at the expense of two public spirited citizens of the locality. The foundation stone of this building was laid by His Excellency the Governor on November 1, 1928. At Dondra, a citizen of that locality has given a room to serve as a Health Centre there. A Social Service League has also been organized for the area.

In the health education field a health exhibition was organized for ten days at Dondra during the fair. A special point here is that all the expenses were borne by certain people of the place.

The unit had to deal with an outbreak of dysentery and it was able to demonstrate to the people the value of Health Unit work, especially when there was a contrast in the action taken in the urban area which was not looked after by the unit and the rural area which was.

The figures relating to the work of this unit are stated below under compilation of data by Health Units.

The following is a compilation of data by Health Units for 1928:—

Provinces.	Western.	North-Western.	Southern.	Totals.
Health Units.	Kalutara Totamune.	Wendawili Hatpattu.	Matara Gravets and Wellaboda Pattu.	3
Year of operation ..	Third	First	First	50½ months
Area—	Sq. Miles.	Sq. Miles.	Sq. Miles.	Sq. Miles.
Total ..	53	174½	110	337½
Worked ..	53	40	30	122
Population—				
Total ..	82,110	27,594	30,739	140,443
Urban ..	14,026	11,219	—	25,245
Rural ..	68,084	16,375	30,739	115,198
Vital Statistics.				
Total births ..	3,203	1,046	—	—
Birth rate ..	39.0	37.9	42.3	—
Total deaths ..	1,987	1,246	—	—
Death rate ..	24.2	45.1	16.2	—
Infant deaths ..	—	386	—	—
Infant death rate ..	—	369	175	—
Maternal deaths ..	—	43	—	—
Maternal death rate ..	—	41.1	13.4	
Expenditure.				
	Rs. c.	Rs. c.	Rs. c.	Rs. c.
Government ..	29,969 95	18,236 91	10,784 70	58,991 56
Local authority ..	36,960 90	50,284 19	3,491 0	90,736 9
	66,930 85	68,521 10	14,275 70	149,727 65
Per capita cost ..	0 81	2 48	0 46	1 6
Activities.				
Health education—				
Lectures ..	31	—	12	43
Lantern talks ..	24	48	7	79
Cinema shows ..	6	3	1	10
School talks ..	60	2	4	66
Health exhibition ..	—	—	1	1
Attendance ..	19,000	16,000	2,620	36,620
Conferences with—				
Health Unit staff ..	49	5	27	81
Attendance ..	473	24	167	664
Conferences with—				
Others ..	9	10	1	20
Attendance ..	—	200	23	—
Health Survey.				
Homes surveyed ..	2,679	4,800	5,533	13,012
Communicable Diseases.				
Notified ..	312	140	167	619
Investigated ..	312	140	167	619
Isolated ..	312	—	167	479
Quarantined ..	—	5	—	5
Houses cleaned ..	248	3	167	418
Hookworm Treatment.				
Given ..	3,122	1,456	—	4,578
Examinations—				
Before ..	3,233	1,054	—	4,287
After ..	902	458	—	1,360
Immunization.				
Anti-typhoid—				
First dose ..	35	9	—	44
Second dose ..	4	9	—	13
Anti-smallpox ..	1,183	—	82	1,265
Laboratory Examinations.				
Locally ..	77	—	—	77
In Colombo ..	3,164	1,512	12	4,688
Totals ..	3,241	1,512	12	4,765

Provinces.	Western.	North-Western.	Southern.	Totals.
Health Units.	Kalutara Totamune.	Weudawili Hatpattu.	Matara Gravets and Wellaboda Pattu.	3
	Hygiene.			
(*a*) Clinics—				
Number of centres	13	2	—	15
Number of clinics	339	32	—	371
Average attendance	210	11	—	—
Under care—				
Expectant mothers	647	94	112	853
Infants	820	192	—	1,012
Preschool	929	304	—	1,233
(*b*) Home visits—				
Prenatal	930	35	679	—
Postnatal	394	—	156	—
Infants	2,464	198	—	2,662
Preschool	2,246	648	—	2,894
(*c*) Confinements by Health Unit midwives	394	63	112	569
(*d*) School Hygiene—				
Examined	261	2,092	304	2,657
Defective	243	1,830	226	2,299
Defects	509	3,590	271	4,370
Consultations at Office—				
Children	418	88	24	530
Adults	206	35	20	261
Food inspection—				
Cattle inspected	2,687	2,818	—	5,505
Goats inspected	87	3,606	—	3,693
Samples of milk analysed	4	6	10	20
Sanitation—				
Inspections of water supplies	4,170	2,523	442	7,135
Inspections of latrine construction	5,828	3,834	438	10,100
Inspection of licensed trades	7,873	6,578	136	14,587
Housing—				
Inspections of private premises	20,018	11,807	2,773	34,598
Building applications reported on for new buildings	131	85	24	240
Additions and alterations	108	60	21	189
Certificate of conformity	12	72	51	135
	Results.			
Latrines—				
(*a*) Newly built—				
Pail	85	7	2	94
Pit	332	17	68	417
Total	417	24	70	511
(*b*) Restored to sanitary type—				
Pail	77	60	—	137
Pit	43	2	21	66
Total	120	62	21	203
Wells—				
Newly constructed	8	2	2	12
Improved	48	1	12	61
Trade premises improved	281	79	42	402
Housing—				
Houses newly built	—	—	—	—
Houses improved	—	—	—	—
Private premises cleaned up	5,019	3,212	409	8,640
Prosecutions	4	6	1	11
Convictions	4	6	1	11

Discussion on the Data relating to the different Units.

Period of Operation.—The 3 units have worked for a total period of 50½ months up to the end of 1928. The Kalutara Totamune Unit has been in operation for 30 months, Weudawili Hatpattu for 13 months, and Matara Gravets and Wellaboda Pattu for 7½ months.

Health Unit Areas and Population.—The total area of the 3 health districts in which health unit work is carried out is 337½ square miles or about 1/74 of the total area of the Island. Of this area only 122 square miles or a little more than a third of it is being worked.

The population in the areas worked is 140,443, which is 1/37th of the total population of Ceylon. Of this population 25,245 is urban and 115,198 is rural. The term " urban " is used in the sense that the Registrar-General uses it, meaning the 35 proclaimed towns.

Expenditure.—The expenditure on all the units during the year has been Rs. 149,727.65, of which the Government has contributed Rs. 58,991.56 and the local authorities Rs. 90,736.09.

The *per capita* cost for all Health Unit work is Rs. 1.06 while that of each unit is as follows:—Kalutara totamune 81 cents, Weudawili hatpattu Rs. 2.48, and Matara Gravets and Wellaboda pattu 46 cents. The high *per capita* cost for Weudawili hatpattu has been explained earlier.

Health Education.—To educate the public 43 lectures, 79 lantern talks, 10 cinema shows, 66 school talks, and 1 health exhibition have been held. The estimated attendance at the 3 units has been 36,620.

Saturday conferences with the Health Unit staff have been a feature of all the units. Eighty-one such conferences have been held.

Conferences with minor headmen, vedaralas, and school teachers are held to instruct them and to obtain their co-operation in the work. Twenty such conferences were held, 9 being at Kalutara totamune, 10 at Weudawili hatpattu, and 1 at Matara Gravets and Wellaboda pattu.

Health Survey.—A total of 13,012 homes have been surveyed during the year as follows:—Kalutara totamune 2,679, Weudawili hatpattu 4,800, and Matara Gravets and Wellaboda pattu 5,533.

Acute Communicable Diseases.—The following is a statement of the incidence of the acute communicable diseases reported in the 3 units:—

Diseases.	Kalutara Totamune.				Weudawili Hatpattu.		Matara Gravets and Wellaboda Pattu.		Total.	
	Old Area.		New Area.							
	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.
Chickenpox	81	—	35	—	36	—	9	—	161	—
Diphtheria	—	—	—	—	1	1	—	—	1	1
Dpsentery	33	8	32	3	4	—	114	22	183	33
Influenza	—	—	—	—	3	—	3	—	6	—
Measles	49	—	3	—	84	—	13	—	149	—
Mumps	—	—	6	—	—	—	10	—	16	—
Typhoid Fever	31	11	38	11	2	1	10	—	81	23
Whooping Cough	1	—	2	1	4	—	—	—	7	1
Pulmonary Tuberculosis	13	3	6	3	3	2	8	3	30	11

594 cases of the acute communicable diseases have been reported. These are by no means all the cases that have occurred. For example, 6 cases of influenza have been reported, but no doubt there have been many more which have not been reported. In the majority of the reported cases isolation of the patients have been in their own homes and concurrent disinfection has been stressed and practised.

Chickenpox.—161 cases have been reported, of which 115 have been at Kalutara totamune.

Diphtheria.—One fatal case occurred in the urban area (Kurunegala) of the Weudawili Hatpattu Unit. Its source of infection is unknown.

Dysentery.—183 cases have been reported, of which 114 with 22 deaths have been in the unit at Matara Gravets and Wellaboda pattu, and 65 with 12 deaths at Kalutara totamune. Four cases have been reported from Weudawili hatpattu, but one feels that reporting here has not been good.

Of 183 cases reported 33 have been fatal, giving a fatality rate of 18 per cent. Most of the cases have been of the bacillary variety, and transmission has been chiefly by contact.

As a result of the outbreak at the Matara Gravets and Wellaboda pattu unit, intensive latrine construction work was started. This epidemic started in July and reached its height in October, and in December it was on the wane. Efforts to check the disease, the Medical Officer of Health reports, were greatly handicapped by the ignorance and the abject poverty of the afflicted. Isolation was possible only to a very limited degree, as in many houses only one living room was available.

Of the Kalutara totamune cases 32 with 3 deaths occurred in the lower half during a period of 6 months. Here the peak was reached in September and the cases were scattered. Transmission was chiefly by contact.

Typhoid Fever.—Eighty-one cases with 23 deaths, giving a fatality rate of 28.4 per cent. have been reported from the 3 units, the largest number, 69, being from the Kalutara totamune unit. Of the latter cases 31 are from the upper area and 38 from the lower for a period of 6 months. The number of cases reported and discovered in the upper half has decreased this year, being 15 for 6 months in 1926, 64 in 1927, and 31 in 1928. One outbreak of 11 cases in the lower half at Pinhena was due to introduction of infection from Nawalapitiya. Contact played the chief part in transmission.

Owing to information being withheld very often the source of infection has not been traced. Owing to inadequate latrine accommodation and consequent improper disposal of excreta, the only means of control of the disease is by inoculation. This is not taken to kindly by the people and the number of inoculations given have not been great.

In the control both of typhoid fever and dysentery nothing very effective can be done till the people are more educated as to the use of latrines and with regard to personal hygiene. Nevertheless it is found that by visiting each case, seeing to its isolation and disinfection of discharges, the number of contact infections are being reduced.

Measles.—149 cases have been reported involving chiefly the upper half of the Kalutara totamune and the rural section of Weudawili hatpattu, 49 cases in the former and 84 in the latter.

Mumps.—There have been 16 cases, of which 10 have occurred at the Matara Gravets and Wellaboda Pattu Unit. The Head Teacher of the Walgama school in this unit had a case in his quarters, and the Medical Officer of Health believes that he was partly responsible for the spread of the disease.

Whooping Cough.—Seven cases with 1 death have been reported from the Kalutara Totamune and Weudawili Hatpattu Units.

Pulmonary Tuberculosis.—Thirty cases with 11 deaths have been reported distributed among the 3 units. The proper isolation of these cases is difficult owing to the poverty of the people. The cases were visited, instructions given to prevent the spread of infection, and the contacts observed by periodical examination.

Hookworm Examination and Treatment.—Hookworm treatment campaigns were carried out by two of the units, viz., Kalutara totamune and Weudawili hatpattu, treatment being given to 4,578 individuals. Of this number 3,122 belonged to Kalutara totamune and 1,456 to Weudawili hatpattu. The treatment was carried out in the schools.

Examination of faeces done was 4,287 before and 1,360 after treatment.

Still this treatment is not taken full advantage of by the people. As education proceeds and more confidence is created there will be greater response.

Anti-Malarial Measures.—Malaria is a public health problem only in 1 of the 3 units, viz., at Weudawili hatpattu. In the urban area (Kurunegala) of this unit a separate organization deals intensively with the problem. In the rural section nothing is done. In this area malaria has 2 peaks: one in June and the other in December-January. An attempt was made during the second season to organize a method of quinine administration in the rural schools. This was interrupted by the closure of the schools in December, but the teachers stated that the attendance was better as a result of the administration of quinine.

Immunizations: Anti-Typhoid.—A total of 44 first doses and 13 second doses have been administered, chiefly in the Kalutara Totamune Unit. There is a certain amount of aversion to any type of injection on the part of the people, especially when it is followed by a reaction and they cannot see any visible results as in parangi or syphilis. Nevertheless this is a procedure which is sound and which should be pushed on.

Anti-Smallpox.—Vaccination against smallpox was carried out chiefly in the Kalutara Totamune Unit. Out of a total of 1,265 done 1,183 were at Kalutara totamune and 82 at Matara Gravets and Wellaboda pattu. No work is done by the unit at Weudawili hatpattu as the departmental vaccinator had already completed his programme. The vaccinations were all primary.

Laboratory Examinations.—Seventy-seven specimens have been examined locally and 4,688 in Colombo, the latter being chiefly specimens of faeces in connection with hookworm treatment. Other specimens examined in Colombo have been faeces for dysentery, blood for widal, sputum for the tubercle bacillus and milk.

Hygiene: Maternity, Infant, and Preschool Hygiene.—Fifteen centres for child welfare work have been established in the Kalutara Totamune and Weudawili Hatpattu Units: 13 in the former and 2 in the latter. No work has been done during the year at Matara Gravets and Wellaboda Pattu Unit owing to the lack of a nurse.

At Kalutara totamune 339 clinics have been held with an average attendance of 21 per clinic, while at Weudawili hatpattu 32 clinics with an average attendance of 11.

There have been under care a total of 853 expectant mothers, 1,012 infants, and 1,233 preschool children.

These have received visits as follows:—

	Kalutara Totamune.	Weudawili Hatpattu.	Matara Gravets and Wellaboda Pattu.	Total.
Expectant mothers ..	930	35	679	1,644
Infants ..	2,464	198	—	2,662
Preschool children ..	2,246	648	—	2,894

A total of 569 confinements have been conducted by health unit midwives as follows:—Kalutara totamune 394, Weudawili hatputtu 63, and Matara Gravets and Wellaboda pattu 112.

School Hygiene.—Medical inspection of school children has been carried out at all the units. At Weudawili hatpattu a special Medical Officer (Dr. Kumarakulasinghe) did the work. In all a total of 2,657 children have been examined, of whom 2,299 or 86.5 per cent. were defective with defects amounting to 4,370 or 1.9 per cent. defects per defective child.

The chief defects found at the 3 units can be classified as follows in the order of their importance:—

Kalutara Totamune.	Weudawili Hatpattu.	Matara Gravets and Wellaboda Pattu.
Non-vaccination	Anaemia	Hookworm infection
Dental defects	Enlarged spleen	Enlarged cervical glands
Defective vision	Pediculosis	Dental defects
Pediculosis	Dental defects	Enlarged tonsils
	Enlarged tonsils	Nutritional defects
	Non-vaccination	
	Defective vision	

Correction of defects has been confined to hookworm treatment and vaccination against smallpox. Defective vision and dental defects require the employment of specialist medical officers. It is felt that there will be a very good response in the correction of dental defects.

Training in health habits has been started in the schools of the upper half of the Kalutara totamune and in the rural section of the Weudawili Hatpattu Unit.

Consultations at the Office.—791 individuals, of whom 530 were children and 261 adults, have consulted the Medical Officers of Health at their offices. At these consultations the individuals are examined and advice given as to the best course that should be pursued. Often these cases are referred to the Medical Officer of the station for treatment.

Food Inspection.—A total of 5,505 heads of cattle have been inspected and 3,693 goats at Kalutara Totamune and Weudawili Hatpattu Units. No animals were inspected at the Matara Gravets and Wellaboda Pattu Unit owing to it being a rural unit.

Twenty milk samples have been analyzed and in every instance it has been found highly adulterated, the adulteration varying from 19 per cent. to 70 per cent. of added water, the average being 43 per cent. The control of milk production and sale in the health unit areas is not satisfactory. In fact, there is no control although in the 2 urban areas of Kalutara and Kurunegala necessary by-laws exist.

Sanitation: Water Supply.—The water supply for the areas within the 3 units is from wells. The Local Board town of Kurunegala in Weudawili Hatpattu Unit will soon be provided with a pipe-borne supply at a cost of about 8 lakhs of rupees—money well invested. The work in this connection is well on the way to completion.

A proper pipe-borne water supply for the important and populous town of Kalutara is a very urgent necessity. A wholesome and adequate supply is the first need of a town. The preliminary step of making inquiries for the installation of a water supply has been taken by the Urban District Council, and it is hoped that it will be pushed to its logical conclusion, viz., the flow of wholesome water from water taps in the town.

In Matara Gravets and Wellaboda pattu there is a scheme to supply Matara town with pipe-borne water. It is stated that the source will be able to supply water to several other places besides Matara. If this is so, it will be desirable to supply populous villages *en route* with a stand pipe each.

Most of the wells are shallow and need protection from pollution. The only way to protect a well is to build it up according to the Government type plan and to cover the mouth of it and abstract the water by means of a pump.

The number of inspections of water supplies carried out in all the units is 7,135. New wells constructed are 12 and wells improved are 61.

A single dug well built up according to the type plan costs about Rs. 600 to 700. This will serve one village only. There are driven wells on the market which cost about Rs. 100. If these are used in suitable locations, the money spent at present on one well could be utilized for providing 6 or 7 driven wells which could serve 6 or 7 villages and furnish water free from pollution. The aim should be to provide each village with a well protected from pollution.

Disposal of Excreta.—Latrine construction work was carried out chiefly in the upper half of the Kalutara totamune, and this was interrupted, to a certain extent, by the hookworm treatment campaign and vaccination against smallpox, in which the Sanitary Inspectors were engaged.

Latrine construction was commenced in Weudawili hatpattu after the completion of the survey, but it was interrupted by the Sanitary Inspectors being switched on to the most urgent need at the time, viz., administration of quinine for malaria in the schools.

Another drawback to rapid latrine construction is that prosecutions are not entered for non-compliance of notice. Although latrine construction without resorting to prosecutions is a slow process, it is found that the villagers use the latrines they construct.

A total of 10,100 inspections have been done for latrine construction and 511 new latrines have been built and 203 existing ones have been restored to sanitary type.

The survey of the Weudawili Hatpattu Unit has revealed that out of 4,800 houses only 742 or 15.4 per cent. are provided with latrines, of which 335 are fly-proofed and 407 used habitually. Thirty-three per cent. of the urban premises and 94 per cent. of the rural showed evidences of soil pollution.

The survey of the Matara Gravets and Wellaboda pattu unit has revealed that out of 5,533 houses, 1,334 or 24 per cent. are provided with latrines, of which 1,282 are used and 1,084 maintained in good condition.

That people appreciate the value of latrines and the proper disposal of excreta is evidenced by the co-operative work in dry-earth conservancy carried out at Alutgamaweediya in Kalutara totamune by the Muslim population. This was organized by Dr. D. M. de Silva, the then Medical Officer of Health, and now continued by the health unit. The Police Vidane is the treasurer and expenses are met from the subscriptions collected. Forty-five latrines are conserved under the supervision of the Sanitary Inspector. Trenching is done by day, a type plan hand cart being used for the removal of excreta.

A great nuisance and a danger to public health is the use of the pig for disposal of human filth. This is very prevalent along the coast of the Kalutara Totamune Unit.

At the urban areas of Kalutara and Kurunegala disposal is by trenching; and transport at the former is by double bullock carts, while at the latter it is most expeditiously done by motor.

Disposal of Refuse.—In areas under local authorities the refuse is systematically collected and disposed of. In the rural areas it is collected and burnt or used for filling. At Kurunegala the refuse is transported by motor and used as manure for coconut trees. It is buried between the trees. At Kalutara transport is by type plan single bullock carts and disposal is by using it to fill up the swamp in the centre of the town, earth being used to cover it up daily. At Alutgama it is sold to a private party who uses it for filling, while at Beruwala it is dumped.

The scavenging of bazaar areas in the rural sections needs attention. A cooly to each bazaar area or to more than one area should be appointed by the Village Committees, the local authorities that control them. This matter has been taken up at Kalutara totamune.

Drainage.—The drainage of all the areas under local authorities needs attention.

Housing.—The total number of inspections of private premises carried out in the 3 units is 34,598, of which 20,018 have been at Kalutara totamune, 11,807 at Weudawili hatpattu, and 2,773 at Matara Gravets and Wellaboda pattu. As a result of these inspections 8,640 premises were cleaned up.

Dealing with building applications takes up a fair amount of time of the Medical Officer of Health, seeing that people conformed to the plan approved requires a great deal of vigilance on the part of Sanitary Inspectors.

A total of 240 applications for new buildings were reported on, 189 for additions and alterations and 135 for certificates of conformity.

Licensed Trades.—A total of 14,587 inspections have been made for such trade premises as bakeries, tea boutiques, eating-houses, meat stalls, fish stalls, vegetable stalls, &c., and 402 such premises have been improved, 281 being at Kalutara totamune, 79 at Weudawili hatpattu, and 42 at Matara Gravets and Wellaboda pattu.

Nuisances.—Lime kilns located in the vicinity of dwelling houses are a source of great discomfort to the people. These should be banished to localities without habitations in the neighbourhood. At Kalutara this nuisance exists.

Prosecutions.—Eleven prosecutions were entered at the 3 units for offences committed in the urban and Sanitary Board areas. With the exception of two at Kurunegala, the others were for contravention of the requirements of the Housing Ordinance and for adulteration of milk. The exceptions mentioned above were for—

(*a*) Keeping a horse in a living room.
(*b*) Allowing stagnant and waste water to remain in the compound.

These had to be entered very reluctantly after persuasion and notices had no effect.

The policy of health unit work is not to prosecute. This has been construed to mean that no prosecutions would be entered under any circumstances. If this were so then no headway could be made.

Prosecutions are entered for offences of two varieties—

(*a*) Those offences which are due to ignorance or alleged ignorance, *e.g.*, keeping food exposed to flies or keeping a back yard dirty;
(*b*) Those offences which are wilful acts, *e.g.*, adulteration of milk or contravention of the requirements of the Housing Ordinance.

It is in the former offences, where the offender does not realize the reason for the sanitary requirements that prosecutions are being withheld. In the latter case it is knowingly done. In the case of adulteration of milk numerous warnings are given before action is taken, while in the case of contravention of the requirements of the Housing Ordinance nothing but legal action will have any effect.

Under the impression that prosecutions will not be entered, people are very slow to comply with sanitary requirements. If we are to have the co-operation of the people this slow progress will have to be continued and education depended on for permanent results.

Collateral Matters.

Public Health Nursing.—The phase of Health Unit Work that appeals most to the public is that of Maternity and Child Welfare. The two members of the staff who were chiefly concerned with it are the Public Health Nurse and the Midwife. Midwives are still available, but there will be a scarcity unless steps are taken to train a suitable number of them of a proper type. They do an immense amount of good to the people of the village who appreciate their services.

For the training of Public Health Nurses, the appointment of a Medical Officer for Maternity and Child Welfare was created by Government and it was offered to Dr. (Mrs.) V. Chinnappa, who was attached in a similar capacity to the Madras Corporation, and it was accepted by her. She assumed duties in June. It had been decided to train all health unit personnel at the Kalutara Totamune Unit and Dr. Chinnappa was given independent charge of the Maternity and Child Welfare portion of the work there for the purpose of training nurses.

Six nurses, who expressed their willingness to be trained and appointed as Public Health Nurses, were relieved from their respective hospital appointments, and sent to Kalutara during July and August. In order to meet the exigencies of work already opened up in the health unit areas of Kalutara, Matara, and Kurunegala, it was found necessary to make them available for posting in January, 1929. The training included attendance at a shortened course of lectures on Elementary Physiology and Hygiene, Preventive Medicine, First Aid, Home Nursing, Maternity and Child Welfare, and a practical course in home visiting and clinic work. Written, oral, and practical examinations were held at the end of the course in December, 1928, the examiners being the Assistant Director of Sanitary Services, Dr. Gunasekara; the Senior Medical Officer of Health, Dr. S. F. Chellappah; and the Medical Officer in charge of Maternity and Child Welfare, Dr Virasinghe Chinnappa. Four nurses passed the examination and have been posted to the Kalutara, Matara, and Kurunegala Health Units. Two have been transferred back again to the medical side.

Owing to the difficulty that has been experienced in holding the interest, in public health nursing, of nurses recruited from the hospital staffs, proposals are under consideration for other methods of recruitment, and for a course of training of a satisfactory standard, having regard to the social and other conditions under which Ceylonese women can be persuaded to join the ranks of Public Health Nursing.

Difficulties have been experienced in the mode of travel of the Public Health Nurses and in placing them in rural areas.

The work done by Dr. Chinnappah in connection with Maternity and Child Welfare work at the Kalutara Totamune Unit is included in this report in the section dealing with Maternity, Infant, and Preschool Hygiene.

Social Service Leagues.—These community organizations are a necessary adjunct to Maternity and Child Welfare work. During the year a league was organized in the Matara Gravets and Wellaboda Pattu Unit and a new one was organized for the Beruwala section of the Kalutara badda area. The Beruwala league has provided the health unit with a house free of rent to serve as a health centre for this area. These leagues besides helping in Child Welfare work also indicate co-operation with the general work of the Health Units.

Medical Society.—Medical men by their interest in health unit work could do much to make it popular with the people, to increase its usefulness and to improve the accuracy and collection of morbidity and mortality statistics. With this in view the Kalutara Totamune Medical Society was organized in July, 1928, on the day of the second anniversary of the Health Unit.

Public Health Advisory Committee.—To inform the public of Health Unit activities and to provide the Medical Officer of Health of the Health Unit with a responsible body which could advise and assist him, as an experiment the Kalutara Totamune Public Health Advisory Committee consisting entirely of unofficials was formed towards the end of the year. This body is provided with all the reports made by the Medical Officer of Health which after circulation are discussed at its quarterly meetings. The Medical Officer of Health is also present and he takes the opportunity to indicate to the members the needs of the unit and manner in which assistance could be given.

There are immense possibilities for a Committee of this nature which could interest itself in all matters pertaining to the health and welfare of the people of Kalutara totamune. The Kalutara Totamune Committee will be worked for a time before others are organized in other units.

Proposals for 1929.—During this year it is proposed to organize two new health units: one at Paranakuru korale including Kegalla town in Sabaragamuwa in May; and the other in the Trincomalee District in the Eastern Province after July.

The existing units will continue to work and consolidate their work. The Kalutara totamune has already had its whole area taken up. In the case of the other two, if provision is made in 1929-30 Budget, the work will be extended to take up and develop further areas after October. The intention is to complete the full development of the work in these two units in three stages.

Conclusion.—Health unit work is sound and quite suitable to our needs. It is acceptable to the people, and the possibilities of the work are very great. The people's co-operation is needed in the work and as much as possible they are being made to feel that it is their work and every opportunity is taken to associate them with it.

Above all, it has been forcibly brought home both here and elsewhere that what the Medical Officer of Health in charge sows, he reaps, that and no more.

We take this opportunity to express our thanks to the local authorities, Government Agents, Assistant Government Agents, school authorities, Social Service Leagues, and prominent citizens in health unit areas and the Press for the encouragement shown and the assistance given towards the work.

S. F. CHELLAPPAH.
Senior Medical Officer of Health.

April 11, 1929.

5.—Report of the Sanitary Engineer for the Year 1928.

Staff.—The staff consists of one Sanitary Engineer, loaned by the International Health Division of a Rockefeller Foundation, 1 Deputy Sanitary Engineer, who will be of the grade of Provincial Engineer in 3 years, one Chief Assistant Sanitary Engineer of the grade of District Engineer, 1 Assistant Sanitary Engineer, 3 Draughtsmen, 2 Clerks, 1 Office Peon, 1 Office Cooly, and 16 Survey Coolies.

The Sanitary Engineer sailed on March 17 for Malaya to investigate anti-malaria drainage in the Straits Settlements and the Federated Malay States and returned to Colombo on April 11.

Mr. H. N. Worth, Deputy Sanitary Engineer, reported for duty on February 1 and sailed on April 25 for the United States on a year's study leave under the auspices of the Rockefeller Foundation.

Mr. W. G. McCarthy, Chief Assistant Sanitary Engineer, was transferred to the Public Works Department with the grade of District Engineer and seconded to the Division of Sanitary Engineering for duty.

Mr. J. W. de Alwis reported for duty as Assistant Sanitary Engineer on February 1.

Two additional Assistant Sanitary Engineers have been authorized by Government and it is hoped that they will report for duty early in 1929.

Mr. R. Lopiesz, additional Draughtsman, reported for duty on December 1.

Mr. T. J. Savundaranayagam replaced Mr. J. R. Mann as Senior Clerk.

Organization.—The Division is too new and the staff is too limited to assign the different Engineers to certain types of work. However, an endeavour is being made to assign certain problems to the Engineers who show the most aptitude for particular phases of Sanitary Engineering.

The organization therefore is based on the different types of work which are classified as follows:—

(*a*) Training of Staff.
(*b*) Malaria.
(*c*) Water Supplies.
(*d*) Anti-Malaria Drainage.
(*e*) General Drainage.
(*f*) Sewage Disposal.
(*g*) Desiccating Mills and Distilleries.
(*h*) Pilgrimages.
(*i*) Plague.
(*j*) Incinerators and Miscellaneous Problems.

Training of Staff.—Training of the staff is of the first importance and consisted of Laboratory work with the Medical Entomologist, visiting various water and sewage works and regular study and report on engineering subjects. Seventy two articles appearing in Engineering journals were reported upon and discussed. Study of the articles was done outside of office hours.

Some water laboratory instruction was given, but was limited by the time available.

Lectures and field instruction to the Medical Officers of Malaria and to students in the Sanitary Inspector Classes were also given by members of the staff.

Malaria.—The Malaria Advisory Board decided to recommend to Government that anti-malaria work should be extended to three additional towns. Before starting work in new centres it is of the utmost importance that the co-operation of the inhabitants be secured. Local Ordinances should be enforced, the policy regarding work done on private property should be clearly defined and the inhabitants should be prepared to pay for the maintenance of the initial measures carried out.

If the proposed Mosquito Ordinance is not accepted by Government, the success of anti-malaria control work in Ceylon will be seriously threatened.

During the year the Departmental Committee on Malaria has organized the staff and methods of work in the three centres and the railway anti-malaria gang. The Committee has also installed a uniform cost system in the three centres and has conducted experiments on the efficiency of Paris green.

Paris green has not proved the success that it has in other countries. However, most of the poor results obtained have been due to the carrier agency (coir dust) and the sprayers, both of which were unsuitable. Road dust has been secured and a new type of sprayer ordered. Experiments should be carried out with the view of determining the comparative effectiveness of the amorphous and granular forms of Paris green.

The unsatisfactory working conditions of Trincomalee have been reported upon.

Little progress has been made in railway anti-malaria work as the Railway Department did not make provision for the increased staff in the 1928-29 Estimates. Work is being carried out with the old staff, but the work cannot be extended to the other stations until the additional staff applied for has become available.

Plans showing breeding places have been made of all centres, and prints are supplied, when needed, to the centres, so that the work can be carried out systematically.

During the year anti-malaria control work has materially improved and considering the difficulties that had to be overcome, satisfactory progress has been made.

One of the most serious questions confronting the Departmental Committee is the status of Medical Officers, Sanitary Inspectors, and Entomological Assistants engaged in the anti-malaria campaign. These officers must be specially trained, are stationed continuously in malaria stations, and have longer hours of work than officers of similar grades stationed in more healthful towns. As a result of such conditions, officers apply for transfers to non-malarious stations.

If the status of these officers is not improved, the anti-malaria campaign may never have the services of fully trained officers.

Anti-Malaria Drainage.—Plans for anti-malaria drainage are based on the results obtained from larvae surveys made by the Medical Entomologist, whose work during 1928 has been of prime importance.

Complete surveys and careful levels with numerous sections have been made for Kurunegala, Chilaw, Trincomalee, and parts of Anuradhapura.

Specifications and estimates have been submitted for Kurunegala, Trincomalee, and the Totuwila-ela in Anuradhapura. The feasibility of anti-malaria drainage in Chilaw is still being studied.

In some towns, principally in Anuradhapura, the work will mainly consist in filling unused minor irrigation channels. Paddy field cultivators should get permission from the proper authority to cut new channels and should be compelled to fill the abandoned channels. These channels are usually very shallow and serve as ideal breeding places for mosquitoes.

The Sanitary Engineer reported that very little anti-malaria drainage was necessary in Diyatalawa, but that considerable drainage would be necessary to drain the swamps.

The preliminary soil survey carried out in Diyatalawa proved very interesting. Patches of peaty mud 2 to 14 feet in depth, overlaid by 4 inches of turf, are responsible for most of the swamps. In some places lying at a steep slope these patches occur in pockets, the impervious clay around the pocket preventing drainage. The complete soil survey will be made during the dry season, after which the data will be plotted in sections and a drainage scheme worked out.

It is very evident that lined drains could not be laid on such soil without providing for adequate drainage of the supporting soil. Attention has been called to trees planted on certain areas which resulted in improved natural drainage. It should be noted that all the trees are planted on firm clay soil and none on the undrained peaty areas.

General Drainage.—In order to work out a general drainage scheme for a town, a great deal of preliminary field work is necessary. To undertake such work, unless a town is seriously considering a drainage scheme, is a waste of time and an expense to Government. It may therefore be feasible for Government to charge Urban District Councils, Local Boards, and private interests a nominal fee, to be paid into revenue, for all investigations made in connection with general drainage.

In Kurunegala, the general drainage scheme was worked out in collaboration with the Provincial Engineer, North-Western Province, and the Divisional Irrigation Engineer, Western Division. One stream, the Wella-ela, is the most important part of the scheme. This stream takes most of the storm water, acts as a sullage drain, and is the continuation of the proposed anti-malaria drainage. It is most important that this stream should be improved, as planned. The stream is approximately 2 miles long and the rough estimates are :—

	Rs.	c.
First mile charged to anti-malaria drainage	29,050	0
Second mile charged to general drainage	43,600	0
	72,650	0

The plans for the general drainage of Chilaw have not been finished but it appears that it is going to be so expensive that it may not be feasible to start construction for some time to come.

Water Supplies.—A sufficient supply of pure potable water is the most crying need of nearly every town in the Colony. It is a most important factor in the reduction of malaria and of many other diseases.

The present method of dealing with water suplies is most unsatisfactory. Innumerable samples of water, many of them not representative samples, are analysed and it is seldom that anything is done as a result of the analyses.

When a water scheme is seriously considered, the Departments concerned work out the details of the proposed scheme, but it often happens that a new source of water is suggested after the plans have been drawn up for the proposed scheme. The new source must be thoroughly investigated by the Engineers, even though the source had been considered before drawing up the original plans.

It should be pointed out that the designs of water schemes and water purification plants are highly technical. It was therefore suggested that a water committee composed of members of the technical departments concerned should be formed. This committee would act in an advisory capacity to Government and would make all investigations and do all plant designing relating to water supplies.

When a town applied for a water supply, the committee would consider whether from an economic view point a water supply would be feasible. If a water supply was considered feasible, the committee would investigate all possible sources of water, choose the best one, and submit plans and specifications of the scheme and the purification plant, if the latter was considered necessary, to Government.

The only additional staff that would be necessary would be several men of the grade of overseers, to take proper water samples, inspect and regulate small filters, and to install and check chlorinators.

Duplication of work would then be avoided to a great degree, more efficient work would be done and it might be possible to construct some small low country supplies.

Ten investigations were made during the year and specifications for two purification plants were worked out. In collaboration with the Public Works Department, the purification system for the Tangalla Water Supply was designed. The scheme consisted of an aerator, mixing chambers, coagulation basins, and a filter with all the accessories. To check design and costs, the Patterson Co. and the Jewel Filter Co. were asked to tender. The only difference in design was the shape of the aerator basin and 26 spraco nozzles instead of 25 as recommended. It is not expected that construction of this scheme will take place in the immediate future as another source with a larger supply of water is under consideration.

For Ramboda hospital, a small slow sand filter was designed. The source of supply and the small amount of water needed (4,000 gallons per day) only permitted a simple cheap type of plant.

In collaboration with an officer of the Public Works Department, recommendations were drawn up for the improvement of the Ragama water plant.

Investigations were made of the water sources of Haputale, Rambukkana, Puttalam, and Dambulla.

Most low-country water supplies are small. A water scheme must be cheap and must deliver pure potable water. To add to other difficulties, a high turbidity and iron bacteria are usually found. To design a plant that is cheap and yet is efficient, it is necessary to carry on experiments for each supply. The Public Works Department and the Sanitary Engineer designed an experimental water plant on a sufficiently large scale so that complete runs of any water can be made. It is complete from aeration to chlorination with all the factors adjustable and any process may be eliminated when desired. It is hoped that with the aid of this plant it will be possible to determine the minimum amount of purification necessary for any individual water.

The Municipality of Kandy has installed a Patterson Chloronome to be used for emergency purposes. It is hoped that several other chlorinators will be installed, for other water supplies, in 1929.

Sewage Disposal.—With the exception of a few preliminary investigations for sewage systems, attention has been paid principally to septic tanks. Proper dilution and regulation of acidity are problems which are being worked upon.

Desiccating Mills.—Fourteen desiccating mills were investigated by the Government Analyst and the Sanitary Engineer. Sufficient field data have been gathered for the necessary laboratory investigation which will be taken up shortly.

Pilgrimages.—In an endeavour to improve the sanitary conditions at the different pilgrimages, investigations of 3 pilgrimage sites were made by the Government Analyst and the Sanitary Engineer. A preliminary report was written, but the conditions of each site vary so greatly that it is thought necessary to draw up specific recommendations for each site.

Plague.—Plans for rat-free railway goods sheds and large and small grain stores were drawn up. In collaboration with the Engineer, Way & Works, Ceylon Government Railway, and the Municipal Microbiologist, Colombo, building specifications were drawn up for old railway goods sheds and the recommendation was made that these specifications should be incorporated in the Ordinance.

Miscellaneous.—Incinerators, cooly lines, and other small matters are now matters of routine.

During 1928 the work of this Division increased enormously, but it is believed that the present authorized engineering staff will be sufficient for 1929.

The draughting room is very crowded and it will undoubtedly be necessary to provide for additional space in 1930.

BRIAN R. DYER,
Sanitary Engineer.

Colombo, February 23, 1929.

TABLES AND RETURNS.

The following tables and returns are annexed:—

Table I.—Return of Statistics of Population for the Year.

Table II., (*a*) to (*f*).—Meteorological Returns.

Table III.—Return of Diseases (Out-patients).

Table IV.—Charts:—

(*a*) Chart showing the General Systemic and Preventable Diseases treated at the Government Hospitals during the Year 1928.
(*b*) Chart showing Deaths from General Systemic and Preventable Diseases treated at the Government Hospitals during the Year 1928.
(*c*) Chart showing Cases of Infectious Diseases treated at the Government Hospitals during the Year 1928.
(*d*) Chart showing Deaths from Infectious Diseases treated at the Government Hospitals during the Year 1928.

Hospital Returns (as given in the Ceylon Blue Book for 1928):—

(1) Details regarding Hospitals (Patients, Attendants, &c.) in each Province.
(2*a*) Return of Diseases—Cases treated, according to Districts.
(2*b*) Return of Diseases—Cases treated, according to Diseases.
(3) Special Diseases.
(4) Water Supply, &c., at Hospitals.

Table I.

Return of Statistics of Population for the Year 1928.

	Europeans.	Ceylonese, including Other Races than Europeans and Indian Immigrants.	Indian Immigrants. on Scheduled Estates.	Total.
Number of inhabitants on December 31, 1927	11,447	4,585,493	691,855	5,288,795
Number of births during the year 1928	167	188,377	24,767	213,311
Number of deaths during the year 1928	88	112,426	19,823	132,337
Number of immigrants during the year 1928		156,050	133,712	289,762
Number of emigrants during the year 1928		118,670	119,000	237,670
Number of inhabitants on December 31, 1928	8,801*	4,695,580	717,480	5,421,861
Increase of population	—	110,087	25,625	133,066

Table II. (*a*).

Colombo.

Meteorological Return for the Year 1928.

Month.	Temperature.						Rainfall.			Winds.		
	Mean Solar Maximum	Mean Minimum on Grass.	Mean Shade Maximum.	Mean Shade Minimum.	Mean Range of Temperature.	Mean Temperature	Amount in Inches.	Degree of Humidity.		General Direction.		Average Force.
	°F.	°F.	°F.	°F.	°F.	°F.		9.30 A.M. and 3.30 P.M. Per Cent	Max and Min. Per Cent	A.M.	P.M.	Mileage.
January	147.2	69.4	86.3	72.4	13.9	79.4	6.27	72	80	NE	NW	116
February	145.5	65.8	87.0	70.3	16.7	78.6	2.78	67	78	NE	WNW	97
March	143.4	70.2	88.3	73.7	14.6	81.0	3.65	66	77	Var	W	90
April	143.4	74.4	87.2	76.1	11.1	81.6	8.99	75	82	Var	WSW	95
May	140.6	75.3	87.8	77.8	10.0	82.8	7.92	78	82	SW	SW	125
June	138.0	75.3	85.9	77.9	8.0	81.9	8.92	77	80	SW	SW	168
July	138.4	74.7	85.1	77.5	7.6	81.3	5.65	76	79	WSW	WSW	165
August	147.8	74.7	85.4	77.4	8.0	81.4	2.12	76	78	SW	SW	171
September	155.1	74.6	87.2	77.8	9.4	82.5	1.44	72	74	SW	SW	166
October	146.3	73.5	84.0	75.5	8.5	79.8	24.70	79	82	SW	SW	137
November	153.8	71.9	85.7	74.0	11.7	79.8	17.59	79	84	Var	W	82
December	154.1	70.9	85.5	73.2	12.3	79.4	8.78	74	80	NE	NW	127
	146.1	72.6	86.3	75.3	11.0	80.8	98.81	74	80			128

* In the estimation of the European population for 1928, migration figures—which were not available—have not been taken into account.

TABLE II. (*b*).

Jaffna.

Meteorological Return for the Year 1928.

Month.	Temperature.						Rainfall.			Winds.		
	Mean Solar Maximum.	Mean Minimum on Grass.	Mean Shade Maximum.	Mean Shade Minimum.	Mean Range of Temperature.	Mean Temperature.	Amount in Inches.	Degree of Humidity.		General Direction.		Average Force.
	°F.	°F.	°F.	°F.	°F.	°F.		9.30 A.M. and 3.30 P.M. Per Cent.	Max. and Min. Per Cent.	A.M.	P.M.	Mileage.
January ..	149·0	69·6	83·3	73·4	9·9	78·4	2·77	74	78	NE	NE	93
February ..	151·6	66·9	84·9	71·8	13·1	78·4	4·38	67	75	E	NE	80
March	158·2	70·3	88·4	75·1	13·3	81·8	0·00	67	70	SE	Var	119
April	160·2	78·1	89·8	80·6	9·2	85·2	2·45	73	74	S	SW	185
May	155·5	80·8	88·3	82·3	6·0	85·3	0·00	78	78	SW	SW	363
June	152·6	79·5	86·7	81·1	5·6	83·9	0·00	77	78	SW	SW	371
July	146·0	77·3	85·4	79·0	6·5	82·2	1·99	78	80	SW	SW	299
August	149·9	77·1	85·3	78·6	6·7	82·0	1·85	80	79	SW	SW	300
September ..	153·2	78·1	85·7	79·3	6·4	82·5	0·30	78	80	SW	SW	314
October ..	149·5	76·8	84·9	78·0	6·9	81·4	6·87	80	80	SW	SW	231
November ..	140·7	72·0	82·8	73·9	8·9	78·4	24·01	88	87	Var	NE	60
December ..	143·7	68·6	82·3	73·1	9·2	77·7	8·01	81	84	NNE	NE	87
	150·8	74·6	85·7	77·2	8·5	81·4	52·63	77	79			209

TABLE II. (*c*).

Galle.

Meteorological Return for the Year 1928.

Month.	Temperature.						Rainfall.			Winds.		
	Mean Solar Maximum.	Mean Minimum on Grass.	Mean Shade Maximum.	Mean Shade Minimum.	Mean Range of Temperature.	Mean Temperature.	Amount in Inches.	Mean Degree of Humidity.		General Direction.		Average Force.
	°F.	°F.	°F.	°F.	°F.	°F.		9.30 A.M. and 3.30 P.M. Per Cent.	Max. and Min. Per Cent.	A.M.	P.M.	Mileage.
January ..	—	70·5	83·6	73·9	9·7	78·8	2·67	83	85	NE	W	111
February ..	—	69·4	85·7	73·4	12·3	79·6	2·31	74	78	ENE	Var	117
March	—	71·6	86·7	75·7	11·0	81·2	4·77	74	78	Var	W	139
April	—	74·8	85·8	77·2	8·6	81·5	8·20	82	84	Var	WWN	147
May	—	76·2	85·7	79·2	6·5	82·4	7·50	82	84	W	W	194
June	—	75·5	83·9	78·2	5·7	81·0	7·02	83	82	WNW	WNW	294
July	—	75·8	82·7	78·2	4·5	80·4	5·25	83	84	WNW	WNW	312
August	—	74·2	81·6	76·2	5·4	78·9	13·08	87	86	WNW	WNW	260
September ..	—	75·8	83·3	78·7	4·6	81·0	3·16	79	82	WNW	WNW	295
October ..	—	74·3	81·8	76·0	5·8	78·9	15·24	86	87	W	WNW	257
November ..	—	73·3	84·1	75·0	9·1	79·6	14·35	83	86	NE	Var	127
December ..	—	72·1	84·6	73·4	11·2	79·0	5·59	80	83	NE	Var	130
		73·6	84·1	76·3	7·8	80·2	89·14	81	83			199

TABLE II. (*d*).

Nuwara Eliya.

Meteorological Return for the Year 1928.

Month.	Temperature.						Rainfall.			Winds.		
	Mean Solar Maximum.	Mean Minimum on Grass.	Mean Shade Maximum.	Mean Shade Minimum.	Mean Range of Temperature.	Mean Temperature.	Amount in Inches.	Mean Degree of Humidity.		General Direction.		Average Force.
								9.30 A.M. and 3.30 P.M. Per Cent.	Max. and Min. Per Cent.	A.M.	P.M.	Mileage.
		°F.	°F.	°F.	°F.	°F.						
January ..	—	45·3	68·9	49·7	19·2	59·3	5·16	68	76	—	—	—
February ..	—	37·1	71·1	42·2	28·9	56·6	4·53	50	68	—	—	—
March	—	38·5	73·0	43·4	29·6	58·2	5·90	52	68	—	—	—
April	—	47·7	72·0	51·4	20·6	61·7	7·23	70	79	—	—	—
May	—	49·1	72·7	53·6	19·1	63·2	2·80	73	78	—	—	—
June	—	52·7	66·2	56·1	10·1	61·2	8·76	82	83	—	—	—
July	—	52·0	65·9	55·1	10·8	60·5	13·33	80	82	—	—	—
August	—	50·3	64·7	54·8	9·6	59·8	8·44	83	85	—	—	—
September ..	—	48·1	67·9	51·5	16·4	59·7	3·07	76	82	—	—	—
October ..	—	52·1	64·7	54·6	10·1	59·6	11·88	79	84	—	—	—
November ..	—	50·4	67·3	53·2	14·1	60·2	9·66	64	74	—	—	—
December ..	—	46·8	67·7	50·8	16·9	59·2	4·17	56	82	—	—	—
		47·7	68.5	51·4	17·1	59·9	84·93	69	78			

TABLE II. (*e*).

Kandy.

Meteorological Return for the Year 1928.

Month.	Temperature.						Rainfall.			Winds.		
	Mean Solar Maximum.	Mean Minimum on Grass.	Mean Shade Maximum.	Mean Shade Minimum.	Mean Range of Temperature.	Mean Temperature.	Amount in Inches.	Mean Degree of Humidity.		General Direction.		Average Force.
								9.30 A.M. and 3.30 P.M. Per Cent.	Max. and Min. Per Cent.	A.M.	P.M.	Mileage.
		°F.	°F.	°F.	°F.	°F.						
January ..	—	64·8	82·9	68·9	14·0	75·9	5·46	72	72	—	—	—
February ..	—	60·4	86·1	66·2	19·9	76·2	5·84	58	68	—	—	—
March	—	61·5	90·4	67·4	23·0	78·9	6·78	56	68	—	—	—
April	—	67·8	87·6	70·4	17·2	79·0	13·31	74	78	—	—	—
May	—	67·6	88·7	72·2	16·5	80·4	3·20	68	74	—	—	—
June	—	68·1	83·2	72·1	11·1	77·6	6·37	74	78	—	—	—
July	—	67·1	81·9	70·7	11·2	76·3	12·37	75	78	—	—	—
August	—	67·7	80·9	70·3	10·6	75·6	8·89	78	80	—	—	—
September ..	—	65·0	84·3	68·5	15·8	76·4	3·07	68	76	—	—	—
October ..	—	67·9	81·1	69·2	11·9	75·2	11·66	80	82	—	—	—
November ..	—	68·8	83·4	69·5	13·9	76·4	7·77	76	82	—	—	—
December ..	—	66·7	83·3	68·0	15·3	75·6	9·07	75	80	—	—	—
		66·1	84·5	69·5	15·0	77·0	93·79	71	76			

TABLE II. (*f*).

Batticaloa.

Meteorological Return for the Year 1928.

Month.	Temperature.						Rainfall.			Winds.		
	Mean Solar Maximum.	Mean Minimum on Grass.	Mean Shade Maximum.	Mean Shade Minimum.	Mean Range of Temperature.	Mean Temperature.	Amount in Inches.	Mean Degree of Humidity.		General Direction.		Average Force.
								9.30 A.M. and 3.30 P.M. Per Cent.	Max. and Min. Per Cent.	A.M.	P.M.	
	°F.	°F.	°F.	°F.	°F.	°F.						Mileage.
January ..	143·6	72·5	82·9	74·6	8·3	78·8	13·95	82	84	Var	NNE	201
February ..	146·7	70·0	84·6	73·2	11·4	78·9	5·15	73	78	WNW	NE	179
March	147·4	70·9	87·0	74·1	12·9	80·6	0·01	72	78	WNW	NE	169
April	145·0	74·5	89·7	77·0	12·7	83·4	2·87	73	78	Var	ENE	145
May	—	74·8	93·0	78·6	14·4	85·8	0·14	66	74	Var	ESE	146
June	145·5	73·0	93·4	78·0	15·4	85·7	0·00	57	66	Var	ESE	144
July	146·4	72·5	91·9	76·6	15·3	84·2	1·99	60	64	WSW	Var	145
August	149·8	72·5	93·2	76·8	16·4	85·0	0·86	60	63	WSW	ESE	127
September ..	147·2	72·3	92·0	76·5	15·5	84·2	1·25	61	66	WSW	E	154
October ..	145·6	72·8	88·0	75·1	12·9	81·6	9·84	73	78	Var	ENE	125
November ..	143·3	73·5	83·7	75·1	8·6	79·4	22·30	82	86	W	NE	128
December ..	150·4	72·9	82·3	74·9	7·4	78·6	9·13	82	84	WNW	NNE	196
	146·5	72·7	88·5	75·9	12·6	82·2	67·49	70	75			155

TABLE III.

Return of Diseases (Out-Patients).

I.—Infectious Diseases—	
Enteric Fevers	597
Fevers of obscure causation ..	2,667
Malarial Fevers	1,437,480
Cerebral Malaria	361
Malarial Cachexia	104,154
Measles	266
Whooping Cough	319
Diphtheria	10
Influenza	79,785
Mumps	88
Dysentery (all forms) ..	29,084
Leprosy	7
Erysipelas	1
Chickenpox	75
Dengue	313
Yaws	34,171
Hydrophobia	—
Tetanus	6
Pulmonary Tuberculosis ..	5,022
Other Tubercular Diseases ..	390
Syphilis (all varieties) ..	6,226
Soft Chancres	126
Gonorrhoea (acute and chronic) ..	7,370
Gonorrhoeal Complications ..	1,958
Filarial Diseases	561
Acute Rheumatic Fever ..	2,456
Puerperal Fever	1,241
II.—General Diseases—	
Malignant Tumours—Carcinoma and Sarcoma	5
Non-malignant Tumours ..	440
Chronic Rheumatism ..	166,111
Arthritis (acute and chronic) ..	4,452
Diabetes Mellitus	469
Anaemias (of unknown causation) ..	17,195
Leukaemias	177
Acute Poisonings	2,067
Other General Diseases ..	60,995
III.—Local Diseases—	
Diseases of the Nervous System ..	26,731
,, ,, Eye	64,657
,, ,, Ear	30,415
,, ,, Nose and throat ..	812
,, ,, Heart and Blood vessels	6,280
,, ,, Lungs and Pleura ..	155,848
,, ,, Pneumonia ..	39
,, ,, Gastro Intestinal Tract	234,960
Diarrhoea and Enteritis ..	1,715
Sprue	77,165
Anchylostomiasis	177,372
Other Intestinal Parasites ..	239,873
Diseases of the Mouth and Gums ..	11,893
Other Diseases of the Digestive System	2,297
Diseases of the Liver and Gall Bladder	4,071
,, ,, Urinary System ..	14,047
,, ,, Generative System ..	23,293
,, ,, Spleen ..	7,234
,, ,, Lymphatic System ..	3,303
,, ,, Skin and Cellular Tissues	159,974
,, ,, Bones and Joints ..	4,237
Ulcers	168,718
General Injuries	18,994
Local Injuries	81,749

TABLE IV (A)

CHART

SHOWING

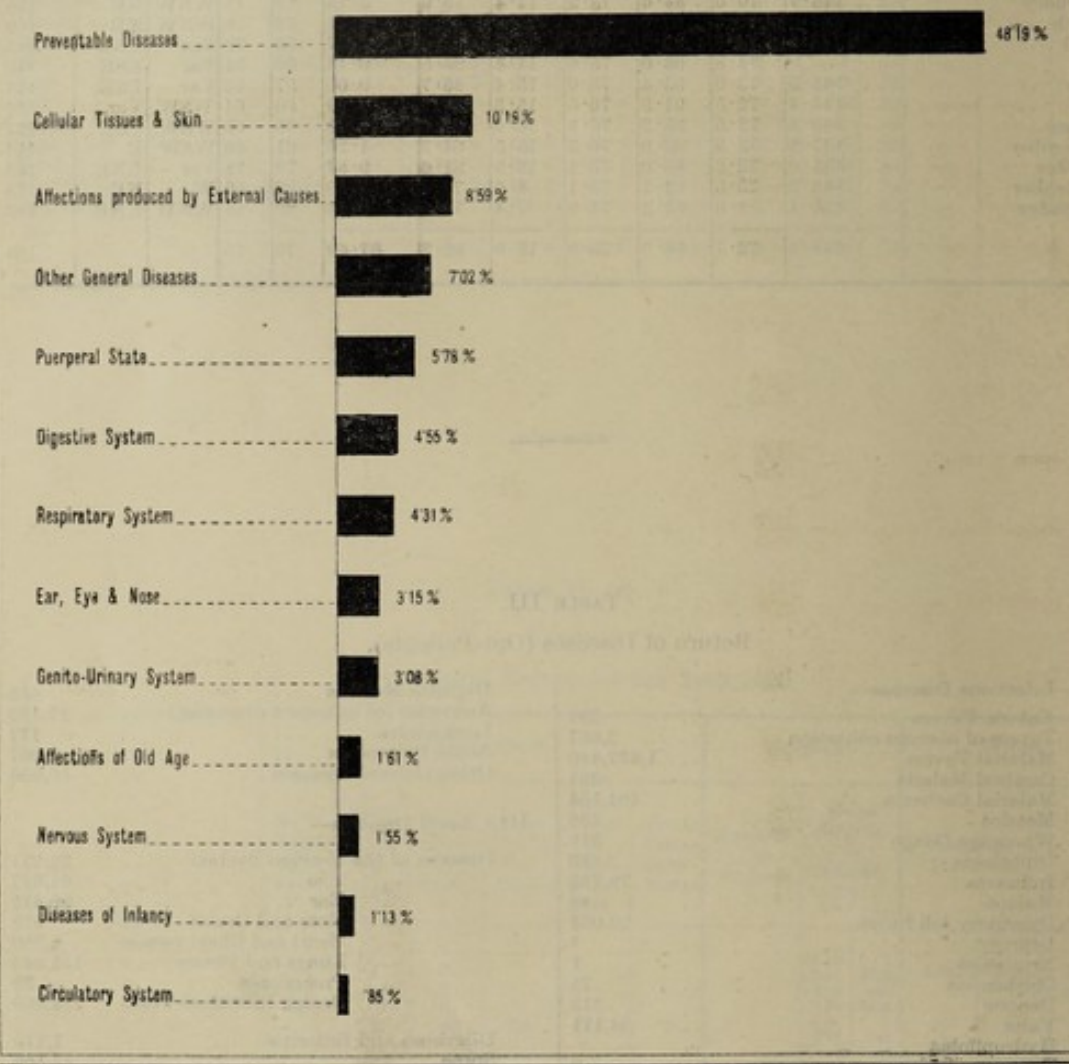
THE GENERAL SYSTEMIC AND PREVENTABLE DISEASES

TREATED AT

THE GOVERNMENT HOSPITALS

DURING THE YEAR 1928.

Total Cases 224,850



Block by Survey Dept. Ceylon 1929

TABLE IV (B)

CHART

SHOWING

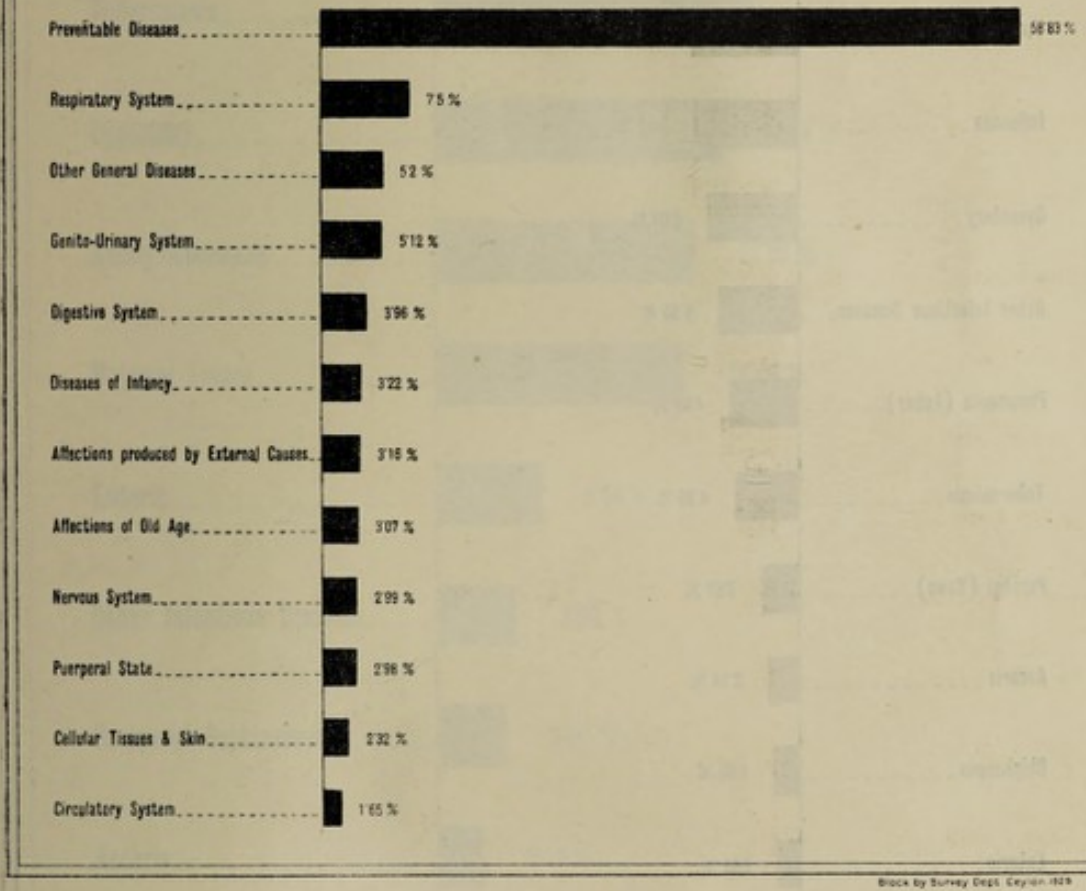
DEATHS FROM GENERAL SYSTEMIC AND PREVENTABLE DISEASES

TREATED AT

THE GOVERNMENT HOSPITALS

DURING THE YEAR 1928.

Total Deaths ..... 14,066.

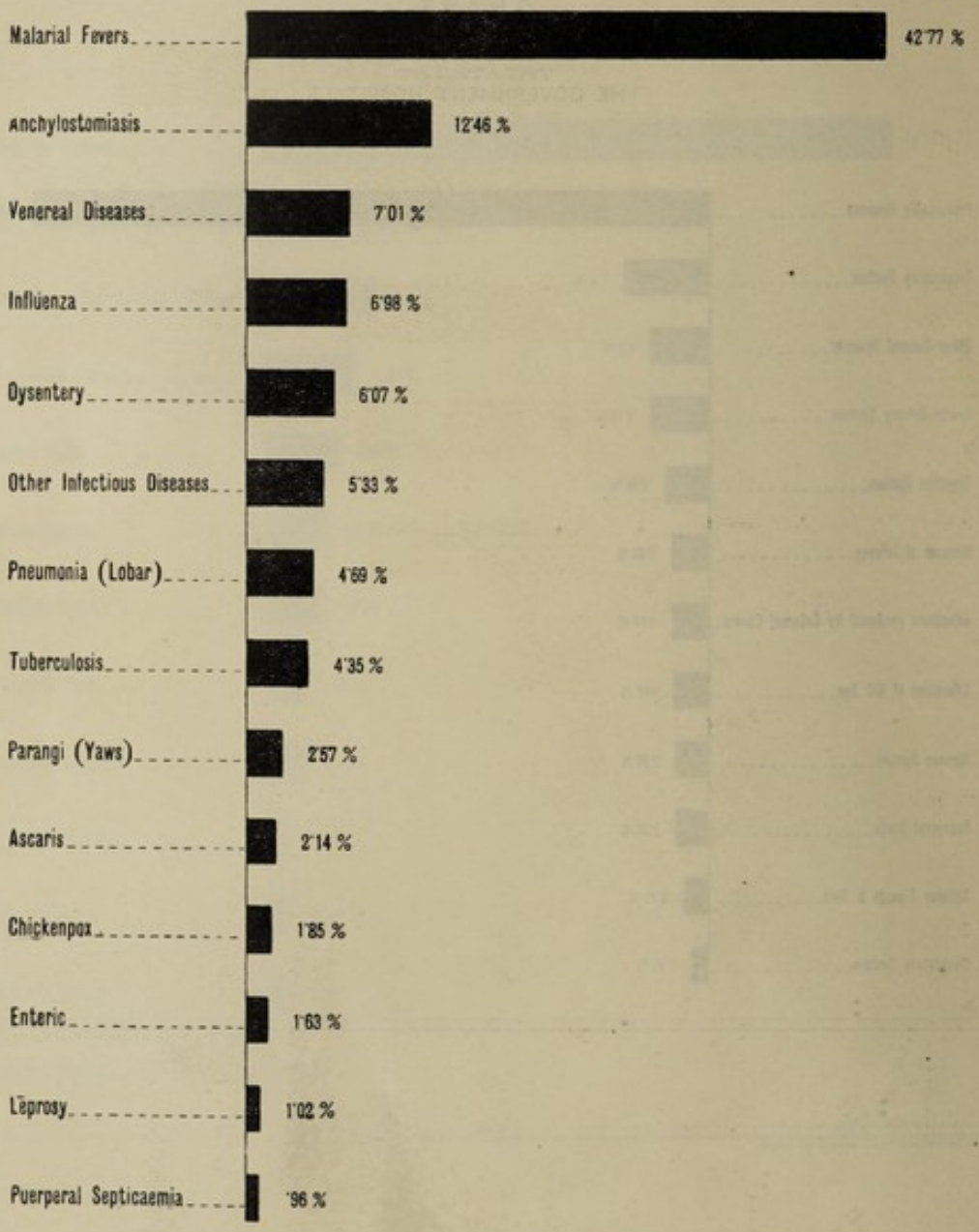


Block by Survey Dept. Ceylon 1929

TABLE IV (C)

CHART
SHOWING
CASES OF INFECTIOUS DISEASES
TREATED AT
THE GOVERNMENT HOSPITALS
DURING THE YEAR 1928.

Total Cases.....103,695.

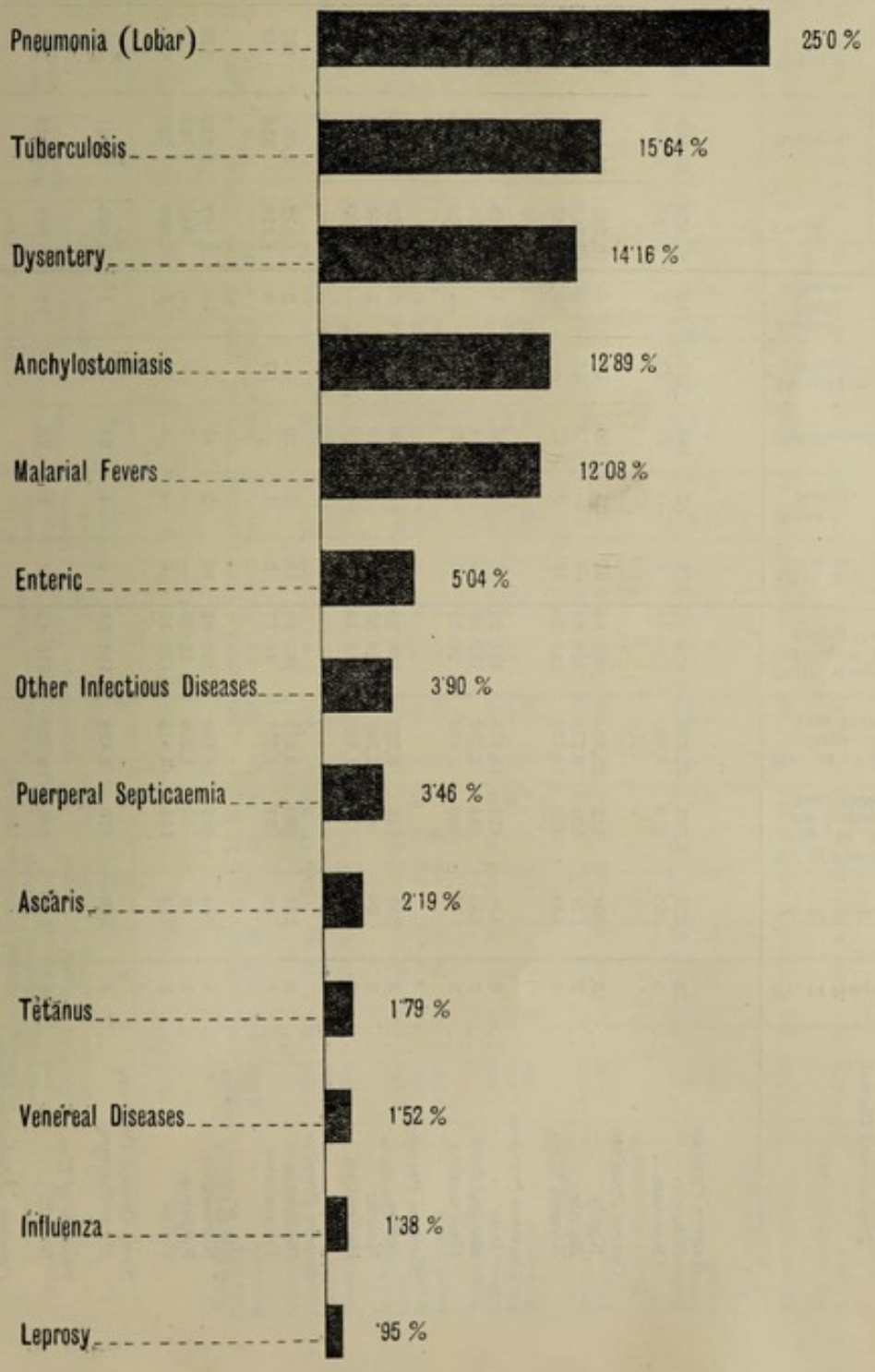


Block by Survey Dept. Ceylon. 1929

TABLE IV (D)

CHART
SHOWING
DEATHS FROM INFECTIOUS DISEASES
TREATED AT
THE GOVERNMENT HOSPITALS
DURING THE YEAR 1928.

Total Deaths.....7,303.



Block by Survey Dept. Ceylon 1929

I.—Hospital Returns.

Province and District.	No. of Hospitals.	No. of Beds.	No. of Patients remaining in Hospital at the beginning of the Year 1928.	No. of Patients Admitted during the Year 1928.	Daily Average No. of Patients in Hospital during the Year 1928.	Attendants.					Patients discharged.			No. of Patients who died in 1928.	Average stay of Patients, who			Specify the Longest Period for which any one Inmate has stayed.
						Nurses doing no other Work.		Servants Partially or not at all employed as Servants.							Died in 1928.	Were discharged in 1928.	Were remaining in 1928.	
						Day Nurses.	Night Nurses.	Not Nurses.	Partial Day Nurses.	Partial Night Nurses.	Cured.	Relieved.	Not improved.					
Western Province.																		
Colombo ..	18	2,821	2,793	52,594	2,878·87	108	42	144	211	112	27,573	16,829	4,535	4,233	26·23	34·07	45·31	1,542
Kalutara ..	5	365	319	9,880	290·44	8	—	21	23	2	5,783	3,493	168	597	12·13	12·34	13·40	125
Central Province.																		
Kandy ..	13	904	812	23,651	1,005·48	51	25	100	13	5	10,623	11,121	1,139	1,725	11·60	14·00	17·36	366
Matale ..	2	222	199	6,718	216·64	4	—	5	17	5	3,748	2,384	107	423	13·62	11·03	10·46	92
Nuwara Eliya ..	8	434	355	10,135	385·95	16	3	31	—	10	4,547	4,297	129	459	10·76	13·53	14·36	271
Southern Province.																		
Galle ..	6	450	471	15,671	481·20	21	4	55	3	1	5,818	8,673	504	705	11·99	11·81	10·72	143
Matara ..	2	130	134	3,702	129·59	4	—	14	—	—	1,804	1,596	73	201	9·62	13·05	12·19	670
Hambantota ..	3	75	100	2,432	76·11	—	—	20	—	—	768	1,378	61	144	8·08	12·53	12·68	106
Northern Province.																		
Jaffna ..	5	231	163	6,292	189·26	9	—	30	—	—	2,428	3,475	148	13	9·20	8·69	10·88	147
Mannar ..	3	98	46	2,544	64·52	2	—	19	—	3	1,754	586	53	131	10·08	8·99	10·41	366
Mullaittivu ..	2	96	70	1,680	49·13	—	—	6	9	—	800	701	44	52	11·12	10·90	10·88	148
Eastern Province.																		
Batticaloa ..	5	326	260	3,271	263·86	13	3	20	—	2	1,872	1,063	137	167	305·54	333·01	81·71	2,593
Trincomalee ..	1	58	37	1,571	46·57	2	1	—	7	2	1,116	314	42	64	11·14	10·23	13·52	174
North-Western Province.																		
Kurunegala ..	4	354	389	12,730	383·63	10	2	43	—	—	3,107	8,212	215	1,017	10·21	11·70	11·13	172
Puttalam ..	1	58	52	1,398	28·35	—	—	7	—	—	942	161	15	132	12·50	11·93	10·44	200
Chilaw ..	2	115	141	3,815	135·15	4	—	3	14	2	2,668	720	113	347	9·76	12·96	14·34	298
North-Central Province.																		
Anuradhapura ..	4	202	170	6,429	191·51	4	1	28	1	1	3,095	2,921	85	301	7·24	8·89	8·65	106
Province of Uva.																		
Badulla ..	10	646	464	16,529	510·13	14	1	26	30	19	6,968	7,024	213	867	11·51	9·46	13·24	187
Province of Sabaragamuwa.																		
Ratnapura ..	7	502	517	18,074	523·84	11	1	54	—	4	11,728	5,066	262	954	10·84	10·18	8·98	361
Kegalla ..	6	531	489	18,375	499·11	15	2	27	17	23	6,862	6,796	480	915	9·00	10·19	10·84	307

II.—Cases treated.

(*a*) According Districts.

Province and District.	Epidemic, Endemic, and Infectious Diseases. 1		General Diseases not mentioned above. 2		Affections of the Nervous System and Organs of the Senses. 3		Affections of the Circulatory System. 4		Affections of the Respiratory System. 5		Diseases of the Digestive System. 6		Diseases of the Genito-Urinary System (non-venereal). 7		Puperal State. 8		Affections of the Skin and Cellular Tissues. 9		Diseases of Bones and Organs of Locomotion. 10		Malformations. 11		Diseases of Infancy. 12		Affections of Old Age. 13		Affections produced by External Causes. 14		Ill-defined Diseases. 15		Total.	
CEYLON.	C.	D.	C.	D.	C.	D.	C.	D.	C.	D.	C.	D.	C.	D.	C.	D.	C.	D.	C.	D.	C.	D.	C.	D.	C.	D.	C.	D.	C.	D.	C.	D.
WESTERN PROVINCE.																																
Colombo ..	19,041	1,041	1,815	142	2,821	57	507	48	4,838	1,087	6,601	752	2,101	154	7,701	305	3,274	99	352	4	30	3	1,069	347	198	38	4,829	166	130	11	55,316	4,254
Kalutara ..	2,663	164	917	30	220	32	89	14	596	85	1,876	108	283	25	646	42	1,045	6	27	—	1	—	25	10	88	9	1,713	41	10	2	10,199	568
CENTRAL PROVINCE.																																
Kandy ..	7,335	429	1,276	64	1,993	72	209	23	1,589	214	3,431	429	675	89	1,000	56	3,187	40	58	2	3	—	27	7	231	16	2,455	58	2,094	228	25,563	1,724
Matale ..	2,690	129	351	13	101	8	18	1	370	79	1,040	101	122	16	167	14	1,099	13	10	—	—	—	347	26	23	4	572	18	7	1	6,917	423
Nuwara Eliya ..	2,981	125	976	24	485	26	110	18	824	87	1,496	108	299	55	304	17	1,020	6	46	1	2	—	154	26	293	8	881	27	115	2	10,486	530
SOUTHERN PROVINCE.																																
Galle ..	2,744	172	1,702	67	1,506	22	171	15	823	116	2,259	107	963	58	817	40	2,456	29	129	—	2	—	87	6	512	25	1,961	47	10	1	16,142	705
Matara ..	825	43	218	4	89	6	35	4	300	35	605	20	168	15	224	17	463	10	10	—	5	—	1	—	14	10	737	24	142	13	3,836	201
Hambantota ..	1,096	43	65	1	43	2	18	4	186	50	254	11	77	6	70	3	330	7	10	—	—	—	24	3	33	3	301	10	25	1	2,532	144
NORTHERN PROVINCE.																																
Jaffna ..	1,892	46	539	20	349	12	46	3	487	41	914	20	208	12	355	5	602	8	18	—	3	—	20	10	134	5	881	12	7	—	6,455	194
Mannar ..	1,451	42	82	2	30	1	21	3	218	34	297	20	57	5	49	6	160	1	10	—	—	—	28	6	5	1	121	3	161	7	2,590	131
Mullaittivu ..	664	15	113	—	114	7	8	2	120	8	210	9	22	2	46	6	227	2	10	—	—	—	1	—	4	—	110	1	1	—	1,650	52
EASTERN PROVINCE.																																
Batticaloa ..	1,385	40	257	11	193	2	9	—	243	47	378	36	84	8	46	2	479	6	19	1	—	—	33	—	47	2	320	12	2	—	3,495	167
Trincomalee ..	690	13	54	2	39	3	9	—	108	27	194	10	25	1	27	3	213	1	7	—	—	—	7	—	96	3	139	1	—	—	1,608	64
NORTH-WESTERN PROVINCE.																																
Kurunegala ..	5,265	259	347	3	257	28	36	11	947	269	2,059	217	377	56	392	26	1,679	31	19	1	—	—	328	67	64	14	1,136	33	213	2	13,119	1,017
Puttalam ..	708	49	23	1	25	1	12	4	133	34	116	20	46	7	41	2	161	2	6	3	—	—	15	4	27	4	136	1	1	—	1,450	132
Chilaw ..	1,343	58	238	40	57	12	13	2	258	74	605	77	83	16	284	12	394	8	2	—	—	—	68	17	74	19	534	12	3	—	3,956	347
NORTH-CENTRAL PROVINCE.																																
Anuradhapura ..	3,359	104	175	2	125	5	141	9	544	85	906	58	115	12	218	5	623	6	39	1	—	—	11	4	50	4	335	5	58	1	6,599	301
PROVINCE OF UVA.																																
Badulla ..	7,076	321	1,197	5.	722	35	90	12	1,251	222	2,087	162	370	50	333	32	2,000	10	48	1	4	—	139	24	140	8	1,185	22	300	4	16,935	960
PROVINCE OF SABARAGAMUWA.																																
Ratnapura ..	7,074	239	1,297	29	774	35	383	28	1,167	192	2,388	234	435	65	430	33	1,674	17	30	1	—	—	55	34	672	26	1,985	21	227	—	18,591	954
Kegalla ..	7,146	217	1,436	39	471	49	129	26	1,031	180	2,541	168	526	59	741	25	2,233	16	122	5	—	—	271	35	525	55	1,484	37	208	4	18,864	915

C = The number of Cases treated in Hospital.

D = The number of Deaths in Hospital.

II.—Cases treated—*contd.*

(*b*) According to Diseases.

Diseases.	* Remaining in Hospital at end of 1927.	Admissions in 1928.	Deaths in 1928.	† Total Cases treated in 1928.	‡ Remaining in Hospital at end of 1928
I.—Epidemic, Endemic, and Infectious Diseases.					
Enteric Group—					
(*a*) Typhoid Fever	63	1,334	313	1,397	98
(*b*) Paratyphoid A.	—	18	—	18	2
(*c*) Paratyphoid B.	—	1	—	1	—
(*d*) Type not defined	5	266	55	271	12
Relapsing Fever	2	12	—	14	—
Malaria—					
(*a*) Tertian	808	37,817	491	38,625	950
(*b*) Quartan	19	2,185	28	2,214	119
(*c*) Aestivo-autumnal	—	334	3	334	15
(*d*) Cerebral Malaria	—	208	139	208	—
(*e*) Cachexia	75	3,802	221	3,877	81
Smallpox	—	14	3	14	1
Measles	1	525	8	526	35
Whooping Cough	5	144	5	149	4
Diphtheria	6	34	13	40	—
Influenza	221	7,016	101	7,237	97
Mumps	1	287	—	288	21
Cholera	—	3	1	3	—
Dysentery—					
(*a*) Amoebic	117	4,285	713	4,302	140
(*b*) Bacillary	12	633	119	645	47
(*c*) Undefined or due to other causes	38	1,205	202	1,243	58
Plague—					
(*a*) Bubonic	2	31	25	33	—
(*b*) Undefined	—	4	1	4	—
Leprosy	750	304	69	1,054	746
Erysipelas	1	86	19	87	2
Acute Poliomyelitis	—	2	—	2	—
Other Epidemic Diseases—					
(*a*) Varicella (Chickenpox)	53	1,864	3	1,916	49
(*b*) Scarlet Fever	—	1	—	1	—
(*c*) Dengue	5	32	—	37	—
(*d*) Yaws	122	2,545	2	2,667	62
Rabies	—	82	26	82	15
Tetanus	15	280	131	295	8
Tuberculosis, Pulmonary, and Laryngeal	558	3,562	1,110	4,120	605
Tuberculosis of the Meninges or Central Nervous System	—	8	3	8	—
Tuberculosis of the Intestines or Peritoneum	—	15	5	15	—
Tuberculosis of the Vertebral Column	1	6	—	7	—
Tuberculosis of Bones and Joints	—	13	—	13	—
Tuberculosis of other organs—					
(*a*) Skin or Subcutaneous Tissue (Lupus)	6	51	4	57	1
(*b*) Bones	2	36	3	38	—
(*c*) Lymphatic System	4	89	7	93	2
(*d*) Genito-urinary	—	1	1	1	—
(*e*) Other organs	2	11	—	13	1
Tuberculosis disseminated—					
(*a*) Acute	1	2	—	3	—
(*b*) Chronic	6	123	9	129	2
Syphilis—					
(*a*) Primary	103	1,507	8	1,610	59
(*b*) Secondary	29	710	11	739	29
(*c*) Tertiary	1	156	8	157	6
(*d*) Hereditary	1	144	54	146	5
(*e*) Period not indicated	8	103	5	111	4

* *I.e.*, the year previous to that for which the Return is made.
† "Total Cases treated" will, of course, include those remaining in Hospital at the end of the previous year.
‡ The figures in this column to be carried on to the next year's Return.

II.—Cases treated—*contd.*

(*b*) According to Diseases—*contd.*

Diseases.	*Remaining in Hospital at end of 1927.	Admissions in 1928.	Deaths in 1928.	†Total Cases treated in 1928	‡Remaining in Hospital at end of 1928.
I.—EPIDEMIC, ENDEMIC, AND INFECTIOUS DISEASES—*contd.*					
Soft Chancre	2	19	—	21	1
A.—Gonorrhoea and its complications	147	3,655	15	3,802	129
B.—Gonorrhoeal Opthalmia	2	20	—	22	3
C.—Gonorrhoeal Aythritis	17	638	10	655	24
D.—Granuloma Venereum	1	3	—	4	—
Septicaemia	4	59	33	63	2
Filarial Diseases	6	29	—	35	—
Acute Rheumatic Fever	3	112	4	115	2
Other Infectious Diseases	103	436	14	539	13
II.—GENERAL DISEASES NOT MENTIONED ABOVE.					
Cancer or other malignant Tumours of the Buccal Cavity	11	394	31	405	5
Cancer or other malignant Tumours of the Stomach or Liver	—	27	10	27	—
Cancer or other malignant Tumours of the Peritoneum, Intestines, Rectum	—	13	5	13	—
Cancer or other malignant Tumours of the Female Genital Organs	5	75	10	80	3
Cancer or other malignant Tumours of the Breast	—	39	6	39	—
Cancer or other malignant Tumours of the Skin	1	46	5	47	—
Cancer or other malignant Tumours of Organs not specified	2	223	46	225	14
Tumours non-malignant	24	359	9	383	20
Chronic Rheumatism	129	4,914	22	5,043	132
Scurvy (including Barlow's Disease)	—	96	—	96	4
Rickets	11	250	69	261	6
Diabetes (not including Insipidus)	17	264	53	281	15
Anaemia—					
(*a*) Pernicious	—	76	1	76	—
(*b*) Other Anaemias and Chlorosis	30	749	45	779	7
Diseases of the Pituitary Body	6	69	—	75	1
Diseases of the Thyroid Gland—					
(*a*) Exophthalmic Goitre	—	30	1	30	—
(*b*) Other diseases of the Thyroid Gland, Myxoedema	3	7	—	10	1
Diseases of the Para-Thyroid Glands	1	—	—	1	—
Diseases of the Supra-Renal Glands	—	4	1	4	—
Diseases of the Spleen	1	84	3	85	1
Leukaemia—					
(*a*) Leukaemia	—	1	—	1	—
(*b*) Hodgkin's Disease	—	5	—	5	—
Alcoholism	—	44	—	44	—
Corrosive Acids	—	33	7	33	—
Metallic Poisons	—	23	1	23	—
Vegetable Alkaloids	1	49	7	50	—
Ptomaine Poisoning	—	9	1	9	—
Other Acute Poisonings	2	49	4	51	—
Other General Diseases—					
Auto-intoxication	69	1,735	56	1,804	37
Debility	16	1,198	48	1,214	47
Purpura Haemorrhagica	—	4	2	4	—
Haemophilia	2	3	1	5	—
Diabetes Insipidus	14	316	41	375	19
Diseases not specified	113	1,832	63	1,945	51

* *I.e.*, the year previous to that for which the Return is made.
† "Total Cases treated" will, of course, include those remaining in Hospital at the end of the previous year.
‡ The figures in this column to be carried on to the next year's Return.

II.—Cases treated—*contd.*

(*b*) According to Diseases—*contd.*

Diseases.	*Remaining in Hospital at end of 1927.	Admissions in 1928.	Deaths in 1928.	†Total Cases treated in 1928.	‡Remaining in Hospital at end of 1928.
III.—Affections of the Nervous System and Organs of the Senses.					
Encephalitis (not including Encephalitis Lethargica)	—	4	4	4	—
Meningitis (not including Tuberculous Meningitis or Cerebro-spinal Meningitis) ..	3	85	39	88	1
Locomotor Ataxia	—	7	1	7	2
Other affections of the Spinal Cord ..	1	63	10	64	1
Apoplexy—					
(*a*) Haemorrhage	8	54	27	62	—
(*b*) Embolism	—	4	3	4	1
(*c*) Thrombosis	—	10	7	10	1
Paralysis—					
(*a*) Hemiplegia	25	382	72	407	29
(*b*) Other Paralysis	19	288	39	307	17
General Paralysis of the Insane ..	—	12	—	12	1
Other forms of Mental Alienation ..	21	558	8	579	8
Epilepsy	14	361	23	375	13
Eclampsia, Convulsions (non-puerperal) 5 years or over	—	47	14	47	1
Infantile Convulsions	3	325	128	328	1
Chorea	1	22	—	23	—
A.—Hysteria	—	254	—	254	8
B.—Neuritis	6	297	4	303	16
C.—Neurasthenia	1	124	6	125	7
Cerebral Softening	—	3	1	3	—
Other affections of the Nervous System, such as Paralysis Agitans	47	441	17	488	10
Affections of the Organs of Vision—					
(*a*) Diseases of the Eye.. ..	70	1,212	1	1,282	56
(*b*) Conjunctivitis	62	2,790	3	2,852	45
(*c*) Trachoma	—	106	—	106	—
(*d*) Tumours of the Eye ..	—	30	—	30	2
(*e*) Other affections of the Eye ..	128	2,109	11	2,237	124
Affections of the Ear or Mastoid Sinus ..	16	566	2	582	12
IV.—Affections of the Circulatory System.					
Pericarditis	6	50	10	56	1
Acute Endocarditis or Myocarditis ..	—	51	17	51	—
Angina Pectoris	1	18	3	19	1
Other Diseases of the Heart—					
(*a*) Valvular—Mitral	21	457	108	478	15
Aortic	—	46	15	46	—
Tricuspid ..	—	15	3	15	—
Pulmonary ..	—	3	2	3	—
(*b*) Myocarditis	—	42	10	42	1
Diseases of the Arteries—					
(*a*) Aneurism	1	4	—	5	—
(*b*) Arterio-Sclerosis	1	57	5	58	3
(*c*) Other diseases	1	16	3	17	—
Embolism or Thrombosis (non-cerebral) ..	—	61	25	61	—
Diseases of the Veins—					
Haemorrhoids	2	295	4	297	16
Varicose Veins	—	15	—	15	—
Phlebitis	1	28	1	29	1
Diseases of the Lymphatic System—					
Lymphangitis	6	103	3	109	1
Lymphadenitis, Bubo (non-specific) ..	13	185	—	198	7
Haemorrhage of undetermined cause ..	—	11	2	11	1
Other affections of the Circulatory System ..	23	397	21	420	10

* *I.e.*, the year previous to that for which the Return is made.
† "Total Cases treated" will, of course, include those remaining in Hospital at the end of the previous year.
‡ The figures in this column to be carried on to the next year's Return.

II.—Cases treated—*contd.*

(*b*) According to Diseases—*contd.*

Diseases.	*Remaining in Hospital at end of 1927.	Admissions in 1928.	Deaths in 1928.	†Total Cases treated in 1928.	‡Remaining in Hospital at end of 1928.
V.—AFFECTIONS OF THE RESPIRATORY SYSTEM.					
Diseases of the Nasal Passages—					
Adenoids	1	40	1	41	1
Polypus	1	13	—	14	2
Rhinitis	4	37	1	41	1
Coryza	—	81	—	81	1
Affections of the Larynx-Laryngitis	3	76	6	79	—
Bronchitis—(*a*) Acute	96	3,470	103	3,566	93
(*b*) Chronic	34	1,620	87	1,654	49
Broncho-Pneumonia	55	1,586	722	1,641	62
Pneumonia—(*a*) Lobar	131	4,433	1,698	4,564	123
(*b*) Unclassified	20	284	128	304	7
Pleurisy, Empyema	9	584	61	593	16
Congestion of the Lungs	—	6	6	6	—
Gangrene of the Lungs	—	4	1	4	—
Asthma	45	1,668	41	1,713	52
Pulmonary Emphysema	—	11	1	11	—
Pneumothroax	—	1	1	1	—
Other affections of the Lungs—Pulmonary Spirochaetosis	19	144	24	163	1
VI.—DISEASES OF THE DIGESTIVE SYSTEM.					
A.—Diseases of Teeth or Gums—					
Caries, Pyorrhoea, &c.	10	435	5	445	5
B.—Other affections of the Mouth—					
Stomatitis	2	256	9	258	8
Glossitis, &c.	—	40	5	40	1
Affections of the Pharynx or Tonsils—					
Tonsillitis	14	450	5	464	4
Pharyngitis	1	101	—	102	—
Affections of the Oesophagus	—	15	1	15	—
A.—Ulcer of the Stomach	1	67	7	68	1
B.—Ulcer of the Duodenum	—	7	—	7	—
Other affections of the Stomach—					
Gastritis	3	696	30	699	15
Dyspepsia, &c.	9	1,185	6	1,194	15
Diarrhoea and Enteritis—					
Under two years	34	1,146	284	1,180	31
Diarrhoea and Enteritis—					
Two years and over	119	3,365	688	3,484	121
Colitis	1	335	53	336	6
Ulceration	—	102	—	102	1
Sprue	1	7	—	7	—
Anchylostomiasis	451	12,470	941	12,921	473
Diseases due to Intestinal Parasites—					
(*a*) Cestoda (Taenia)	2	5	—	7	—
(*b*) Trematoda (Flukes)	—	1	—	1	—
(*c*) Nematoda (other than Ankylostoma)—					
Ascaris	47	2,173	160	2,220	60
Oxyuris	—	2	—	2	1
(*d*) Other parasites	—	165	—	165	2
(*e*) Unclassified	1	45	—	46	1
Appendicitis	17	313	17	330	15
Hernia	36	601	46	637	15
A.—Affections of the Anus Fistula, &c.	—	314	13	314	7
B.—Other affections of the Intestines—					
Enteroptosis	1	239	12	240	2
Constipation	2	999	5	1,001	20
Acute Yellow Atrophy of the Liver	—	1	1	1	—

* *I.e.*, the year previous to that for which the Return is made.
† "Total Cases treated" will, of course, include those remaining in Hospital at the end of the previous year.
‡ The figures in this column to be carried on to the next year's Return.

II.—Cases treated—*contd.*

(*b*) According to Diseases—*contd.*

Diseases.	*Remaining in Hospital at end of 1927.	Admissions in 1928.	Deaths in 1928.	†Total Cases treated in 1928.	‡Remaining in Hospital at end of 1928.
VI.—Diseases of the Digestive System—*contd.*					
Cirrhosis of the Liver—					
(*a*) Alcholic	5	119	34	124	3
(*b*) Other forms	9	223	65	232	11
Biliary Calculus	1	12	—	13	1
Other affections of the Liver—					
Abscess	13	108	12	121	2
Hepatitis	4	321	13	325	8
Cholecystitis	—	33	2	33	—
Jaundice	—	176	22	176	—
Diseases of the Pancreas	1	24	5	25	1
Peritonitis (of unknown origin)	9	254	81	263	4
Other affections of the Digestive System	154	2,506	110	2,660	91
VII.—Diseases of the Genito-Urinary System (non-Venereal).					
Acute Nephritis	83	1,991	401	2,074	88
Chronic	20	701	193	721	37
A.—Chyluria	—	1	—	1	—
Other affections of the Kidneys, Pyelitis, &c.	7	264	31	271	5
Urinary Calculus	1	43	—	44	—
Diseases of the Bladder-Cystitis	5	425	24	430	8
Diseases of the Urethra—					
(*a*) Stricture	1	375	6	376	8
(*b*) Other	4	514	6	518	16
Diseases of the Prostate—					
Hypertrophy	—	20	2	20	—
Prostatitis	1	43	—	44	1
Diseases (non-venereal) of the Genital Organs of Man—					
Epididymitis	6	111	—	117	2
Orchitis	15	312	—	327	9
Hydrocele	2	237	8	239	5
Ulcer of Penis	2	90	—	92	1
Cysts or other non-malignant Tumours of the Ovaries	6	186	27	192	4
Salpingitis—					
Abscess of the Pelvis	1	53	1	54	2
Uterine Tumours (non-malignant)	—	83	2	83	2
Uterine Haemorrhage (non-puerperal)	1	112	2	113	1
A. Metritis	—	61	—	61	3
B.—Other affections of the Female Genital Organs—					
Displacement of Uterus	16	545	13	561	16
Amenorrhoea	—	92	1	92	1
Dysmenorrhoea	5	99	1	104	3
Leucorrhoea	2	198	1	200	2
Affections not specified	15	73	1	88	—
Diseases of the Breast (non-puerperal)—					
Mastitis	4	21	—	25	1
Abscess of Breast	—	97	2	97	4

* *I.e.*, the year previous to that for which the Return is made.
† "Total Cases treated" will, of course, include those remaining in Hospital at the end of the previous year.
‡ The figures in this column to be carried on to the next year's Return.

II.—Cases treated—*contd.*

(*b*) According to Diseases—*contd.*

Diseases.	*Remaining in Hospital at end of 1927.	Admissions in 1928.	Deaths in 1928.	†Total Cases treated in 1928.	‡Remaining in Hospital at end of 1928.
VIII.—PUERPERAL STATE.					
A.—Normal Labour	235	8,349	74	8,584	230
B.—Accidents of Pregnancy—					
(*a*) Abortion	14	554	49	568	15
(*b*) Ectopic Gestation	1	13	2	14	—
(*c*) Other accidents of Pregnancy	42	645	62	687	25
Puerperal Haemorrhage	—	114	41	114	2
Other accidents of Parturition	18	367	39	385	7
Puerperal Septicaemia	29	961	253	990	32
Phlegmasia Dolens	—	13	1	13	—
Puerperal Eclampsia	1	322	78	323	5
Sequelae of Labour	82	2,191	73	2,273	9
Puerperal affections of the Breast	2	36	—	38	3
IX.—AFFECTIONS OF THE SKIN AND CELLULAR TISSUES.					
Gangrene	18	977	90	995	64
Boil—					
Carbuncle	21	624	13	645	16
Ulcers	138	3,705	38	3,843	133
Abscess—					
Whitlow	108	1,575	32	1,683	72
Cellulitis	122	4,451	100	4,573	160
Non-specified	14	497	8	511	13
A.—Tinea	9	266	1	275	11
B.—Scabies	42	3,108	4	3,150	69
Other Diseases of the Skin—					
Brythema	71	1,166	17	1,237	50
Urticaria	—	70	—	70	—
Eczema	94	2,121	4	2,215	70
Herpes	2	63	—	65	4
Psoriasis	—	118	2	118	5
Elephantiasis	—	69	1	69	—
Chigoes	—	2	—	2	—
Cutaneous Leishmaniasis	98	3,338	17	3,436	89
X.—DISEASES OF BONES AND ORGANS OF LOCOMOTION (OTHER THAN TUBERCULOUS).					
Diseases of Bones—Osteitis	8	109	2	117	1
Diseases of Joints—Arthritis	10	476	11	486	20
Synovitis	2	193	3	195	6
Other Diseases of Bones or Organs of Locomotion	6	177	6	183	8
XI.—MALFORMATIONS.					
Malformations—Hydrocephalus	—	3	—	3	—
Undescended Testics	—	13	3	13	—
Spina Bifida, &c.	—	14	—	14	—
Hare-Lip	—	16	—	16	—
XII.—DISEASES OF INFANCY.					
Congenital Debility	27	1,780	223	1,807	39
Premature Birth	—	104	67	104	—
Other affections of Infancy	5	352	95	357	34
Infant neglect (infants of three months or over)	—	274	68	274	—
XIII.—AFFECTIONS OF OLD AGE.					
Senility—Senile Dementia	41	3,584	432	3,625	117

* *I.e.*, the year previous to that for which the Return is made.
† "Total Cases treated" will, of course, include those remaining in Hospital at the end of the previous year.
‡ The figures in this column to be carried on to the next year's Return.

II.—Cases treated—*contd.*

(*b*) According to Diseases—*contd.*

Diseases.	*Remaining in Hospital at end of 1927.	Admissions in 1928.	Deaths in 1928.	†Total Cases treated in 1928.	‡Remaining in Hospital at end of 1928.
XIV.—Affections produced by External Causes.					
Suicide by Poisoning	—	1	1	1	—
Corrosive Poisoning (intentional)	—	15	3	15	—
Suicide by hanging or strangulation	—	1	1	1	—
Suicide by Firearms	—	1	1	1	—
Other Suicides	—	1	1	1	—
Food Poisoning—Botulism	1	20	3	21	—
Attacks of Poisonous Animals—					
Snake Bite	1	47	5	48	3
Insect Bite	—	20	—	20	—
Other accidental Poisoning	5	49	4	54	2
Burns (by Fire)	45	780	109	825	35
Burns (other than by Fire)	5	137	10	142	2
Poisoning by Gas (accidental)	—	2	—	2	—
Drowning (accidental)	—	10	2	10	1
Wounds (by Firearms)	25	195	13	220	13
Wounds (by cutting or stabbing instruments)	99	3,870	51	3,969	122
Wounds (infected)	—	99	7	99	—
Wounds (by Fall)	96	3,069	23	3,165	98
Wounds (in Mines or Quarries)	1	100	—	101	1
Wounds (by Machinery)	14	361	3	375	11
Wounds (crushing, *e.g.*, Railway accidents, &c.)	12	547	11	559	15
Injuries inflicted by Animals, Bites, Kicks, &c.	31	921	5	952	14
B.—Hunger or Thirst	—	7	—	7	—
Sunstroke	—	6	1	6	—
Lightning Stroke	—	6	—	6	—
Electric Shock	—	2	—	2	—
Murder by cutting or stabbing instruments	—	2	2	2	—
A.—Dislocation	2	183	2	185	7
B.—Sprain	6	292	—	298	8
C.—Fracture	78	1,752	141	1,830	92
Other external Injuries	201	6,206	45	6,407	124
Deaths by Violence of unknown cause	1	—	1	1	—
XV.—Ill-defined Diseases.					
A.—Diseases not already specified or ill-defined—					
Ascites	2	205	18	207	8
Oedema	8	143	1	151	3
Asthenia	6	1,270	100	1,276	—
Shock	—	70	23	70	—
Hyperpyrexia	—	3	—	3	—
B.—Malingering	14	1,732	142	1,746	136

* *I.e.*, the year previous to that for which the Return is made.
† "Total Cases treated" will, of course, include those remaining in Hospital at the end of the previous year.
‡ The figures in this column to be carried on to the next year's Return.

III.—Special Diseases.

Table of Cases of Yellow Fever or other Endemic Fever, Plague, Typhus, Smallpox, Scarlatina, Cholera, Enteric (or Typhoid) Fever, Erysipelas, or Pyaemia occurring amongst Patients, and also amongst Officers.

Hospital and Name of Disease.	Occurring amongst Patients. Number of Cases.	Number of Deaths.
Western Province.		
General Hospital :—		
Plague	4	1
Enteric (or typhoid) Fever	385	77
Lying-in Home, Colombo :—		
Enteric (or typhoid) Fever	1	—
Lady Havelock and Ridgeway Hospitals, Colombo :—		
Influenza	77*	—
Measles	20	—
Diphtheria	3	2
Dysentery	82	28
Enteric (or typhoid) Fever	43	12
Erysipelas	1	—
Whooping Cough	9	—
Police Hospital, Borella :—		
Enteric (or typhoid) Fever	8	—
Erysipelas	1†	—
Prison Hospital, Colombo :—		
Enteric (or typhoid) Fever	15	3
Infectious Diseases Hospital, Angoda :—		
Plague	22	17
Smallpox	12	2
Enteric (or typhoid) Fever	147	29
Erysipelas	1	1
Scarlatina	1	—
Cholera	2	1
Kalutara Hospital :—		
Enteric (or typhoid) Fever	86	16
Erysipelas	3	—
Negombo Hospital :—		
Enteric (or typhoid) Fever	12	5
Erysipelas	2	—
Watupitiwela Hospital :—		
Enteric (or typhoid) Fever	8	4
Erysipelas	3	—
Central Province.		
Agrapatana Hospital :—		
Enteric (or typhoid) Fever	6	—
Bogawantalawa Hospital :—		
Enteric (or typhoid) Fever	—	—‡
Dikoya Hospital :—		
Pyaemia	1	—
Kandy Civil and Infectious Diseases Hospital :—		
Plague	2	1
Enteric (or typhoid) Fever	81	23
Erysipelas	11	3
Smallpox	1	1
Endemic Fevers	1,165	26
Madulkele Hospital :—		
Enteric (or typhoid) Fever	5	1
Matale Hospital :—		
Enteric (or typhoid) Fever	2	—
Erysipelas	2	—
Maturata Hospital :—		
Enteric (or typhoid) Fever	2	—
Nawalapitiya Hospital :—		
Enteric (or typhoid) Fever	31‡	5
Erysipelas	6	1
Ramboda Hospital :—		
Enteric (or typhoid) Fever	17	1
Teldeniya Hospital :—		
Enteric (or typhoid) Fever	1	1
Southern Province.		
Deniyaya Hospital :—		
Enteric (or typhoid) Fever	12	3
Erysipelas	1	1
Galle Infectious Diseases Hospital :—		
Smallpox	1	—
Hambantota Hospital :—		
Enteric (or typhoid) Fever	3	—
Tissamaharama Hospital :—		
Enteric (or typhoid) Fever	2	1

* And 10 cases among resident officers.
† And 1 case among non-resident officers.
‡ And 1 case among resident officers.

III.—Special Diseases—*contd.*

Hospital and Name of Disease.	Occurring amongst Patients. Number of Cases.	Number of Deaths.
Northern Province.		
Chavakachcheri Hospital :—		
Enteric (or typhoid) Fever ..	2	—
Erysipelas	3	—
Jaffna Hospital :—		
Plague	2	2
Enteric (or typhoid) Fever ..	3	—
Mannar Hospital :—		
Enteric (or typhoid) Fever ..	6	—
Mullaittivu Hospital :—		
Enteric (or typhoid) Fever ..	3	1
Point Pedro Hospital :—		
Enteric (or typhoid) Fever ..	17	1
Talaimannar Hospital :—		
Enteric or (typhoid) Fever ..	2	1
Plague	1	1
Eastern Province.		
Batticaloa Hospital :—		
Enteric (or typhoid) Fever ..	12	5
Mahaoya Hospital :—		
Enteric (or typhoid) Fever ..	4	—
North-Western Province.		
Kurunegala Hospital :—		
Enteric (or typhoid) Fever ..	3	1
Pyaemia	1	1
Erysipelas	6	5
Puttalam Hospital :—		
Enteric (or typhoid) Fever ..	2	—
Erysipelas	2	—
Pyaemia	1	1
North-Central Province.		
Anuradhapura Hospital :—		
Enteric (or typhoid) Fever ..	3	—
Province of Uva.		
Alutnuwara Hospital :—		
Enteric (or typhoid) Fever ..	1	—
Cholera	5	2
Badulla Hospital :—		
Enteric (or typhoid) Fever ..	8	1
Erysipelas	2	—
Koslanda Hospital :—		
Enteric or (typhoid) Fever ..	13	6
Lunugala Hospital :—		
Enteric (or typhoid) Fever ..	6	6
Erysipelas	1	1
Passara Hospital :—		
Enteric (or typhoid) Fever ..	2	—
Province of Sabaragamuwa.		
Aranayaka Hospital :—		
Erysipelas	2	—
Enteric (or typhoid) Fever ..	6	—
Balangoda Hospital :—		
Enteric (or typhoid) Fever ..	2	—
Erysipelas	3	—
Eheliyagoda Hospital :—		
Enteric (or typhoid) Fever ..	23	6
Kegalla Hospital :—		
Enteric (or typhoid) Fever ..	5	—
Cholera	1	—
Kolonna Hospital :—		
Erysipelas	1	—

IV.—Water Supply, &c.

Situation of Hospital.	Water available for each Patient every Day.	Source of Supply.	Quality of Water.	Arrangements as to Baths and Lavatories.	System of Sewerage.	Condition of Privies.
WESTERN PROVINCE.						
Angoda Infectious Diseases Hospitals	Unlimited ..	Reservoir ..	Good ..	A bath and separate fly-proof lavatory to each ward	Dry-earth system	Satisfactory
Avissawella ..	do. ..	do. ..	do. ..	A bath and lavatory to eachward	do. ..	—
Colombo.						
Borella Branch Hospital	do. ..	do. ..	do. ..	1 bathroom and 5 lavatories	Water carriage system	Good
Borella Police Hospital ..	do. ..	do. ..	do. ..	2 bathrooms and 2 lavatories	do. ..	Satisfactory
Borella Prison Hospital..	do. ..	do. ..	do. ..	2 bathrooms and 2 lavatories to each ward	do. ..	do.
De Soysa Lying-in Home	do. ..	do. ..	do. ..	Baths and shower baths..	do. ..	Good
General Hospital ..	do. ..	do. ..	do. ..	Sufficient ..	do. ..	Satisfactory
Lady Havelock and Lady Ridgeway Hospitals	do. ..	do. ..	do. ..	10 bathrooms ..	do. ..	do.
Victoria Memorial Eye Hospital	do. ..	do. ..	do. ..	10 bathrooms and 10 lavatories	do. ..	Very clean
Gampaha Lady Manning Hospital	Sufficient ..	From wells	do. ..	Satisfactory ..	Dry-earth system	—
Hendala Leper Asylum..	Ample ..	Reservoir, for cooking and drinking purposes	do. ..	24 bathrooms adjoining the wards, supplied with hot and cold water	do. ..	Clean
Ingiriya ..	Unlimited ..	Spring water led into a reservoir	do. ..	7 bathrooms attached to wards and fly-proof lavatories	do. ..	Satisfactory
Kalutara ..	do. ..	From wells	Satisfactory ..	Bathrooms attached to wards	do. ..	—
Kandana Sanatorium ..	30 to 40 gallons	do. ..	do. ..	Baths and lavatories attached to wards	do. ..	Good
Mahara (jail) ..	Unlimited ..	From Ragama reservoir pipe bourne	Wholesome ..	Satisfactory ..	do. ..	Satisfactory
Moratuwa ..	Limited and insufficient	From a well	Slightly brackish	4 baths and 6 latrines ..	do. ..	—
Neboda ..	20 gallons (approximately)	From a well pumped to a storage tank	Good ..	4 bathrooms and 8 lavatories	do. ..	Satisfactory
Negombo ..	Sufficient for drinking only, no water available for bathing	From a well	do. ..	A bathroom and lavatory attached to each ward, water for bathing not available on the premises	do. ..	—
Panadure ..	Unlimited ..	do. ..	Satisfactory ..	2 baths and 2 latrines ..	do. ..	Clean
Pimbura ..	4 gallons (approximately)	do ..	Very unsatisfactory	Bathrooms and lavatories are connected to wards	do. ..	—
Ragama Tuberculosis Hospital	Very insufficient	Pumped from a large well and stored in two tanks	do. ..	Bathroom and lavatory in fly-proof room	do. ..	Clean
Watupitiwala ..	Unlimited ..	From a well	Satisfactory ..	Baths attached to wards	do. ..	Satisfactory
CENTRAL PROVINCE.						
Agrapatana ..	Unlimited ..	Natural spring water	Good, but muddy during rainy season	2 bathrooms and 2 lavatories for each ward	Dry-earth system	—
Bogawantalawa ..	do. ..	do. ..	do. ..	do.	do. ..	Satisfactory
Dambulla ..	3 gallons ..	From a well	do. ..	Bathrooms and tubs provided in each ward, patients who can walk bathe in a stream	do. ..	do.
Deltota ..	Unlimited ..	Natural spring water	Good and clean	A bathroom near each ward tap and zinc baths provided, 2 latrines	do. ..	Fair
Dikoya ..	do. ..	Reservoir ..	Pure ..	8 bathrooms ..	do. ..	Satisfactory
Dimbula (Kotagala) ..	do. ..	Natural spring water	Good and wholesome	A bathroom attached to each ward	do. ..	Clean
Dolosbage ..	do. ..	do. ..	do. ..	3 bathrooms connected to wards	do. ..	Satisfactory

IV.—Water Supply, &c.—*contd.*

Situation of Hospital.	Water available for each Patient every Day.	Source of Supply.	Quality of Water.	Arrangements as to Baths and Lavatories.	System of Sewerage.	Condition of Privies.
CENTRAL PROVINCE—*contd.*						
Gampola ..	15 gallons (approximately)	Reservoir ..	Good and wholesome	2 bathrooms in each ward provided with zinc baths	Dry-earth system	Satisfactory
Kandy ..	Unlimited ..	do. ..	do. ..	Bathrooms and lavatories attached to each ward	do. ..	Clean
Lindula ..	do. ..	Natural spring water through Jewel filters	do. ..	A bath and lavatory in each ward	do. ..	Satisfactory
Madulkele ..	do. ..	Pipe borne spring water	do. ..	9 bathrooms and 13 lavatories	do. ..	do.
Maskeliya ..	Sufficient ..	do. ..	Pure ..	4 bathrooms ..	do. ..	Good
Matale ..	Unlimited ..	Reservoir ..	Good ..	Baths and latrines attached to each set of wards	do. ..	do.
Maturata ..	do. ..	Natural spring water	do. ..	2 bathrooms to each ward	do. ..	do.
Mulhalkele ..	do. ..	From irrigation channel	Filtered ..	3 lavatories and 2 bathrooms	do. ..	Satisfactory
Nawalapitiya ..	do. ..	Mountain stream pipe borne	Good ..	A bath and lavatory in each ward	do. ..	do.
Nuwara Eliya ..	do. ..	Reservoir ..	Pure ..	do. ..	do. ..	—
Pussellawa ..	do. ..	Natural spring water	Good ..	3 bathrooms ..	do. ..	Good
Ramboda ..	do. ..	do. ..	Unsatisfactory during rainy seasons	6 bathrooms and 6 lavatories	do. ..	—
Teldeniya ..	Abundant in rainy season and scanty in dry season	Reservoir ..	Good ..	Bathrooms and lavatories separate for males and females connected to wards	do. ..	—
Uda Pussellawa ..	Unlimited ..	Natural spring water, filtered	do. ..	do. ..	do. ..	Clean
Watawala ..	do. ..	Reservoir ..	do. ..	Baths and lavatories connected to wards by a covered passage	do. ..	Good
SOUTHERN PROVINCE.						
Balapitiya ..	Unlimited ..	From a well	Poor in quality	2 bathrooms, convalescents prefer seabaths	Dry-earth system	—
Deniyaya ..	do. ..	Natural spring water	Good ..	8 bathrooms and 12 latrines	do. ..	Satisfactory
Elpitiya ..	11½ gallons ..	From a well	do. ..	2 baths and 2 lavatories in each ward	do. ..	—
Galle ..	Limited, but just sufficient	Reservoir ..	do. ..	Bathrooms and lavatories in each ward	do. ..	—
Hambantota ..	Sufficient for drinking purposes	From wells through a contractor	Fair ..	1 bathroom and 2 fly-proof latrines	do. ..	—
Matara ..	Unlimited ..	Public wells	Chalky and unsatisfactory	Bathrooms attached to latrines	do. ..	—
Tangalla .	Hardly two gallons	do. ..	Very poor and unsatisfactory	A bathroom and lavatory in each ward	do. ..	Satisfactory
Tissamaharama ..	Unlimited, except for 2 months of the year.	do. ..	Hard and poor	A bathroom and lavatory attached to each ward	do. ..	do.
Udugama ..	Sufficient ..	From a well and reservoir	Good ..	2 lavatories and 2 bathrooms for two wards and 1 each for the other wards	do. ..	Good
Unawatuna Bathfield House Hospital	do. ..	From a well	do. ..	2 wells; water drawn out for those unable to do so	do. ..	—
NORTHERN PROVINCE.						
Chavakachcheri ..	Unlimited ..	From 2 wells	Good ..	A bath attached to each ward	Dry-earth system	—
Jaffna ..	do. ..	Well water	do. ..	Separate bathrooms and latrines for males and females in respective wards	do. ..	Clean

IV.—Water Supply, &c.—*contd.*

Situation of Hospital.	Water available for each Patient every Day.	Source of Supply.	Quality of Water.	Arrangements as to Baths and Lavatories.	System of Sewerage.	Condition of Privies.
NORTHERN PROVINCE—*contd.*						
Kilinochchi ..	10 gallons ..	From a well and tank	Fresh and good	Baths and lavatories connected to each ward	Dry-earth system	Clean and good
Mannar ..	Unlimited ..	From wells; pipe borne	Good and palatable	6 bathrooms and 5 latrines	do. ..	—
Mantota ..	do. ..	do. ..	Fairly good ..	Bathrooms and latrines separately for males and females	do. ..	In good order
Mullaittivu ..	do. ..	From wells, in the premises	do. ..	4 bathrooms, 4 latrines 2 for each sex	do. ..	Satisfactory
Point Pedro ..	do. .	do. ..	Clean and wholesome	5 bathrooms and 8 latrines connected to wards	do. ..	Good
Talaimannar ..	do. ..	From wells, pipe borne	Good ..	Baths and lavatories adjoin wards	do. ..	—
Vavuniya ..	Sufficient ..	From wells in the premises	Fair ..	4 bathrooms and 5 latrines	do. ..	Good
EASTERN PROVINCE.						
Batticaloa ..	Unlimited ..	From wells pipe borne	Good ..	4 bathrooms and latrines	Dry-earth system	—
Kalmunai ..	Unlimited except during November and December	do. ..	do. ..	A separate bathroom and latrine to each ward	do. ..	Clean
Mahaoya ..	Sufficient ..	do. ..	Unsatisfactory; filtered before use	2 bathrooms ..	do. ..	Satisfactory
Mantivu Leper Asylum..	Unlimited ..	Reservoir ..	Good ..	Latrines and bathrooms provided to each ward and a set of latrines and bathrooms for a group of five cottages	do. ..	—
Trincomalee ..	do. ..	From a well outside the premises for drinking	do. ..	2 Bathrooms, convalescents and skin cases bathe in the sea; 2 permanent and 1 portable latrines	do. ..	Dark and out of date
NORTH-WESTERN PROVINCE.						
Chilaw ..	Sufficient for drinking	From a well	Good ..	Convalescents bathe in the public baths or in the river	Dry-earth system	Satisfactory
Dandagamuwa ..	Limited ..	do. ..	do. ..	5 bathrooms and 5 latrines	do. ..	—
Kurunegala ..	Unlimited ..	From wells in the premises	do ..	Sufficient number of latrines; bathrooms provided with tubs, the stream is preferred by patients	do. ..	—
Marawila ..	do. ..	do. ..	do. ..	2 bathrooms and 2 lavatories	do. ..	—
Nikaweratiya ..	do. ..	do. ..	Very hard ..	Baths and 6 lavatories, patients prefer to bathe in the irrigation channel	do. ..	Clean
Puttalam ..	do. ..	Reservoir ..	Unsatisfactory	6 bathrooms and 8 latrines	do. ..	—
Ridigama ..	12 gallons ..	From a well	Good ..	Baths and lavatories adjoin the wards	do. ..	Satisfactory
NORTH-CENTRAL PROVINCE.						
Anuradhapura ..	Unlimited except during dry season	From wells	Hard	7 lavatories and 7 bathrooms attached to wards	do. ..	—
Mihintale ..	Unlimited ..	From a well	Poor ..	3 bathrooms and latrines attached to wards	do. ..	Fair
Ratmale ..	Sufficient except during dry whether	do.	Fair ..	2 bathrooms and 2 sets lavatories	do. ..	—
PROVINCE OF UVA.						
Alutnuwara ..	Unlimited ..	From a well and the river	Fair ..	Bathrooms and latrines to each ward	Dry-earth system	—
Badulla ..	do. ..	From a mountain spring	Good ..	8 bathrooms and lavatories with water service	do. ..	—

IV.—Water Supply, &c.—*contd.*

Situation of hospital.	Water available for each Patient every Day.	Source of Supply.	Quality of Water.	Arrangements as to Baths and Lavatories.	System of Sewerage.	Condition of Privies.
PROVINCE OF UVA—*contd.*						
Buttala ..	Unlimited ..	From a well and river water	Unsatisfactory	2 sets of bathrooms and lavatories	Dry-earth system	—
Haputale ..	do. ..	From a mountain stream	Good ..	Water service by means of pipes	do. ..	Good
Koslanda ..	do. ..	do. ..	do. ..	4 bathrooms and 6 latrines	do. ..	—
Lunugala ..	do. ..	do. ..	do. ..	5 bathrooms ..	do. ..	—
Medagama ..	Sufficient ..	From a well for drinking	Fair ..	No proper baths, the stream is used by patients	do. ..	Good
Monaragala ..	Sufficient in wet weather, 1 gallon in dry weather	Pipe borne supply from a mountain and rain water	Soft and impure	Baths and latrines attached to the ward	do. ..	Clean
Passara ..	Unlimited ..	From a mountain stream	Wholesome	2 bathrooms for males and 3 bathrooms for females	do. ..	—
PROVINCE OF SABARAGAMUWA.						
Aranayaka ..	8 gallons in wet weather and 2 gallons in dry weather	From a well	Good ..	A bathroom and lavatory in each ward	Dry-earth system	Satisfactory
Balangoda ..	do. ..	From a spring	do. ..	Taps and tubs provided in bathrooms	do. ..	Clean
Eheliyagoda ..	Sufficient ..	From wells	Unsatisfactory	A bathroom and lavatory in each ward	do. ..	Satisfactory
Embilipitiya ..	do. ..	do. ..	Good ..	Baths and lavatories provided to each ward	do. ..	do.
Kahawatta ..	do. ..	From a natural spring	Satisfactory ..	2 bathrooms and 2 latrines attached to each ward	do. ..	Fine
Kaltota ..	Unlimited ..	Irrigation channel	Good ..	—	do. ..	Good
Karawanella ..	do. ..	From a well and river	Pure ..	Separate bathrooms for males and females, river baths by convalescents	do. ..	—
Kegalla ..	Sufficient ..	From a well	do. ..	Pipe borne supply of water to bathrooms and lavatories	do. ..	Satisfactory
Kitulgala ..	Unlimited ..	Reservoir ..	Excellent ..	11 bathrooms with water service	do. ..	Clean
Kolonna ..	Sufficient ..	Stream ..	Usually hard ..	Convalescents bathe in the stream	do. ..	do.
Rakwana ..	Unlimited ..	Well ..	Good ..	Bathrooms in each ward, and patient bathe in the stream nearby	do. ..	—
Ratnapura ..	Insufficient ..	Reservoir ..	do. ..	Bathrooms and lavatories for males and females, patents bathe in the river also	do. ..	—
Undugoda ..	Sufficient ..	From a natural spring	Pure ..	Bathrooms with water service	do. ..	—