

## **Annual report of the Medical and Sanitary Department / Sierra Leone.**

### **Contributors**

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SIERRA LEONE

**Annual Report**  
OF THE  
**Medical and Sanitary Department**  
**For the Year 1933.**

*Price 2s. 6d.*

1934

Printed by the GOVERNMENT PRINTER, Freetown.







SIERRA LEONE

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# Annual Report

OF THE

Medical and Sanitary Department

For the Year 1933.





SIERRA LEONE

# Annual Report

OF THE

Medical and Sanitary Department

G.P.D. O 1638-166 27-7-34.

For the Year 1933.

MEDICAL AND SANITARY DEPARTMENT,  
FREETOWN, SIERRA LEONE.

*5th July, 1934.*

ANNUAL MEDICAL AND SANITARY REPORT,  
1933.

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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 for the Colonies, the Medical Report on the Health and Sanitary Conditions of Sierra Leone for the year 1933, together with the Returns, etc., appended thereto.


I have the honour to be,

SIR,

Your obedient servant,

PHILIP D. OAKLEY,  
*Director of Medical and Sanitary Services.*

THE HONOURABLE  
THE COLONIAL SECRETARY,  
FREETOWN.



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# Annual Report of the Medical and Sanitary Department for the Year 1933.

## I—Administration.

### (a) ESTABLISHMENT, INCLUDING VACANCIES, ACTING APPOINTMENTS, AND PROMOTIONS.

#### MEDICAL AND SANITARY STAFF.

- 1 Director of Medical and Sanitary Service
- 1 Surgical Specialist
- 1 Assistant Director of Health Service
- 1 Senior Health Officer
- 1 Medical Officer of Health
- 2 Senior Medical Officers
- 10 Medical Officers of the West African Medical Staff
- 7 African Medical Officers
- 1 Chief Sanitary Superintendent
- 2 Sanitary Superintendents

#### EUROPEAN NURSING STAFF.

- 2 Senior Nursing Sisters
- 5 Nursing Sisters.

#### SUBORDINATE MEDICAL AND SANITARY STAFF.

- 1 Chief Dispenser
- 1 Assistant Chief Dispenser
- 10 First Class Dispensers
- 10 Second Class Dispensers
- 15 Third Class Dispensers
- 1 Hospital Warden
- 1 Chief Store-keeper
- 2 Assistant Store-keepers
- 32 Male Nurses and Apprentices
- 25 Female Nurses and Probationers
- 2 Midwives
- 3 Health Visitors
- 1 School Nurse
- 36 Sanitary Inspectors and Learners
- 1 Dispenser for Infant Welfare Clinic
- 1 Head Attendant, Lunatic Asylum
- 1 Assistant Head Attendant, Lunatic Asylum
- 1 Matron, Lunatic Asylum
- 3 Female Attendants, Lunatic Asylum
- 10 Male Attendants, Lunatic Asylum
- 1 Laboratory Assistant.

There are, in addition to above, cooks, stokers, gate-keepers, watchmen, labourers, hospital porters, carpenter, motor-ambulance driver, etc.

#### CLERICAL STAFF.

There are 18 clerks: 1 Chief Clerk, 2 second grade, 9 senior third grade, 6 junior third grade.

#### PRINCIPAL ACTING APPOINTMENTS.

Dr. J. A. A. Duncan acted as Director of Medical and Sanitary Service from 17th May to 13th October.

Dr. A. B. Monks acted as Assistant Director of Health Service from 17th May to 13th October.

Dr. A. B. Monks acted as Medical Officer of Health from 1st January to 12th May.

Dr. W. Allan acted as Medical Officer of Health from 13th May to 31st December.

Dr. P. D. Oakley acted as Director of Medical and Sanitary Service on 14th October.



## NEW APPOINTMENTS.

Dr. A. C. Dalzell appointed Medical Officer on the 19th April and arrived Freetown on 29th April.

Dr. W. J. Laird appointed Medical Officer on the 29th November and arrived Freetown on 9th December.

Miss M. C. Jennings appointed Nursing Sister on 17th May and arrived Freetown on 27th May.

## PROMOTIONS.

Dr. G. H. Gallagher, Senior Medical Officer, promoted Assistant Director of Medical Service, Gold Coast, on the 5th August.

Dr. C. B. Jennings, Medical Officer, promoted Senior Medical Officer on the 10th September, *vice* Dr. G. H. Gallagher.

Dr. P. D. Oakley, Deputy Director, Medical Service, Gold Coast, promoted Director of Medical and Sanitary Service on the 15th October, *vice* Dr. J. C. S. McDouall.

## RESIGNATION.

Miss C. H. B. Goodwin, Nursing Sister, resigned 15th May.

## RETIREMENTS.

Mr. S. W. Thomas, Third Class Dispenser, retired on the 1st January.

Mr. I. H. Wright, Chief Dispenser, retired on 1st April.

Mr. O. V. E. J. Nylander, First Class Dispenser, retired on 1st November.

Dr. J. C. S. McDouall, Director of Medical and Sanitary Service, retired on 15th October.

It is with regret that the death of Mr. D. G. Kawaley, Assistant Store-keeper, on the 13th November is announced.

(b) LIST OF ORDINANCES, ETC., AFFECTING PUBLIC HEALTH ENACTED DURING THE YEAR.

## ORDINANCES.

Vaccination Ordinance, 1924, Amendment Ordinance No. 10 of 1933.

Public Health Ordinance, 1924, Amendment Ordinance No. 15 of 1933.

Midwives, Training and Registration of, Ordinance No. 18 of 1933.

Medical Practitioners, Midwives, Dentists and Druggists Ordinance, 1924, Amendment Ordinance No. 19 of 1933.

Midwives Ordinance, 1933, Amendment Ordinance No. 31 of 1933.

Public Health Ordinance, 1926, Amendment Ordinance No. 33 of 1933.

## ORDERS IN COUNCIL.

Protectorate Health Areas Order in Council, 1931, Amendment, No. 6 of 1933.

Protectorate Health Areas (Amendment) (No. 2) Order in Council, No. 18 of 1933.

Protectorate Health Areas (Amendment) (No. 3) Order in Council, No. 22 of 1933.

## RULES.

Quarantine (Amendment) Rules, No. 26 of 1933.

Public Health (Protectorate) (Amendment) Rules, No. 29 of 1933.

## BYE-LAWS.

Freetown (Slaughterhouse) Amending Bye-Laws, 1933.

Freetown (Slaughterhouse) (No. 2) (Amending) Bye-Laws, 1933.

## (c) FINANCIAL.

The following table gives the revenue and expenditure for the years 1932 and 1933 :—

Medical Revenue.				1932.			1933.		
				£	s.	d.	£	s.	d.
Hospitals receipts	...	...	...	702	12	3	822	1	0
Sundry receipts (out-patients' fees, etc.)	...	...	...	743	0	4	812	14	11
Druggist fees (registration)	...	...	...	2	2	0	—		
Maintenance of lunatics	...	...	...	150	0	4	188	16	8
Departmental fines	...	...	...	4	13	5	7	9	6
Total	...	...	...	£1,602	8	4	£1,831	2	1

Medical Expenditure.				1932.			1933.		
				£	s.	d.	£	s.	d.
Personal Emoluments	...	...	...	38,325	14	7	36,934	0	1
Other Charges	...	...	...	11,620	15	5	12,230	14	2
Total	...	...	...	£49,946	10	0	£49,164	14	2

Sanitary Revenue.				1932.			1933.		
				£	s.	d.	£	s.	d.
Sanitary Services	...	...	...	2	3	0	1	10	11
Maintenance of persons in quarantine	...	...	...	89	1	4	—		
Total	...	...	...	£91	4	4	£1	10	11

Sanitary Expenditure.				1932.			1933.		
				£	s.	d.	£	s.	d.
Personal Emoluments	...	...	...	9,469	2	5	9,321	17	1
Other Charges	...	...	...	13,330	15	10	8,759	13	3
Total	...	...	...	£22,799	18	3	£18,081	10	4

Ratios of combined Medical and Sanitary votes to total estimated revenue for the past five years :—

Year.				£		
1929	...	...	...	94,188	1 : 8.33	
1930	...	...	...	97,975	1 : 7.86	
1931	...	...	...	86,708	1 : 9.08	
1932	...	...	...	75,407	1 : 10.80	9.27%
1933	...	...	...	73,092	1 : 10.67	9.41%



## ANALYSIS OF HOSPITAL EXPENDITURE FOR THE YEAR 1933.

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Institution.	Total Number of Patients.	Daily Average Number of Patients.	Hospital Days.	Provisions from Store-keeper.	Fresh Provisions.	5 and 6 per Patient per Day.	Wines, Spirits, Minerals, Tobacco, Ice.	8 per Patient per Day.	7 and 9 per Patient per Day.	Fuel, Light.	Miscellaneous: Cleaning Materials, Hospital Equipment, Replacements.	Total of 5, 6, 8, 11 and 12.	5, 6, 8, 11 and 12 per Patient per Day.	Total Sum Recoverable from Paying Patients.
Nursing Home ...	109	335	1,258	£ s. d. 103 3 7	£ s. d. 199 0 4	£ s. d. 0 4 9½	£ s. d. 70 2 10	£ s. d. 0 1 1½	£ s. d. 0 5 11	£ s. d. 60 11 2	£ s. d. 44 11 6	£ s. d. 477 9 5	£ s. d. 0 7 7	£ s. d.
Connaught Hospital	2,170	100.11	30,380	£ s. d. 400 13 0	£ s. d. 993 11 3	£ s. d. 0 0 11	£ s. d. 29 9 7	—	£ s. d. 0 0 11	£ s. d. 114 1 4	£ s. d. 122 5 4	£ s. d. 1,660 0 6	£ s. d. 0 1 1	£ s. d.
Lunatic Asylum ...	136	68.37	24,958	£ s. d. 32 11 1½	£ s. d. 518 14 9½	£ s. d. 0 0 5½	£ s. d. 32 10 9	—	£ s. d. 0 0 5½	£ s. d. 39 16 3	£ s. d. 3 0 0	£ s. d. 626 12 11½	£ s. d. 0 0 6	£ s. d.
Kissy Infirmary ...	293	86.55	31,584	£ s. d. 37 1 3½	£ s. d. 533 5 3½	£ s. d. 0 0 4½	£ s. d. 16 2 0	—	£ s. d. 0 0 4½	£ s. d. 50 8 6	£ s. d. 3 0 0	£ s. d. 639 17 1	£ s. d. 0 0 4½	£ s. d.
Bonthe Hospital ...	292	21.77	7,946	£ s. d. 1 17 9	£ s. d. 106 2 1	£ s. d. 0 0 3½	£ s. d. 1 3 9	—	£ s. d. 0 0 3½	£ s. d. 17 12 10	£ s. d. 1 8 5	£ s. d. 128 4 10	£ s. d. 0 0 3½	£ s. d. 1 10 6



## II—Public Health.

### (a) GENERAL REMARKS.

#### (i) GENERAL DISEASES.

The outbreak of smallpox that was reported in the 1932 Annual Report was widespread throughout the Colony and Protectorate during the year under review. Apart from this fact the health of the people has received a slight setback during the year. There was an increase (of 9,253) in the total number of cases treated, and it may be that this increase is due to the low standard of living resulting from the continued financial depression.

The rainfall for 1933 was in excess of the previous year and that, combined with the financial conditions, probably accounts for the marked increase in malaria.

*European Officials.*—The figures for 1933 bear a marked resemblance to those of 1931. The percentage of invaliding was greater than in the previous year. There was one European death during the year. Out of the seven Europeans invalided only one can be attributed to tropical disease; the only death was from Broncho-pneumonia. The invaliding rate of the European Officials is slightly higher than the average for the last decennial period.

TABLE I.

## HEALTH OF EUROPEAN OFFICIALS.

*Table showing Sick, Invaliding and Death-rates of European Officials.*

	1931.	1932.	1933.
Total number of officials resident ...	261	240 ✓	218 ✓
Average number resident ...	177	176 ✓	155 ✓
Total number on sick list ...	151	114	136
Total number of days on sick list ...	1,463	1,235	1,564
Average daily number on sick list ...	4.00	3.37	4.28
Percentage of daily sick to average number resident ...	2.25	1.91	2.76
Average number of days on sick list to each patient ...	9.68	10.83	11.5
Average sick time to each resident ...	8.26	7.01	10.09
Total number invalided ...	8	6 ✓	7 ✓
Percentage of invalidings to total residents ...	3.06	2.5	3.21
Percentage of invalidings to average resident ...	4.51	3.40	4.51
Total number of deaths ...	1	— ✓	1 ✓
Percentage of deaths to total residents ...	.38	—	.45
Percentage of deaths to average number resident ...	.56	—	.64

#### *Causes of Invalidings and Deaths of European Officials.*

Causes.	Invalided.	Died.
Blackwater fever ...	1 ✓	—
Broncho-pneumonia ...	—	1 ✓
Dementia ...	1	—
Insomnia ...	1	—
Pleurisy ...	1	—
Pulmonary tuberculosis ...	2 ✓	—
Typhoid fever ...	1	—
Total ...	7	1

*The invaliding rate of European officials for the past ten years is shown below.*

Year.	Average Number Resident.	Total Number of Invalidings.	Percentage of Invalidings to Average Resident.
1924 ... ..	164	13	7.92
1925 ... ..	180	5	2.77
1926 ... ..	184	6	3.26
1927 ... ..	250	16	6.40
1928 ... ..	280	9	3.21
1929 ... ..	251	11	4.38
1930 ... ..	260	3	1.15
1931 ... ..	177	8	4.51
1932 ... ..	176	6	3.40
1933 ... ..	153	7	4.51

*European Non-Officials.*—A satisfactory state of affairs can be recorded here. Invalidings were four less than in 1932 and there were three deaths as against six in the previous year. Of the seven invalidings only two are directly attributable to tropical disease. Taking into account the increased activity in the mining industry, the health of the European non-officials can be regarded as very satisfactory.

TABLE II.

HEALTH OF EUROPEAN NON-OFFICIALS.

*Table showing Sick, Invaliding and Death-rates of European Non-officials.*

	1931.	1932.	1933.
Total number of non-officials resident ... ..	494	434 ✓	400 ✓
Average number resident ... ..	343	292 ✓	285 ✓
Total number on sick list ... ..	75	63	45
Percentage of sick to average number resident ... ..	21.86	21.57	15.78
Average number of days on sick list to each patient ... ..	—	—	—
Average sick time to each resident ... ..	—	—	—
Total number invalided ... ..	11	11 ✓	7 ✓
Percentage of invalidings to total residents ... ..	2.22	2.53	1.75
Percentage of invalidings to average number resident ... ..	3.20	3.76	2.45
Total deaths ... ..	3	6 ✓	3 ✓
Percentage of deaths to total residents ... ..	.60	1.38	.75
Percentage of deaths to average number resident ... ..	.84	2.05	1.05



*Causes of Invalidings and Deaths of European Non-officials.*

Causes.	Invalided.	Died.
Appendicitis ...	1	—
Blackwater fever ...	1 ✓	1 ✓
Dysentery ...	1 ✓	—
Heart disease ...	1	—
Hyper-pyrexia ...	—	1
Pulmonary tuberculosis ...	1 ✓	—
Purpura hæmorrhagica ...	—	1
Tubercular arthritis ...	1 ✓	—
Tumour ...	1	—
Total ...	7	3

*African Officials.*—There is an increase of 60 as shown in the total number of official residents. There is an increase in the total number of days on the sick list and on the average daily number on the sick list. There is also an increase in the total number invalided, and a decrease of one in the total number of deaths. In spite of this increase in the average daily number on sick list the percentage of deaths to total residents and to average number resident is less than in 1932. The health of the African officials can therefore be considered as satisfactory.

TABLE III.

HEALTH OF AFRICAN OFFICIALS.

*Table showing Sick, Invaliding and Death-rates of African Officials.*

	1931.	1932.	1933.
Total number of officials resident ...	920	900 ✓	960 ✓
Average number resident ...	884	880 ✓	950 ✓
Total number on sick list ...	959	680	861
Total number of days on sick list ...	7,863	5,464	6,347
Average daily number on sick list ...	21.54	14.92	17.38
Percentage of daily sick to average number resident ...	2.43	1.69	1.82
Average number of days on sick list to each patient ...	8.19	8.03	7.37
Average sick time to each resident ...	8.5	6.20	6.68
Total number invalided ...	11	4 ✓	10 ✓
Percentage of invalidings to total residents ...	1.19	.44	1.04
Percentage of invalidings to average number resident ...	1.24	.45	1.05
Total deaths ...	7	5 ✓	4 ✓
Percentage of deaths to total residents ...	.76	.55	.41
Percentage of deaths to average number resident ...	.79	.56	.42

*Causes of Invalidings and Deaths of African Officials.*

Causes.	Invalided.	Died.
Anal fistula ...	1	—
Cystic tumour ...	1	—
Defective vision ...	1	—
Empyema ...	1	—
Hydrocele (carcinoma testis) ...	1	—
Mania ...	1	—
Mental instability ...	1	—
Pneumonia ...	—	1 ✓
Pulmonary tuberculosis ...	2 ✓	—
Pyrexia of unknown origin ...	—	1
Salpingitis and pericarditis ...	1	—
Shock following dilation of urethral stricture ...	—	1
Typhoid fever ...	—	1 ✓
Total ...	10	4



TABLE SHOWING THE COMPARATIVE FIGURES OF THE HEALTH OF AFRICAN OFFICIALS FOR THE LAST TEN YEARS. 2

Year.	Average Number of Officials.	Number on Sick List.	Number of Days off Duty through Sickness.	Average Sick Time to each Official.	Number Invalided.	Percentage of Invalidings to Average Number.	Total Deaths.	Percentage of Deaths to Average Number.
1924	900	1,009	8,920	9.91	18	2.00	5	0.55
1925	997	1,121	8,735	8.76	18	1.80	10	1.00
1926	1,000	950	5,375	5.37	6	0.60	4	0.40
1927	1,000	933	7,919	7.91	20	2.00	4	0.40
1928	1,050	967	6,415	6.10	25	2.38	9	0.85
1929	969	1,057	7,486	7.72	8	0.83	6	0.61
1930	970	1,048	9,052	9.33	12	1.23	8	0.92
1931	884	959	7,863	8.5	11	1.24	7	0.79
1932	880	680	5,464	6.20	4	0.45	5	0.56
1933	944	861	6,347	6.72	10	1.05	4	0.42

TABLE IV.  
HEALTH OF AFRICAN TROOPS.

There is a slight increase in the figures for 1932. The average strength is increased by four, but there were two deaths. The total number of men on the sick list shows an increase of 23 and the sick rate shows a small increase.

*Royal West African Frontier Force (Non-European).*

Average Strength of Battalion in 1933.	Total Number of Deaths.	Death-rate per 1,000.	Total Number of Men on Sick List.	Sick-rate per 1,000.
374 (370)	2	5.34	403 (370)	1,077

TABLE V. (1979)

HEALTH OF AFRICAN POLICE.

Contrary to 1932, the statistical table in respect of the health of the police makes better reading; the average strength is the same. There have been no deaths and there has been a marked decrease in the number of men on the sick list. The health of the police has therefore been more satisfactory than in 1932.

Total Number of Men.	Total Number of Deaths.	Death-rate per 1,000.	Total Number of Men on Sick List.	Sick-rate per 1,000.
265	—	—	313	1,181

TABLE VI.

HEALTH OF PRISONERS AND MENTAL PATIENTS.

A special report on these is found in Section III—"Prisons and Asylums."

TABLE VII.

INSTITUTIONAL TREATMENT.

The table shows this year's out-patients divided into Colony and Protectorate, but there are several differences in figures. There has been a marked increase in the total number of Protectorate out-patients and a slight increase in the African in-patients in the Protectorate. There has been a decrease in the number of subsequent attendances. The progressive increase in the recorded deaths in the Protectorate is due to stricter control of the registration of births and deaths. Registration is not compulsory and therefore these figures can only be approximate.

	1931.	1932.	1933.
<b>IN-PATIENTS :</b>			
European { Colony ... ..	94	96	114
European { Protectorate ... ..	—	1	9
African { Colony ... ..	3,318	3,154	2,964
African { Protectorate ... ..	1,457	2,112	2,176
<b>OUT-PATIENTS :</b>			
European { Colony ... ..	363	641	313
European { Protectorate ... ..	238	155	95
African { Colony ... ..	34,312	35,734	38,524
African { Protectorate ... ..	54,977	46,497	53,445
Total ... ..	94,759	88,387	97,640
<b>DEATHS :</b>			
European { Colony ... ..	3	—	3
European { Protectorate ... ..	—	1	1
African { Colony ... ..	248	213	212
African { Protectorate ... ..	49	70	86
Total ... ..	300	284	302
Percentage of deaths to total number treated ...	.31	.32	.30
Showing decrease or increase of total number of patients treated ... ..	—5,496	—6,372	+9,253
Subsequent attendances ... ..	239,551	263,569	254,796



The following table gives the number of diseases for which patients attended the various hospitals and dispensaries. Comparing the figures for 1933 with those for 1932, it will be seen that there was a marked increase in malaria and yaws and also in avitaminosis. There is also an increase in diseases of the intestinal tract. These increases may be attributed to the increased number of patients seeking relief from their ailments.

	1932.	1933.
Malaria ... ..	4,857 ✓	✓6,548
Yaws ... ..	5,891 ✓	✓7,655
Acute rheumatism ... ..	783	620
Chronic rheumatism ... ..	6312 4,529	977 5,157
Hemiplegia ... ..	89	119
Conjunctivitis ... ..	829	807
Affections of the ear ... ..	860	852
Hæmorrhoids ... ..	116	100
Lymphadenitis (bubo non-specific) ... ..	536	596
Coryza ... ..	552	873
Acute bronchitis ... ..	5,326	5,981
Chronic bronchitis ... ..	3,461	3,109
Asthma ... ..	162	159
Caries, pyorrhœa, etc. ... ..	1,400	1,423
Gastritis ... ..	389	299
Dyspepsia ... ..	3,603	3,859
Diarrhœa and enteritis ... ..	908	1,262
Ankylostomiasis ... ..	185	131
Hernia ... ..	689	713
Constipation ... ..	8,251	8,725
Acute nephritis ... ..	53	94
Schistosomiasis ... ..	59	71
Epididymitis ... ..	33	61
Orchitis ... ..	225	199
Hydrocele ... ..	287	233
Abscess ... ..	577	612
Scabies ... ..	1,091	1,210
Eczema ... ..	221	337
Osteitis ... ..	291	1,432
Arthritis ... ..	✓1,616	✓1,802
Wounds (by cutting or stabbing instruments) ... ..	1,049	1,260
Fracture ... ..	159	303
Other external injuries ... ..	3,948	2,850
Asthenia ... ..	591	752
Syphilis ... ..	388	616
Gonorrhœa ... ..	2,114	2,236
Avitaminosis ... ..	221	327

#### (ii) COMMUNICABLE DISEASES.

*Malaria.*—Preventive measures against this disease are detailed in Section IV—"Hygiene and Sanitation."

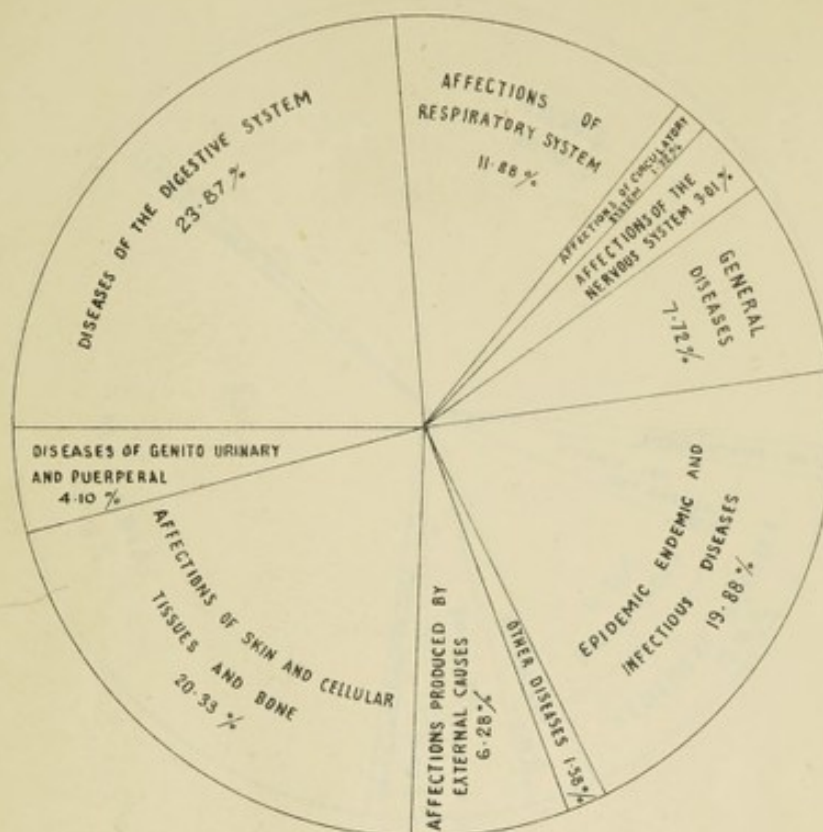
(104) *In Europeans.*—86 Europeans were treated during the year which shows a decrease of 18. The incidence of the disease in officials and non-officials is practically equal. In contradistinction to 1932 the majority of cases were in the Colony and were treated at the European Hospital. There were no deaths.

The following table shows the relative position of malaria as a cause of "lost time" in Europeans during the last five years:—

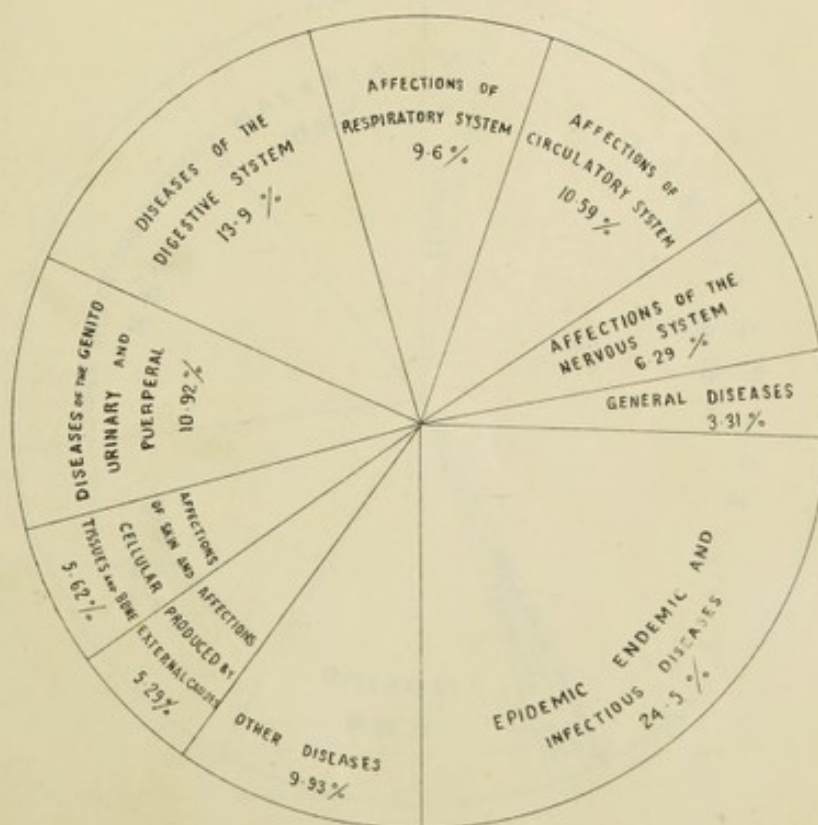
Year.	Average Number Resident.	Total Sick Days.	Total Days spent on Sick List for Malaria.	Total Days spent on Sick List for other Causes.	Percentage of Malaria Days to Total Days.	Number of Days lost through Malaria for year per 100 Residents.
1929	251	✓1,935	435	1,500	22.48	173
1930	260	1,785	526	1,259	29.46	202
1931	177	1,463	258	1,205	17.63	145
1932	176	1,235	370	865	29.95	210
1933	153	1,564	372	1,192	23.78	243



# THE PROPORTION OF EPIDEMIC ENDEMIC AND INFECTIOUS DISEASES.



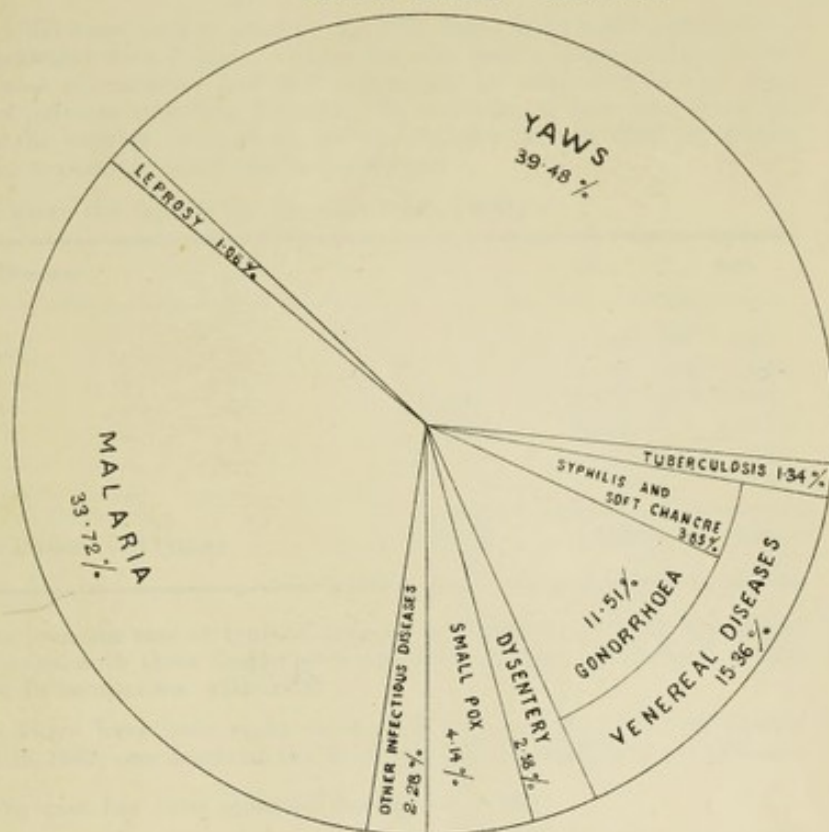
**TOTAL INCIDENCE — 97,640.**



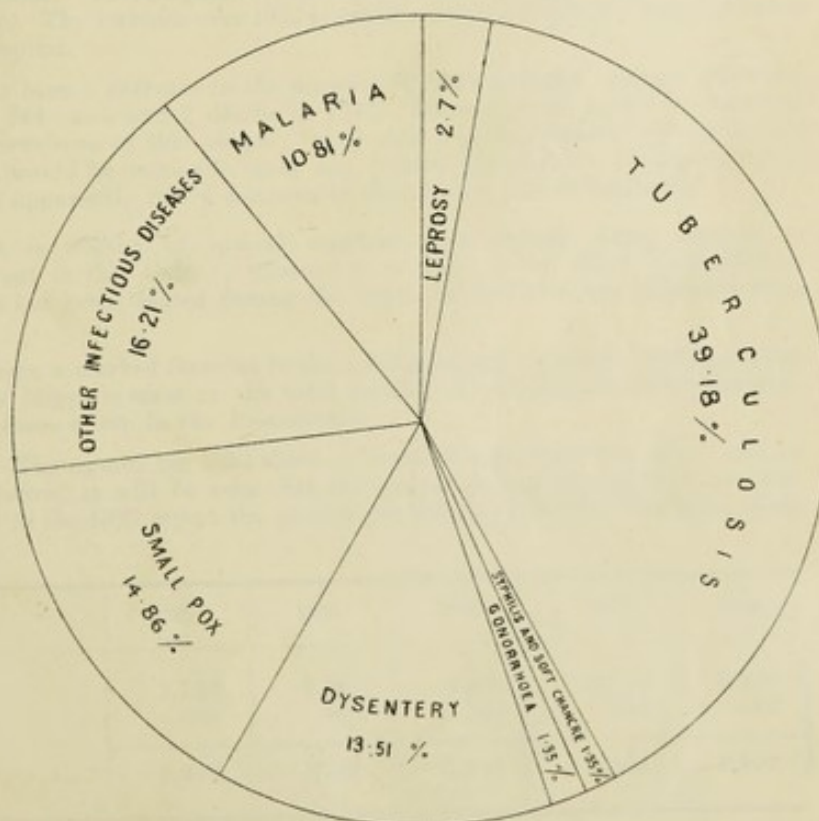
**TOTAL DEATHS — 302.**



THE PROPORTION OF EPIDEMIC ENDEMIC INFECTIOUS  
SYSTEMIC AND OTHER DISEASES SHOWN AS PERCENTAGES OF  
TOTAL CASES TREATED.



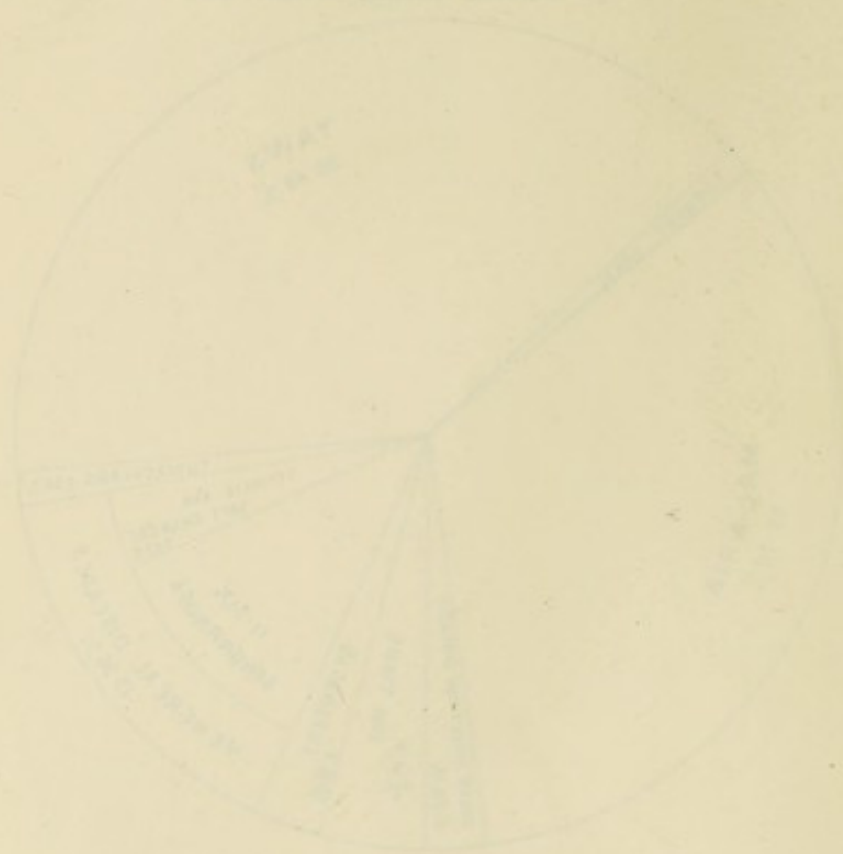
TOTAL INCIDENCE—19,413.



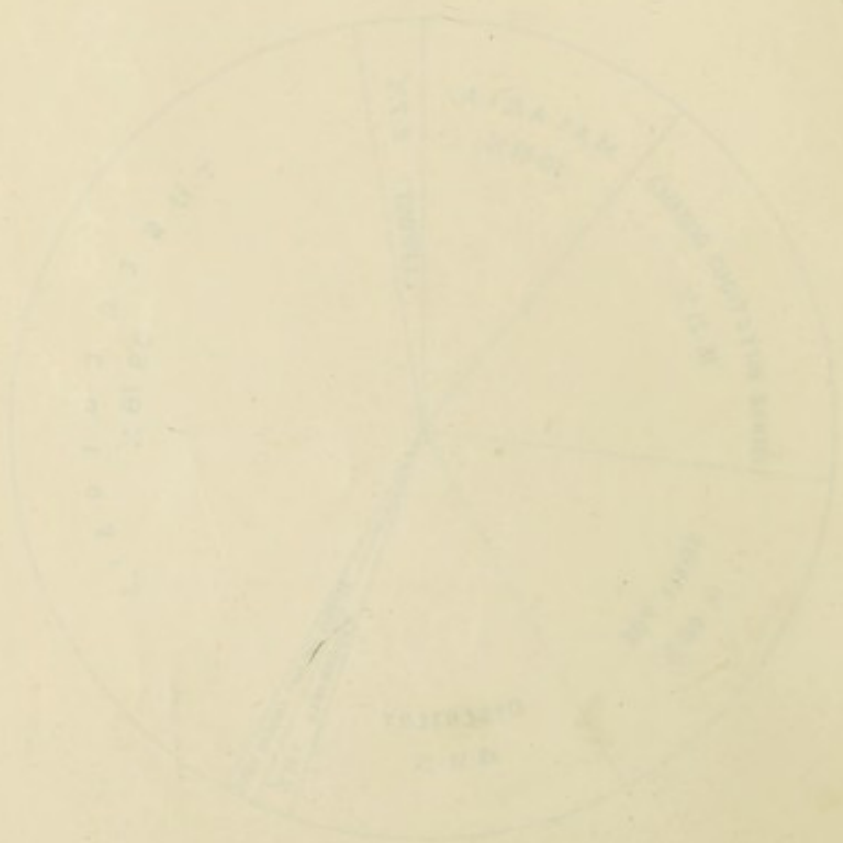
TOTAL DEATHS—74.



THE PROPORTION OF EPIDEMIC BUBBLES INFLUENZA  
 SYSTEMS AND OTHER DISEASES SHOWN AS PERCENTAGES OF  
 TOTAL CASES TREATED.



TOTAL INCIDENCE - 1911



TOTAL DEATHS - 1911

*In Africans.*—The figures for Africans in 1933 show a marked increase over those of the previous year.

In 1932 there were 4,755 cases with 6 deaths. In 1933 there were 6,462 cases with 6 deaths and 5 cases of Blackwater with 1 death. There has also been a large increase in the number of unclassified cases of malaria, and this again can be attributed to the large increase of the number of patients attending hospital. It is worthy of note that there has been a large increase in the number of cases of quartan malaria, 106 in 1933 as against 34 in 1932. At present no reasonable cause can be ascertained.

The following table gives the figures for the past three years:—

Diseases.					1931.	1932.	1933.
Malaria—tertian	...	...	...	...	2	66	513
Malaria—quartan	...	...	...	...	24	34	106
Aestivo—autumnal	...	...	...	...	2,235	1,036	1,563
Unclassified	...	...	...	...	4,324	3,680	4,321
Cachexia	...	...	...	...	39	41	37
Blackwater	...	...	...	...	4	2	8
Total cases of malaria (all types)					6,628	4,859	6,548

*Typhoid.*—There has been one case of typhoid fever in an European in 1933, the official being invalided. Three cases with three deaths were reported amongst the Africans. This shows a marked decrease in comparison with 1932.

*Blackwater Fever.*—There have been eight cases with two deaths in 1933 as against two cases and one death in 1932, one death in the European and one death in the African.

*Trypanosomiasis.*—No case has been reported during the year.

*Smallpox.*—As already stated, smallpox has been widespread over the Colony and Protectorate during the year. Full details will be found in Section IV, sub-section B.

*Dysentery.*—There has been an increase in the incidence of dysentery. In 1933, 500 cases, amongst Europeans and Africans, were treated with 10 deaths, as against 330 cases and 6 deaths in the previous year. There were no fatal cases in Europeans.

*Tuberculosis.*—Four Europeans were invalided in 1933. Amongst the Africans there were 258 cases and 29 deaths. These figures cannot be taken as a guide to the incidence of this disease or its fatality. The increase over 1932 is small, compared with the large increase in patients attending hospital.

*Leprosy.*—There has been a decrease in the number of cases reported, namely 206 cases and 2 deaths as against 244 cases and 2 deaths in 1932. These figures cannot be taken as any true guide to the prevalence of this disease; and, until a proper leprosy survey of this Colony is undertaken, it would be unwise to make any definite statement as to the incidence of the disease; but it is apparently fairly common in the Colony and Protectorate.

*Guinea Worm.*—It is worthy of special mention that guinea worm appears to be practically non-existent in this Colony, whereas it is rife in the other West African colonies. Only one case has been treated during the year and this case was imported from Liberia.

*Yaws.*—There has been a marked increase in the number of cases treated; but this again can be attributed to the large increase in the total number of patients attending hospital. The great majority of cases occur in the Protectorate.

*Veneral Diseases.*—The figures for 1933 show an increase over those for 1932; and on scrutinizing the table below, it will be seen that the pendulum has swung back to 1930. But in contradistinction to the 1930 report the greater percentage of increase has taken place in the syphilitic group.

Diseases.				1929.	1930.	1931.	1932.	1933.
Gonorrhœa	...	...	...	2,753	2,581	2,366	2,114	2,236
Syphilis	...	...	...	895	605	592	388	616
Total	...	...	...	3,648	3,186	2,958	2,502	2,852



*Beriberi*.—In 1933 there were only 4 cases of beriberi reported and no deaths. It would appear that the introduction of the new diets has had a marked effect on the incidence of this disease.

## (b) VITAL STATISTICS.

### GENERAL POPULATION.

#### REPORT OF THE CHIEF REGISTRAR OF BIRTHS AND DEATHS.

##### GENERAL.

The staff and the number of registration districts remained the same as in 1932. The latter are shown in Tables A and B at the end of this section.

The Births and Deaths Registration Ordinance provides for the compulsory registration of all births and deaths in the Colony. It was not possible to increase the number of "Special Districts" where the appointment of registrars' officers might have brought about more efficient registration of births and deaths, owing to economic reasons and the shortage of staff in other departments who might in normal times have been able to render assistance. The necessity for the appointment of registrars' officers in all Colony districts is reflected in the returns in Table E which show a marked disparity in the figures recorded over a number of years for a stationary population and obviously do not represent the true position either as regards the number of births and deaths which actually took place or the rates to be derived from such figures. The table is included to keep in view the desirability of providing adequate machinery for enforcing registration, which can only be brought about when more progress generally has been made throughout the Colony. Meantime some improvement may be expected from propaganda directed through the schools and village headmen to indicate the benefits of registering.

In the Protectorate, comprising ninety-five per cent. of the total population of this territory, registration of births and deaths is compulsory only for non-natives, i.e. Europeans, Asiatics and Colony-born Africans. This non-native population numbered 4,268 persons at the Census of 1931. Registration is optional for the aboriginal natives, who numbered 1,667,790 persons; and is at present practically non-existent owing to the fees charged for registering. As the result of recent consultations with the Provincial Commissioners, it is expected that several applications will be received at an early date from the Paramount Chiefs for compulsory and free registration for the aboriginal natives, as provided for in the Ordinance. This will be confined in the first instance to health areas where machinery for enforcement is already available.

##### POPULATION.

The total population of the Colony and Protectorate at the Census of 1931 was 1,768,480 persons, this number including 651 Europeans. The population was distributed as follows:

Protectorate	...	...	...	...	1,672,058
Colony (excluding Freetown)	...	...	...	...	41,064
Freetown	...	...	...	...	55,358

Details of the population of Freetown, the Colony, and the Protectorate by nationality and sex will be found in Tables 1 and 2 at end.

Freetown is the only registration district which corresponded to a Census district and for which separate population figures are available. Here the population increased by 11,335 persons during the intercensal period, due mainly to immigration of Protectorate natives (chiefly males in search of work) whose numbers increased by 7,219, compared with the Creoles or Sierra Leoneans whose numbers were 5,179 more than in 1921; this figure probably accounting for a number who returned from the Protectorate and Colony districts.

##### FREETOWN.

As explained in the 1932 report, the numbers of births and deaths registered at Freetown for the last three years fairly closely approximate those which actually took place. Nevertheless, they must be accepted with reserve.

*Population*.—The estimated mid-year population was 58,175. Birth and death-rates are calculated from this figure.

*Births*.—The number of births registered was 1,378 (males 691 and females 687) and exceeded the number registered in 1932 by 102.

The proportion of male to female births was 100.6:100 and has remained almost stationary for the past three years, but this is the first occasion on which the number of births has exceeded that of deaths registered.



## FREETOWN.

YEAR.	BIRTHS.			DEATHS.
	Males.	Females.	Total.	
1931	629	634	1,263	1,380
1932	635	641	1,276 ✓	1,400 ✓
1933	691	687	1,378 ✓	1,229 ✓

*Birth-rate.*—The crude birth-rate was 23·6 compared with 22·4 per 1,000 in 1932 (see Table D). Owing to the customs of this country it would be almost impossible to differentiate between so-called legitimate and other births.

*Deaths.*—The number of deaths registered was 1,229 (males 686, females 543) which is 171 less than the number registered in 1932. The reduction is due mainly to a decrease in the number of female deaths. The proportion of male to female deaths was 126:100. The figures for the last three years are as follows:—

YEAR.	DEATHS AT FREETOWN.			RATIO: Males. Females.
	Males.	Females.	Total.	
1931	772	608	1,380	127·0 : 100
1932	708	692	1,400	100·2 : 100
1933	686	543	1,229	126·3 : 100

✓ *Death-rate.*—The crude death-rate was 21·1 per 1,000. This is lower than last year (24·6) but still high and is coincident with excess of males over females in the population (see Table 1) and the attraction of sick persons to the two largest institutions affording medical treatment.

Steps should be taken before the next Census to ensure that the age-sex constitution of the populations of Freetown and the rest of the Colony will be included in the form required to permit of standardizing the death-rate. It is hoped that it will then be possible to arrive at some conclusion as to what are the main diseases responsible for maintaining the death-rate at a higher level than that shown for England and Wales. (The figures for 1933 were: England and Wales 12·3; 118 county boroughs and great towns including London 12·2; 113 smaller towns with estimated resident populations of 25–50,000 at the 1931 Census 10·9). It is not unlikely that the standardized rates will bear a much more favourable comparison with those for England and Wales than might be inferred from the crude figures now available. Remarks on a comparison between the death-rate for Freetown in 1933 with that for Accra and other large towns on the Gold Coast will be found in the foot-note under Table F). Causes of death are dealt with at length in Table L.

In the following table are set out the principal causes of death:—

Causes.	Freetown (including Cline Town) 1,229.		
	Number of Deaths.	Ratio per 1,000 deaths from all causes.	Certified.
Bronchitis and pneumonia ... ..	280	226	51
Ill-defined diseases ... ..	165	137	45
Malaria ... ..	108	87	12
Premature birth ... ..	68	55	4
Senility ... ..	63	51	—
Infantile convulsions ... ..	61	49	—
Dysentery, diarrhoea and enteritis ... ..	60	48	15
Tuberculosis, all forms ... ..	56	45	41
Nephritis ... ..	49	38	22
Diseases of the heart ... ..	48	39	26

The number of deaths registered on Medical Certificate was 361, comprising 29.3 per cent. of the total deaths registered—an increase from 22.7 per cent. in 1932. The figures as to the causes of deaths registered at Freetown are therefore only an approximate statement of the mortality cause.

At present all non-certified deaths are personally investigated by the Medical Officer of Health (who is also Deputy Chief Registrar of Births and Deaths). From the information given an approximate diagnosis is made; prescription forms or records of previous treatment received as in- or out-patients at the hospitals are sought, if available. On the slightest suspicion of infectious disease a post-mortem examination is made.

It will be noticed that respiratory diseases (non-tuberculous) head the list as usual, the figure being 13 higher than last year. Although the number of cases of malaria showed a remarkable increase over 1932, the number of deaths decreased from 197 (of which 14 were certified) to 108 (12 certified) in 1933. There can be little doubt but that some proportion of deaths from uncertified ill-defined diseases, such as "fever," may be attributed to malaria. The same applies to uncertified deaths from such diseases as dysentery, diarrhoea, enteritis, gastritis, colitis, etc.; and perhaps also to some proportion of the very large number of uncertified deaths from bronchitis and pneumonia.

*Tuberculosis.*—The mortality from tuberculosis at Freetown appears to be on the increase: 53 deaths (38 certified) were recorded from tuberculosis of the respiratory tract, compared with 38 (11 certified) in 1932. The tuberculosis mortality figures for the last three years at Freetown are as follows.—

	1931.	1932.	1933.
Pulmonary tuberculosis ...	25 <sup>(3)</sup>	38 <sup>(11)</sup>	53 <sup>(38)</sup>
Other forms ...	1 <sup>(1)</sup>	—	3 <sup>(3)</sup>
All forms ...	26 <sup>(10)</sup>	38 <sup>(11)</sup>	56 <sup>(41)</sup>
Percentage of total deaths from all causes ...	1.9	2.7	4.5
Total deaths from all causes ...	1,380	1,400	1,229

The small figures in brackets indicate the number of deaths registered on Medical Certificate. The majority of the deaths at Freetown are of patients who wander down from the Protectorate and ultimately receive treatment at the hospitals. The increase may be due to the fact that lean years tend to bring to hospital cases of tuberculosis which in normal times would never have been reported. This is borne out by the fact that a remarkably higher percentage of these deaths are now registered on Medical Certificate.

*Dangerous Infectious Diseases.*—These have already been noticed under each heading in Section IV 1—(b) Epidemic Diseases.

*Mortality according to Age and Sex.*—The following table shows the mortality figures according to age and sex at Freetown in 1933.

	Under 24 hours.	24 hours to 1 year.	1-5 years.	5-15 years.	15-25 years.	25-45 years.	45-65 years.	65 years and over.	
Males ...	31	138	62	26	40	205	130	63	686
Females ...	13	135	49	20	31	120	68	98	543
Persons ...	44	273	111	46	71	325	198	161	1,229

It will be noticed that the excess of male over female deaths is very marked in the age groups 0 to 24 hours, and 25 to 65 years.



*Seasonal Mortality.*—The following table shows the seasonal mortality from all causes at Freetown in 1933:—

Month.	Deaths, 1933.	
	Total.	Percentage of Total Deaths.
January ... ..	111	9.0
February ... ..	88	7.1
March ... ..	97	7.8
April ... ..	87	7.0
May ... ..	90	7.2
June ... ..	131	10.6
July ... ..	119	9.6
August ... ..	115	9.3
September ... ..	120	9.7
October ... ..	83	6.7
November ... ..	80	6.5
December ... ..	108	8.7
Yearly Total ... ..	1,229	—

The highest mortality occurs during the wettest months, June to September, and during the months of December and January when the cold Harmattan wind blows at night (*see* Appendixes F and G).

*Infant Mortality.*—The total number of deaths of infants under one year at Freetown was 317 (males 168 and females 149) compared with 348 (males 179 and females 169) in 1932. The infant mortality rate or proportion of deaths under one year of age per 1,000 live births was high—230, but again shows a decrease compared with 272 in 1932 and 289 in 1931. This decline may be due in some part to the more accurate registration of age, which is checked now by comparison with birth certificates which must be produced, if available, before the deaths of infants and very young children are registered. On the other hand, it may represent a real improvement due to the activities of the health visitors and infant welfare clinics. Comparison with the child mortality over a number of years will be the best indication (*vide infra*).

The crude infant mortality rate compares very unfavourably with that of England and Wales and the Union of South Africa in 1933, which were 64 and 63 respectively.

The infant mortality was equivalent to a crude death-rate of 5.5 per 1,000 persons living; 26 per cent. of the total deaths being of children under the age of one year.

Owing to the customs of the country, there are no data available to demonstrate any difference in mortality rates between so-called legitimate and other children.

The principal causes of deaths of infants under one year of age were premature birth 68, pneumonia and bronchitis 64, convulsions 48, malaria 32 and tetanus neonatorum 20, in that order. A detailed list of the causes will be found in Table G.

*Still-births.*—87 still-births were registered in Freetown (males 47 and females 40). These figures cannot be considered as accurate owing to the reluctance of African women to disclose the fact of not having carried to full term. They were in the proportion of 59 per 1,000 total births as compared with a ratio varying from 22–60 in the administrative counties of England and Wales in 1932.

*Child Mortality.*—Deaths of young children between the ages of 1–5 numbered 111 or 9 per cent. of the total deaths registered (*see* Table H). The figures for the past three years appear to indicate an improvement in this respect, but much remains to be done towards improving environmental hygiene by public health education through the health officers, health visitors and infant welfare clinics.

*Death-rates for the first five years of life over a period of three years at Freetown.*

YEAR.	Per 1,000 Births 0–1.	Per 1,000 Survivors.				
		1–2.	2–3.	3–4.	4–5.	1–5.
1931	289	83	45	42	16	44
1932	272	70	63	34	26	52
1933	230	54	31	42	14	37



*Maternal Mortality.*—The number of maternal deaths (Table J) associated with pregnancy and child-bearing was 6 (of which 5 were certified) yielding a maternal mortality rate of 4.16 per 1,000 total births compared with 14.0 in 1932 and 9.1 in 1931. The low rate shown for 1933 compares very favourably with that for England and Wales for 1932 (4.04) and for the Union of South Africa for 1931 (4.7). The registers have been scrutinized very carefully for possible omissions in the case of uncertified deaths. Nevertheless, the figures must be accepted with very considerable reserve. Some proportion of the uncertified deaths shown under malaria may really have been due to puerperal sepsis.

#### COLONY APART FROM FREETOWN.

As explained in the opening paragraph, birth, death and infant mortality rates for the Colony outside Freetown (and therefore for the Colony as a whole) are not reliable, the registration figures probably not representing even approximately the true position. They are shown in Tables C and E. The principal causes of deaths as registered and a list of certified deaths will be found in Tables K and M.

#### PROTECTORATE.

At the 1931 Census there were only 66 towns with a population of 1,000 or more; Makeni with 2,325 being the largest.

Registration of births and deaths is compulsory only for 4,268 non-natives. The number of non-natives living near enough to towns with registration offices to make registration probable is not known. Hence birth, death, and infant mortality rates are not available. The figures of total births and deaths registered in each area are shown in Table B which includes those registered optionally by the aboriginal natives on payment of a fee. Table M contains a list of the causes of deaths registered on certificates furnished by medical officers or mission doctors.

The Census Officer for 1941 should be reminded to include a return of the population of the main towns and villages, in the usual age-sex constitution form, so that vital statistics may be ascertained from the figures available when compulsory registration for the natives has been extended to existing and proposed health areas.

#### CONCLUSION.

Although the small figures available hardly justify the inclusion of so many tables, they will provide a groundwork to indicate future progress, and will be necessary when registration in the Colony and Protectorate villages is placed on a satisfactory basis and the larger figures available may be considered as a whole.

A. B. MONKS,

*Acting Chief Registrar of Births and Deaths.*

TABLE 1.

Showing the population of Freetown and the Colony by nationality and sex at the Census of 1931.

	FREETOWN.				COLONY APART FROM FREETOWN.				WHOLE COLONY.			
	Persons.	Males.	Females.		Persons.	Males.	Females.		Persons.	Males.	Females.	
Protectorate Native Tribes ...	28,233	17,115	11,118		28,696	17,133	11,563		56,929	34,248	22,681	
Sierra Leoneans (Creoles)* ...	20,970	9,353	11,617		11,876	5,085	6,791		32,846	14,438	18,408	
Kroos (from Liberia) ...	4,460	2,392	2,068		21	12	9		4,481	2,404	2,077	
Other African Non-Natives (from Nigeria, Gold Coast, Gambia, etc.) ...	580	384	196		104	70	34		684	454	230	
West Indians ...	83	55	28		13	8	5		96	63	33	
Mulattoes ...	121	58	63		28	8	20		149	66	83	
Various ...	226	166	60		148	97	51		374	263	111	
Europeans ...	286	210	76		†135	99	36		421	309	112	
Syrians† ...	375	258	117		38	24	14		413	282	131	
Indians‡ ...	19	16	3		4	4	—		23	20	3	
Arabs (of African birth) ...	5	4	1		1	1	—		6	5	1	
Total ...	55,358	30,011	25,347		41,064	22,541	18,523		96,422	52,552	43,870	

\* Creoles are the descendants of Liberated Africans who were placed in Sierra Leone in accordance with the enactments made for the suppression of the slave trade. They represent the Christian and educated class and are sometimes called Sierra Leoneans. In Freetown, their numbers increased from 15,791 in 1921 to 20,970 in 1931. The increase is partly due to persons returning from the Protectorate owing to lack of trade, and to the fact that there is a tendency for persons of purely aboriginal blood having embraced Christianity and obtained a little education, to describe themselves as Sierra Leoneans. In the remainder of the Colony their numbers decreased by 555, which probably indicates a gradual movement from rural places to Freetown.

† The great majority are Government officials who live on the residential area at Hill Station, which is situated on the hills near Freetown.

‡ Of the total 413 Syrians, 90·8 per cent. reside at Freetown, where their numbers increased from 156 to 375 in the intercensal period. Elsewhere in the Colony their numbers increased from 21 to 38. Many have brought their wives and children out; the latter increased from 45 in 1921 to 131 in 1931. Of the total, 22·7 per cent. were born in Sierra Leone. The males are all engaged in trade as merchants or as their clerks, salesmen or shop assistants. The Syrians are now well established as successful traders both in the Colony and Protectorate (*vide infra*) and a steady increase in their numbers may be expected.

§ The number of Indians appears to fluctuate with trade conditions generally. In 1911 there were 24 in the Colony, 4 in 1921 and 23 in 1931. In 1921 there were 15 in the Protectorate, in 1931 only 2.



TABLE 2.  
PROTECTORATE POPULATION, CENSUS 1931.

	* NON-NATIVES.								Aboriginal Natives.
	† Creoles.	‡ Europeans	§ Syrians.	Indians.	Arabs.	West Indians.	¶ Mulattoes.	Miscellaneous.	Total.
Males ..	1,632	173	561	2	14	6	81	46	2,515
Females ...	1,414	58	192	—	3	—	60	26	1,753
Total ...	3,046	231	753	2	17	6	141	72	* 4,268
									1,667,790

\* This represents the population for which registration of births and deaths is compulsory. Registration applies only to comparatively small and isolated districts where trading activities attract the presence of non-natives. Their number decreased by 329 during the inter-censal period.

† The Creoles are for the most part traders, mercantile clerks, Government officials, catechists and school teachers. Their numbers decreased by 789 in the intercensal period, probably owing to the recent trade depression.

‡ The number of Europeans has been increased since the Census by the presence of staffs engaged in mining operations at Marumpa, Makong, Maranda, Tonkolili, Yengema and various small prospecting camps throughout the Protectorate. Vital statistics for European officials and non-officials will be found on pages 5-7.

§ The Syrian population increased from 386 to 753, of whom 134 were born in Sierra Leone.

¶ 81.5 per cent. are African-Syrian.



TABLE A.

*Births and Deaths recorded at all Registration Districts in the Colony—1933.*

DISTRICTS.	BIRTHS.			DEATHS.			DEATHS UNDER TWELVE MONTHS.		
	Males.	Females.	Total.	Males.	Females.	Total.	Males.	Females.	Total.
Freetown and Cline Town ...	691	687	1,378✓	686	543	1,229✓	168	149	317✓
Murray Town ...	26	25	51	48	28	76	15	9	24
Wilberforce ...	43	47	90	47	29	76	14	8	22
Regent ...	23	14	37	23	22	45	7	1	8
Kissy ...	27	20	47	59	54	113	5	11	16
Wellington ...	45	34	79	35	45	80	17	15	32
Hastings ...	28	27	55	41	17	58	9	4	13
Waterloo ...	98	86	184	72	59	131	13	6	19
Songo Town ...	45	49	94	39	44	83	6	5	11
Tombo ...	34	29	63	39	25	64	8	6	14
Kent ...	14	9	23	9	11	20	1	3	4
Bananas ...	5	6	11	7	1	8	—	1	1
York ...	15	27	42	23	23	46	5	5	10
Hamilton ...	14	9	23	21	10	31	4	3	7
Tassoh Island ...	40	33	73	15	21	36	10	5	15
Sherbro Judicial ...	38	38	76	54	55	109	12	15	27
Total ...	1,186	1,140	2,326✓ (2459)	1,218	987	2,205✓ (2205)	294	246	540✓ (557)

*1/11 = 96422 (97921)      24.1 (24.9)      21.8 (20.5)      13.207 (13.244)*

TABLE B.

*Births and Deaths recorded at all Registration Districts in the Protectorate—1933.*

DISTRICTS.	BIRTHS.			DEATHS.			DEATHS UNDER TWELVE MONTHS.		
	Males.	Females.	Total.	Males.	Females.	Total.	Males.	Females.	Total.
<i>Northern Province.</i>									
Port Loko ...	13	11	24	2	—	2	—	—	—
Kambia ...	20	13	33	40	43	83	9	11	20
Batkanu ...	7	8	15	—	—	—	—	—	—
Makeni ...	5	4	9	1	—	1	—	—	—
Kabala ...	2	3	5	—	—	—	—	—	—
<i>Southern Province.</i>									
Mabang ...	40	37	77	14	16	30	1	6	7
Bauya ...	3	5	8	4	—	4	—	—	—
Moyamba ...	5	4	9	—	—	—	—	—	—
Mano ...	5	8	13	11	2	13	1	1	2
Sembehun ...	—	1	1	—	—	—	—	—	—
Bo ...	1	3	4	—	1	1	—	—	—
Sumbuya ...	4	2	6	2	1	3	—	—	—
*Panguma ...	10	7	17	25	15	40	3	—	3
Kenema ...	12	5	17	5	1	6	2	1	3
Kono ...	12	12	24	—	—	—	—	—	—
Daru ...	9	8	17	13	1	14	—	—	—
Pendembu ...	19	11	30	29	22	51	5	1	6
Kailahun ...	18	10	28	21	20	41	2	3	5
Pujehun ...	9	7	16	12	4	16	1	1	2
Sulima ...	1	1	2	—	—	—	—	—	—
Shebar ...	3	—	3	3	1	4	2	—	2
Total ...	198	160	358✓	182	127	309✓	26	24	50✓

\* Panguma District was reopened in October, 1933.

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TABLE C.

*Birth, Death and Infant Mortality Rates for the whole Colony of Sierra Leone (including Freetown), for the last five years.*

Year.	Estimated Mid-year Population.	Births Registered.	Crude Birth-rate per 1,000 Population.	Deaths Registered.	Crude Death-rate per 1,000 Population.	Number of Deaths under twelve months.	Infant Mortality per 1,000 Live Births.
1929	94,144	2,022	21.4	2,457	26.0	596	295
1930	95,375	1,892	19.8	2,197	23.0	568	300
1931	96,633	2,101	21.7	2,305	23.9	556	265
1932	97,921	2,439	24.9	2,404	24.5	567	233.4
1933	99,239	2,326	23.4	2,205	22.2	540	232.1

TABLE D.

*Birth, Death and Infant Mortality Rates, Freetown, 1929-1933.*

Year.	Estimated Mid-year Population.	Births Registered.	Crude Birth-rate per 1,000 Population.	Deaths Registered.	Crude Death-rate per 1,000 Population.	Number of Deaths under twelve months.	Infant Mortality per 1,000 Live Births.
1929	53,080	1,093	20.6	1,450	27.5	349	319
1930	54,311	1,102	20.3	1,358	25.0	371	336
1931	55,569	1,263	22.7	1,380	24.8	365	289
1932	56,857	1,276	22.4	1,400	24.6	348	272.7
1933	58,175	1,378	23.6	1,229	21.1	317	230.6

TABLE E.

*Birth, Death and Infant Mortality Rates, Colony (excluding Freetown), for the last five years.*

Year.	Estimated Mid-year Population.	Births Registered.	Crude Birth-rate per 1,000 Population.	Deaths Registered.	Crude Death-rate per 1,000 Population.	Number of Deaths under twelve months.	Infant Mortality per 1,000 Live Births.
1929	41,064	929	22.6	1,007	24.5	247	266
1930	41,064	790	19.2	839	20.4	197	249
1931	41,064	838	20.4	925	22.5	191	228
1932	41,064	1,163	28.3	1,004	24.4	219	188.5
1933	41,064	948	23.0	976	23.7	223	235.2



TABLE F.

Showing populations according to sex and sex-ratio at 1931 Census, total population figures for 1931 and mid-year (estimated) 1933, birth and death-rates at Freetown, and at Accra, Kumasi and Sekondi in the Gold Coast, 1933.

	POPULATION.					Births, 1933.	Birth-rate, 1933.	Deaths, 1933.	Death-rate, 1933.	Deaths under one year, 1933.	Infant Mortality.
	1931.				Mid-year, 1933.						
	Males.	Females.	Ratio : Males : Females.	Persons.							
...	...	...	...	...	...	...	...	...	...	...	...
Freetown	30,011	25,347	118.4 : 100	55,358	58,175	1,378	23.6	1,929	21.1	317	230
Accra ...	32,833	27,893	117.7 : 100	60,726	65,136	2,799	43.0	1,476	22.7	—	126
... Kumasi	21,219	14,610	140.5 : 100	35,829	38,559	898	23.3	770	20.0	—	—
... Sekondi	10,020	6,933	144.5 : 100	16,953	18,630	371	19.9	232	12.5	—	73
England and Wales	—	—	92 : 100	—	—	—	—	—	12.3	—	64

The sex-constitution of the Freetown and Accra populations are almost identical—slightly more unfavourable at Freetown. The birth-rates differ widely but the death-rates are similar. Figures are not available to show whether this represents better environmental conditions, or more favourable age distribution of the population, or less effective enforcement of registration at Freetown. The infant mortality at Freetown does not suggest the former. A study of the populations, birth and death-rates for Kumasi and Sekondi lead inevitably to the conclusion that the degree of success in enforcing registration is very variable and that comparisons between the figures for Freetown, Kumasi and Sekondi would be grossly misleading. For instance, the birth-rate in Kumasi is shown as very similar to that in Freetown, but the proportion of males to females in the Kumasi population is 22 per cent. higher and relatively more unlikely to produce a lower death-rate; yet the figure for deaths registered gives a death-rate of 1.1 per 1,000 lower. It is extremely unlikely that the markedly more unfavourable sex-constitution of the Kumasi population could be counteracted by a more favourable age distribution and/or a higher standard of groundwork sanitation, resulting in this lower figure. It points rather to a large number of deaths escaping registration. In Sekondi the sex-constitution of the population is even more unfavourable, yet the death-rate is recorded as only 12.5 per 1,000.



TABLE G.  
*Causes of Deaths under twelve months.*  
*Freetown, 1933.*

International List Number.	Causes.	No.	Certified.
22	Tetanus neonatorum ...	20	6
36a	Septicæmia ...	1	—
38	Malignant tertian malaria ..	1	1
38	Malaria ...	31	1
40	Ankylostomiasis ...	1	—
63 : 1	Rickets ...	9	5
86	Infantile convulsions ...	48	—
87e	Cerebral anæmia ...	1	1
106	Bronchitis ...	16	6
106a	Acute septic bronchitis ...	1	1
107	Broncho-pneumonia ...	19	5
108	Lobar pneumonia ...	2	2
109	Pneumonia ...	26	6
115	Stomatitis ...	1	—
119&120a:1	Colitis ...	1	—
119&120a:2	Infantile diarrhœa ...	2	1
119&120a:2	Intestinal colic ...	1	1
158	Congenital debility ...	20	8
159	Premature birth ...	68	4
160	Prolonged labour ...	1	1
161a	Atelectasis ...	4	1
161a	Asphyxia pallida ...	1	1
161c : 1	Septic infection of umbilical cord ...	2	2
161c : 2	Pemphigus neonatorum ...	1	1
182	Asphyxia ...	1	—
200 : 1	Cardiac failure ...	7	5
200 : 2	Fever ...	16	—
200 : 3	Other ill-defined diseases ...	15	1

TABLE H.

*Number of deaths in certain age periods under one year and during next four years of age.**Freetown, 1933.*

—			No. of Deaths.	Percentage of Deaths under One Year.	Death-rate per 1,000 Live Births.
Under 24 hours	...	...	44	14	32
1-7 days	...	...	75	23	53
1-2 weeks	...	...	34	11	26
*Total under 2 weeks	...	...	153	48	111
2-4 weeks	...	...	38	12	27
Total under 1 month	...	...	191	60	138
1-3 months	...	...	34	11	25
Total under 3 months	...	...	225	71	163
3-6 months	...	...	40	13	29
6-9 months	...	...	30	9	22
9-12 months	...	...	22	7	16
Total under 1 year	...	...	317	100	230

—			No. of Deaths.	Percentage of Total Deaths.	† Death-rate per 1,000 Living at all Ages.
0-1 year	...	...	317	26	5.45
1-2 years	...	...	50	4	0.86
2-3 "	...	...	26	2	0.45
3-4 "	...	...	26	2	0.45
4-5 "	...	...	9	1	0.15
Total 1-5 years	...	...	111	9	1.91
Total 0-5 years	...	...	539	35	7.36
Deaths at all ages	...	...	1,229	—	21.1

\* This represents the period within which births must be registered. It will be seen that almost 50 per cent. of the deaths under one year occur before the age of two weeks and 77 per cent. of the latter under one week which points to the necessity for notification of births within 36 hours, as in England and Wales.

† The death-rate per 1,000 living at each age is not available because of the unusual age grouping adopted in the Census Report.

TABLE I.  
Deaths at various Ages up to Twelve Months with Percentages of Total Deaths under Twelve Months, Freetown, 1932 and 1933.

YEAR.	NUMBER OF DEATHS AT AGES AND PERCENTAGES OF TOTAL DEATHS UNDER TWELVE MONTHS.									
	Under 24 Hours.	24 Hours to 2 Weeks.	Total under 2 Weeks.	2-4 Weeks.	Total under 1 Month.	1-3 Months.	Total under 3 Months.	3-6 Months.	6-12 Months.	Total under 12 Months.
1932	52 or 14.9 per cent.	111 or 31.9 per cent.	163 or 46.8 per cent.	23 or 6.6 per cent.	186 or 53.4 per cent.	38 or 10.9 per cent.	224 or 64.4 per cent.	37 or 10.6 per cent.	87 or 25.0 per cent.	348
1933	44 or 13.9 per cent.	109 or 34.4 per cent.	153 or 48.3 per cent.	38 or 11.9 per cent.	191 or 60.2 per cent.	34 or 10.7 per cent.	225 or 70.9 per cent.	40 or 12.6 per cent.	52 or 16.4 per cent.	317

It will be observed that there was a marked decline in infant mortality in the age-group of 6-12 months, but an almost corresponding increase in other age-groups, resulting in only a slight decrease in the total infant mortality—from 272 to 230, which points to the necessity for earlier notification of births (see note under Table H and page 75.)



TABLE J.

*Maternal Deaths associated with Pregnancy and Child-bearing, Freetown, 1933.*

International List Number	Causes of Death.	Number of Deaths.			Maternal Mortality Rates per 1,000 Live Births.
		Certified.	Uncertified	Total.	
144b	Post-partum hæmorrhage	1 ✓	—	1	Puerperal hæmorrhage=0·7
145a	Puerperal septicæmia ...	2 ✓	—	2	Puerperal sepsis=1·45
146 : 1	Eclampsia ...	1 ✓	—	1	Puerperal albuminuria and convulsions=0·7
150 : 3	Childbirth (unqualified) ...	—	1	1	Other or unspecified conditions of the puerperal state=1·45
150 : 3	Premature labour ...	1	—	1	
	Total ...	5	1	6 ✓	

The maternal mortality rate was 4·35 per 1,000 live births (4·10 per 1,000 total births).

TABLE K.

*Principal Causes of Deaths, Colony (excluding Freetown), 1933.*

	No.	Proportion per 1,000 Deaths from all Causes.	Certified.
Bronchitis and pneumonia ...	122	125	9
Dysentery, diarrhœa and enteritis ...	76	77	2
Malaria ...	65	66	2
Infantile convulsions ...	46	47	1
Rheumatism ...	44	44	—
Heart disease ...	33	33	2
Abdominal disease ...	29	29	—
Palmonary tuberculosis ...	20	20	4
Nephritis ...	18	18	1
Premature birth ...	15	15	—
Debility ...	14	14	—
Septicæmia ..	13	13	—

The number of deaths registered on Medical Certificate was 83, comprising 8·5 per cent. of the deaths registered.

In the Colony apart from Freetown there are no private practitioners or medical officers except at Kissy and Bonthe which had a combined population of 7,783 at the Census of 1931, compared with 33,281 in the other rural areas combined. In the latter areas the registrars are Government dispensers, school teachers or traders and difficulty is often experienced in finding a literate person capable of making the entries in the registers. Further, as the returns are received for correction by the Chief Registrar only at the end of each quarter, little supervision can be exercised beyond periodic visits and written guidance as to the methods of ascertaining and entering up the causes of death, which are therefore of but little value for the purpose of statistics.

TABLE L.

*Causes of Death—Freetown (including Cline Town), 1933.*

International List Number.	Causes.	No.	Certified.
1	Typhoid fever ...	3	3
2	Paratyphoid fever ...	1	1
13	Dysentery ...	29	7
13a	Amœbic dysentery ...	1	1
22	Tetanus ...	6	1
22	Tetanus neonatorum ...	20	6
23	Pulmonary tuberculosis ...	53	38
25	Abdominal tuberculosis ...	2	2
27	Abscess of hip ...	1	1
32c	General tuberculosis ...	1	1
36a	Septicæmia ...	8	—
36a	General sepsis ...	1	1
36b	Pyæmia ...	1	1
38	Malignant tertian malaria ...	2	2
38	Malaria ...	105	9
38	Quartian malaria ...	1	1
40	Ankylostomiasis ...	8	—
42	Elephantiasis of scrotum ...	1	1
46	Cancer of liver ...	1	1
46	Cancer of stomach ...	2	1
48	Cancer of cervix ...	1	1
48	Cancer of body of uterus ...	2	2
50	Cancer of the breast ...	1	1
51	Cancer of testicle ...	1	1
54	Fibroid tumour of uterus ...	2	2
56	Rheumatism ...	12	1
56	Rheumatic carditis ...	1	1
56	Rheumatic endocarditis ...	1	1
57:1	Chronic rheumatism ...	1	—
57:2	Acute rheumatoid arthritis ...	1	1
59	Diabetic coma ...	1	1
59	Diabetes mellitus ...	3	3
63:1	Rickets ...	11	5
73:2	Abscess of spleen ...	1	1
78a	Abscess of brain ...	3	3
79	Meningitis ...	1	1
79	Pachymeningitis ...	1	1
82a	Cerebral hæmorrhage ...	5	2
82a:1	Pontine hæmorrhage ...	1	1
82a:2	Paralytic stroke ...	3	—
82b:2	Cerebral thrombosis ...	1	1
82c:1	Hemiplegia ...	5	—
82c:2	Cerebral paralysis ...	1	—
82c:2	Paralysis ...	7	1
82c:2	Diplegia ...	1	1
82c:2	General paresis ...	1	1
82c:2	Paraplegia ...	2	—
84b	Mental disease ...	2	1
86	Infantile convulsions ...	61	—
87b	Multiple neuritis ...	1	1
87b	Neuritis ...	1	1
87e	Cerebral anæmia ...	1	—
87e	Convulsions ...	1	—
89a	Abscess of ear ...	1	1
89a	Otorrhœa ...	1	1
89b	Mastoiditis ...	2	1
92:1	Aortic regurgitation ...	9	5
92:2	Mitral regurgitation ...	6	6
92:2	Mitral stenosis ...	1	1
92:5	Chronic endocarditis ...	2	2
93c	Myocarditis (undefined) ...	7	—
93b:1	Fatty degeneration of heart ...	1	1
93b:3	Myocardial degeneration ...	7	4
95b:2	Cardiac disease ...	13	5
96	Aneurysm ...	2	—
96	Aneurysm of aorta ...	2	2
98b	Gangrene of scrotum ...	1	1



TABLE L—*continued.*  
*Causes of Death—continued.*

International List Number.	Causes.	No.	Certified.
101	Enlarged lymphatic glands ...	1	1
104 : 2	Abscess of frontal sinus ...	1	1
106	Bronchitis ...	96	2
106a	Acute septic bronchitis ...	6	6
106b	Chronic bronchitis ...	17	3
106b	Bronchiectasis ...	1	1
107	Broncho-pneumonia ...	40	8
108	Lobar pneumonia ...	26	18
109	Pneumonia ...	90	9
110 : 1	Empyema ...	1	1
111 : 1	Pulmonary congestion ...	1	1
111 : 1	Oedema of lungs ...	2	2
114a	Chronic pneumonia ...	1	1
114b : 2	Pulmonary hæmorrhage ...	1	1
115 : 1	Stomatitis ...	2	...
115 : 1	Pyorrhœa alveolaris ...	1	1
118 : 1	Gastritis ...	2	...
118 : 2	Dyspepsia ...	1	...
118 : 2	Hæmatemesis ...	1	1
119 & 120a : 1	Colitis ...	1	...
119 & 120a : 2	Enteritis ...	10	4
119 & 120a : 2	Intestinal intoxication ...	1	1
119 & 120a : 2	Diarrhœa ...	15	2
119 & 120a : 2	Infantile diarrhœa ...	5	1
119 & 120a : 2	Intestinal toxæmia ...	3	1
119 & 120a : 2	Gastro-enteritis ...	1	1
119 & 120a : 2	Intestinal colic ...	1	1
119 & 120b	Ulcerative colitis ...	1	1
122a : 1	Strangulated hernia ...	7	5
122a : 2	Hernia ...	3	1
122b	Intestinal obstruction ...	6	1
123 : 1	Constipation ...	2	...
123 : 3	Perforation of intestine ...	1	1
124b	Cirrhosis of liver ...	8	4
125 : 2	Hepatic abscess ...	1	1
129	Peritonitis ...	4	2
130	Acute nephritis ...	4	3
131	Chronic nephritis ...	27	10
132	Interstitial nephritis ...	1	1
132	Renal dropsy ...	1	1
132	Nephritis ...	15	6
132	Uræmic coma ...	1	1
135a	Cystitis ...	5	3
135b	Vesico-vaginal fistula ...	2	2
135b	Retention of urine ...	2	1
136a	Stricture of urethra ...	1	1
136b	Urinary fistula ...	1	1
137	Enlargement of prostate ...	2	2
138	Hydrocele ...	1	1
138	Cellulitis of scrotum ...	1	1
139b	Amenorrhœa ...	3	3
139b	Dysmenorrhœa ...	2	2
139c	Abscess of breast ...	1	1
141 : 2	Premature birth ...	1	1
144b	Post-partum hæmorrhage ...	1	1
145a	Puerperal sepsis ...	2	2
146 : 1	Eclampsia ...	1	1
150 : 3	Childbirth ...	1	1
152 : 1	Cellulitis ...	2	2
152 : 2	Cervical abscess ...	4	4
153	Ulcer (unqualified) ...	4	3
154	Osteomyelitis ...	2	2
158	Congenital debility ...	20	8
159	Premature birth ...	68	4
160	Prolonged labour ...	1	1
161a	Atelectasis ...	4	1
161a	Asphyxia pallida ...	1	1

TABLE L—*continued.*  
*Causes of Death—continued.*

International List Number.	Causes.	No.	Certified.
161c:1 ...	Septic infection of umbilicus	2	2
161c:2 ...	Pemphigus neonatorum ...	1	1
162b ...	Senility ...	63	...
182 ...	Asphyxia ...	1	...
186 ...	Accidental injury by fall ...	1	1
189 ...	Destitution ...	4	4
194:2 ...	Accidental fracture ...	4	4
194:2 ...	Foreign body in œsophagus	1	1
195 ...	Found drowned ...	2	2
198 ...	Judicial execution ...	3	3
200:1 ...	Heart failure ...	29	18
200:1 ...	Cardiac exhaustion ...	1	1
200:2 ...	Abdominal disease ...	11	4
200:2 ...	Dropsy ...	2	...
200:2 ...	Debility ...	5	...
200:2 ...	Hyperpyrexia ...	1	1
200:2 ...	Ascites ...	2	2
200:2 ...	Pyrexia ...	3	2
200:2 ...	Marasmus ...	6	...
200:2 ...	Fever ...	50	...
200:3 ...	Operation ...	1	1
200:3 ...	Unknown or ill-defined ...	54	13



TABLE M  
*Causes of Deaths Certified—Colony and Protectorate, 1933.*

International List Number.	Causes.	Colony (excluding Freetown).	Protectorate.
6	Smallpox ...	1	1
6	Confluent smallpox ...	1	...
13	Dysentery ...	1	3
22	Tetanus ...	1	...
23	Pulmonary tuberculosis	4	2
33	Leprosy ...	1	...
34bc	Tertiary syphilis	1	...
36a	Septicæmia ...	...	1
38	Malaria ...	1	...
38	Quartan malaria	1	...
40	Ankylostomiasis	1	...
44 : 6	Blackwater fever	1	1
48	Cancer of cervix	1	...
55	Cerebral tumor	...	1
59	Diabetic coma	1	...
70	Purpura hæmorrhagica	1	...
71b : 2	Anæmia ...	3	...
80	Tabes dorsalis	1	...
82c : 1	Hemiplegia ...	2	...
82c : 2	Paraplegia ...	2	...
82c : 2	Paralysis ...	1	...
84b	Dementia ...	2	...
85	Epilepsy ...	1	...
85	Status epilepticus	1	...
86	Infantile convulsions	1	...
92 : 1	Mitral incompetency	...	2
92 : 2	Aortic incompetency	1	...
92 : 5	Valvular disease	2	...
97	Atheroma ...	1	...
104 : 2	Sinusitis ...	1	...
106b	Chronic bronchitis	1	...
107	Broncho-pneumonia	3	1
108	Lobar pneumonia	...	1
109	Pneumonia ...	3	...
110	Pleurisy ...	1	...
110 : 2	Pleural effusion	...	1
111 : 2	Pulmonary infarct	1	...
119 & 120a : 2	Gastro-enteritis	1	1
119 & 120a : 2	Intestinal toxæmia	1	...
122a	Inguinal hernia	...	1
122a : 1	Strangulated hernia	...	1
123 : 1	Constipation	1	...
123 : 3	Rupture of intestine	...	1
131	Chronic nephritis	1	...
132	Nephritis ...	...	2
135a	Cystitis ...	1	...
136a	Stricture of the urethra	...	1
143	Pregnancy ...	...	1
152	Cellulitis ..	...	1
153	Ulcer (unqualified)	6	...
154	Osteomyelitis	...	1
162b	Senility ...	1	...
189	Destitution ...	2	...
189	Starvation ...	2	...
194	Accidental fracture	2	...
195	Found drowned	1	...
200	Heart failure	4	...
200 : 2	Hypoppyrexia	1	...
200 : 2	Pyrexia ...	1	...
	Unknown ...	4	4

TABLE N.

*Death Certificates, Freetown and Kissy, 1932 and 1933.*

YEAR.	European Hospital.	Connaught Hospital.	P. C. M. Hospital.	Kissy Institutions.	Private Practitioners.	Ships in Harbour.
1932	—	207	14	53	98	—
1933	3	208	21	60	129	—

TABLE O.

*Deaths of non-Africans by age, sex, nationality and place of occurrence.*

No.	Age (Years).	Sex.	Nationality.	Date of Death.	Cause of Death.	Residence at Death.
1.	25	Male	Syrian	5-1-33	Accidental drowning	Kenema
2.	10	"	"	20-1-33	Blackwater fever ...	P'endembu
3.	75	"	"	28-1-33	Cirrhosis of liver ...	Freetown
4.	60	"	"	22-2-33	Septic bronchitis ...	"
5.	20	"	English	6-3-33	Hyperpyrexia ...	Wilberforce
6.	3	"	Syrian	20-3-33	Diarrhœa ...	Kambia*
7.	85	"	"	23-4-33	Apoplexy ...	Mano*
8.	60	"	"	24-4-33	Urinary fistula ...	Freetown
9.	27	Female	"	9-6-33	Blackwater fever ...	Bonthe
10.	23	Male	German	17-7-33	Purpura hæmorrhagica	Wilberforce
11.	34	"	British	22-7-33	Blackwater fever ...	Makeni
12.	60	"	Canadian	10-8-33	Hemiplegia ...	Freetown
13.	24	"	Syrian	23-8-33	Cerebral hæmorrhage	"
14.	56	"	"	25-8-33	Dysentery ..	Kambia*
15.	33	"	British	30-9-33	Quartan malaria ...	Wilberforce
16.	11m	Female	Syrian	11-10-33	Acute bronchial catarrh	Freetown
17.	32	Male	"	12-10-33	Sarcoma ...	"
18.	2m	Female	"	14-11-33	Broncho-pneumonia ...	"*

\* Uncertified.



### III—Prisons and Asylums.

#### KISSY LUNATIC ASYLUM.

*Staff.*—Medical Officer-in-charge  
First Class Dispenser  
Chief Attendant  
Assistant Chief Attendant  
11 Male Attendants  
Matron  
3 Female Attendants  
1 Cook  
4 Porters

There has again been a marked decrease in the number of deaths during the period under review, a total number of 16 as against 24 in 1932. There were no deaths from pericarditis. The deaths were due to the following:—

1. Chronic gastro-enteritis following arterio-sclerosis.
2. Dysentery, amœbic (clinical).
3. Pulmonary infection due to pulmonary artery embolism.
4. Pneumonia and gastro-enteritis resulting in heart failure.
5. Generalized arterio-sclerosis and cerebral hæmorrhage.
6. Heart failure following pneumonia in a very emaciated person.
7. Tubercular meningitis secondary to T. B. lungs.
8. Sub-acute nephritis and cardiac failure.
9. Exhaustion and repeated epileptic attack—result of brain disease.
10. Cardiac failure following sub-acute nephritis.
11. Fluid in the heart due to kidney disease which embarrassed the action of the heart.
12. Arterio-sclerosis, clinical nephritis.
13. Lobar pneumonia following gastro-enteritis.
14. Sub-acute nephritis, secondary pneumonia.
15. Heart failure due to arterio-sclerosis.
16. Toxæmia from miliary tuberculosis.

The Male Visiting Committee made four visits and the Female Committee two visits during the year.

The following table gives the statistical details of in-patients during the year:—

	Males.	Females.	Total.
Remaining in the Asylum 31st December, 1932 ...	39	33	72
Admitted under observation ...	48	16	64
Admitted certified ...	5	—	5
Deaths amongst certified ...	10	3	13
Discharged after observation ...	23	9	32
Discharged as cured ...	—	2	2
Discharged on trial (Governor's Order) ...	1	2	3
Re-admitted ...	5	1	6
Absconded ...	1	—	1
Number of patients certified ...	12	6	18
Remaining in Asylum 31st December, 1933 ...	44	32	76

#### REPORT ON THE FREETOWN PRISON, 1933.

Dr. C. B. Jennings was in charge until the end of the third quarter of the year when he was relieved by Dr. A. J. Johnson. Dispenser M. P. Neville was relieved on July 15th by Dispenser M. T. Metzger and the latter was relieved on October 5th by Dispenser P. Q. A. John.

#### HEALTH OF PRISON OFFICERS.

*Europeans.*—This has not been as satisfactory as in the previous years. One official has been on the sick list on two occasions, malaria for 9 days and amœbic dysentery for 26 days.

*Africans.*—The health of the African Prison officers and employees has been good. 36 were treated, and of these 10 were placed on the sick list and 4 were referred to the Connaught Hospital for further treatment. Malaria accounted for 9 cases of the 36 which required treatment. There were no deaths.

## HEALTH OF PRISONERS.

The health of prisoners has been good. During the second quarter of the year two prisoners were reported sick suffering from epidemic oedema; a routine examination of all the prisoners revealed a further 15 cases, and a few further cases were discovered at short intervals. Of these, 8 were admitted to hospital. There were no deaths.

There were 682 new cases with 5,672 subsequent attendances treated as out-patients, and 196 prisoners were admitted to hospital. The prevalent diseases were malaria (112 cases), dyspepsia (50 cases), gonorrhoea (47 cases), minor injuries (43 cases), ulcers (42 cases), constipation (30 cases) and conjunctivitis (27 cases). On Wednesday afternoons there was a medical inspection parade and suitable treatment was given by the dispenser for minor complaints, constipation the most common.

50 prisoners were transferred to Masanki in October to work on the Government Oil-palm Plantation. These men received medical attention from the Medical Officer stationed at Moyamba.

During the course of the year there were 5 deaths from natural causes and 3 autopsies were held. The following conditions were the cause of death:—Toxaemia; septic bronchitis and cardiac failure; pyelitis; paralysis; rupture of an aneurysm of the descending aorta.

There were 330 specimens of faeces sent to the Laboratory at the Connaught Hospital for examination with the following results:—

✓ Ancylostome ova	..	88	✓ Tania ova ...	...	2
✓ Ascaris ova	...	60	Entamoeba histolytica	...	2
✓ Strongyloides larvae	...	24	Schistosoma mansoni	...	1
✓ Trichuris ova	...	14	Intestinal flagellates	...	1
No parasites	...	...	...	178.	...

Three condemned prisoners were executed during the year. 5 prisoners were sent under Emergency Certificates to the Lunatic Asylum at Kissy and 2 were detained.

The weight of prisoners ranged from 97 lb. to 210 lb. There were 28 vaccinations performed and 21 were successful. 1 prisoner was referred to the Surgical Specialist at the Connaught Hospital and there an alveolar tumour was removed. There were 29 minor operations performed in the Prison Hospital:—

Dental extractions	...	...	...	...	17
Circumcision	...	...	...	...	7
Dilatation urethral stricture	...	...	...	...	4
Incision of infected hand	...	...	...	...	1

The sanitary condition of the Prison remained good throughout the year.

ATHOL J. JOHNSON,

*Medical Officer in-charge, Freetown Prison.*

## STATISTICAL RETURN.

In hospital at the end of December, 1932	...	...	4
Admitted during the year 1933	...	...	196
Remaining in hospital at the end of December, 1933	...	...	8

—	Admitted.	Cured.	Improved.	Not Relieved.	Died.	Observed.
March quarter ...	25	18	6	nil	nil	1
June quarter ...	60	54	4	nil	2	nil
September quarter ...	67	54	9	nil	2	2
December quarter ...	44	23	17	1	1	2
Total ...	196	149	36	1	5	5

Daily average number of prisoners, 264.

—	New-comers.	Remands and Trial.	Corporal Punishment	Execution.	Solitary Confinement.
March quarter ...	139	13	2	1	45
June quarter ...	159	19	nil	1	48
September quarter ...	282	18	nil	nil	74
December quarter ...	215	45	nil	1	97
Total ...	795	95	2	3	264



## OUT-PATIENTS.

	New Cases.	Subsequent Attendances.
March quarter ... ..	145	1,159
June quarter ... ..	170	1,091
September quarter ... ..	144	1,484
December quarter ... ..	233	1,938
Total ... ..	692	5,672

	1931.	1932.	1933.
Total number of prisoners admitted ... ..	913	749	895
Average strength ... ..	239	233	264
Total deaths ... ..	4	7	5
Total number of prisoners on sick list ... ..	179	152	196
Daily average number on sick list ... ..	9.1	6.25	7.03
Daily sick-rate per 1,000 of average strength ... ..	38.07	26.82	26.51
Death-rate per 1,000 of average strength ... ..	16.73	30.4	18.93

Prison.	Daily Average Number in Custody in 1933.	Daily Sick-rate per 1,000 of Average Strength.	Death-rate per 1,000 of Average Strength.
Freetown ... ..	264	26.51	18.93
Pujehun ... ..	20	18	—
Batkanu ... ..	32	22	—
Kenema ... ..	51	9.80	19.60
Moyamba ... ..	25	16	40

ATHOL J. JOHNSON,

*Medical Officer-in-charge, Freetown Prison.*

## IV—Hygiene and Sanitation.

## A—GENERAL REVIEW OF WORK DONE AND PROGRESS MADE.

## I—PREVENTIVE MEASURES.

(a) *Insect-borne Diseases.*

**Malaria.**—Gordon and Davey, in their observations on the results of anti-mosquito measures in Freetown contained in Appendix E of the report for 1932, have shown that there has been a marked reduction in the incidence of adult anophelines at Freetown since the beginning of the century and their figures for 1931 suggest a further slight improvement as the result of better drainage afforded by the canalization of Sanders Brook. Nevertheless, malaria comes second after respiratory diseases, which head the list, as a principal cause of death.\* The figures for 1933 were 2,856 cases and 108 deaths, compared with 1,546 cases and 196 deaths in 1932; the sharp rise in the number of cases presenting themselves for treatment being due to the frequent and intermittent nature of the early rains, with small rainfall, favouring the development of several batches of anopheline larvæ which would in the usual course have been scoured away by the torrential rains of a normal wet season. It is unusual to find large numbers of anopheline larvæ in the course of compound inspection but the number showed an increase from 1 in 1932 to 7 in 1933. Samples of larvæ found in *pools, gutters, and earth drains* in 1932 were: *Anopheles* 41, *Aedes* 33, *Culex* 4, and in 1933 *Anopheles* 39, *Aedes* 125, *Culex* 40; these figures demonstrating the anopheline preference for breeding over a wide area in non-domestic situations, thus rendering preventive measures correspondingly more difficult. The available staff worked longer hours, inspected a larger number of compounds and found a higher general larvæ index throughout the first nine months of the year (*vide infra*). But a number of sanitary inspectors comprising the normal staff at Freetown were removed for various periods to deal with smallpox in the Protectorate,

\*See Table on page 13.

which made it impossible to carry out that thorough inspection of non-domestic situations which is necessary to control the activities of the sanitary labourers engaged in such anti-larval measures as the cleansing and oiling of existing drains, cutting and grading earth ditches, filling or oiling of ponds, and oiling or brushing out the innumerable rock pools, rain-puddles and small collections of water on river terrain and many other situations. The magnitude of the problem lies in the extent and diversity of the situations in which anopheline breeding occurs in and around the city† the fact that under favourable conditions the cycle of development from egg to adult can be completed in seven days,‡ and the amount of supervision necessary to maintain efficient measures when dealing with illiterate labourers capable of but little initiative.

It is clear that the staff of sanitary inspectors and labourers should be increased, the latter to normal strength at least, as soon as financial conditions permit. Meantime the temporary employment and training of additional staff might be adopted when weather conditions point to the likelihood of excessive breeding of anophelines.

The following table shows the mortality from malaria at different age periods:—

Age.	Number of Deaths from Malaria.		
	Total.	Percentage of Total Deaths from Malaria	Certified.
0-3 months ...	13	12.1	—
3-6 " ...	6	5.5	—
6-9 " ...	6	5.5	—
9-12 " ...	6	5.5	1
0-1 year ...	32	29.6	1
1-5 years ...	18	16.6	5
5-15 " ...	9	8.3	—
15-25 " ...	10	9.2	1
25-45 " ...	18	16.6	—
45-65 " ...	9	8.3	1
65 years and over	12	11.1	1
All ages ...	108*	100	9†

\* 8.7 per cent. of the total deaths were registered as due to malaria.

† 8.3 per cent. of the latter were certified.

The seasonal mortality from malaria was as follows:—

Month.	Number of Deaths from Malaria.	Percentage of Total Deaths from Malaria.	Certified.
January ...	11	10.2	—
February ...	3	2.8	1
March ...	6	5.6	—
April ...	7	6.5	—
May ...	10	9.3	2
June ...	9	8.3	1
July ...	14	12.5	—
August ...	8	7.4	—
September ...	13	12.0	2
October ...	7	6.8	—
November ...	9	8.3	1
December ...	11	10.2	2
Total ...	108	100	9

The seasonal mortality from malaria follows fairly closely the months of highest rainfall and the cold periods experienced during the Harmattan season in December and January. Meteorological data are contained in Appendix F.

† Blacklock, D. B., and Eans, R. M. (1926)—Breeding places of Anopheline Mosquitoes in and around Freetown, Sierra Leone. *Ann. Trop. Med. and Parasitol.* XX, 59.

‡ Barber, M. A. (1932)—Malaria control in West Africa. *South. Med. Jour.* XXV, 649.



The following extract from the report of the Medical Officer of Health indicates the nature of anti-malarial measures, and embraces the preventive methods adopted against yellow fever:—

EXTRACT FROM THE REPORT OF THE MEDICAL OFFICER OF HEALTH, FREETOWN.

*"Anti-malarial Measures."*

"The chief of these is the routine inspection of compounds. During the year 108,638 compounds were inspected, an increase of 9,500 from 1932, and mosquito larvæ were found in 290. The owners were prosecuted and convicted, and fines amounted to £41 13s. 0d. ✓

"The larvæ were classified as follows:—

Anopheles	...	...	...	...	...	7	✓
Culex	...	...	...	...	...	26	✓
Stegomyia	...	...	...	...	...	225	✓
Culex and Stegomyia	...	...	...	...	...	13	✓
						<u>271</u>	✓

"Oiling.—56,357 pools and 5,226 gutters were oiled. The number of pools and gutters oiled in Freetown is gradually diminishing as pools are filled in and gutters repaired and renewed. The oil used is Anti-Malarial Oil supplied by the Vacuum Oil Company, and is an improvement on the mixture formerly used, being not only more efficacious but very cheap. The work of the oiling gangs is so arranged that the whole of Freetown is covered once every six days. 204 samples of larvæ were found:—

Stegomyia	...	...	...	...	...	125
Culex	...	...	...	...	...	40
Anopheles	...	...	...	...	...	39
						<u>204</u>

"Trees.—12,408 trees were inspected, 2,081 holes chipped and 4,003 holes filled with a mixture of tar and cement. 209 samples of mosquito larvæ were found as follows:—

Stegomyia	...	...	...	...	...	191
Culex	...	...	...	...	...	18
						<u>209*</u>

These figures are an indication as to the danger of old trees in the neighbourhood of houses, and there is no doubt that a big clearing-out of trees in Freetown is a necessity. Paw-paw trees, mango trees, and cotton trees are always liable to hold water, and their presence, while giving shade and food, is dangerous on that account. Another source of mosquito breeding is in the palm tree after it has been tapped, as the opening left invariably holds water after a shower of rain. There are far too many old trees in Freetown, and at least a thousand could be felled with advantage. From the viewpoint of providing shade, new trees of the eucalyptus, silky oak or neem type could be planted.

"Inspection of Boats and Canoes.—7,845 boats and canoes were inspected and seven samples of larvæ discovered:—

Stegomyia	...	...	...	...	...	6
Culex	...	...	...	...	...	1
						<u>7</u>

"Cesspits.—Watery cesspits were oiled regularly throughout the year.

"Canalization of Streams.—This was carried out as usual.

"Tins and Bottles.—During the rains gangs are employed in clearing throughout the town tins, bottles and other receptacles likely to hold water and form breeding places.

*Mosquito Larvæ Index.*

	1933.	1932.	1931.
First Quarter	1.14	0.28	0.57
Second "	0.86	0.57	3.43
Third "	2.29	0.57	0.57
Fourth "	1.43	1.43	3.42

\*This agrees with the findings of Blacklock and Evans in 1925. In numerous samples taken from various natural, small collections of water in tree holes, axils of leaves and bamboo, pine-apple and banana stems, the larvæ of some species of mosquitoes were present in 179 cases; but in no case were the larvæ of anophelines found in such sites (see foot-note on page 34). ✓



These figures are obtained by inspecting five compounds in each of five streets in each of the fourteen sections of Freetown, making a total of 350 compounds inspected; the number of samples found is then calculated as a percentage. The figures are slightly worse than those of 1932, but much better than those of 1931.

"Hill Station.—No less than 482 samples of mosquito larvæ were found at Hill Station during the year. These were as follows:—

Stegomyia	...	...	...	...	...	410
Culex	...	...	...	...	...	67
Culex and stegomyia	...	...	...	...	...	4
Stegomyia and anopheles	...	...	...	...	...	1
						<hr/> 482

"Most samples were found at the beginning of the rainy season, and although a certain number were found in various plants and shrubs in compounds, by far the greatest number were breeding in holes in trees and in the surrounding bush. A special inspection of trees was made in October, and as a result it was decided that as the majority of trees in the district were capable of holding water, a special tree cutting gang was employed to fell all those considered dangerous from that point of view. Over 600 trees were marked out by the Medical Officer of Health and Sanitary Superintendent for felling, and each one was a potential source of mosquito-breeding. Twice that number could have been felled with advantage, but funds did not permit. Special bushing work was carried out in December, especially around the Nursing Home, where the growth of bush had hidden the presence of large borrow pits formed when the roads were made up." Fortunately, adequate drainage is afforded by steep gradients everywhere and adult anophelines are very rarely seen on Hill Station.

In the other towns and villages throughout the Colony and Protectorate where Government does not provide sanitary labourers (except at the Port of Sherbro), conditions are notably worse than in Freetown, with a consequent large increase in the adult anopheline population. As an instance, Gordon and Davey\* have shown that the anopheline infective density of the village of Kissy in 1932 was thirty-four times greater than in Freetown where preventive measures are in operation. The number of cases of malaria reported from outstations showed a slight increase from 3,311 in 1932 to 3,592 in 1933, these figures in no way indicating the real prevalence of the disease.

*Preventive Measures.*—Daily inspection of compounds is carried out in towns where a sanitary inspector is available. At Bonthe, sanitary labour is also provided by Government to deal with the repair and canalization of street drains. If conditions are to show any appreciable improvement in other situations there will have to be an increase in the number of sanitary inspectors to direct the anti-larval operations of the labourers provided by the chiefs and village headmen. At present this labour is insufficient, and provided only spasmodically; and in this respect it will be necessary to have more enthusiastic co-operation in the future.

*Personal Prophylaxis.*—Recent inspection of houses reveals the fact that personal prophylaxis through the medium of mosquito nets is common; the majority of the inhabitants use them in the larger towns of the Protectorate. Daily prophylactic doses of 5 grains of quinine appear to be effective in preventing attacks of malaria in situations which are not in close proximity to hyper-endemic areas.

*Treatment.*—As regards treatment, the cases treated so far by Atrebrin and Plasmoquine were too few in number to warrant any conclusions as to the efficiency of these drugs.

*Filariasis.*—282 cases of elephantiasis were treated in the hospitals and dispensaries as compared with 296 in 1932. This figure represents but a small percentage of the number of cases existing and not applying for treatment. The disease is very widespread and those who are able or can afford to travel long distances to medical stations will come for surgical treatment, which is becoming ever more popular, the number of cases dealt with depending to some extent on the medical officers concerned.

The large majority of 86 cases treated by the Surgical Specialist at Freetown were natives of the Protectorate. 40 cases were treated at Bo, 36 at Pujehun, 20 at Makeni and 18 at Kabala and lesser numbers in eleven other stations, including cases from the surrounding districts. In the Colony, 36 cases were treated at Bonthe, which also serves the adjacent Protectorate district of that name. At Kissy 11 cases were seen. This is significant, because of 2,103 anophelines collected at Kissy by Gordon and Davey in 1932, 2 per cent. were found to be infected in the head and/or proboscis and 11 per cent. in either the thorax, head or proboscis.

\*Gordon, R. M., Hicks, E. P., Davey, T. H., and Watson, M. (1932).—A study of the House Haunting Culicidæ occurring in Freetown, Sierra Leone, and of the part played by them in the transmission of certain Tropical diseases, together with observations on the relationship of anophelines to housing, and the effects of anti-larval measures in Freetown. *Ann. Trop. Med. and Parasitol.* XXVI, 407.



No figures are available for other forms of filaria. *Loa loa* exists but is not very commonly met with.

Preventive measures are identical with those adopted against malaria and yellow fever and are outlined in the preceding section.

According to the Census of 1931, Kissy, with 2,700 inhabitants, is the largest town in the Colony after Bonthe. In view of the marked prevalence of malaria and the potential danger of an increase in the incidence of elephantiasis, serious consideration will have to be given to improvement of the sanitary conditions there, although the problem of providing labour presents a difficulty, the sanitary services rendered under the Headmen Ordinance being utterly inadequate in every respect.

*Trypanosomiasis*.—This does not present a problem in Sierra Leone. No cases were reported during the year.

*Yellow Fever*.—No cases of yellow fever in the clinically recognizable form have been notified since 1910; but in the report for 1932 reference was made to protection tests carried out by the Yellow Fever Commission of the Rockefeller Foundation at Lagos, which appear to indicate that unrecognized cases have occurred in the Protectorate.

Preventive measures are those adopted against the breeding of domestic mosquitoes as detailed in the section on malaria.

#### (b) EPIDEMIC DISEASES†.

*Plague*.—There are no records of the occurrence of plague in this territory; probably due in some measure to the absence of a wharf which might facilitate the importation of rats from ocean-going vessels. No cases were notified during the year, and of the 4,900 rats caught by the rat-catcher 156 were examined by the Pathologist who reported no signs of infection observed.

The preventive measures adopted against plague were outlined in the report for 1932, and reference thereto will be found under Section V—Port Health Work and Administration. The daily collection and removal of refuse from Freetown and in the health areas is an important factor in the control of breeding and the development of epizootic disease amongst rodents.

*Smallpox*.—Last year's report contained a brief review of the outbreak of smallpox in the Colony and Protectorate in 1932. The spread of the outbreak to other districts in 1933 was probably the result of a few undetected cases carrying the infection from the Karene and Bombali districts into Koinadugu, one of the most thinly populated districts of the Protectorate, and also from the northwestern portion of Kailahun—where a number of cases occurred in 1932—into the Kono District.

From these points the disease appears to have spread southwards and westwards into the Kenema and Bo districts, a much more thickly populated area, and in northern Kenema it assumed the proportions of a serious outbreak due almost entirely to the fear of the native to report to his Chief and, in some instances, the reluctance of the Chiefs to report to their District Commissioners. Fear of vaccination also accounts for the fact that only 57,141 vaccinations could be performed in the infected areas.

The following table shows briefly the number of cases, deaths, and vaccinations performed in each district:—

AREA.	Number of Cases Discovered.	Number of Deaths.	Number of Vaccinations.
COLONY DISTRICTS:			
Freetown ... ..	27* ✓	2 ✓	2,118
Headquarters Judicial ... ..	4	—	768
Sherbro ... ..	1	—	820
PROTECTORATE DISTRICTS:			
<i>Northern Province:</i>			
Port Loko ... ..	106	1	5,848
Kambia ... ..	101	2	3,928
Karene ... ..	20	4	177
Bombali ... ..	160	1	8,537
Koinadugu ... ..	86	1	4,588
<i>Southern Province:</i>			
Kailahun ... ..	81	5	2,782
Kono ... ..	591 ✓	147† ✓	9,954
Kenema ... ..	451	62	5,112
Bo ... ..	631	46	4,504
Moyamba ... ..	116	17	4,809
Pujehun ... ..	3	—	3,196
	2,378 ✓	288 ✓	57,141 ✓

\* Eight of these cases were imported.

† Not all verified.

‡ The disparity of the Medical and Health figures for the following diseases is explained partly by the laxity of notification from out-stations, notification by private practitioners to the Health Office only, and partly by the registration of causes of death (not medically certified) by lay informants.



To prevent infection of Freetown from the Protectorate all persons arriving by rail or by sea were met on arrival by sanitary inspectors and vaccinated if they could not show vaccination marks or pitting from a previous attack of smallpox.

*Dysentery.*—253 cases and 81 deaths (12 certified) were registered in reporting stations, compared with 307 cases and 95 deaths in 1932. These statistics are of little value even for reporting stations, as many cases probably do not attend for treatment and the figures may include cases coming for treatment from surrounding villages. Registration of deaths is optional and practically non-existent for the natives in the Protectorate.

The disease appears to be most prevalent at Pujehun where 84 cases and 3 deaths were recorded on medical certificate. The following cases were diagnosed in places where a medical officer was stationed: Freetown 33, Kissy 3, Bonthe 13, Sulima 17, Pujehun 84, Daru 34, Bo 13, Moyamba 12, Kabala 9, Makeni 6, Port Loko 5. The figures for Freetown represent chiefly Protectorate natives who come for treatment to the Connaught Hospital. Daru is a West African Frontier Force station and there is a constant movement of troops to and from their home villages, where infection may be acquired.

Preventive measures are directed towards efficient disposal of refuse and night soil and protection of water supplies from fecal contamination. During Health Week it is customary to conduct propaganda explaining these ends and the need for improved domestic hygiene.

*Typhoid Fever.*—Four cases and 3 deaths (certified) occurred during the year at Freetown. No other cases were reported.

Two cases of paratyphoid fever were diagnosed and one death was registered (certified) at Freetown. Facilities for establishing a definite diagnosis are available only at Freetown, so no estimate can be given of the prevalence of this group of diseases. It is believed to be small.

Preventive measures are similar to those outlined above for dysentery.

*Cerebro-spinal Fever.*—Two cases were notified by the Medical Officer at Daru. No further cases occurred.

*Poliomyelitis.*—Two cases were notified by the Medical Officer at Pujehun.

*Tuberculosis.*—This disease was made notifiable in 1931. Except in the areas where medical officers or private practitioners are stationed, not much information is available as to the existence or prevalence of tuberculosis, and in these areas the numbers presenting themselves for treatment are but a rough indication of the real prevalence of the disease.

Tuberculosis of the respiratory tract, and consequently the most infectious form of the disease, is far more common than any other type. Tuberculosis in local cattle is almost unknown, but in cattle imported from French Guinea it is not uncommon—see Section 7, Food in Relation to Health and Disease.

The total number of cases notified was 196 compared with 219 in 1932. With the exception of 14 cases, all were of the respiratory type. The exceptions were tubercular meningitis 2, tuberculosis of the intestines 3, vertebral column 3, bones 4, skin 2.

Medical stations from which cases were notified were as follows: Freetown 88, Bonthe 14, Pujehun 20, Bo 14, Moyamba 10, Makeni 18, Port Loko 4; 3 each at Sumbuya, Daru, Maranda and Bullom; 2 at Pendembu; and 1 each at Rokelle, Murray Town, Regent, Sulima, Mafindo (Kono), Lunsar, Koya, Magbeli and Mafoki Chiefdom in Port Loko District, Batkanu, Gbinti, and Gbomgbahun Chiefdom of Karene District and at Kabala. These figures may be useful later for comparison with future years.

Sixty-two deaths (47 certified) were reported as due to tuberculosis in all stations compared with 78 in 1932. Statistics for Freetown have been included in the section dealing with Vital Statistics (56 deaths, 41 certified). 4 deaths at Kissy and 2 at Pujehun were certified due to this disease.

*Preventive Measures.*—The chief hope in curtailing the spread of this disease lies in the gradual improvement of housing conditions and in bringing home to the mass of the people by education and propaganda the practical measures necessary to prevent the spread of infection, in other words, the need for personal prophylaxis on the part of those living in contact with people suffering from the disease. In Freetown, houses where cases or certified deaths have occurred are thoroughly disinfected with an alkaline coal tar preparation and examination of the contacts made for early signs and symptoms. Advice of a very detailed nature is given to the patient himself and his relatives as regards personal prophylaxis and one of the health visitors pays a call from time to time to ascertain the health of the other inmates. Free examination and treatment is provided for all cases and suspected cases of tuberculosis. Special attention is given to this subject during Health Week.



## (c) HELMINTHIC DISEASES.

The following table shows the position as regards cases treated at hospitals and dispensary stations in 1933:—

Disease.	1932.	1933.
Ascariasis .. ...	3,847 ✓	4,306 ✓
Ankylostomiasis ... ..	185 ✓	131 ✓
Schistosomiasis ... ..	59 ✓	74 ✓
Tæniasis ... ..	264 ✓	314 ✓
	4,355	4,825

The following lists, which are included for the purpose of comparison with future years, show the medical or dispensary stations in which cases presented themselves for treatment, the numbers in each case including patients who came in from the surrounding villages for treatment. Next year, figures for the residents of each station will be shown separately so that they may be used to indicate the progress or otherwise of preventive methods in future years.

*Ascariasis*.—Colony: Freetown, Connaught Hospital 325, European Hospital 5, Prisons 13, Cline Town 257, Wilberforce Barracks 14, Regent 210, Goderich 82, Kissy 114, Hastings 25, Waterloo 111, York 140, Kent 99, Songo 11, Bonthe 593. Protectorate: Northern Province—Kambia 281, Port Loko 75, Batkanu 47, Makeni 44, Kabala 30. Southern Province—Mabang 123, Bauya 47, Moyamba 136, Sembehun 42, Mano 457, Bo 41, Sumbuya 143, Kenema 174, Daru 40, Pendembu 186, Kailahun 188, Pujehun 135, Sulima 120.

No deaths were registered as due to this disease. This infection is widespread and is very prevalent in the schools.

*Ankylostomiasis*.—Colony: Freetown, Connaught Hospital 26, European Hospital 5, Prisons 18, Kissy 5, Bonthe 8. Protectorate: Northern Province—Makeni 10, Kabala 28; Southern Province—Moyamba 9, Bo 12, Sumbuya 2, Daru 7, Kailahun 1. At Freetown there were 8 deaths (none certified) and at Kissy 1 death (certified) as due to this disease.

*Schistosomiasis*.—Colony: Freetown, Connaught Hospital 3, Prisons 1. Protectorate: Northern Province—Kabala 13, Southern Province—Bo 15, Kenema 18, Daru 17, Kailahun 7. No deaths were registered.

Prevention of this group of diseases lies in the extension of improved methods of nightsoil disposal and the prevention of indiscriminate defæcation and contamination of water supplies. Although the figures shown above include cases from surrounding districts, it is significant that no cases of ankylostomiasis or schistosomiasis occurred in stations where the water supply is derived exclusively from wells. Eleven cases of *S. mansoni* were discovered at Kabala\*, where extensive canalization and clearance of bush around streams has since been carried out with most beneficial results.

*Tæniasis*.—Colony: Freetown, Connaught Hospital 83, European Hospital 2, Prisons 10, Cline Town 13, Wilberforce Barracks 4, Regent 3, Kissy 5, Waterloo 4, York 11, Kent 1, Bonthe 8. Protectorate: Northern Province—Kambia 5, Port Loko 7, Batkanu 13, Kabala 14; Southern Province—Bauya 5, Moyamba 8, Mano 27, Bo 2, Sumbuya 10, Pujehun 12, Sulima 3, Kenema 35, Daru 9, Pendembu 18, Kailahun 12.

No deaths were recorded.

Prevention lies in the strict inspection of carcasses after slaughtering. Sometimes this inspection may fail to reveal a light infection. Care should be taken, therefore, to ensure that meat is properly cooked before eating.

## (d) ANIMAL DISEASES.

*Animal Diseases*.—A note on the increased numbers of cases of anthrax in cattle at the Freetown Slaughterhouse is included in Section 7—Food in Relation to Health and Disease.

No cases of rabies were reported during the year.

Peaston, H. (1933)—Preliminary note on a focus of *S. Mansoni* infection in Sierra Leone. *Ann. Trop. Med. and Parasitol.* XXVII, 497.



## 2—GENERAL MEASURES OF SANITATION.

Freetown, the Capital and chief port, has an area of 2.75 square miles and is the largest town in Sierra Leone. The population at the 1931 Census was 55,358 and the number of houses 6,718.

Bonthe comes second to Freetown, both as a port of call for ocean-going ships, and as regards its population, which is twice as large as that of any town in the Protectorate. It has an area of .89 of a square mile. At the Census of 1931 there were 925 houses and a population of 5,110.

At the 1931 Census there were only 66 towns in the Protectorate with a population of 1,000 or more. At present the largest of these is Bo, with 664 houses and a population of 2,500. Makeni with 300 houses has the largest population (3,000). Thirty-five are health areas and accessible from Freetown by sea, railway or thereafter by motor-road. The average population of the ten largest towns—which are health areas—is 2,500 and the average number of houses 430. The conditions are thus mainly rural and sanitation is still primitive although marked advances are being made.

*Sewage Disposal.*—Most of the night soil of Freetown is disposed of in privately-owned cesspits, of which there are over 5,000. The chief objection to the use of cesspits is the fact that in congested areas they are situated too close to dwelling-houses or kitchens. In other situations they give rise to little nuisance; they are regularly supervised by the Health Department and, when necessary, fumigated or oiled. Fly-breeding is small. There are also fifteen latrines of the permanent concrete type with corrugated iron roof, each accommodating twelve or more pails which are headloaded for considerable distances, tipped into the sea and then washed on the foreshore which is patrolled to prevent nuisance occurring. In the European and some of the better class African houses the pail system is used, the contents being emptied into the sea or "Otway" pits, or disposed of by shallow trenching. Even if funds were available, a good deal of town-planning and reconstruction and increased water storage would be required before the water carriage system of sewage disposal could be introduced. There are at present a few private installations in which sewage is dealt with in septic tanks or by discharge directly into the sea. They have proved eminently satisfactory. When more water storage is available, the introduction of communal tank latrines of the Colombo type, similar to those recently installed by the Lagos Town Council, should be considered. Disposal of effluent should present no difficulty.

At Bonthe, which is almost at sea-level, the construction of cesspits and "Salga" (covered-pit) latrines is impossible and public latrines accommodating pails are used. The pails are headloaded by Government labourers to the sea and the contents tipped in from a dejection jetty. There is no nuisance.

In the Protectorate villages, defecation into the bush around the outskirts is universal. In all the more important towns, and to some extent in the larger villages, cesspits are favoured and their numbers are increasing considerably. In many of the health areas there are individuals who are experts at digging cesspits, the usual charge being about 3s. for a depth of 20 feet, which will be completed in one day. In elevated situations these pits are sometimes dug to a depth of 18 to 20 feet. When this occurs it usually indicates care and forethought on the part of the owner and the openings are generally surrounded by an elevated coping of concrete or beaten mud protected by a roomy structure of mud and wattle with thatched roof and hinged wooden door. Cesspits of this kind, constructed so as to exclude as much light as possible, may be devoid of flies or unpleasant odour. Usually, however, the pit is too shallow and the more important details are not attended to. They are then liable to become a nuisance especially when, as is so often the case owing to lack of adequate supervision, they are situated within the prohibited distance from a dwelling-house or kitchen. In low-lying swampy areas, such as Makeni, these pits are very shallow owing to the danger of infecting through the sub-soil wells which are used for domestic purposes. It is difficult to envisage the introduction of the pan system in these situations, which are solely dependent upon chiefs' labour for daily service. When funds are available the trough closet latrine or the Colombo type communal tank latrine will have to be considered. The construction of wells or water collecting sheds and storage tanks might be found to solve the problem of providing water for daily service extending throughout the dry season.

*Refuse Disposal.*—The following extract from the annual report of the Medical Officer of Health describes the systems in operation at Freetown during the year:—

"Refuse is deposited by the householders in 74 public dustbins. The refuse collected from these and from various schools and firms is taken by lorries to Cline Town and loaded into railway trucks, which are taken to Allen Town, a distance of about twelve miles from Freetown, and the refuse tipped there. In addition, a certain amount of refuse was disposed of by tipping in various farms in Freetown and care exercised to ensure that a good layer of soil was spread over the refuse to prevent the breeding of flies. During May and June it was found possible to dispose of all refuse by tipping in Freetown and no nuisance arose, while there was a considerable saving in petrol consumption and labour



during that period owing to the short distance travelled by the lorries and the withdrawal of labour from Allen Town. With the advent of the rains, however, it was considered advisable to renew the scheme of transport to Allen Town, which is a more sanitary arrangement than tipping in Freetown, with the dangers of fly breeding attending the latter procedure. Even with a layer of soil of the depth of one foot, the soil becomes baked and cracked and eggs are then easily deposited, so that although no nuisance arose by tipping in Freetown, the practice is not to be recommended."

At Bonthe, householders deposit their refuse into permanent type concrete dustbins. The contents are removed by Government labourers and dumped in the crude state into the lagoon, which has free access to the sea and is gradually being reclaimed in this way. The system was introduced in 1932 and continues to give satisfaction. The refuse is covered with grass or by the incoming tide and no nuisance arises.

At Waterloo and Colony villages adjacent to the seaboard, the refuse so collected is removed by Government or Chiefs' labourers and dumped into the sea. At Wilberforce and other upland situations in the Colony it is deposited into refuse boxes and removed by Chiefs and/or Government labourers to incinerators or burning dumps.

In the Protectorate villages, household refuse is dumped indiscriminately into the bush around the outskirts and allowed to rot. In many of the health areas Government has provided permanent type concrete dustbins and incinerators; or several dustbins and "Otway" type incinerators, with adjacent drying sheds, of native construction have been built in selected situations by Chiefs' labourers under Government supervision. They cost but little to erect and are very efficient when properly tended. The inhabitants are still somewhat averse to carrying refuse to these sites; they prefer to dump it in the bush alongside their compounds, or around the base of banana trees as fertilizer or to retard evaporation from the roots. There would be no objection to individuals using their household refuse for manurial purposes, as is done at Freetown, provided it were covered with a layer of earth, which is never done.

Refuse is also disposed of in the crude state to fill up gradually the innumerable borrow pits arising from uncontrolled excavations within the prohibited area to provide material for building operations. In the rainy season of 1931, Gordon and Davey found amazing numbers of anopheline larvæ in these pits during building operations at New Pepel. Sometimes misguided individuals actually dig such pits for the reception of refuse. In the future special attention will be given to the prohibition of borrow pits in the neighbourhood of towns. Existing nuisances in this respect will be eliminated by filling with refuse, suitably covered, and the erection of grass thatch shelters to keep out the rain, pending the purchase and use of larvicides by the Chiefs.

*Drainage.*—Owing to the financial depression, funds were not available for extension of permanent surface drainage. Recent inspections in the Protectorate have shown that drainage around houses must be studied carefully in the health areas. In several instances deep drains of recent construction, with no leadaways, were seen around new houses to receive the water from the eaves. These drains are usually quite unnecessary and must be a potential source of mosquito breeding.

*Cemeteries.*—In the larger health areas (*vide infra*) sites for cemeteries have been cleared, demarcated and surrounded with live fences.

*Sanitary Inspections.*—The Chief Sanitary Superintendent, under the guidance of the Assistant Director of Health Service, now personally advises the Chiefs in sanitary matters and remains in each health area for a period of a fortnight or more. During this time he supervises the labour provided by the Chief (who is the Health Authority and entitled to demand communal services for sanitary objects) for protecting and improving water supplies, building "Salga" pit latrines and "Otway" incinerators, clearing of trees and bush around the outskirts and at watering places, marking old ramshackle houses for demolition, straightening streets, demarcating new building plots and generally initiating or improving the practice of groundwork sanitation. Special care is taken in the siting of public "Salga" pit latrines at an adequate distance from any water supply; this having sometimes to be held over to the wet season so that an opportunity may be gained of gauging the high water level.

During the year the Chief Sanitary Superintendent made a sanitary survey of eleven health areas in the Northern Province for the purpose of advising the Health Authorities. Although the chiefs appeared to appreciate these visits and promised to carry out the measures advised, it was found on revisiting these areas that owing to lack of initiative very little had been done and that more personal direction and the presence of a European officer would be necessary to achieve results. The scheme outlined above was therefore decided upon and, with very few exceptions, the Chiefs proved enthusiastic.

In this way, a great deal of improvement was effected during the year in the Southern Province at Kailahun, Pendembu, Daru, Segbwema and Bo; and a site was cleared and houses built on a new layout at Maranda in the Northern Province. Applications have already been received from a number of Chiefs to have their towns laid out and declared Health Areas.



*Offensive Trades.*—There are no offensive trades of any importance in Sierra Leone.

*Occupational Diseases.*—During the process of loading iron ore from the bunker to the cars and revolving belts in the tunnel at Pepel, the dust is excessive. Respirators have been supplied to those concerned, but their use for more than an hour or so at a time causes extreme discomfort in hot climates. It may be found necessary to fit extraction shafts when further orders for iron ore require occupation for long periods in the tunnel. The Sierra Leone Development Company are giving this matter consideration.

### 3—WATER SUPPLIES.

As indicated in last year's report, the examination of three tributaries of the Orogu River at Regent, Kongo and Charlotte villages was continued during the dry season with "V" Notch Gauges for the purpose of estimating their value as possible sources for augmenting the water supply of Freetown. Readings were taken and the minimum flow on the 8th of May was—

Takuyama	...	...	...	140,415 gallons. per diem
Kongo	...	...	...	75,750    "    "
Pine-apple Water	...	...	...	173,400    "    "
Total				389,565    "    "

As the dry season was again an abnormally wet one, further readings will have to be taken to estimate the minimum dry weather flow in an abnormally dry year.

During the first eight months of the year the Chief Sanitary Superintendent was engaged in making surveys of eleven health areas in the Northern Province of the Protectorate, particular attention being given to the protection of the existing water supplies, whether from wells, springs or streams. This was much appreciated by the Chiefs who readily gave assistance when required.

A survey was also made of the Scarcies River, about one mile above the town of Kambia near the village of Royil, in the wet season, for the purpose of ascertaining whether an adequate supply of pipe-borne water could be obtained for the town of Kambia. No further action could be taken pending the results of a similar survey to be carried out in the dry season when an Engineer may be available to visit Kambia.

In health areas where the water supply is derived mainly from wells, a noticeable improvement has been effected as regards their construction. Concrete copings and hinged wooden covers are provided as often as not, thus lessening the risk of pollution and mosquito breeding. During a recent inspection of Pepel new village the larvæ of *Culex* and *Aedes* were found in twelve out of sixteen uncovered wells. In no instance were they found when a cover had been provided, even if it did not fit very closely.

### 4—SCHOOL HYGIENE.

The teaching of hygiene is compulsory in all assisted primary and secondary schools in the Colony and Protectorate and the grants-in-aid are conditional upon the school buildings reaching a satisfactory standard as regards hygiene and sanitation. In the majority of instances—except in the rural areas—inspection discloses a more or less satisfactory condition of the school grounds, but latrine accommodation is generally inadequate, although improvement has been made in some instances.

The Medical Officer of Health, Freetown reports as follows:—

"In the absence of a School Medical Officer, this work was commenced by the Acting Medical Officer of Health in the latter part of the year and was necessarily a spare time occupation. At present the Medical Officer of Health is assisted by two of the health visitors.

It was considered advisable to examine the infant classes first and three schools were completed. The following table shows the main results of the examination of 264 children at Bathurst Street, Government Model and Christ Church schools, of whom 200 were Creoles and 64 of other races:—

*School Medical Inspection at Freetown, 1933.*

Number of Children Examined.		Average Age in years.		Average Height in inches.		Average Weight in pounds.		Average Chest Measurement in inches.	
Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.
142	102	7.2	6.7	46½	46½	46	43½	23	22



The following table gives the percentage of the principal disabilities found:—

Disabilities.	Cases.	Percentage.
Clothing, defective ... ..	19	7.5
Want of cleanliness ... ..	13	5.1
Malnutrition—(a) under-nourished ... ..	6	11.4
(b) avitaminosis ... ..	23	
Deformities ... ..	1	0.4
Skin Diseases (chiefly scabies) ... ..	37	14.1
Non-vaccinated against smallpox ... ..	70	28.0
Teeth, defective ... ..	52	20.5
Vision, defective ... ..	2	0.8
Hearing, defective ... ..	1	0.4
Ear discharge ... ..	1	0.4
Heart (a) Mitral regurgitation ... ..	5	1.9
(b) Arrhythmia ... ..	1	0.4
Lungs (bronchitis) ... ..	17	6.7
Malaria parasites in blood ... ..	56	22.0
Enlarged lymphatic glands (mainly cervical) ... ..	21	8.3

No defects were observed in connection with the eyes, throat or speech; nor any other conditions of the blood, lungs or nervous system.

It is hoped next year to arrange for the health visitors to investigate the cause of absence of children from daily attendance at school and also to induce the parents to notify the health visitors when a child is too ill to attend school.

#### 5—LABOUR CONDITIONS.

The main industry is agriculture which is carried on by the individual farmers who utilize only the services of their families. The chief crop and staple food is rice, which is cheap and plentiful; the collection and preparation of palm kernels for export providing the main source of income for payment of house tax and the provision of clothing, cooking utensils, salt, occasional tinned foodstuffs and the other simple wants of the country native.

It is gratifying to note that the number of Kroomen obtaining employment on ships calling at Freetown showed an increase of approximately seventy per cent. during the year. In the Protectorate 700 labourers obtained regular employment at the Sierra Leone Development Company's iron ore works at Marampa and Pepel and the railway connecting these points; 420 with the Sierra Leone Goldfields Ltd. at Maranda; 1,748 with Maroc Ltd. at Makong; and 450 men were engaged at various points by the Consolidated African Selection Trust Ltd. in the newly-discovered diamond areas in the Kono District.

At Marampa the labourers are housed under model conditions with a complete medical and sanitary service provided by the Company; new villages have been built and occupied at Makong and Maranda; and similar action will be taken on the diamond areas as soon as the point of concentration is decided upon; meanwhile temporary structures have been provided for the labourers in the scattered camps which are occupied for but a few months during road construction or prospecting.

The wages paid vary from 9d. to 1s. per diem with, in some instances, a generous ration of rice provided so as to ensure physical fitness in the event of the labourers gambling away their pay, which appears to be their chief recreation. That the pay is more than adequate for their needs is shown by the fact that, even in situations where work can always be obtained, the men usually knock off for a day or two at very frequent intervals; and rather than live in the houses provided by the Companies they will pay exorbitant rents to join in the social life of the villages. Food is usually available very cheaply—see Section 7—except in the later part of the year when an artificial shortage and increase in the price of rice results from indiscriminate selling at rock-bottom prices to Syrian traders just after the harvesting time.

#### 6—HOUSING AND TOWN PLANNING.

*Freetown.*—Writing in 1922, the Director of Medical and Sanitary Service observed that Freetown was “an excellent example of an originally well laid out town allowed to sink into its present insanitary, overcrowded, irregular condition through lack of power to regulate building” . . . . . “Originally its streets and building plots were admirable but through encroachments, sub-letting, sub-dividing, and other causes, streets and plots shrank, resulting in the most striking insanitary feature of the city. To retrieve the errors of the past must be a slow and costly procedure, but action should no longer be delayed. The longer the delay the more stereotyped will these insanitary features become. The majority of the houses are still inexpensive and of a semi-permanent type but there are still many areas unbuilt on.” The report went on to point out the necessity of preventing building where undesirable in general, i.e. in the public health interest.



As the result of collaboration between the Public Works and the Medical Departments the Freetown improvement Ordinance was passed in 1924. The provisions dealt chiefly with town planning as regards streets and fences, the correction of frontages, and placed the control of new buildings or alterations and additions to old buildings under the Director of Public Works. It also provided for the immediate demolition of dangerous buildings, *huts, or buildings with flimsy materials.*

The Freetown Improvement (Amendment) Ordinance was passed in 1926 and made regulations for the construction of roofs, the size and ventilation of rooms, the height of buildings, their distance from each other and from the centre line of the street, the area of each plot to be built upon, and the amount of open space on plots in the rear of residences.

The following statistics are taken from the Census Reports of 1921 and 1931.

#### FREETOWN.

Year.	Population.	Number of Houses.	Increase. +	Persons per Acre.	Houses per Acre.	Persons per House.	Persons per inhabited House.
1921	44,023	6,657	—	25.0	3.8	6.6	6.8
1931	55,358	6,718	+ 61	31.5	3.8	8.2	8.4

In the congested areas the house and population density is many times higher than the average shown above, in other areas less, notably on the outskirts. But although overcrowding still undoubtedly exists in certain areas, notably around Little East Street, there are very few high buildings in these situations and the conditions are not so bad as might be expected. Frequent inspections are made by the Sanitary Department to prevent nuisance arising, but it is difficult to take action under the Public Health Ordinance against overcrowding, because this occurs chiefly at night when the Sanitary Inspectors have no powers of entry.\*

*Type of Housing.*—At the 1921 Census there were 6,657 houses: 538 stone, 5,603 frame and 516 of wattle. In 1931 the number had increased by 61 to 6,718: stone 523, frame 5,745 and wattle 450. Frame houses are timber-framed on concrete or stone and mortar dwarf walls and roofed with corrugated iron sheets or palm tile thatch, the floors being either of concrete or native timber boarding, and window openings fitted with glazed casements or boarded hinged shutters according to the means of the occupant. "Wattle and daub" houses are of brittle construction and rapidly become dilapidated unless constantly repaired, which should not be allowed.

*Building Societies.*—There are no building societies in Freetown. But after prolonged efforts, dating as far back as June, 1931, on the part of the President and Members of the City Council in educating the community as to the objects and benefits of the Municipal Housing Scheme, the Ordinance empowering its introduction (No. 17 of 1933) was duly passed in the Legislative Council and became operative on 1st August, 1933. The scheme enabled the City Council to create a fund out of which to make advances (with repayment at low rates of simple interest) upon good and sufficient security for the improvement of buildings within the city to the owners of lands or buildings for any one or more of the following purposes:—

- (a) the erection of new buildings;
- (b) the completion, extension or reconstruction of existing buildings;
- (c) the repair or reconditioning of existing buildings;
- (d) the painting and decorating of new or existing buildings;
- (e) the installation of electric light or power in new or existing buildings;
- (f) any other works whereby such premises may be improved.

*Bonthe.*—Bonthe comes second to Freetown as a port of call for ocean-going ships, and as regards its population which is twice as large as that of any town in the Protectorate. At the Census of 1931 there were 925 houses, regularly laid out on the grid system, occupying 0.89 of a square mile; and a population of 5,110. Both as regards the average number (and distribution) of houses and persons per acre this is a notable improvement on Freetown.

		Persons per Acre.	Houses per Acre.	Persons per House.
Freetown	...	31.5	3.7	8.2
Bonthe	...	9.0	1.6	5.5

\*The congregation of persons in congested districts may raise the general death-rate owing to higher mortality from respiratory diseases, for example, pulmonary tuberculosis, the incidence of which is definitely influenced by overcrowding and bad housing.



*Housing.*—There was a decrease of 3 in the total number of houses during the intercensal period. Stone and frame houses increased from 159 to 237 and "wattle and daub" houses decreased from 769 to 688, i.e. by 61 (compared with a decrease of only 66 in Freetown where there were more than seven times the number of houses). Building is under the control of the District Commissioner and the Medical Officer who continue to take a keen interest in maintaining the lines of the original layout and improvement as regards construction, size of rooms and ventilation.

At Kissy, Hastings, Waterloo and York, which have an average population of 1,880 persons each, the type of house is similar and the average number of persons per house is lower. The houses are spaced further apart.

*Protectorate.*—In the 1932 Report reference was made to progress in housing conditions in the mining villages and camps. Elsewhere (*see* Section 2) the average number of persons per house in the ten largest health areas is 6. In many instances the actual numbers are more.

*Housing.*—Even in the big towns almost all the houses, of whatever type, are built of mud or "wattle and daub." The type usually seen in the Northern Province is the round house built on the "double-drum" system, i.e. a round centre room as the main room and a second outer concentric wall enclosing a space for verandah and sleeping. They are strongly built of mud in a wattle stick frame with stout centre and wall posts. The covering is for the most part grass and, where grass is scarce, tiles made of woven palm fronds are used. Near the railway line palm tiles are commonly used by non-natives and rectangular shops of any size are roofed with corrugated iron. Oblong houses are occasionally met with and certain other improvements in the way of construction are noticeable, such as boarded verandah walls, carpentered doors and windows.

In the Southern Province these improvements are more noticeable, especially in the Chiefs' and sub-chiefs' towns along the railway line and frequented routes. The oblong or rectangular house is largely replacing the round-shaped house. This type has a front verandah, centre space or "parlour" and several bedrooms. They are better lighted and better ventilated, more carpentry work is noticeable and roofs of corrugated iron are common. Progressive Chiefs and the more well-to-do natives have led the way and their imitative brethren have copied them.

*Town-planning.*—Housing and town-planning are controlled in a simple manner by the Public Health (Protectorate) Rules. In new towns and the rebuilding or extension of old ones streets are well laid out and the spacing of houses is studied in order to avoid congestion. This is very noticeable at Daru—which is a model for all other towns in the Protectorate—and in the layout of new building areas at Bo, Makeni and Pepel.

The Chiefs are definitely interested in the layout of their towns.

#### 7—FOOD IN RELATION TO HEALTH AND DISEASE.

Rice is the chief crop and staple food throughout the whole Colony and Protectorate. It is grown in the swamps and also on upland areas which have to be cleared and burnt every year prior to sowing. When the crop has been harvested the price is often as low as three shillings a bushel of 84 lb., i.e. less than a halfpenny a lb.

Cassada, sweet potatoes, coco-yams, plantains, bananas, ground-nuts, garden-eggs, ochros and tomatoes are grown as garden produce and vary the diet. Spinach, "krain-krain," or the leaves of the sweet potato or cassada are taken at the principal meal; palm oil is the invariable sauce and flavouring agent, ground-nut oil being occasionally used for this purpose; tomatoes and locally grown peppers or spices are added for seasoning. Animal proteins are obtained chiefly from dried fish caught locally in the rivers or sent up in bales from the towns and villages on the seaboard; the amount consumed daily by an adult can be bought for one penny. Meat and poultry are eaten only occasionally, usually towards the end of the week or on special occasions such as the entertainment of a neighbouring Chief. With the addition of salt, which must be purchased from the stores, the diet of a country native may thus be considered as adequate and well-balanced.

*Food Inspection.*—The position as regards meat inspection was fully outlined in the report for 1931, and reference made therein to the special facilities existing at Freetown for training the sanitary staff in meat inspection. The number of animals slaughtered at Freetown in 1933 was as follows:—

Bullocks	...	...	...	...	...	4,593
Sheep	...	...	...	...	...	444
Goats	...	...	...	...	...	492
Pigs	...	...	...	...	...	97



Every animal is thoroughly inspected before, and the carcass after, slaughter. The cases of anthrax in the following list of seizures made during the year, which were all confirmed bacteriologically, were thus chiefly discovered before slaughter and the animal incinerated whole in every case:—

Cause of Seizure.			Parts of Carcass Condemned.
Anthrax	...	...	23 bullocks, 1 sheep
Cysticercus bovis	...	...	19 bullocks, 9 quarters, 2 hearts
Tuberculosis	...	...	4 bullocks, 6½ lb. liver, 2½ lb. heart, 1 lung, 1 spleen
Septicæmia	...	...	1 bullock
Angioma	...	...	653 lb. liver
Abscess	...	...	265 lb. liver, 1 spleen
Liver fluke	...	...	429 lb. liver, 1 spleen

Although all cattle arriving at Freetown come from French Guinea, it was found necessary for part of the year to post a sanitary inspector for duty on inspection of the local grazing grounds to prevent the spread of anthrax to other animals or the possibility of diseased animals being removed for disposal in rural places. On two occasions the grazing grounds at Mount Aureol were closed for this cause and no animal allowed to enter or leave there for two weeks.

*Cysticercus bovis*, it will be seen, accounted for the condemnation of nineteen carcasses. They are usually very heavily infected. The destruction of a whole carcass is a big loss for a butcher; many of them can ill afford it and a scheme is now under consideration to form a pool whereby a butcher who has a bullock condemned and destroyed may receive an adequate amount as compensation.

Towards the end of the year the City Council introduced the Captive Bolt Pistol method of stunning the animal prior to the usual slow and cruel method of slaughter by cutting the throat and bleeding from the jugular vein. The Mohammedans objected to the use of the pistol on religious grounds but after advice was received of the opinion of the Moslem learned men of Cadis College to the effect that the practice is not against the precepts of the Koran, legislation was introduced to enforce its use.

*Food-Stuffs.*—In Freetown there are seven public markets which are inspected daily by the sanitary inspectors and twice weekly by the European Sanitary Superintendents. On the whole the markets are kept very clean, especially the meat markets, but the market-keepers and stall-holders require constant stimulation as regards cleanliness of the buildings and surroundings, white-washing, etc.

During the inspection of markets all foodstuffs exposed for sale are carefully examined, and periodically throughout the year inspections are made of the premises and stores of the various firms and unsound food seized and condemned. It is the practice of several firms to sell off old stock cheaply just before Christmas and special inspections are made at this time. The following articles were seized and destroyed during the year:—

9 bags Rice	1 tin Pilchards
1 bag Maize	2 tins Pelota
3 packets Biscuits	14 tins Petit Pois
1 box Onions	12 tins Tomatoes
43 pints Lager	3 tins Stuffed Onions
86 lb. Butter	1 tin Beet
200 „ Mess Beef	31 tins Cherries
65 Pigs Feet	9 tins Damsons
303 tins Conserve	8 tins Gooseberries
78 „ Bacon	2 tins Loganberries
34 „ Steak & Kidney	163 tins, 25 Boxes Cheese
12 „ Ham	50 tins Cocoa
2 „ Ox Tongue	2 tins Ovaltine
2 „ Sausages	27½ dozen tins Milk
1 tin Kidney Soup	20 tins Sugar
20 tins Sardines	3 tins without labels
9 tins Kippers	

*Bakeries, etc.*—2,225 inspections of bakeries, 812 inspections of tanneries and 3,679 inspections of other trades were made. No nuisances were reported.

In the Protectorate meat and foodstuffs are inspected daily in the markets in stations where a sanitary inspector is available. No other food inspections were made during the year owing to so much of the time of the staff being taken up with smallpox duties.



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

As stated in previous reports, the teaching of hygiene is compulsory in all assisted primary and secondary schools in the Colony and Protectorate.

In the course of their daily visits, the health visitors take the opportunity of explaining to mothers and attendants the principles and practice of domestic hygiene and the sanitary inspectors are likewise responsible for the dissemination of similar advice as regards the maintenance of compounds and surroundings.

During Health Week it is customary to prosecute a vigorous campaign of propaganda on the subject of hygiene and disease prevention in its various aspects. The period previously chosen for this event having proved unsuitable for many reasons, chiefly owing to the uncertainty of the weather and the school children being engaged in the final preparation for progress examinations, it was decided to postpone the event this year until March, 1934.

## C—TRAINING OF SANITARY PERSONNEL.

The sanitary inspectors were so thoroughly occupied in the pursuance of preventive measures against smallpox and malaria that there was no time available for repetition courses in other subjects. The Chief Sanitary Superintendent was in the Protectorate making sanitary surveys of the health areas of the Northern Province until September, when his services were required for the smallpox campaign in the eastern area of the Southern Province. He was thus able to give practical demonstrations in rural sanitation and smallpox prevention to the sanitary inspectors posted in outstations.

## V—Port Health Work and Administration.

At Freetown, the principal port of call, 648 ships arrived during the year: 305 from the North, 296 from the South, and 47 from Sherbro. The Medical Officer of Health, who is Port Medical Officer, has the use of a Government launch and boards all ships on arrival between 6 a.m. and 6 p.m., accompanied by African sanitary inspectors trained for this work. During the year Government came to an arrangement with the shipping Lines whereby ships could be given pratique after 6 p.m. on payment of a special fee for boarding after hours. Fifty-two ships were thus cleared after normal working hours, half the fees therefor accruing to Government.

As a routine measure, all Kroo boys and deck passengers embarking at Freetown are examined on board and vaccinated unless they can show recent marks of vaccination. During the year 17,912 Kroo boys and 1,120 deck passengers were thus examined; 4,451 of the former and 717 of the latter were passed through the disinfecting station. When plague was reported near Dakar, ships coming from that port were inspected for rats, the discharging of cargo was supervised and passengers passed through the disinfector and kept under surveillance for several days. Dakar was regarded as infected with plague at various times during the year and yellow fever occurred at Kaolack in French Senegal, whence there is easy communication with Dakar and Bathurst. At such periods ships were thoroughly inspected for mosquitoes on arrival, which was not permitted between sunset and sunrise.

Freetown was not in quarantine during the year.

A. B. MONKS,

*Acting Assistant Director of Health Service.*

## VI—Maternity and Child Welfare.

Maternity and Child Welfare work has maintained good progress throughout the year. Details of the Maternity work, Ante-Natal and Post-Natal Clinics and Infant Welfare will be found in Appendixes "B," "C" and "D."

The work of the Princess Christian Mission Hospital has been well maintained throughout the year.

## VII—Hospitals and Dispensaries.

### (a) CONNAUGHT HOSPITAL.

The work of the Connaught Hospital continues to maintain a satisfactory standard, and although there has been a slight decrease in in-patients—360 cases—there has been a marked increase in the number of new patients, which is 5,294 greater than that of 1932.



The Surgical Specialist was resident for six months during the year. In spite of his absence the surgical work of the hospital has been well maintained.

The number of patients admitted to the Maternity Ward was 382, the largest number ever recorded.

The following table shows the figures of in-patients and maternity cases admitted to the Connaught Hospital during the past ten years:—

Year.	Total In-patients,	Maternity In-patients.	Remarks.
1924	1,862	263	
1925	1,860	214	
1926	1,867	251	
1927	2,046	301	
1928	1,945	311	
1929	2,228	353	
1930	2,383	363	New surgical block—two wards of fourteen beds and four cubicles.
1931	2,335	357	New children's ward—ten beds and cubicle.
1932	2,628	344	
1933	2,268	382	

The following table gives the comparative figures of out-patient attendances during the last ten years:—

Out-patients at the Connaught Hospital during the past ten years:—

	1924.	1925.	1926.	1927.	1928.	1929.	1930.	1931.	1932.	1933.
New cases ...	10,955	14,106	13,834	14,780	13,864	14,265	14,276	10,583	12,019	17,313
Subsequent attendances	38,475	22,335	32,176	34,780	47,040	59,441	41,722	50,059	55,198	50,147
Total ...	49,430	36,441	46,010	49,560	60,904	73,706	55,998	60,642	67,217	67,460

(b) EUROPEAN HOSPITAL.

(92) During the year 112 cases were admitted to the Nursing Home. This is an increase of 20 over the previous year. Of this number, 54 were officials and 55 non-officials. There were 3 deaths in the Nursing Home, 1 official and 2 non-officials, due to the following causes:—

Broncho-pneumonia	...	...	...	...	...	...	1 Official
Purpura hemorrhagica	...	...	...	...	...	...	1 Non-official
Hyper-pyrexia	...	...	...	...	...	...	1 „

(c) OTHER HOSPITALS.

There are two permanent Protectorate type hospitals, one at Makeni and one at Bo in the Northern and Southern Provinces, respectively.

The figures of attendances are as follows:—

	MAKENI.	Bo.
In-patients ...	318 (191)	279 (249)
Out-patients—new cases	1,429 (1536)	2,473 (273)
Subsequent attendances	4,860	18,826

The surgical work at Bo mentioned in the 1932 Report has been well maintained during the year. There has been a decrease in the number of subsequent attendances at Makeni; this decrease is probably accounted for by the financial depression.

(d) MISSION HOSPITALS SUBSIDIZED BY GOVERNMENT.

During the year the Government has subsidized three Mission hospitals in the Protectorate and given a substantial grant-in-aid to the Princess Christian Mission Hospital in Freetown. The Mission hospital at Segbwema has made steady progress and has carried out useful work amongst the people.

The United Brethren in Christ Mission employed one doctor, namely at Taiaia. The American Wesleyan Mission, who also employ one doctor, are erecting a new hospital at Kamakwie, which should be completed in 1934.



## (c) GOVERNMENT DISPENSARIES.

There are eight dispensaries established in the Colony and ten in the Protectorate. Senior dispensers, who are assisted by a hospital boy, are placed in charge. These dispensaries are inspected once or twice a month by the medical officer of the district. In addition to supplying simple remedies and dressings to the local population they serve as feeders to the district hospitals.

## VIII—Meteorology.

The rainfall for the year at Freetown (Tower Hill) was 145.13 inches, which compares with the 132.22 inches recorded in 1932. August was the heaviest month with 37.45 inches, and the highest rainfall in any one day was 6.30 inches on the 6th June. The lowest temperature recorded on the Tower Hill Observatory was 62 degrees in the shade on the 8th and 22nd November; the highest temperature was 93 degrees in the shade on the 16th and 29th January, 3rd, 4th and 17th April and 3rd and 7th May. The highest minimum was 81 degrees on the 2nd June, and the lowest maximum was 75 degrees on the 16th August.

Hill Station had a rainfall of 170.32 inches for the year, which compares with 157.35 in 1932. The heaviest month was August with 48.68 inches and the highest in any one day was 6.03 on the 16th August.

A summary of the rainfall of Freetown for the last 50 years is attached, from which it will be seen that there is a steady and progressive reduction in the rainfall in successive decennial periods. (Appendix G).

## IX—Scientific.

## ANNUAL REPORT ON THE CONNAUGHT HOSPITAL LABORATORY, 1933.

The amount of material sent in to the Laboratory at the Connaught Hospital during 1933 shows an appreciable increase over the previous year.

In 1933, 10,932 specimens have been examined, whilst in 1932 the total was 8,183. This gives an increase for the present year of 2,549 specimens even though the number of rat smears examined had decreased by the large number of 1,189. Details are fully enumerated in Table I.

Blood examination of school children started in the Connaught Hospital Laboratory in September, and the gametocyte rate was found to be 10.9 as compared with 16.6 for the whole of 1931.

During the routine blood examination a case of sickle cell anaemia was diagnosed in a patient in the female ward in care of Dr. A. J. Johnson. We have collaborated in sending in a separate report on this interesting case (*vide infra*).

TABLE I.

Material Examined.	African.				European.			
	1932.	1933.	Increase.	De-crease.	1932.	1933.	In-crease.	De-crease.
Blood slides ...	2,129	3,108	979	...	143	380	237	...
Blood counts ...	99	165	66	...	19	50	31	...
Kahn test ...	35	270	235	...	...	6	6	...
Widal reaction ...	27	20	...	7	...	3	3	...
Van den Bergh reaction ...	...	3	3	...	...	...	...	...
Fæces ...	1,880	2,267	387	...	44	166	122	...
Urines ...	1,623	2,402	779	...	110	321	211	...
Sputum ...	236	369	133	...	7	30	23	...
V. D. Smear ...	278	757	479	...	27	55	28	...
Leprosy smear ...	121	57	...	64	...	...	...	...
Throat smear ...	...	3	3	...	...	...	...	...
Cerebro-spinal fluid ...	...	3	3	...	...	...	...	...
Microscopical sections ...	...	15	15	...	...	...	...	...
Post-mortems ...	60	75	15	...	1	1	...	...
Total ...	6,488	9,504	3,037	71	350	1,012	661	...
ANIMAL SMEARS.								
Rat smears ...	1,345	156	...	1,189	...	...	...	...
Cattle smears ...	...	60	60	...	...	...	...	...
Total ...	1,345	216	60	1,189	...	...	...	...
GRAND TOTAL ...	7,833	9,720	3,097	1,260	350	1,012	661	...

TABLE II.

## 1—BLOOD EXAMINATIONS.

		African.		European.	
Total examinations	...	3,108		380	
Subtertian parasites	...	482	534	72	64.9
Percentage positive	...	15.4		18.9	54.9
Quartan parasites	...	277	298	21	0.1
Percentage positive	...	8.9		5.5	
Benign tertian parasites	...	...	1	1	
Percentage positive	...	...	0.5-3	.2	
Microfilaria	...	3		...	
Trypanosoma gambiense	...	1		...	

Crescents were found in 9 smears from Africans.

## Blood Counts.

Total examinations	...	165	50
Total red counts	...	37	8
Total white counts	...	67	9
Differential counts	...	61	33

## 2—BLOOD SERUM EXAMINATIONS.

## (a) Kahn Test.

Total examinations	...	270	276	6
Positive	...	180	...	...

## (b) Widal Reaction.

Total examinations	...	20	3
Positive to B. typhosus	...	3	2
Positive to B. paratyphosus A	...	1	...
Positive to B. paratyphosus B	...	2	...

## (c) Van den Bergh's Reaction.

Total examinations	...	3	...
Positive	...	{ 2 indirect 1 direct	...

## 3—FÆCES EXAMINATIONS.

Total examinations	...	2,267	2435	166
Ankylostome ova	...	465	...	9
Ascaris ova	...	461	...	3
Trichuris ova	...	150	...	5
Tænia ova	...	25	...	1
E. histolytica	...	48	...	1
Giardia	...	5	...	1
Balantidium coli	...	2	...	—
E. histolytica cysts	...	3	...	—
Strongyloides larvæ	...	137	...	—

## 4—URINE EXAMINATIONS.

Total examinations	...	2,402	321
Albumen	...	907	101
Sugar	...	56	—
Casts	...	11	8
Blood	...	24	12
Pus	...	33	22
Acetone	...	—	7
Diacetic acid	...	—	2
Urea estimations	...	5	6
Schistosome ova	...	1	—

## 5—SPUTUM EXAMINATIONS.

Total examinations	...	369	30
Tubercle bacilli present	...	86	3



## 6—VENEREAL DISEASE SMEARS.

Total examinations	...	...	757	812	55
Sp. Pallida	...	...	—		3
Gonococcus	...	...	493		30

## 7—LEPROSY SMEARS.

Total examinations	...	...	57		—
Positive	...	...	10		—

## 8—THROAT SMEARS.

Three throat smears were examined and no evidence of diphtheria was found.

## 9—CEREBRO-SPINAL FLUID.

Two cerebro-spinal fluids for trypanosomiasis and one for meningococcus proved negative.

## 10—SMEARS FROM RATS.

156 smears were examined and no evidence of plague infection found.

## 11—SMEARS FROM CATTLE.

Total examinations	...	...	...	...	60
Anthrax bacilli	...	...	...	...	36
Trypanosomiasis	...	...	...	...	12

## TABLE III.

## BLOOD EXAMINATION OF SCHOOL CHILDREN.

Number examined	...	...	...	...	153	✓
Number positive	...	...	...	...	37	✓
Percentage positive	...	...	...	...	24.1	✓
Number with M. T.	...	...	...	...	16	
Number with Q.	...	...	...	...	17	
Number with mixed M.T. & Q.	...	...	...	...	1	
Number with mixed Crescents	...	...	...	...	2	
Number with mixed Q. gametocytes	...	...	...	...	1	
Percentage of total examined showing M. T. & Q. gametocytes	...	...	...	...	10.9	

## TABLE IV.

Fifteen sections for microscopical examination were sent during the year, viz.—

Fibroma	...	...	...	...	3
Epithelioma from edge of ulcer	...	...	...	...	1
Adenoma	...	...	...	...	1
Angioma of liver	...	...	...	...	1
Tubercular tissue from sinus	...	...	...	...	1
Tubercular glands	...	...	...	...	1
Teratoma of testes	...	...	...	...	3
Squamous epithelioma of cervix	...	...	...	...	1
Spindle-celled sarcoma	...	...	...	...	2
Small celled sarcoma	...	...	...	...	1
					15

## TABLE V.

## POST-MORTEM EXAMINATIONS.

Lobar pneumonia	...	...	...	...	10
Aortic aneurysm	...	...	...	...	5
Pulmonary tuberculosis	...	...	...	...	9
Cerebral hæmorrhage	...	...	...	...	1
Valvular disease of the heart	...	...	...	...	8
Cerebral abscess	...	...	...	...	1
Carcinoma of the stomach	...	...	...	...	1
Sub-acute nephritis	...	...	...	...	2
Septic bronchitis	...	...	...	...	1
Peritonitis	...	...	...	...	3
Cystic degeneration of brain	...	...	...	...	1
Strangulated hernia	...	...	...	...	1
Pyelitis	...	...	...	...	1

Carried forward ... 44

TABLE V—continued.

Brought forward	...	...	...	44
Suppurative mediastinitis	...	...	...	1
Arterio-sclerosis	...	...	...	4
Fatty degeneration of heart	...	...	...	1
Cystic degeneration of kidney	...	...	...	1
Toxaemia	...	...	...	1
Rupture of uterus	...	...	...	1
Empyema	...	...	...	1
Miliary tuberculosis	...	...	...	3
Splenic abscesses	...	...	...	2
Cirrhosis of liver	...	...	...	1
Asphyxia—drowning	...	...	...	3
Fracture of skull	...	...	...	2
Fracture of ribs	...	...	...	2
Pyæmia	...	...	...	1
Pulmonary embolism	...	...	...	1
Gastro-enteritis	...	...	...	1
Chronic bacillary dysentery	...	...	...	1
Acute pericarditis	...	...	...	1
Acute pulmonary oedema	...	...	...	1
Shock following fracture of forearm	...	...	...	1
Cause unknown	...	...	...	2
				<hr/> 76

A. E. RENNER,

*Medical Officer-in-charge, Laboratory.*

18th January, 1934.

## A CASE OF SICKLE CELL ANÆMIA.

Recorded by

ATHOL J. JOHNSON, M.B., B.Ch. (CANTAB.), D.T.M. & H. (LONDON)—*Medical Officer.*E. A. RENNER, M.B., Ch.B. (EDIN.), D.T.M. (LIVERPOOL)—*Medical Officer-in-charge of Laboratory.*

We are prompted to record this case of sickle cell anæmia because of the rare occasions, if any, on which this type of anæmia has been recorded in Sierra Leone, and because of certain clinical and pathological findings which differ from those described by Russell and Taylor.<sup>1</sup>

A female patient aged about twenty years was admitted to the Connaught Hospital, Freetown, on October 29th, 1933. She was a seamstress and she gave a history of having been beaten three days previously, and on the day following her chastisement, she had vomited twice and had had pain in the chest. She showed indifference to her surroundings and no further history could be elicited.

*Examination.*—She was a small, well nourished woman of poor physique. The temperature, pulse rate and respirations were 102° F, 120 and 32 per minute. There was no evidence of the corporal punishment which she stated she had received.

Anæmia was marked and the sclerotics were distinctly yellow. The cardiac impulse was diffuse but there was no clinical evidence of enlargement of the heart. Over the apex and over the pulmonary area was a loud localized systolic murmur succeeding the first sound. The liver was not palpable, but the spleen was enlarged, firm and not tender, and extended four-and-a-half inches below the costal margin. There were small discrete and painless lymphatic glands in the left axilla and groin.

It was considered by one of us that the patient was suffering from malaria and that she might develop blackwater fever.

On the day following her admission to hospital, the following examination had been made.—

Fæces	...	...	No ova, no protozoa
Blood	...	...	No parasites
Urine	...	...	sp. gr. 1010, acid, a large amount of albumen, no sugar, bile pigments present.

<sup>1</sup> Russell, H. & Taylor, C.J.S.O. (1932) "A Case of Sickle Cell Anaemia"—*The West African Medical Journal*, Vol. V, No. 4, pp. 68-69



On November 2nd the presence of sickle cells was recognized, during a total red cell count. The following is the result of the examination of the patient's blood:—

Total red cell count	2,800,000 per c.mm.	Total white cells	6,000 per c.mm.
Hæmoglobin	35 per cent.	Polymorphonuclears	75 per cent.
Colour index	·6	Lymphocytes	19·5 per cent.
		Monocytes	1·5 per cent.
		Eosinophils	3 per cent.
		Basophils	1·0 per cent.
Normoblasts	10	in a count of 400 cells.	
Megaloblasts	20		

Sickle cells were numerous. A cover glass slide preparation sealed with vaseline and kept at room temperature for half-an-hour started to show sickling of the red corpuscles and this was completed in an hour and a-half.

#### Van der Bergh Positive Indirect Reaction.

The patient was now questioned further and she admitted to having had intermittent fever for three months and during this period she had been jaundiced, but she would not admit to having had any pain or dyspnoea, both her father and mother were dead, and no information could be obtained as to their health or causes of death. One brother had died at the age of two years and again no further information could be obtained. But the patient had two half-sisters (paternal) who were alive and stated to be well. We examined both the sisters and could find no evidence of any ill-health, and neither of their blood examinations showed sickling.

The patient was placed on a full diet and given extras and was now receiving chicken, eggs, bread, butter, fish, milk, rice, and vegetables. Hepatex (3 drachms) twice a day was prescribed, and after ten days' treatment the blood was re-examined.

Total red cell count	...	...	...	2,090,000 per c.mm.
Hæmoglobin	...	...	...	25 per cent.
Colour index	...	...	...	·6
White cell count	...	...	...	12,600 per c.mm.

In view of the expense of Hepatex and the lack of response to the treatment, it was decided to replace the liver extract by sulphate of iron grs. XV three times a day, in an acid solution. After a few days the patient complained of digestive disturbances, which were relieved by the administration of acidum hydrochloricum m xxx three times a day with meals. The blood was re-examined after this treatment had been in force for a week:—

Total red cells	...	...	...	3,260,000 per c.mm.
Hæmoglobin	...	...	...	40 per cent.
Colour index	...	...	...	·8
Total white cells	...	...	...	7,850 per c.mm.

After a further period of nine days, a blood examination showed the following result:—

Total red cells	...	...	...	3,400,000 per c.mm.
Hæmoglobin	...	...	...	35 per cent.
Colour index	...	...	...	·5
Total white cells	...	...	...	8,000 per c.mm.

The patient was discharged on December 6th, 1933, at her own request, after having been thirty-nine days in hospital. The blood was examined again on the day of her discharge:

Total red cells	...	...	...	3,100,000 per c.mm.
Hæmoglobin	...	...	...	35 per cent.
Colour index	...	...	...	·5
Total white cells	...	...	...	7,995 per c.mm.

The temperature varied between 97·8° F. and 100° F. during her stay in hospital, the peak occurring usually at 6 p.m.

A fractional test meal might have proved of interest, but we decided that such a procedure would have alarmed the patient and she would not have been willing to stay in hospital. An attempt was made to obtain blood for a Kahn Test, but a little difficulty was experienced in obtaining the blood during which the patient became very nervous and restless.

A further examination of the patient's blood was made thirteen days after her discharge from hospital, during which time she had been supplied with iron.

Total red cells	...	...	...	2,500,000 per c.mm.
Hæmoglobin	...	...	...	35 per cent.
Colour index	...	...	...	·7
Total white cells	...	...	...	7,600 per c.mm.

The jaundice was still present, though it had slightly decreased in intensity. The patient stated that she felt better, in spite of the lack of evidence of improvement.

## Tables.

## I—STAFF.

## MEDICAL STAFF.

Office.	Name.	Absent on Leave.		Remarks.
		From	To	
Director of Medical and Sanitary Service ...	J. C. S. McDouall, O.B.E. ...	17 5 33	14 10 33	Retired on 15-10-33.
Surgical Specialist ...	P. D. Oakley ...	—	—	
	Q. Stewart ...	20 4 33	29 9 33	
Senior Medical Officer	G. H. Gallagher ...	4 10 33	—	
" ...	E. S. Walls ...	20 9 33	—	
" ...	C. B. Jennings ...	—	—	
Medical Officer ...	A. W. Lewis ...	—	—	Acting M.O.H.
" ...	W. Allan ...	—	12 5 33	
" ...	R. B. Henderson ...	12 1 33	26 5 33	
" ...	H. R. F. Tweedy ...	3 5 33	13 10 33	
" ...	H. Peaston ...	14 6 33	27 10 33	
" ...	A. Cathcart ...	30 11 33	—	
" ...	W. A. Burnett ...	—	14 4 33	
" ...	A. J. Johnson ...	—	—	
" ...	A. C. Dalzell ...	—	—	
" ...	W. J. Laird ...	—	—	
African Medical Officer	E. J. Wright ...	—	—	
" ...	M. C. F. Easmon ...	12 1 33	25 1 33	
" ...	E. H. T. Cummings ...	26 12 33	—	
" ...	E. A. Renner ...	—	—	
" ...	W. B. Hughes ...	—	—	
" ...	W. F. O. Taylor ...	—	3 3 33	
" ...	M. A. S. Margai ...	—	—	

## HEALTH STAFF.

Assistant Director of Health Service ...	J. A. A. Duncan, M.C.	—	—	
Senior Health Officer	A. B. Monks ...	1 11 33	—	
Medical Officer of Health ...	vacant	—	—	
Chief Sanitary Superintendent ...	G. V. Herd ...	—	26 5 33	
Sanitary Superintendent ...	A. E. Wilkinson ...	31 5 33	13 10 33	
" ...	P. Osment ...	—	—	

## NURSING STAFF.

Senior Nursing Sister	Miss A. E. MacMaster	17 5 33	13 10 33	
" ...	Miss I. A. Marr ...	17 5 33	27 10 33	
Nursing Sister ...	Miss C. H. B. Goodwin	—	—	Resigned 15-5-33. Acting S.N.S. Connought Hosptl. 17-5-33-13-10-33. Acting S.N.S. European Hosptl. 17-5-33-27-10-33.
" ...	Miss L. D. S. McPetrie	—	—	
" ...	Miss N. M. Brown ...	—	—	
" ...	Miss M. G. Morgan	19 10 33	—	
" ...	Miss H. W. F. Young	—	—	



## AFRICAN MEDICAL SUBORDINATE STAFF.

Office.	Name.	Absent on Leave.		Remarks.
		From	To	
Chief Dispenser ...	I. H. Wright ...	—	—	Retired on 1-4-33.
" ...	M. O. Frazer ...	—	—	Promoted C.D. 1-4-33.
Assistant Chief Dispenser ...	P. J. John ...	—	—	Promoted A.C.D. 1-4-33
Hospital Warden ...	P. Q. A. John ...	—	—	
First Class Dispenser	O. V. E. J. Nylander	23 9 33	31 10 33	Retired on 1-11-33.
" "	M. P. Neville ...	17 7 33	16 9 33	
" "	I. B. Doherty ...	13 9 33	22 9 33	
" "	T. M. T. Scott ...	12 5 33	11 7 33	
" "	J. C. May ...	—	—	
" "	S. B. Williams ...	—	—	
" "	E. W. Cole ...	20 6 33	19 6 33	
" "	G. C. Heroe ...	—	—	
" "	E. F. Smith ...	—	—	
" "	W. D. Hedd ...	—	—	
Second Class Dispensers	Ten	—	—	
Third Class Dispensers	Fourteen	—	—	
Laboratory Assistant	C. H. R. Greene ...	—	—	
Male Nurses and Apprentices ...	Thirty-two	—	—	
Female Nurses and Probationers ...	Twenty-five	—	—	
Midwives ...	Two	—	—	

## AFRICAN HEALTH SUBORDINATE STAFF.

Senior Health Visitor	Miss O. T. Metzger	...	...	
Health Visitors ...	Mrs. V. Shaw Macfoy	...	...	
" " ...	Miss A. Macauley	...	...	
School Nurse ...	Vacant	...	...	
Second Grade Sanitary Inspector ...	W. E. J. Corkson ...	...	...	
Fourth Grade Sanitary Inspectors ...	Six	...	...	
Fifth Grade Sanitary Inspectors and Learners	Twenty-nine	...	...	

## MEDICAL AND HEALTH CLERICAL STAFF.

Chief Clerk ...	S. G. Randall ...	23 1 33	12 4 33	
Second Grade Clerk ...	C. B. K. Macarthy	25 8 33	24 10 33	
" " ...	J. M. Williams ...	...	...	
Senior Third Grade Clerks ...	Nine	...	...	
Junior Third Grade Clerks ...	Six	...	...	

## MEDICAL STORE-KEEPING STAFF.

Chief Store-keeper ...	K. A. King ...	...	...	
Assistant Store-keeper	E. J. Beale ...	...	...	
" "	D. J. Kawaléy ...	...	...	Died 13-11-33.

## II—FINANCE.

*1933 Estimates—Expenditure.*

## MEDICAL.

Personal Emoluments:					£
European	...	...	...	...	17,350
African	...	...	...	...	19,860
Allowances	...	...	...	...	904
Total	...	...	...	...	<u>£38,114</u>

Other Charges:					£
Medical supplies and hospital equipment	...	...	...	...	3,460
Diets, provisions, etc.	...	...	...	...	4,000
Contributions to various associations and subsidies to institutions	...	...	...	...	3,260
Passages, transport, freight, etc.	...	...	...	...	2,149
Other items	...	...	...	...	605
Total	...	...	...	...	<u>£13,474</u>

## HEALTH.

Personal Emoluments:					£
European	...	...	...	...	4,559
African	...	...	...	...	5,110
Labour	...	...	...	...	8,500
Total	...	...	...	...	<u>£18,169</u>

Other Charges:					£
Refusal disposal	...	...	...	...	700
Preventive measures	...	...	...	...	950
Transport	...	...	...	...	1,565
Other items	...	...	...	...	120
Total	...	...	...	...	<u>£3,335</u>

## RECEIPTS.

					£
Hospital fees	...	...	...	...	823
Lunatic hospital fees	...	...	...	...	192
Sale of medicines	...	...	...	...	813
Total	...	...	...	...	<u>£1,828</u>



## III—RETURN OF DISEASES AND DEATHS—EUROPEAN.

Diseases.	IN-PATIENTS.					Out-patients.
	Remaining in Hospital at end of 1932.	Total Admission.	Total Cases treated.	Deaths.	Remaining in Hospital at end of 1933.	
I—EPIDEMIC, ENDEMIC, AND INFECTIOUS DISEASES.						
1. Enteric Group :						
(a) Typhoid fever ... ..	...	1	1	...	1	1
5. Malaria :						
(a) Tertian ... ..	...	28	28	...	1	...
(b) Quartan ... ..	...	7	7	...	...	5
(c) Aestivo-autumnal ... ..	2	6	8	...	...	25
(d) Unclassified ... ..	...	1	1	...	...	12
(e) Blackwater ... ..	...	3	3	1	...	...
11. Influenza ... ..	...	2	2	...	..	...
16. Dysentery :						
(a) Amœbic ... ..	...	1	1	...	...	...
(c) Undefined or due to other causes	...	...	...	...	...	1
31. Tuberculosis, pulmonary and laryngeal ... ..	1	2	3	...	...	...
40. A.—Gonorrhœa and its complica- tions ... ..	...	...	...	...	...	4
II—GENERAL DISEASES NOT MENTIONED ABOVE.						
51. Acute rheumatism ... ..	...	2	2	...	...	...
52. Chronic rheumatism ... ..	...	...	...	...	...	14
58. Anæmia :						
(b) Other anæmias and chlorosis ...	...	2	2	...	...	17
69. Other general diseases ... ..	...	...	...	...	...	3
Auto-intoxication ... ..	...	...	...	...	...	1
Purpura hæmorrhagica ... ..	...	1	1	1	...	...
III—AFFECTIONS OF THE NERVOUS SYSTEM AND ORGANS OF THE SENSES.						
75. Paralysis :						
(b) Other paralysis ... ..	...	1	1	...	...	...
77. Other forms of mental alienation	...	2	2	...	...	...
78. Epilepsy ... ..	...	...	...	...	...	1
B.—Neuritis ... ..	...	...	...	...	...	4
C.—Neurasthenia ... ..	...	1	1	...	...	1
Carried forward ... ..	3	60	63	2	2	89

The form shows in the main the arrangement of diseases in the International Nomenclature, 1921 Edition. To save space the unimportant diseases of any class can be grouped in their places as "Other Diseases" of the class.

## EUROPEAN—continued.

Diseases.	IN-PATIENTS.					Out-patients.
	Remaining in Hospital at end of 1932.	Total Admission.	Total Cases treated.	Deaths.	Remaining in Hospital at end of 1933.	
Brought forward ...	3	60	63	2	2	89
III—AFFECTIONS OF THE NERVOUS SYSTEM AND ORGANS OF THE SENSES—continued.						
84. Other affections of the nervous system, such as paralysis agitans ...	...	3	3	...	...	...
85. Affections of the Organs of Vision :						
(a) Diseases of the eye ...	...	1	1	...	...	...
(b) Conjunctivitis ...	...	...	...	...	...	3
(c) Other affections of the eye ...	...	...	...	...	...	6
86. Affections of the ear or mastoid sinus ...	...	...	...	...	...	11
IV—AFFECTIONS OF THE CIRCULATORY SYSTEM.						
90. Other Diseases of the Heart :						
(b) Myocarditis ...	...	1	1	...	..	2
93. Diseases of the Veins :						
Hæmorrhoids ...	...	...	...	...	...	6
Phlebitis ...	...	2	2	...	...	...
94. Diseases of the Lymphatic System : Lymphadenitis, bubo (non-specific) ...	...	...	...	...	...	1
96. Other affections of the circulatory system ...	...	2	2	...	...	1
V—AFFECTIONS OF THE RESPIRATORY SYSTEM.						
97. Diseases of the Nasal Passages :						
Rhinitis ...	...	...	...	...	...	1
Coryza ...	...	...	...	...	...	22
98. Affections of the Larynx :						
Laryngitis ...	...	1	1	...	...	1
99. Bronchitis :						
(a) Acute ...	...	5	5	...	...	33
(b) Chronic ...	...	...	...	...	...	3
100. Broncho-pneumonia :	...	2	2	1	...	...
102. Pleurisy, empyema ...	...	3	3	...	1	1
105. Asthma ...	...	...	...	...	...	3
106. Pulmonary emphysema ...	...	...	...	...	...	1
107. Other affections of the lungs ...	...	...	...	...	...	2
Carried forward ...	3	80	83	3	3	186



## EUROPEAN—continued.

Diseases.	IN-PATIENTS.					Out-patients.
	Remaining in Hospital at end of 1932.	Total Admission.	Total Cases treated.	Deaths.	Remaining in Hospital at end of 1933.	
Brought forward ...	3	80	83	3	3	186
VI—DISEASES OF THE DIGESTIVE SYSTEM.						
108. A.—Diseases of Teeth or Gums :	...	...	...	...	...	1
Caries, pyorrhœa, etc. ...	...	1	1	...	...	4
B.—Other Affections of the Mouth :	...	...	...	...	...	...
Stomatitis ...	...	...	...	...	...	1
Glossitis, etc. ...	...	...	...	...	...	1
109. Affections of the Pharynx or Tonsils :	...	...	...	...	...	...
Tonsilitis ...	...	...	...	...	...	8
Pharyngitis ...	...	...	...	...	...	11
B.—Ulcer of the duodenum ...	...	...	...	...	...	1
112. Other Affections of the Stomach :	...	...	...	...	...	...
Gastritis ...	...	3	3	...	...	7
Dyspepsia, etc. ...	...	2	2	...	1	31
114. Diarrhœa and Enteritis :	...	...	...	...	...	...
Two years and over* ...	...	2	2	...	...	19
Colitis ...	...	...	...	...	...	1
115. Ankylostomiasis ...	...	4	4	...	...	2
116. Diseases due to Intestinal Parasites :	...	...	...	...	...	...
(a) Cestoda (tænia) ...	...	1	1	...	...	1
Ascaris ...	...	1	1	...	...	4
117. Appendicitis ...	...	2	2	...	...	...
B.—Other Affections of the Intestines ...	...	...	...	...	...	1
Constipation ...	...	...	...	...	...	28
124. Other Affections of the Liver :	...	...	...	...	...	...
Hepatitis ...	...	1	1	...	...	1
127. Other Affections of the digestive system ...	...	...	...	...	...	2
VII—DISEASES OF THE GENITO-URINARY SYSTEM (NON-VENEREAL).						
129. Chronic ...	...	...	...	...	...	1
131. Other affections of the kidneys	...	1	1	...	...	1
Pyelitis, etc. ...	...	4	4	...	...	1
133. Diseases of the Bladder :	...	...	...	...	...	...
Cystitis ...	...	1	1	...	...	...
Carried forward ...	3	103	106	3	4	313

## EUROPEAN—continued.

Diseases.	IN-PATIENTS.					Out-patients.
	Remaining in Hospital at end of 1932.	Total Admission.	Total Cases treated.	Deaths.	Remaining in Hospital at end of 1933.	
Brought forward ...	3	103	106	3	4	313
VII—DISEASES OF THE GENITO-URINARY SYSTEM (NON-VEREREAL), <i>continued.</i>						
134. Diseases of the Urethra :						
(b) Other ...	...	...	...	...	...	3
Orchitis ...	...	1	1	...	...	1
Ulcer of penis ...	...	...	...	...	...	1
138. Salpingitis :	...	1	1	...	...	...
Abscess of the pelvis ...	...	...	...	...	...	...
142. Mastitis ...	...	...	...	...	...	1
IX—AFFECTIONS OF THE SKIN AND CELLULAR TISSUES.						
152. Boil ...	...	1	1	...	...	8
Carbuncle ...	...	1	1	...	...	3
154. A.—Tinea ...	...	...	...	...	...	8
B.—Scabies ...	...	1	1	...	...	5
155. Other diseases of the skin ...	...	1	1	...	...	7
(a) Erythema ...	...	...	...	...	...	6
(b) Urticaria ...	...	...	...	...	...	2
(c) Eczema ...	...	...	...	...	...	5
(d) Herpes ...	...	...	...	...	...	1
(j) Ulcer ...	...	2	2	...	...	2
X—DISEASES OF BONES AND ORGANS OF LOCOMOTION (OTHER THAN TUBERCULOUS).						
157. Diseases of Joints :						
Arthritis ...	...	...	...	...	...	1
158. Other diseases of bones or organs of locomotion ...	...	...	...	...	...	2
XIV—AFFECTIONS PRODUCED BY EXTERNAL CAUSES.						
176. Attacks of Poisonous Animals :						
Insect bite ...	...	...	...	...	...	1
179. Burns (other than by fire) ...	...	...	...	...	...	1
185. Wounds (by fall) ...	...	...	...	...	...	12
201. B.—Sprain ...	...	1	1	...	...	7
202. Other external injuries ...	...	6	6	...	...	14
XV—ILL-DEFINED DISEASES.						
205. A.—Diseases not already specified or Ill-defined :						
Asthenia ...	...	1	1	...	...	2
Hyper-pyrexia ...	...	1	1	1	...	...
Undiagnosed ...	...	...	...	...	...	2
Total ...	3	118	123	4	4	408



## IV—RETURN OF DISEASES AND DEATHS—AFRICAN.

Diseases.	IN-PATIENTS.					Out-patients.
	Remaining in Hospital at end of 1932.	Total Admission.	Total Cases treated.	Deaths.	Remaining in Hospital at end of 1933.	
I—EPIDEMIC, ENDEMIC AND INFECTIOUS DISEASES.						
1. Enteric Group :						
(a) Typhoid fever ... ..	...	3	3	2	...	...
(c) Paratyphoid B. ... ..	...	2	2	...	...	...
5. Malaria :						1933
(a) Tertian ... ..	...	62	62	2	1	423
(b) Quartan ... ..	...	35	36	1	...	58
(c) Aestivo-autumnal ... ..	...	75	76	2	2	1,454
(d) Cachexia ... ..	...	...	17.4	...	...	37
(e) Unclassified ... ..	...	199	200	1	1	4,108
(f) Blackwater ... ..	...	1	1	1	...	4
6. Smallpox ... ..	9	231	240	8	...	541
Alastrim ... ..	...	18	18	3	...	5
7. Measles ... ..	...	...	14.7	...	...	526
9. Whooping cough ... ..	...	...	...	...	...	181
10. Diphtheria ... ..	...	...	...	...	...	3
11. Influenza ... ..	...	...	...	...	...	8
13. Mumps ... ..	...	...	...	...	...	8
16. Dysentery :						
(a) Amœbic ... ..	...	91	91	10	5	263
(b) Bacillary ... ..	...	4	4	...	...	8
(c) Undefined or due to other causes	...	15	15	...	...	118
20. Leprosy ... ..	15	2	17	2	11	189
22. Acute poliomyelitis ... ..	...	1	1	...	...	2
24. Epidemic cerebro-spinal fever ... ..	...	2	2	...	...	2
25. Other Epidemic Diseases :						
(b) Varicella (chicken-pox) ... ..	1	88	89	...	...	46
(f) Epidemic dropsy ... ..	...	...	...	...	...	7
(g) Yaws ... ..	8	47	55	...	2	7,610
29. Tetanus ... ..	...	20	20	2	...	10
30. Mycosis ... ..	...	1	1	...	1	1
31. Tuberculosis, pulmonary and laryngeal	2	57	59	26	1	184
32. Tuberculosis of the meninges or central nervous system ... ..	...	1	1	...	...	1
33. Tuberculosis of the intestines or peritoneum ... ..	1	2	3	2	...	...
34. Tuberculosis of the vertebral column	...	1	1	...	...	2
36. Tuberculosis of other organs :						
(a) Skin or subcutaneous tissue (Lupus) ... ..	...	2	2	1	...	...
(b) Bones ... ..	...	...	...	...	...	4
(c) Lymphatic system ... ..	...	1	1	...	...	...
38. Syphilis :						
(a) Primary ... ..	...	1	1	...	...	44
(b) Secondary ... ..	1	8	9	...	...	35
(c) Tertiary ... ..	...	39	39	1	2	411
(d) Hereditary ... ..	...	...	...	...	...	14
(e) Period not indicated	...	...	...	...	...	63
39. Soft chancre ... ..	2	12	14	...	...	119
Carried forward ... ..	42	1,021	1,063	64	27	15,965

The form shows in the main the arrangement of diseases in the International Nomenclature, 1921 Edition. To save space the unimportant diseases of any class can be grouped in their places as "Other Diseases" of the class.

## AFRICAN—continued.

Diseases.	IN-PATIENTS.					Out-patients.
	Remaining in Hospital at end of 1932.	Total Admission.	Total Cases treated.	Deaths.	Remaining in Hospital at end of 1933.	
Brought forward ...	42	1,021	1,063	64	26	15,965
I—EPIDEMIC, ENDEMIC AND INFECTIOUS DISEASES—continued.						
40. A.—Gonorrhœa and its complications	3	58	61	1	2	1,953
B.—Gonorrhœal ophthalmia ...	...	12	12	...	...	25
C.—Gonorrhœal arthritis ...	1	18	19	...	1	157
D.—Granuloma venereum ...	...	...	...	...	...	5
41. Septicæmia ...	...	8	8	8	...	...
42. Other infectious diseases ...	...	...	...	...	...	43
II—GENERAL DISEASES NOT MENTIONED ABOVE.						
44. Cancer or other malignant tumours of the stomach or liver ...	...	2	2	...	...	2
45. Cancer or other malignant tumours of the peritoneum intestines, rectum	1	...	1	...	...	...
46. Cancer or other malignant tumours of the female genital organs ...	...	1	1	1	...	4
47. Cancer or other malignant tumours of the breast ...	...	...	...	...	...	1
48. Cancer or other malignant tumours of the skin ...	...	4	4	...	1	...
49. Cancer or other malignant tumours of organs not specified ...	1	2	3	...	...	4
50. Tumours, non-malignant ...	5	43	48	5	11	131
51. Acute rheumatism ...	...	2	2	...	...	616
52. Chronic rheumatism ...	6	31	37	...	7	5,106
55. Beri-beri ...	...	4	4	...	...	...
56. Rickets ...	...	...	...	...	...	10
57. Diabetes (not including insipidus)	...	5	5	...	...	5
58. Anæmia :						
(b) Other anæmias and chlorosis ...	...	4	4	1	...	581
Avitaminosis ...	4	16	20	1	1	307
60. Diseases of the Thyroid Gland :						
(a) Exophthalmic goitre ...	...	3	3	...	...	9
(b) Other diseases of the thyroid gland, myxœdema ...	...	1	1	...	...	9
61. Diseases of the para-thyroid glands	...	...	...	...	...	2
64. Diseases of the spleen ...	...	12	12	...	1	398
65. Leukæmia :						
(a) Leukæmia ...	...	1	1	1	...	3
69. Other general diseases ...	...	1	1	...	...	138
Auto-intoxication ...	...	1	1	...	...	9
Carried forward ...	63	1,250	1,313	82	50	25,483



## AFRICAN—continued.

Diseases.	IN-PATIENTS.					Out-patients.
	Remaining in Hospital at end of 1932.	Total Admission.	Total Cases treated.	Deaths.	Remaining in Hospital at end of 1933.	
Brought forward ...	63	1,250	1,313	82	50	25,483
III—AFFECTIONS OF THE NERVOUS SYSTEM AND ORGANS OF THE SENSES.						
71. Meningitis (not including tuberculous meningitis or cerebro-spinal menin- gitis) ...	1	1	2	...	...	...
72. Locomotor ataxia ...	...	4	4	1	...	6
73. Other affections of the spinal cord ...	...	2	2	1	...	3
74. Apoplexy :	...	1	1	...	...	...
(a) Hæmorrhage ...	...	2	2	2	...	1
(c) Thrombosis ...	...	1	1	1	...	...
75. Paralysis :	...	...	...	...	...	...
(a) Hemiplegia ...	8	26	34	5	5	85
(b) Other paralysis ...	11	16	27	6	10	66
77. Other forms of mental alienation	8	18	26	2	9	16
78. Epilepsy ...	...	8	8	1	...	29
79. Eclampsia, convulsions (non-puer- pera) 5 years or over ...	...	1	1	...	...	...
80. Infantile convulsions ...	...	2	2	...	...	6
81. Chorea ...	...	1	1	...	...	2
82. A.—Hysteria ...	...	...	...	...	...	2
B.—Neuritis ...	...	1	1	...	...	116
C.—Neurasthenia ...	...	1	1	...	...	45
84. Other affections of the nervous system, such as paralysis agitans	1	9	10	...	...	232
85. Affections of the Organs of Vision :	...	...	...	...	...	...
(a) Diseases of the eye ...	1	7	8	...	5	102
(b) Conjunctivitis ...	2	36	38	...	...	766
(c) Trachoma ...	...	...	...	...	...	1
(d) Tumours of the eye ...	...	...	...	...	...	14
(e) Other affections of the eye ...	5	13	18	...	...	389
86. Affections of the ear or mastoid sinus	1	9	10	...	...	831
IV—AFFECTIONS OF THE CIRCULATORY SYSTEM.						
88. Acute endocarditis, or myocarditis	...	1	1	...	1	3
90. Other diseases of the heart ...	...	5	5	1	...	46
(a) Valvular ...	...	13	13	4	2	18
Mitral ...	...	10	10	2	1	158
Aortic ...	...	2	2	1	...	17
Tricuspid ...	...	...	...	...	...	5
(b) Myocarditis ...	1	27	28	12	4	13
91. Diseases of the Arteries :	...	...	...	...	...	...
(a) Aneurism ...	...	6	6	3	...	5
(b) Arterio-sclerosis ...	...	2	2	...	...	11
(c) Other diseases ...	...	2	2	...	...	6
93. Diseases of the Veins :	...	...	...	...	...	...
Hæmorrhoids ...	...	11	11	...	...	83
Varicose veins ...	...	1	1	...	...	5
Phlebitis ...	...	2	2	...	...	...
Carried forward ...	102	1,491	1,593	124	87	28,565

## AFRICAN—continued.

Diseases.	IN-PATIENTS.					Out-patients.
	Remaining in Hospital at end of 1932.	Total Admission.	Total Cases treated.	Deaths.	Remaining in Hospital at end of 1933.	
Brought forward ...	102	1,491	1,593	124	87	28,565
IV—AFFECTIONS OF THE CIRCULATORY SYSTEM—continued.						
94. Diseases of the Lymphatic System :						
Lymphangitis ...	...	8	8	...	...	35
Lymphadenitis, bubo (non-specific)	4	61	65	...	1	530
95. Hæmorrhage of undetermined cause	1	...	1	...	...	1
96. Other affections of the circulatory system ...	...	52	52	9	...	133
V—AFFECTIONS OF THE RESPIRATORY SYSTEM.						
97. Diseases of the Nasal Passages :						
Adenoids ...	...	1	1	...	...	16
Polypus ...	...	1	1	...	...	3
Rhinitis ...	...	2	2	...	...	58
Coryza ...	...	4	4	...	...	847
Other diseases of the nasal passages	...	4	4	...	...	19
98. Affections of the Larynx :						
Laryngitis ...	...	4	4	...	1	143
99. Bronchitis :						
(a) Acute ...	1	90	91	...	2	5,852
(b) Chronic ...	...	24	24	1	1	3,082
100. Broncho-pneumonia ...	...	41	41	10	2	41
101. Pneumonia :						
(a) Lobar ...	3	55	58	12	...	92
(b) Unclassified ...	1	21	22	2	2	69
102. Pleurisy, empyema ...	...	43	43	3	...	124
103. Congestion of the lungs ...	...	5	5	...	...	...
105. Asthma ...	...	5	5	...	...	151
106. Pulmonary emphysema ...	...	...	...	...	...	14
107. Other affections of the lungs ...	...	4	4	...	...	707
VI—DISEASES OF THE DIGESTIVE SYSTEM.						
108. A.—Diseases of teeth or gums						
Caries, pyorrhœa, etc. ...	...	9	9	...	...	1,409
B.—Other Affections of the Mouth :						
Stomatitis ...	...	3	3	...	...	301
Glossitis, etc. ...	...	1	1	...	...	59
109. Affections of the Pharynx or						
Tonsils:						
Tonsillitis ...	...	8	8	...	...	396
Pharyngitis ...	...	7	7	...	...	128
111. A.—Ulcer of the stomach ...	...	...	...	...	...	1
B.—Ulcer of the duodenum ...	...	1	1	1	...	...
112. Other Affections of the Stomach :						
Gastritis ...	...	12	12	...	1	277
Dyspepsia, etc. ...	1	11	12	...	...	3,814
Carried forward ...	113	1,968	2,081	162	97	46,867



## AFRICAN—continued.

Diseases.	IN-PATIENTS.					Out-patients.
	Remaining in Hospital at end of 1932.	Total Admission.	Total Cases treated.	Deaths.	Remaining in Hospital at end of 1933.	
Brought forward ...	113	1,968	2,081	162	97	46,867
VI—DISEASES OF THE DIGESTIVE SYSTEM—continued.						
113. Diarrhœa and Enteritis :						
Under two years ...	...	1	1	...	...	192
114. Diarrhœa and Enteritis :						
Two years and over...	2	47	49	12	...	999
Colitis ...	...	5	5	...	...	38
Ulceration ...	...	...	...	...	...	5
115. Ankylostomiasis ...	2	36	38	...	1	87
116. Diseases due to Intestinal Parasites :	...	...	...	...	...	1
(a) Cestoda (tænia) ...	...	6	6	...	...	306
(c) Nematoda (other than ankylostoma)...	...	1	1	...	...	38
Ascaris ...	1	27	28	2	2	4,273
Trichocephalus dispar ...	...	...	...	...	...	1
Dracunculus ...	...	1	1	...	...	...
Strongylus ...	...	...	...	...	...	4
Oxyuris ...	...	...	...	...	...	2
(e) Other parasites ...	...	...	...	...	...	1
117. Appendicitis ...	1	7	8	...	...	1
118. Hernia ...	19	412	431	17	32	282
119. A.—Affections of the anus, fistula, etc. ...	...	17	17	1	7	16
B.—Other affections of the intestines ...	...	1	1	...	...	13
Enteroptosis ...	...	...	...	...	...	1
Constipation ...	...	...	...	...	...	8,697
121. Hydatid of the liver ...	...	...	...	...	...	1
122. Cirrhosis of the Liver :						
(a) Alcoholic ...	...	1	1	...	...	3
(b) Other forms ...	...	10	10	1	...	3
124. Other affections of the liver ...	...	7	7	1	1	10
Abscess ...	...	8	8	2	1	5
Hepatitis ...	...	16	19	1	1	63
Cholecystitis ...	...	1	1	...	...	3
Jaundice ...	...	2	2	...	...	43
126. Peritonitis (of unknown cause) ...	...	7	7	4	...	...
127. Other affections of the digestive system ...	...	25	25	...	...	982
VII—DISEASES OF THE GENITO-URINARY SYSTEM (NON-VENEREAL).						
128. Acute nephritis ...	...	32	32	12	2	62
129. Chronic ...	...	10	10	1	2	97
130. A.—Chyluria ...	...	1	1	...	...	...
B.—Schistosomiasis ...	3	15	18	...	1	53
131. Other affections of the kidneys :						
Pyelitis, etc. ...	...	4	4	1	...	43
Carried forward ...	141	2,668	2,809	217	147	63,192

## AFRICAN—continued.

Diseases.		IN-PATIENTS.					Out-patients
		Remaining in Hospital at end of 1932.	Total Admission.	Total Cases treated.	Deaths.	Remaining in Hospital at end of 1933.	
Brought forward	...	141	2,668	2,809	217	147	63,192
VII—DISEASES OF THE GENITO-URINARY SYSTEM (NON-VEREREAL)— continued.							
133. Diseases of the Bladder:							
Cystitis ...	...	1	5	6	1	...	105
134. Diseases of the Urethra:							
(a) Stricture ...	...	1	64	65	3	8	155
(b) Other ...	...	...	19	19	1	...	237
135. Diseases of the Prostate:							
Hypertrophy ...	...	...	...	...	...	...	1
Prostatitis ...	...	...	1	1	...	1	2
136. Diseases (non-venereal) of the Genital Organs of Man:							
Epididymitis ...	...	2	1	3	...	...	58
Orchitis ...	...	...	15	15	...	1	182
Hydrocele ...	...	10	83	93	...	4	140
Ulcer of penis ...	...	1	23	24	...	1	257
Other diseases of the male genital organs ...	...	2	23	25	...	...	51
137. Cysts or other non-malignant tumours of the ovaries ...	...	2	4	6	...	...	4
138. Salpingitis ...	...	...	11	11	...	...	40
Abscess of the pelvis...	...	...	2	2	...	...	...
139. Uterine tumours (non-malignant)	...	1	18	19	...	2	32
140. Uterine hæmorrhage (non-puerperal) ...	...	...	...	...	...	...	11
141. A.—Metritis ...	...	...	5	5	...	...	83
B.—Other affections of the female genital organs ...	...	5	39	44	5	3	260
Displacements of uterus ...	...	...	1	1	...	1	3
Amenorrhœa ...	...	...	1	1	...	...	704
Dysmenorrhœa ...	...	1	2	3	...	...	268
Leucorrhœa ...	...	...	...	...	...	...	94
142. Diseases of the Breast (non-puerperal):							
Mastitis ...	...	...	3	3	...	1	95
Abscess of breast ...	...	...	4	4	...	1	16
VIII—PUERPERAL STATE.							
143. A.—Normal labour ...	...	6	290	296	3	4	9
B.—Accidents of pregnancy ...	...	...	...	...	...	...	13
(a) Abortion ...	...	...	15	15	...	1	47
(c) Other accidents of pregnancy ...	...	...	48	48	2	3	76
145. Other accidents of parturition ...	...	...	4	4	4	...	9
148. Puerperal eclampsia ...	...	...	2	2	1	...	1
149. Sequelæ of labour ...	...	...	...	...	...	...	2
150. Puerperal affections of the breast	...	...	...	...	...	...	1
Carried forward	...	173	3,353	3,526	237	178	66,150



## AFRICAN—continued.

Diseases.				IN-PATIENTS.					Out-patients.
				Remaining in Hospital at end of 1932.	Total Admission.	Total Cases treated.	Deaths.	Remaining in Hospital at end of 1933.	
Brought forward ...				173	3,353	3,526	237	178	66,150
IX—AFFECTIONS OF THE SKIN AND CELLULAR TISSUES.									
151.	Gangrene ...	...	...	...	1	1	...	...	...
152.	Boil ...	...	...	...	2	2	...	...	325
	Carbuncle ...	...	...	...	11	11	...	...	93
153.	Abscess ...	...	...	8	82	90	1	6	522
	Whitlow ...	...	...	...	22	22	...	1	305
	Cellulitis ...	...	...	2	87	89	2	9	369
154.	A.—Tinea ...	...	...	...	...	...	...	...	403
	B.—Scabies ...	...	...	1	6	7	...	...	1,197
155.	Other diseases of the skin ...	...	...	1	12	13	...	...	645
	(a) Erythema ...	...	...	...	...	...	...	...	4
	(b) Urticaria ...	...	...	...	1	1	...	...	28
	(c) Eczema ...	...	...	...	5	5	...	...	327
	(d) Herpes ...	...	...	...	...	...	...	...	36
	(e) Psoriasis ...	...	...	...	1	1	...	...	7
	(f) Elephantiasis ...	...	...	11	106	117	3	18	168
	(g) Myiasis ...	...	...	...	...	...	...	...	...
	(h) Chigoes ...	...	...	...	1	1	...	1	36
	(j) Ulcer ...	...	...	37	439	476	9	34	8,567
X—DISEASES OF BONES AND ORGANS OF LOCOMOTION (OTHER THAN TUBERCULOUS).									
156.	Diseases of Bones :								
	Osteitis ...	...	...	...	18	18	...	...	1,414
157.	Diseases of Joints :								
	Arthritis ...	...	...	4	48	52	...	5	1,749
	Synovitis ...	...	...	1	30	31	...	2	226
158.	Other diseases of bones or organs of locomotion ...	...	...	2	31	33	1	2	2,405
XI—MALFORMATIONS.									
159.	Malformations ...	...	...	...	...	...	...	...	...
	Hydrocephalus ...	...	...	...	2	2	...	1	...
XII—DISEASES OF INFANCY.									
162.	Other affections of infancy ...	...	...	...	2	2	2	...	7
XIII—AFFECTIONS OF OLD AGE.									
164.	Senility ...	...	...	...	6	6	3	...	66
	Senile dementia ...	...	...	...	...	...	...	...	4
XIV—AFFECTIONS PRODUCED BY EXTERNAL CAUSES.									
171.	Suicide by cutting or stabbing instruments ...	...	...	...	2	2	...	...	...
176.	Attacks of Poisonous Animals :								
	Snake bite ...	...	...	...	5	5	...	...	35
	Insect bite ...	...	...	...	1	1	...	...	43
177.	Other accidental poisonings ...	...	...	...	1	1	...	...	5
178.	Burns (by fire) ...	...	...	...	11	11	1	...	126
Carried forward ...				240	4,286	4,526	259	257	85,262

Diseases.	IN-PATIENTS.					Out-patients.
	Remaining in Hospital at end of 1932.	Total Admission.	Total Cases treated.	Deaths.	Remaining in Hospital at end of 1933.	
Brought forward ...	240	4,286	4,526	259	257	85,262
XIV—AFFECTIONS PRODUCED BY EXTERNAL CAUSES—continued.						
179. Burns (other than by fire) ...	1	13	14	...	...	88
182. Drowning partial ...	...	1	1	...	...	12
183. Wounds (by firearms, war excepted) ...	...	16	16	2	1	10
184. Wounds (by cutting or stabbing instruments) ...	2	41	43	2	2	1,217
185. Wounds (by fall) ...	1	14	15	2	1	246
186. Wounds (in mines or quarries) ...	...	...	...	...	...	14
187. Wounds (by machinery) ...	...	1	1	...	...	12
188. Wounds (crushing, e.g. railway accidents, etc.) ...	...	1	1	...	...	48
189. Injuries inflicted by animals, bites, kicks, etc. ...	...	120	120	2	6	535
192. B.—Hunger or thirst ...	...	12	12	2	...	2
196. Electric shock ...	...	1	1	...	...	1
201. A.—Dislocation ...	1	8	9	...	...	30
B.—Sprain ...	1	5	6	...	...	283
C.—Fracture ...	8	57	65	5	8	238
202. Other external injuries ...	...	115	115	...	4	2,715
XV—ILL-DEFINED DISEASES.						
205. A.—Diseases not already specified or ill-defined ...	...	...	...	...	...	1
Ascites ...	4	23	27	11	2	73
Edema ...	2	41	43	1	1	102
Asthenia ...	10	23	33	12	10	716
Shock ...	...	1	1	...	...	2
B.—Malingering ...	...	2	2	...	...	4
Undiagnosed ...	...	16	16	...	1	16
No appreciable disease ...	1	53	54	...	...	236
Pyrexia of uncertain origin ...	2	17	19	...	1	106
Total ...	273	4,867	5,140	298	294	91,969



## Appendixes.

### A—REPORT OF THE SURGICAL SPECIALIST.

I was on leave for five months in 1933 and the figures for the year are therefore somewhat less than for the preceding year; there has been an increase in minor operations in the out-patients theatre which has kept the total up.

The necessity for economy prevented the surgical clinic from branching out in any new direction, but the ordinary routine was not interfered with and the work went steadily on.

Q. STEWART,  
*Surgical Specialist*

### OPERATIONS AT THE CONNAUGHT AND EUROPEAN HOSPITALS IN 1933.

				Cured.	Relieved.	Unrelieved.	Died
(1) <i>Abdominal:</i>							
Herniotomy—inguinal	...	...		180	...	...	1
Herniotomy—femoral	...	...		4	...	...	...
Herniotomy—ventral	...	...		1	...	...	...
Herniotomy—strangulated	...	...		7	...	...	2
Gastro-enterostomy	...	...		1	...	...	...
Cholecystectomy	...	...		1	...	...	...
Closure of faecal fistula	...	...		2	...	...	...
Enterectomy	...	...		...	...	...	2
Appendicectomy	...	...		7	...	...	...
Colostomy	...	...		...	2	...	...
Exploratory laparotomy	...	...		2	2	3	2
Aspiration of liver for liver abscess	...	...		5	...	...	1
Aspiration of ascites	...	...		...	1	...	...
Talma-Morrison operation	...	...		...	1	...	...
(2) <i>Ano-Rectal:</i>							
Excision of fistula in ano	...	...		4	...	...	1
Excision of haemorrhoids	...	...		2	...	...	...
Dilatation of rectal stricture	...	...		...	2	...	...
Sigmoidoscopy	...	...		...	3	4	...
(3) <i>Ear, Nose and Throat:</i>							
Excision of ranula	...	...		1	...	...	...
For antral cyst	...	...		1	...	...	...
Caldwell-Luc operation	...	...		1	...	...	...
Mastoidectomy	...	...		3	...	...	1
Curettage of adenoids	...	...		4	...	...	...
Enucleation of tonsils	...	...		1	...	...	...
Oesophagoscopy	...	...		...	...	1	...
Bronchoscopy	...	...		...	...	1	...
Laryngoscopy	...	...		...	1	...	1
(4) <i>Eyes:</i>							
Extraction of cataract	...	...		6	...	...	...
Iridectomy	...	...		1	...	1	...
Excision of eye ball	...	...		3	...	...	...
(5) <i>Genito-Urinary:</i>							
Nephrectomy	...	...		1	...	...	...
Cystoscopy	...	...		...	...	8	...
Excision of scrotum for elephantiasis	...	...		30	...	...	...
Excision of hypertrophied scrotum	...	...		27	...	...	...
Radical cure of hydrocele	...	...		88	...	...	1
Tapping and injection of hydrocele	...	...		...	2	...	...
Suprapubic puncture of bladder	...	...		...	4	...	...
Suprapubic cystostomy for drainage of bladder	...	...		2	...	...	...
Catheterisation	...	...		...	23	...	...
Dilatation of stricture	...	...		...	161	...	2
Removal of vesical calculus	...	...		1	...	...	...
Removal of foreign body from bladder	...	...		1	...	...	...
Amputation of penis	...	...		1	...	...	...
Excision of urethral fistulae	...	...		...	2	...	...
Circumcision	...	...		21	...	...	...
Orchidectomy	...	...		10	...	...	...
Vasostomy	...	...		...	2	...	...
(6) <i>Gynaecological:</i>							
Examination under anaesthesia	...	...		...	...	2	...
Hysterectomy	...	...		12	...	...	1
Myomectomy	...	...		4	...	...	1
Curettage	...	...		12	...	...	...
Induction of labour	...	...		1	...	...	...
Cæsarean section	...	...		1	...	...	...
Excision of vulval elephantiasis	...	...		1	...	...	...

## OPERATIONS AT THE CONNAUGHT HOSPITAL—continued.

(6) *Gynaecological—continued:*

		Cured.	Relieved.	Unrelieved.	Died.
Gilliams operation for retro-flexion	...	1	...	...	...
Excision of broad ligament cyst	...	1	...	...	...
Excision of ovarian cyst	...	2	...	...	...
Salpingo-oophorectomy	...	2	...	...	...
Cauterisation of cervix	...	2	...	...	...
Perineorrhaphy	...	1	...	...	...
Colporrhaphy	...	1	...	...	...
Excision of elephantiasis of breast	...	1	...	...	...
Excision of breast	...	1	...	...	...
Repair of vesico-vaginal fistula	...	1	...	1	...
Repair of recto-vaginal fistula	...	2	...	...	...

(7) *Head and Neck:*

Excision of goundon	...	2	...	...	...
Excision of cystic tumours, jaw	...	7	...	...	...
Excision of follicular odontome	...	1	...	...	...
Repair of hare-lip	...	...	...	...	1
Decompression of brain	...	...	...	...	1
Drainage of brain abscess	...	...	...	...	1
Thyroidectomy for goitre	...	2	...	...	...
Ligature of c. carotid artery	...	1	...	...	...
Ligature of innominate	...	...	...	...	1

(8) *Miscellaneous:*

Drainage of septic conditions	...	317	...	...	2
Excision of glands	...	10	...	...	...
Excision of ganglia	...	1	...	...	...
Suture of wounds	...	330	...	...	...
Aspiration of pleura	...	2	...	...	...
Drainage of empyema	...	2	...	...	...
Extraction of teeth	...	259	...	...	...
Excision of cysts	...	9	...	...	...
Removal of foreign bodies	...	42	...	...	...

(9) *Orthopædics:*

Reduction of fractures and separated epiphyses	...	28	...	...	...
Reduction of dislocations	...	11	...	...	...
Extension of fractures by means of pins	...	5	...	...	...
Laminectomy	...	...	...	1	...
Drainage and sequestrectomy for osteomyelitis	...	6	...	...	1
Excision of giant-celled tumour, femur	...	1	...	...	...
Drainage of arthritis	...	2	...	...	...
Breaking down of adhesions in joints	...	...	9	...	...
Tendon lengthening	...	...	2	...	...
Tendon suture	...	1	...	...	...
Nerve suture	...	1	...	...	...
Amputation of leg	...	3	...	...	...
„ toe	...	13	...	...	...
„ arm	...	...	...	...	1
„ finger	...	8	...	...	...
Plaster cases	...	...	12	...	...

(10) *Skin and Subcutaneous Tissues:*

Excision of ulcers	...	8	...	...	...
Excision of elephantiasis, leg	...	...	2	...	...
Skin grafting-Tiersch	...	18	...	...	...
Skin-grafting-tube pedicle	...	2	...	...	...
Plastic operation	...	2	...	...	...
Removal of nails	...	9	...	...	...
Excision of non-malignant tumours	...	20	...	...	...

Total	...	1,588	231	22	24
-------	-----	-------	-----	----	----

NOTE.—(a) Dilatations of stricture of the urethra and rectum are placed under the heading “Relieved” in all cases.

(b) Diagnostic procedures such as cystoscopy and sigmoidoscopy are placed under the heading “Unrelieved.”



## OPERATIONS PERFORMED ON EUROPEANS.

				Cured.	Relieved.	Unrelieved.	Died.
Appendicectomy	...	...	...	1	...	...	...
Excision of simple tumours	...	...	...	1	...	...	...
Suture of wounds	...	...	...	2	...	...	...
Suture of tendons	...	...	...	1	...	...	...
Excision of cyst	...	...	...	1	...	...	...
Dislocation of elbow	...	...	...	1	...	...	...
Extraction of teeth	...	...	...	2	...	...	...
Amputation of finger	...	...	...	1	...	...	...
Drainage of septic conditions	...	...	...	1	...	...	...
Sigmoidoscopy	...	...	...	...	...	1	...
Total				11	...	1	...

Percentage of deaths	...	...	...	...	...	1.2
Number of operations in 1926	...	...	...	...	...	29
" " " " 1927	...	...	...	...	...	257
" " " " 1928	...	...	...	...	...	755
" " " " 1929	...	...	...	...	...	761
" " " " 1930	...	...	...	...	...	1,566
" " " " 1931	...	...	...	...	...	1,410
" " " " 1932	...	...	...	...	...	1,913
" " " " 1933	...	...	...	...	...	1,877

*Anæsthetics:*

Spinal	...	...	...	...	...	397
Ethyl chloride	...	...	...	...	...	121
Chloroform	...	...	...	...	...	169
Local	...	...	...	...	...	309
Rectal	...	...	...	...	...	7
Intravenous	...	...	...	...	...	3
Total				...	...	1,006

## B—MATERNITY WARD—CONNAUGHT HOSPITAL.

(240)

During the year 382 patients were admitted to the Ward, of which number 281 gave birth and 101 were complicated pregnancies or patients delivered before admission. The 281 cases were of the following nationalities:—

Creoles	...	...	...	...	...	171
Kroos	...	...	...	...	...	70
Timne	...	...	...	...	...	11
Mendes	...	...	...	...	...	12
Mandingoes	...	...	...	...	...	4
Loko	...	...	...	...	...	1
Limba	...	...	...	...	...	7
Susu	...	...	...	...	...	5
						<hr/> 281 <hr/>

(241)

There were 99 primigravidae and 182 multigravidae who gave birth to 291 children, there being eight twin births and one set of triplets.

Of the 281 labour cases, 70 were abnormal. The following list gives the salient features making the cases abnormal:—

Abnormality.	No.	Remarks.
Torn perinaeum	17	Sutured
Premature labour	9	—
Dead birth	7	One impacted shoulder
Footling	1	Premature, child lived
Breech	6	—
Miscarriage late in pregnancy	4	One 22 weeks, lived 6½ hours. One retained placenta removed under anæsthetic.
Forceps	3	One flat pelvis with large child 11 lbs.
Accidental hæmorrhage	3	—
Concealed accidental hæmorrhage	1	Dead-birth.
Central placenta prævia	1	Dead-born.
Lateral placenta prævia	1	Living child.
Craniotomy	2	Obstructed labour at home, 2 days.
Shoulder presentation	1	Internal version: still-birth.
Triplets	1	All dead-born.
Post-partem eclampsia	1	Recovered.
Episiotomy	1	—
Ruptured uterus	1	Hysterectomy—recovered.
Pyæmic abscesses	1	Maternal death two weeks after delivery.
Pneumonia and pyelitis	1	Maternal death on 2nd day of puerperium.

Of the 281 children born in the Ward, one was still-born, 18 dead-born and 19 died before being discharged from hospital. The following table gives the salient feature (maternal or fetal) of each of these cases where known:—

Stillbirth.	Dead-birth.	Died after Birth.
1 breech	3 Triplets	5 Twins
	1 Twin	2 Premature.
	2 Craniotomy	1 Atelectasis.
	1 Concealed accidental hæmorrhage	1 Placenta prævia.
	1 A. P. H.	10 No feature.
	1 Placenta prævia	
	1 Breech	
	1 Shoulder	
	7 No feature	
<hr/> 1 <hr/>	<hr/> 18 <hr/>	<hr/> 19 <hr/>

(1) There were two maternal deaths:—

1. *Pneumonia*—pyelitis.
2. *Pyæmia*—Admitted for tumour complicating pregnancy. Post-mortem revealed pyæmic abscess of liver and kidneys.



The following list is of 101 complicated pregnancies and cases admitted during the puerperium:—

Bronchitis	...	...	...	...	...	7
False pains	...	...	...	...	...	18
Severe avitaminosis	...	...	...	...	...	11
Observation	...	...	...	...	...	26
Albuminuria	...	...	...	...	...	8
Clinical malaria	...	...	...	...	...	2
A. P. H.	...	...	...	...	...	3
Pneumonia	...	...	...	...	...	2
Complete abortion	...	...	...	...	...	2
M. T. Malaria	...	...	...	...	...	6
Contusion vulva	...	...	...	...	...	1
Incomplete abortion	...	...	...	...	...	2
Pyrexia	...	...	...	...	...	3
Quartan malaria	...	...	...	...	...	4
Pre-eclampsia	...	...	...	...	...	1
Threatened abortion	...	...	...	...	...	2
Vaginitis	...	...	...	...	...	1
P. P. H.	...	...	...	...	...	2
Enteritis	...	...	...	...	...	1
B. B. A.	...	...	...	...	...	2
Ascariasis	...	...	...	...	...	1
Retained placenta	...	...	...	...	...	1
Hemiplegia following parturition	...	...	...	...	...	1

There was one death among these cases—post-partum hæmorrhage—delivered at home and brought to hospital moribund.

E. J. WRIGHT,  
*Medical Officer.*

### C—CLINICAL REPORTS.

#### ANTE-NATAL CLINIC.

A weekly clinic was held at 99, Campbell Street on Tuesdays and was attended by patients from the city and adjacent villages. Patients requiring and desiring institutional treatment were sent to the maternity ward at the Connaught Hospital.

There were 567 individuals registered during the year and of this number 494 were found to be actually pregnant—159 were primigravidae and 335 multigravidae. Of this number 200 patients were delivered at the Connaught Hospital. The following table shows the attendances at the clinics month by month:—

Month.			New Cases.	Repeated Visits.	Total.
January	...	...	48	303	351
February	...	...	43	260	303
March	...	...	37	272	309
April	...	...	33	224	257
May	...	...	66	318	384
June	...	...	38	278	316
July	...	...	39	288	327
August	...	...	60	393	453
September	...	...	50	337	387
October	...	...	58	457	515
November	...	...	57	316	373
December	...	...	38	235	273
Total	...	...	567 ✓	3,681	4,248 ✓

The work done at this clinic is steadily increasing and may need an extra session a week to enable all the patients to receive adequate attention.

E. J. WRIGHT,  
*Medical Officer.*

## POST-NATAL CLINIC.

This clinic was started on July 1st this year, was held weekly and was intended primarily for the surveillance and treatment of patients discharged from the maternity ward of the Connaught Hospital.

Patients who have delivered at home are also encouraged to attend. So far, it has been the policy to keep mother and baby attending for one month, after which the mother is discharged if fit and the baby drafted to the Infant Welfare Clinic.

The following table gives the number of individuals and subsequent attendances at this clinic. The numbers have steadily increased since its inception, but will never grow unwieldy on account of the policy of discharging patients from the clinic after four weeks observation:—

*Record of Attendances, July—December, 1933.*

Date.	New Cases.	Repeated Visits.	Total.
July ... ..	8	—	8
August ... ..	15	12	27
September ... ..	21	32	53
October ... ..	19	35	54
November ... ..	29	44	73
December ... ..	29	43	72
Total ... ..	121 ✓	166	287 ✓

E. J. WRIGHT,  
*Medical Officer.*

## D—REPORT ON INFANT WELFARE.

This work has been carried on in the Central, East and West Wards of the city with centres at the Connaught Hospital, Princess Christian Mission Hospital and 99, Campbell Street. The staff consists of three health visitors and their method of working is as follows: Each health visitor has a city ward for which she is responsible and once a week receives from the Registrar of Births a list of the names and addresses of all newly-registered births and these she makes it her duty to visit as early as possible—if a doctor or midwife is found to be in attendance the health visitor naturally withdraws her attentions unless specially asked to continue. Whilst she is making these domiciliary visits she pays attention to any child within clinic age, i.e. up to three years, that she comes across and at the same time urges regular attendance at the infant clinics, as well as at the ante-natal clinic; she directs mothers who have attended the ante-natal clinic and given birth at home to attend the post-natal clinic which was started this year.

This report will only deal with work done at the West and Central clinics—the work of the East Ward is in charge of the Medical Officer at the Princess Christian Mission Hospital.

During the year, 764 individuals attended the clinics and their total number of subsequent attendances was 11,068. The following table shows the age at which the 764 individuals first attended the clinics. The information seems satisfactory with the exception of the increase in the number of children brought to the clinics when under seven days old. For easy comparison the figures for 1931 and 1932 are placed alongside.

TABLE I.

*Ages at which children first attended Infant Welfare Clinic.*

Age.	1931.	1932.	1933.
Under 1 week ... ..	1	27	60
" 2 weeks ... ..	30	100	109
" 1 month ... ..	128	159	156
1- 3 months ... ..	158	167	161
3- 6 months ... ..	125	94	58
6-12 months ... ..	105	113	94
1- 2 years ... ..	107	116	80
2- 3 years ... ..	68	30	46
Total ... ..	722	806 ✓	764 ✓



The large number (60) of newly-born children attending is undoubtedly the result of increased interest taken in the clinics but certainly calls for investigation and necessary action; for it is obviously undesirable that mother and child should be out so early during the puerperium. Whilst considering this matter, it should be realized that although a great deal of the infant mortality takes place during the first two weeks of life, the majority of births are not notified within four days, consequently a number of the mothers are out before they receive the advice of the health visitors (*see* note under Table H in Section II (b) Vital Statistics).

The next table shows the number of old cases and new cases attending each clinic month by month and it can be presumed from a survey of these figures that the number of attendances varies according to the healthiness of the season. It will be seen that during the rains, the number of attendances increases.

TABLE II.  
*Record of Attendances—January to December, 1933.*

Connaught Hospital.				Campbell Street.			
Month.	Old Cases.	New Cases.	Total.	Month.	Old Cases.	New Cases.	Total.
January ...	308	33	341	January ...	430	24	454
February ...	314	38	352	February ...	415	30	445
March ...	356	44	400	March ...	472	35	507
April ...	256	31	287	April ...	372	29	401
May ...	362	20	382	May ...	469	32	501
June ...	474	37	511	June ...	368	36	404
July ...	342	21	363	July ...	523	39	562
August ...	383	24	407	August ...	479	39	518
September ...	472	41	513	September ...	533	32	565
October ...	482	34	516	October ...	683	37	720
November ...	346	33	379	November ...	584	30	614
December ...	429	21	450	December ...	452	24	476
Total ...	4,524	377 ✓	4,901 ✓	Total ...	5,780	387 ✓	6,167 ✓

Table III is a record of the visits paid by the health visitors in the Central and West Wards month by month during the year.—

TABLE III.

Month.	Newly-born.	New Cases.	Repeated Visits.
January ...	57	32	481
February ...	71	35	382
March ...	62	36	474
April ...	58	26	350
May ...	58	21	432
June ...	51	26	409
July ...	65	30	492
August ...	61	43	335
September ...	63	28	369
October ...	75	30	338
November ...	58	20	384
December ...	69	21	412
Total ...	748 ✓	348 ✓	4,858 ✓

No attempt is made to classify the diseases seen at the clinics—so many are baby ailments which nevertheless require treatment; but more important is the fact that an individual during the year will run through the best part of the list of ailments, which even, if possible to record, would be of little value. Malaria, malnutrition, bronchitis, helminthiasis, skin eruptions and constipation continue to be the most frequent ailments.

There were 1,378 births registered in the Freetown area with 317 infantile deaths (under twelve months of age), which gives an infant mortality rate of 230 for Freetown for the year. Last year there was a reduction of 17 in the infant mortality rate and it was recorded that when it is remembered that there is a direct relation between poverty and infantile mortality, even this small reduction is gratifying.

This year there is a reduction of 42 in the infant mortality rate.



For comparison the infant mortality rate for the last six years is given:—

Year.	Births Registered.	Deaths under Twelve Months.	Infant Mortality Rate.
1928	1,036	377	364
1929	1,093	349	319
1930	1,102	371	336
1931	1,263	365	289
1932	1,276	348	272
1933	1,378	317	230

E. J. WRIGHT,  
*Medical Officer.*

### E—SPINAL ANÆSTHESIA WITH SPECIAL REFERENCE TO STOVAINE.

*By Q. STEWART, F.R.C.S.E.*

I should have thought that the use of "spinal" would have been universal throughout the West African Medical Service, but I am told by a Senior Medical Administrator that during his out-station inspections he does not find it as popular as he thinks it ought to be.

I am somewhat surprised to learn this and, although I have nothing new to say on the subject, it might be helpful to offer to men unfamiliar with the use of "spinal" the experience of an enthusiast.

I have been employing this form of anaesthesia for many years and have given it over 2,000 times in the last five years. Within certain definite limitations I think there is nothing to touch it for routine use in West Africa, especially in stations where a skilled anaesthetist is not available.

#### LIMITATIONS.

There are two main limitations to the use of spinal anaesthesia, one anatomical, the other clinical. The anatomical confines, by general consensus of opinion, its use to that part of the body below the diaphragm. Various people have used it above this level and Koster and Kasam<sup>1</sup> advocated it even for head operations, but they have not been followed to any extent by other authorities. I have tried high spinal without untoward results, but I am convinced that with the drugs available at present spinal anaesthesia for work above the diaphragm is unsafe.

The main clinical contra-indication, since all the intrathecal anaesthetics in use lower the blood pressure, is a pressure below 105 mm. Hg. Other contra-indications are shock, myocardial degeneration, and disease of the central nervous system.

Extremes of age are no bar—"spinal" is very useful in infants with intussusception<sup>2</sup> and elderly people do well with it.

#### STOVAINE.

Stovaine was one of the first drugs to be used intrathecally for the production of anaesthesia, and I began to employ it early in my medical career. I have had no reason to complain of it and have continued to use it.

Stovaine has the reputation of being toxic, among its delinquencies are said to be a high mortality, paresis of the lower limbs, paresis of eye muscles, and difficulties of micturition, but I cannot say that any of these have been troublesome in my experience. I have had of course the very occasional death that one sees with any anaesthetic sooner or later, and I have in one case had a complaint of micturition difficulty which persisted for a few weeks, but apart from these there have been no serious after-effects.

#### ADVANTAGES.

The technique of stovaine administration is simple; its action is quick—the operation can be begun right away; muscular relaxation is excellent; and—no small consideration in these days—it is cheap, costing approximately 5d. an ampoule.

#### DISADVANTAGES.

There is one disadvantage peculiar to stovaine, a relatively short duration of anaesthesia. Like other intrathecal anaesthetics it varies in its duration, but for operations below the umbilicus at all events I rarely find the time it gives insufficient, even although a combined operation, such as a large double hernia with excision of scrotum, is being



undertaken. There is, however, nothing against carrying on with chloroform in the event of the spinal giving out before the operation is completed. My only objection to this is, that there is usually a stage of struggling during the  $\text{CHCl}_3$  induction which necessitates a short break in the operation.

For operations of any duration in the upper abdomen I am now using percaine, the action of which is prolonged. Percaine requires a somewhat different technique and this has been admirably set forth by Blair Aitken in the *West African Medical Journal*.<sup>3</sup>

#### PRE-OPERATIVE TREATMENT.

It is well to see that the lower bowel is clear, as one result of "spinal" may be to cause a bowel action on the table. Aperients and enemata effect this along with some restriction of diet—drastic purgation is quite unnecessary. For operations in the perineal region, such as hæmorrhoidectomy, it is advisable to be specially careful, and as an additional safeguard XV m. of Tinct. Opii. is given overnight by the mouth.

Unless there is some special indication, none of my male cases receive pre-operative hypnotics; on the other hand female cases receive as a routine a hypodermic injection containing—

Morphia gr.  $\frac{1}{4}$   
Atropine gr. 1/120  
Hyoscine gr. 1/100.

This is given three-quarters of an hour before operation. Under special circumstances, such as in a very apprehensive individual, one of the barbiturates, such as nembutal in a dose of  $1\frac{1}{2}$  grain in capsule by the mouth, is given the night before and possibly repeated with or without morphia before operation. If premedication is given the ears are plugged and the eyes bandaged at the same time. It is only the question of expense that makes it impossible to use as one would like to do in every case one or other of the methods of putting the patient to sleep in bed beforehand, and thus getting over the pre-operative fear, the harrowing journey to the theatre, and the discomfort associated with the anæsthetic induction. It is unwise to give before spinal anæsthesia pre-operative hypnotics such as intravenous nembutal which lower the blood pressure.

Recovery is quick and few if any bad after-effects are seen—vomiting is rare and the patient in the average case is soon calling for food or drink, nor is there any reason to withhold these except in special cases.

#### FORMULA AND DOSAGE.

The particular preparation of stovaine that I employ has the following formula:—

Stovaine	...	...	...	0.10 gramme
Glucose	...	...	...	0.10 gramme
Aq. destillat ad	...	...	...	2 c.c.s.

It is issued in 2 c.c. ampoules by Messrs. May and Baker.

I have also used stovaine powder, getting it made up in the dispensary as a saline solution, but I find the ampoules handy and sterile. The dosage from the ampoule ranges from 4 c.c.s. to 1.75 c.c. The average amount I use in adults is 1.25 c.c. and I increase or diminish it according to the height of anæsthesia required and the estimated length of operation. The maximum dose I employ is 1.75 c.c.s.

I have not had occasion to use stovaine in infants.

#### INSTRUMENTS REQUIRED.

These are—

- 1 2 c.c. syringe with hypodermic needle
- 1 2 c.c. syringe with lumbar puncture needle
- 1 stilette for L.P. needle
- 1 spare lumbar puncture needle
- 1 sharp pointed knife e.g. Von Graefe or tenotomy.

#### TECHNIQUE.

The patient being on the table he is turned on to his right side and his back arched by an assistant approximating the knees and shoulders, at the same time keeping the shoulders level, as any sluing round of one shoulder will twist the spine.

The skin of the area involved is iodined and the sister places a small sterile towel over the iliac bone. With the fingers of his left hand palpating the crest of the ilium the surgeon feels with his thumb for the vertebral interval in the line of the crest, i.e. between L. 4 and 5, either this interval may be used or either of the two immediately above (the spinal medulla may finish between L. 1 and 2). At the same time he extends his right hand for the assistant to place therein a 2 c.c. syringe charged with  $\frac{1}{2}$  per cent. novocaine, then



removing his left thumb he raises a wheal of novocaine exactly in the mid-line at the marked spot—extending his right hand again for removal of the syringe and substitution of the knife he makes a nick through the centre of the wheal—again the hand is extended and the knife being replaced by the lumbar puncture needle without its stylet the needle is introduced through the nick straight into the canal—it can usually be felt to pierce the dura on its way.

Immediately cerebro-spinal fluid flows further entry should cease, otherwise the anterior bony wall of the canal will be run up against and pain and perhaps hæmorrhage caused. Whenever the fluid is seen to run freely it should be immediately stopped with the left thumb over the end of the needle, and the right hand having received the second syringe charged with stovaine introduces the requisite dose. By this technique the eye can be kept constantly on the particular spot.

The table is now tilted into a slight head down position for about a couple of minutes after which the operation position can be assumed—full Trendelenburg if necessary—and the operation proceeded with.

#### DIFFICULTIES.

In the average case one seldom has any difficulty, but now and again, for one reason or another, it may not be easy to get in at the first attempt—the patient may be abnormally fat or the spine may be deformed. At this stage, therefore, a few hints with regard to difficult cases may be indicated.

1. If the needle comes up against bone it will be necessary to change its direction upwards or downwards without withdrawing it.
2. If entrance through one interval is not successful don't persist but try one above or below.
3. Failing to get in in the horizontal try again with the patient in the sitting position.
4. Never inject the drug without seeing the cerebro-spinal fluid flow freely—not that it is likely to do any harm but it probably won't get inside the theca and anaesthesia will be lacking.
5. When apparently in the canal and no fluid comes, first rotate the needle; this may send it through the membranes and allow the flow; if not, insert the stylet—if these fail try another interval.
6. If pure blood appears try another interval.
7. If blood is mixed with the cerebro-spinal fluid it will be well to try another interval as anaesthesia is likely to be incomplete.

The knack of the successful lumbar puncture is soon acquired if one is doing any number and I cannot remember a case in which I have had to give up. As regards the resulting anaesthesia it is very exceptional to have a bad result, occasionally there may be a little delay.

#### COMPLICATIONS.

During operation there may be a fall of blood pressure to a greater or lesser extent perhaps accompanied by a feeling of faintness and nausea or actual vomiting, this is not usually seen unless in the large doses and high anaesthetics. To counteract this the main thing is to lower the head end of the table, and ephedrine or pituitrin may be given hypodermically.

In the rare case of serious collapse which persists in spite of the above treatment and which is likely to be the result of the operative procedure as much as or more than the anaesthesia, I find that intravenous saline with 10–15m. of adrenaline solution in the first few ounces is the most useful form of restoring the circulation.

In a certain small percentage of cases headache and pain in the back of the neck is troublesome after operation—this may be counteracted to some extent by preventing loss of cerebro-spinal fluid at the time of the puncture, by using needles of small calibre, and by keeping the head low following the puncture and for at least 24 hours after by raising the foot of the bed and not allowing pillows.

If headache is present a phenacetine-aspirin-caffein combination may be given, and if it persists an endeavour should be made to lower the cerebro-spinal fluid pressure by the use of magnesium sulphate per rectum, and lastly by lumbar puncture and removal of a small amount of fluid. But these latter measures are seldom if ever called for in my experience.

#### LOW SPINAL.

It is advantageous in certain cases to confine the anaesthesia to the perineal region in which many gynaecological, genito-urinary and rectal operations are located. In my own practice I find its greatest indication in the passage of bougies and cystoscopes, circumcisions, and in hæmorrhoids, fissures, and sinuses. It is not suitable for operations on the testicle as this is not supplied by the sacral nerves.



The advantages are that owing to the small nervous area involved there is no fall in blood pressure, and there is therefore no necessity to lower the patient's head—further there is not that tendency to faintness and vomiting sometimes seen in higher "spinals." It is especially useful in out-patient work as the patient after lying for an hour or two can go home.

A preliminary narcotic may or may not be given about three-quarter of an hour beforehand—I rarely use one. The lumbar puncture is made in the sitting position with the usual technique. The space between L. 4 and L. 5 is the site for choice, but if it is not easy to locate as in the case of a fat person any interval from L. 2 to the sacrum will do, although the higher the introduction the higher the anaesthesia. The only nerves affected as a rule are S 2, 3, 4, 5, this means that a saddle-shaped area of anaesthesia will be present in the perineum, along with anaesthesia of the penis and scrotum. Movement and sensation are not interfered with in the legs. If the injection is made between L. 2 and L. 3 there is usually some action on the legs. The extent of anaesthesia will also vary of course with the dosage—4 c.cm. to 7 c.cm., according to the particular operation.

The injection is made slowly and the sitting position retained for two minutes in order to keep the stovaine solution with its relatively high specific gravity low and give it time to become fixed to the nerve area aimed at. The patient may now be placed in any position desired and the operation proceeded with.

On leaving the table the patient should be carried with the head low to a bed or couch and retained in a head-low position for an hour or two at least before leaving hospital.

#### DISCUSSION.

It might be relevant at this stage to touch on one or two points in regard to theoretical considerations in the use of spinal anaesthesia.

A great deal has been written about solutions of greater and lesser specific gravity, than cerebro-spinal fluid, and about the behaviour of these hyperbaric and hypobaric solutions when injected into the spinal canal, especially with regard to their controllability; much of this matter is arguable and some of it has been discounted. The position has perhaps been best stated and clarified by Howard Jones.<sup>4</sup>

As regards the stovaine glucose preparation used, it is hyperbaric S.G. 1023 (average S.G. of cerebro-spinal fluid 1007) and is acted on by gravity in relation to the spinal fluid. Therefrom it tends to proceed towards the cephalic end of the spine when the Trendelenburg position is assumed and might be expected to affect the higher centres and be dangerous—in actual practice with the doses used this does not occur, and the probability is that by absorption, diffusion in the spinal fluid, and retention in the dorsal curve, it loses its vulnerability before it reaches, if it ever does, the higher centres.

To show that statements to the contrary are made, let me quote Hamilton Bailey's *Emergency Surgery* 1930. "Use stovaine in saline not the older preparation stovaine in glucose . . . the latter owing to its higher specific gravity does not allow tilting of the table by the head, for if it were done, the stovaine would gravitate to the medulla and kill the patient." To show the falsity of this statement it may be said first that the stovaine in saline has a higher specific gravity than the stovaine in glucose<sup>1</sup> and second that I have proceeded to fully Trendelenburg my patients in gynaecological cases after stovaine glucose for many years without such dire results.

#### SUMMARY.

1. The advantages of spinal anaesthesia for use in West Africa have been set forth.
2. Stovaine has been specified.
3. A simple technique has been demonstrated.
4. Pre-operative and post-operative treatment has been considered.
5. Theoretical points have been discussed and a fallacy exposed.

#### CONCLUSION.

To my mind, then, the claim of spinal to be the routine anaesthesia in West Africa cannot be ignored. Its advantages are so obvious: first and foremost no anaesthetist is required, the surgeon himself gives the anaesthesia; its technique is simple; it is safe and reasonably certain in action; little pre-operative and less post-operative treatment is required, thus relieving the nursing staff; and lastly it saves money.

#### BIBLIOGRAPHY.

1. *Koster and Kasman*. Spinal Anaesthesia for the Head, Neck and Thorax. *Surg. Gynec. and Obst.* 1929 XLIX 617.
2. *Hamilton Bailey*. Spinal Anaesthesia in Intussusception of Infants. *Lancet* September, 1926. 648.
3. *Blair Aitken*. A Note on Spinal Anaesthesia by Percaine. *West African Medical Journal*, October, 1932.
4. *Howard Jones*. Subarachnoid Block. *British Medical Journal*, 1933. II 488.

APPENDIX F.  
FREETOWN METEOROLOGICAL OBSERVATIONS—(TOWER HILL OBSERVATORY).

	Month.	Mean Pressure.	AIR TEMPERATURE.				Relative Humidity. 9 a.m.	RAINFALL.					
			9 a.m.	Mean.	Means of Absolute.			Total.	Maximum.	Date.	Number of Days Rain.		
					Minimum. Maximum. Minimum. Maximum.								
					Minimum.	Maximum.						Minimum.	Maximum.
Latitude 8° 27' N Longitude 13° 9' W Height above M.S.L. Barometer Cistern 224 feet Site of Rain Gauge 115 feet	January February March April May June July August September October November December YEAR ...	29.909 29.905 29.885 29.892 29.944 29.949 29.979 29.984 29.971 29.946 29.883 29.915 29.930	77.8 78.5 80.5 83.2 82.3 78.3 77.0 76.1 77.5 79.4 78.4 78.7 78.9	80.8 81.0 82.8 83.1 82.8 78.7 76.3 73.9 75.2 76.6 75.7 76.6 78.6	74.5 74.4 76.3 76.0 76.2 72.4 70.0 66.9 67.1 66.9 67.1 67.6 71.2	87.2 86.5 89.3 90.3 89.5 85.0 82.7 80.9 83.4 86.3 84.8 85.6 85.9	69 69 72 71 70 66 65 64 63 64 62 64 66.6	93 90 92 93 93 89 87 86 86 88 89 89 89	89.7 86.6 82.7 77.7 83.2 86.7 93.0 90.8 89.8 82.3 87.0 73.1 85.2	— 0.57 0.21 3.72 3.65 30.01 31.76 37.45 15.63 7.78 13.12 1.23 145.13	— 0.53 0.11 0.85 1.93 6.30 4.68 4.16 2.54 1.02 2.50 0.72 6.30	— 14th 28th 25th 8th 6th 5th 5th 4th 1st 21st 7th 6th June	— 3 2 11 13 29 26 31 25 23 19 6 188



APPENDIX G.

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Rainfall in Freetown

1882—1933

BY

Decennial Periods

## APPENDIX G.

## Rainfall.

MONTH.	1882.	1883.	1884.	1885.	1886.	1887.	1888.	1889.	1890.	1891.	Average 10 years.
January ...	1.50	—	—	.32	.11	.55	1.93	—	—	—	.44
February ...	—	.66	.62	.30	—	—	—	.26	.24	—	.21
March ...	.45	—	.37	1.26	.05	3.28	.98	.98	—	—	.74
April ...	1.48	5.70	4.04	1.16	7.93	6.24	3.93	3.63	3.97	9.32	4.76
May ...	4.27	25.29	12.91	8.03	13.74	8.16	7.96	10.06	10.48	12.72	11.36
June ...	11.04	47.99	28.67	19.84	15.29	19.09	18.59	23.10	16.87	24.98	22.55
July ...	16.89	46.25	27.63	42.99	39.59	28.49	35.96	45.93	21.80	32.07	33.26
August ...	20.49	27.84	31.53	47.51	54.17	23.50	34.88	61.13	40.65	31.02	37.27
September ...	32.31	28.56	20.41	29.15	32.88	39.52	37.11	26.27	31.17	40.20	33.76
October ...	8.70	14.74	11.42	8.59	16.52	21.07	19.17	11.18	8.45	11.75	13.16
November ...	4.61	5.58	8.59	9.42	10.25	8.31	3.55	6.43	6.16	9.22	7.21
December ...	5.43	1.58	.52	2.37	5.33	.82	1.40	1.41	7.20	2.43	2.85
Total ...	107.17	204.19	146.71	170.93	195.81	159.21	165.72	190.36	146.75	173.71	166.07

MONTH.	1902.	1903.	1904.	1905.	1906.	1907.	1908.	1909.	1910.	1911.	Average 10 years.
January ...	—	.54	.10	.64	—	—	—	.16	—	.01	.41
February ...	.01	—	—	—	.34	—	—	.03	.48	.07	.30
March ...	5.04	1.12	1.74	—	1.87	.27	.41	3.26	.28	.02	1.21
April ...	12.69	4.82	2.56	2.04	.62	.94	.98	3.18	.51	.66	3.99
May ...	9.46	12.92	4.59	5.89	16.56	18.66	11.29	10.37	9.17	4.00	11.86
June ...	22.65	18.09	24.58	24.03	27.67	17.61	17.69	21.04	7.62	15.52	21.34
July ...	38.84	36.90	42.67	51.25	43.59	29.64	34.34	28.79	43.24	26.05	35.18
August ...	43.49	53.75	41.00	39.99	35.30	33.93	36.65	38.96	40.57	36.08	38.38
September ...	34.18	29.87	22.28	24.22	23.20	26.58	29.74	15.00	19.80	33.04	28.37
October ...	11.36	11.37	12.00	16.51	14.18	12.50	8.39	12.62	8.86	12.43	13.28
November ...	3.24	3.77	4.38	5.64	4.35	11.76	3.32	5.70	2.29	6.00	5.94
December ...	2.37	.16	1.12	.73	3.24	1.24	—	.86	.62	.91	1.70
Total ...	183.31	173.31	157.62	170.94	170.92	153.13	142.81	139.97	133.44	134.79	162.41

MONTH.	1922.	1923.	1924.	1925.	1926.	1927.	1928.	1929.	1930.	1931.	Average 10 years.
January ...	—	—	.07	—	—	—	2.06	—	—	1.72	.36
February ...	—	.03	.56	—	—	—	—	—	.15	.03	.17
March ...	—	.62	.93	.15	.12	.22	1.68	.53	.92	1.82	.86
April ...	4.45	5.14	2.72	2.76	5.03	6.90	2.65	.63	.57	1.94	3.04
May ...	3.82	8.16	7.52	5.06	7.02	9.52	7.60	8.44	9.89	10.21	8.62
June ...	15.87	13.25	26.52	16.37	21.55	20.46	11.10	27.10	10.12	13.20	17.21
July ...	37.68	34.76	29.35	30.72	31.58	34.16	33.15	45.11	29.43	40.65	31.69
August ...	32.79	21.82	36.40	34.38	34.07	22.02	37.50	29.00	23.09	33.65	30.77
September ...	38.38	24.71	39.57	22.88	25.35	24.50	30.43	27.23	28.33	27.27	29.16
October ...	12.18	11.80	7.52	19.74	8.25	12.63	16.41	10.69	9.15	10.28	9.89
November ...	7.12	4.80	5.51	7.40	5.74	4.48	3.62	6.32	2.68	5.05	4.98
December ...	1.61	0.19	—	.15	.42	.23	2.34	.10	.10	1.56	1.25
Total ...	153.90	125.28	149.67	140.23	129.33	135.12	148.54	155.15	114.43	147.38	145.73



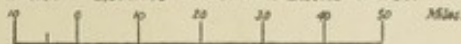




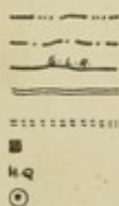


## SIERRA LEONE.

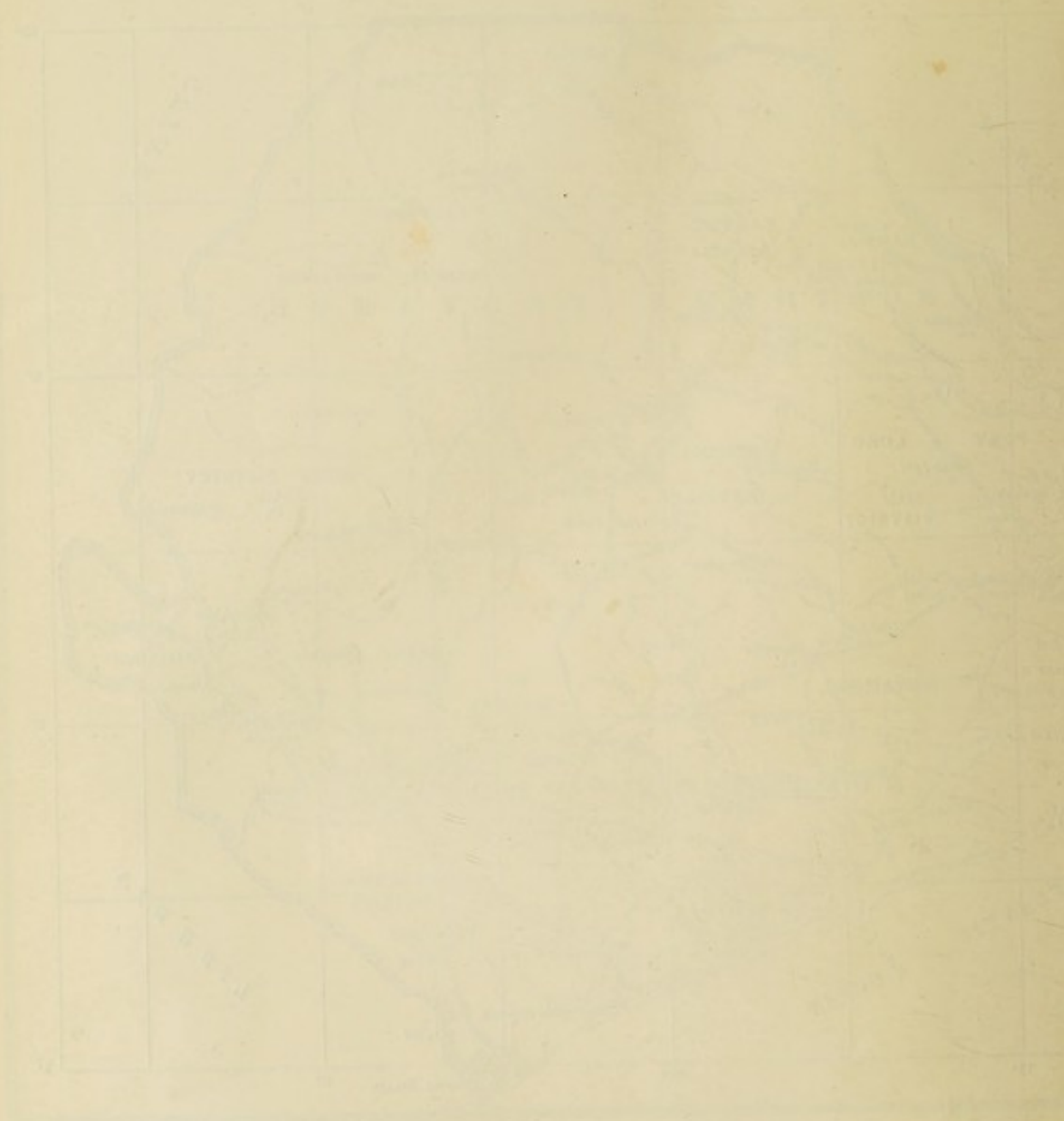
SIERRA LEONE SURVEY.

Scale  $\frac{1}{2,000,000}$  or 31.564 Miles to 1 in.

Provincial Boundaries shown  
 District  
 Sierra Leone Government Railway  
 Roads  
 Roads under construction  
 District Head Quarters  
 Native Areas



The Colony comprises the Peninsular area including Freetown, Waterloo, Songo, Kent and York.



Map of the [illegible] [illegible]

[illegible] [illegible] [illegible]

[illegible] [illegible] [illegible]

[illegible] [illegible] [illegible]

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[illegible] [illegible] [illegible]



