

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

### **Contributors**

Sierra Leone. Medical and Sanitary Department.

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SIERRA LEONE.



# Annual Report

OF THE

## Medical and Sanitary Department

### For the Year 1929.

*Price : 2s. 6d.*

Printed by the GOVERNMENT PRINTER, Freetown.

1931.





SIERRA LEONE.

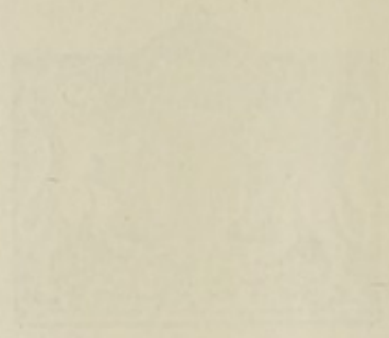
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# Annual Report

OF THE

**Medical and Sanitary Department**

**For the Year 1929.**



SIERRA LEONE

# Annual Report

of the

Medical and Sanitary Department

For the Year 1929.

**Annual Medical and Sanitary Report,  
1929.**

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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, the Medical Report on the health and sanitary conditions of Sierra Leone for the year 1929, together with the Returns, etc. appended thereto.

I have the honour to be,

SIR,

Your obedient servant,

J. C. S. McDOUALL,  
*Director of Medical and Sanitary Services.*

THE HONOURABLE  
THE COLONIAL SECRETARY,  
FREETOWN.

WATER AND SEWERAGE DEPARTMENT,  
TOWN OF BOSTON,  
1923.

# Annual Medical and Sanitary Report, 1923.

I have the honor to report to the Board of Health of the City of Boston, the results of the medical and sanitary work of the Department during the year 1923. The work of the Department during the year 1923 has been characterized by a steady and continuous effort to improve the public health of the City of Boston. The work of the Department during the year 1923 has been characterized by a steady and continuous effort to improve the public health of the City of Boston.

Very respectfully,  
A. C. ROBERTSON,  
Commissioner of Health and Sanitation.

Printed and Bound by  
The Boston Book Company,  
Boston, Mass.

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# Annual Report of the Medical and Sanitary Department for the year 1929.

## I—Administration.

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

#### MEDICAL AND SANITARY STAFF.

- 1 Director of Medical and Sanitary Services.
- 1 Deputy Director of Health Service.
- 1 Surgical Specialist.
- 1 Pathologist.
- 1 Senior Health Officer.
- 2 Senior Medical Officers.
- 1 Medical Officer of Health.
- 13 Medical Officers of the West African Medical Staff.
- 1 Lady Medical Officer.
- 3 African Medical Officers.

#### EUROPEAN NURSING STAFF.

- 2 Senior Nursing Sisters.
- 6 Nursing Sisters.

#### SUBORDINATE MEDICAL AND SANITARY STAFF.

- 1 Sanitary Superintendent and Training Officer.
- 2 European Superintendent Sanitary Inspectors.
- 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.
- 33 Male Nurses and Apprentices.
- 27 Female Nurses and Probationers.
- 2 Midwives.
- 3 Health Visitors.
- 39 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.
- 12 Male Attendants, Lunatic Asylum.
- 2 Laboratory Assistants.

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



## CLERICAL STAFF.

There are eighteen clerks: 1 chief clerk, 2 second grade, 9 senior third grade and 6 junior third grade.

## TEMPORARY ASSISTANCE.

Owing to the shortage of medical officers, due to invalidings, Dr. J. B. S. Baxter was temporarily engaged from 4th June to 20th July.

## PRINCIPAL ACTING APPOINTMENTS.

(Substantive Holders are given in Table 1.)

Dr. W. H. Peacock acted as Director of Medical and Sanitary Services from 21st April to 17th October.

Dr. J. M. MacKay, M.C., acted as Deputy Director of Health Service from 21st April to 17th October.

Dr. D. D. Barker acted as Medical Officer of Health until 22nd September, when Dr. R. F. Campbell took over the duties of that office. Dr. Campbell also acted as Senior Health Officer from 30th October to end of year.

## NEW APPOINTMENTS.

Dr. J. N. Leitch, appointed Pathologist on the 16th, arrived in Freetown on the 25th January.

Dr. R. B. Henderson, appointed Medical Officer on the 14th, arrived in Freetown on the 23rd August.

Dr. H. R. F. Tweedy, appointed Medical Officer on the 28th August, arrived Freetown on the 6th September, *vice* Dr. Malone, resigned.

## PROMOTIONS.

Dr. A. C. Paterson was promoted Senior Medical Officer on the 6th March, *vice* Dr. D. T. Birt, transferred to Gambia.

Mr. M. St. George Auber, Second Grade Clerk, was promoted First Grade Clerk, from the 23rd July.

## RESIGNATION.

Dr. W. A. A. Malone, Medical Officer, resigned his appointment on the 6th July.

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

## ORDINANCE.

Births and Deaths Registration Ordinance (No. 28 of 1929).

## ORDERS IN COUNCIL.

Dangerous Drugs Order in Council (No. 15 of 1929).

Freetown Improvement (Part V application) Order in Council (No. 25 of 1929).

## RULES.

Public Health (Protectorate) Rules (No. 27 of 1929).

## (c) FINANCIAL.

The following table gives the revenue and expenditure\* for the years 1928 and 1929:—

| Medical Revenue.                                  | 1928.  |    |    | 1929.  |    |    |
|---|--------|----|----|--------|----|----|
|   | £      | s. | d. | £      | s. | d. |
| Connaught Hospital receipts ... ..                | 169    | 19 | 6  | 106    | 5  | 7  |
| European Hospital receipts ... ..                 | 596    | 17 | 6  | 676    | 5  | 3  |
| Sundry receipts (out-patients' fees, etc.) ... .. | 405    | 11 | 6  | 650    | 1  | 2  |
| Druggist fees (registration) ... ..               | —      | —  | —  | —      | —  | —  |
| Maintenance of lunatics ... ..                    | 143    | 6  | 8  | 259    | 9  | 7  |
| Departmental fines ... ..                         | 12     | 14 | 6  | 11     | 9  | 7  |
| Total ... ..                                      | £1,328 | 9  | 8  | £1,703 | 11 | 2  |

\*This sum is the expenditure controlled by the Director of Medical and Sanitary Services and does not include money spent by the Public Works Department on new buildings sanitary works, etc.

| Medical Expenditure |     |     |     | 1928.  |         |    | 1929.  |         |    |    |
|---------------------|-----|-----|-----|--------|---------|----|--------|---------|----|----|
|                     |     |     |     | £      | s.      | d. | £      | s.      | d. |    |
| Personal Emoluments | ... | ... | ... | 37,193 | 13      | 8  | 40,790 | 7       | 9  |    |
| Other Charges       | ... | ... | ... | 22,711 | 9       | 10 | 24,386 | 10      | 1  |    |
| Total               |     |     |     | ...    | £59,905 | 3  | 6      | £65,176 | 17 | 10 |

| Sanitary Revenue                              |     |     |     | 1928. |      |    | 1929. |    |    |   |
|---|-----|-----|-----|-------|------|----|-------|----|----|---|
|   |     |     |     | £     | s.   | d. | £     | s. | d. |   |
| Sanitary services (contributions from Bonthe) | ... | ... | ... | 207   | 12   | 2  | 3     | 3  | 6  |   |
| Maintenance of persons in quarantine          | ... | ... | ... | —     | —    | —  | —     | —  | —  |   |
| Total   |     |     |     | ...   | £207 | 12 | 2     | £3 | 3  | 6 |

| Sanitary Expenditure. |     |     |     | 1928.  |         |    | 1929.  |         |    |   |
|-----------------------|-----|-----|-----|--------|---------|----|--------|---------|----|---|
|                       |     |     |     | £      | s.      | d. | £      | s.      | d. |   |
| Personal Emoluments   | ... | ... | ... | 9,640  | 13      | 5  | 8,894  | 19      | 2  |   |
| Other Charges         | ... | ... | ... | 14,789 | 7       | 11 | 14,726 | 2       | 4  |   |
| Total                 |     |     |     | ...    | £24,430 | 1  | 4      | £23,621 | 1  | 6 |

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

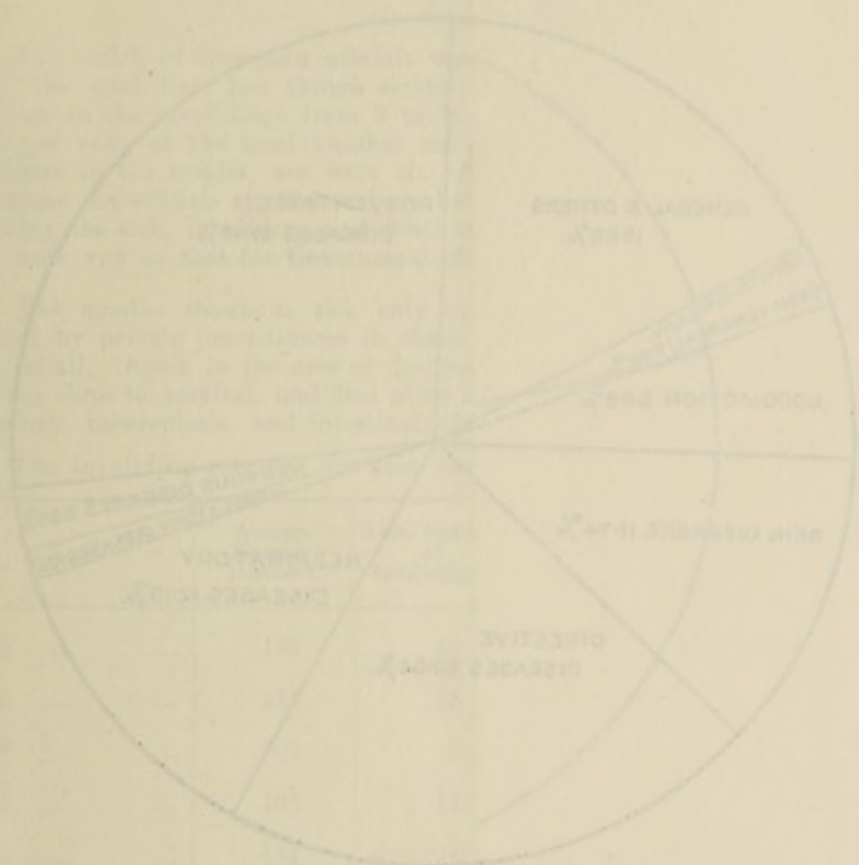
| Year. | ... | ... | ... | £      |          |
|-------|-----|-----|-----|--------|----------|
| 1925  | ... | ... | ... | 73,731 | 1 : 11   |
| 1926  | ... | ... | ... | 78,916 | 1 : 11·7 |
| 1927  | ... | ... | ... | 82,206 | 1 : 8·21 |
| 1928  | ... | ... | ... | 88,365 | 1 : 8·36 |
| 1929  | ... | ... | ... | 94,188 | 1 : 8·33 |

ANALYSIS OF HOSPITAL EXPENDITURE FOR THE YEAR 1929.

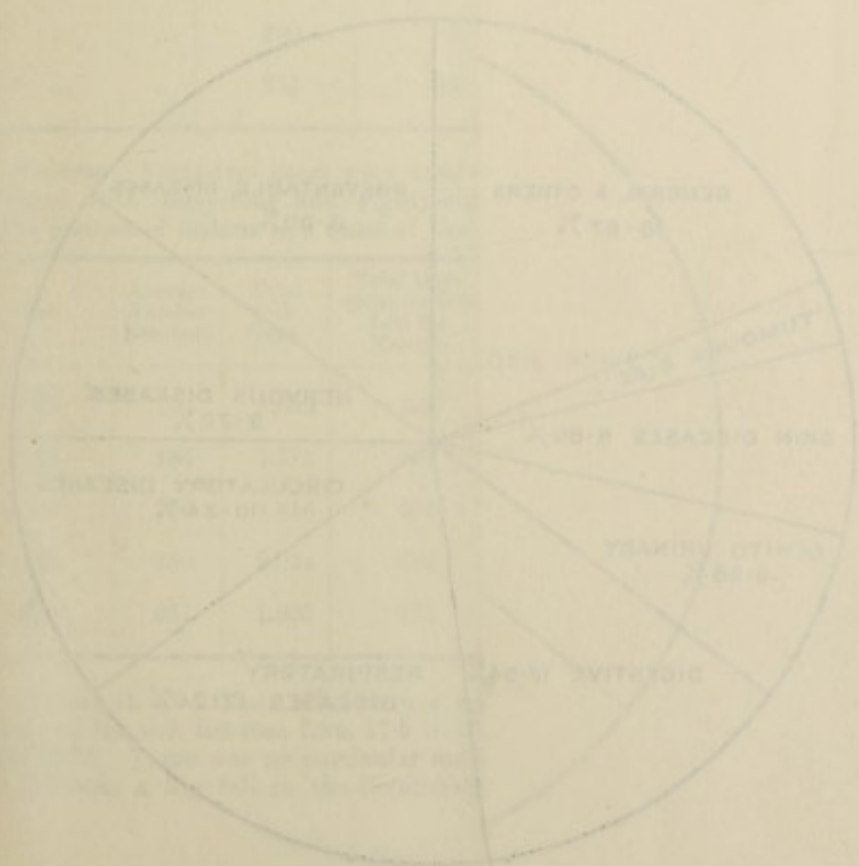
| 1                   | 2                         | 3                                 | 4              | 5                                       | 6                           | 7                            | 8   | 9                      | 10                           | 11                     | 12   | 13                           | 14                                      | 15  |
|---------------------|---------------------------|-----------------------------------|----------------|---|-----------------------------|------------------------------|---|------------------------|------------------------------|------------------------|--|------------------------------|---|---|
| Institution.        | Total Number of Patients. | Daily Average Number of Patients. | Hospital Days. | Provisions from Store-keeper.<br>Total. | Fresh Provisions.<br>Total. | 5 and 6 per Patient per Day. | Wines, Spirits, Minerals, Tobacco, Ice.<br>Total. | 8 per Patient per Day. | 7 and 9 per Patient per Day. | Fuel, Light.<br>Total. | 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. |
|                     |                           |                                   |                | £ s. d.                                 | £ s. d.                     | £ s. d.                      | £ s. d.   | £ s. d.                | £ s. d.                      | £ s. d.                | £ s. d.  | £ s. d.                      | £ s. d.                                 | £ s. d.                                     |
| Nursing Home ...    | 138                       | 4.00                              | 1,787          | 112 2 5½                                | 182 4 2                     | 0 3 4                        | 59 3 9  | 0 0 8                  | 0 4 0                        | 65 3 0                 | 40 17 10½  | 459 11 2½                    | 0 5 1                                   |   |
| Connaught Hospital  | 2,228                     | 83.64                             | 30,512         | 724 5 5                                 | 882 13 2½                   | 0 1 0½                       | 45 12 2½  | 0 0 0¼                 | 0 1 0½                       | 352 15 1½              | 61 8 1½  | 2,066 14 1½                  | 0 1 4½                                  |   |
| Lunatic Asylum ...  | 155                       | 100.00                            | 40,304         | 44 2 3½                                 | 815 0 7                     | 0 0 5                        | 26 15 3   | 0 0 0¼                 | 0 0 5½                       | 40 16 0                | 46 4 9½  | 972 18 10½                   | 0 0 5½                                  |   |
| Kissy Infirmary ... | 308                       | 79.29                             | 28,944         | 58 3 5                                  | 652 2 1                     | 0 0 5½                       | 15 17 7   | 0 0 0¼                 | 0 0 6                        | 56 14 0                | 32 14 9½   | 815 11 10½                   | 0 0 6½                                  |   |
| Bonthe Hospital ... | 437                       | 22.58                             | 8,222          | 34 10 1                                 | 298 5 10                    | 0 0 9½                       | 5 4 9   | ...                    | 0 0 9½                       | 24 2 6                 | 17 12 0  | 379 15 2                     | 0 0 11                                  |   |

GENERAL SYSTEMATIC AND PREVENTIVE DISEASES

Total Deaths 1921

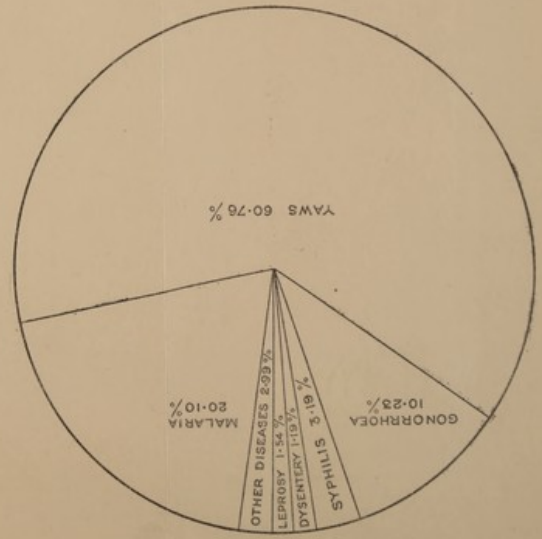


Total Deaths 1922

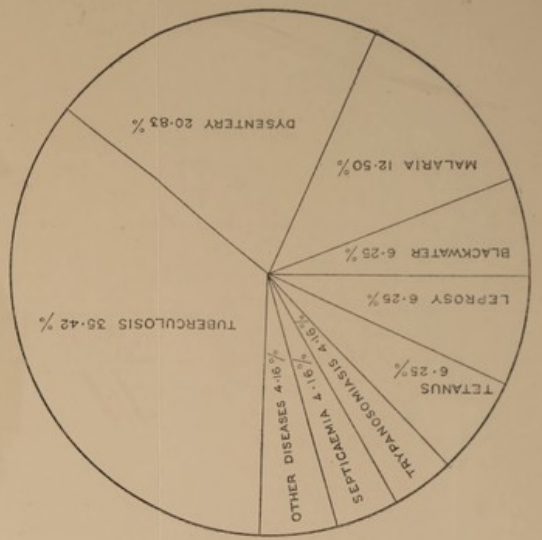




INFECTIVE DISEASES.



Total Incidence 27,855.

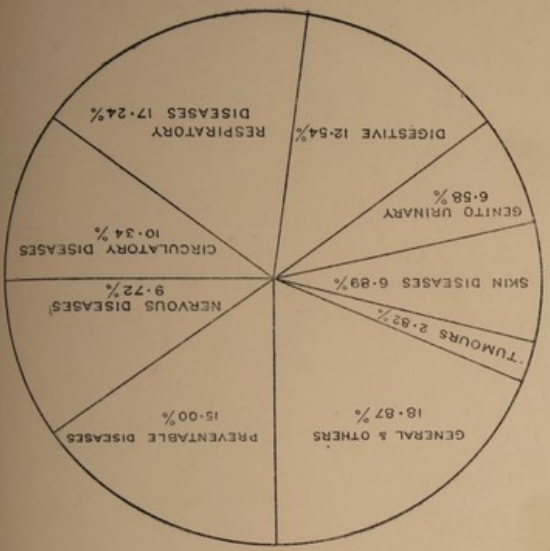


Total Deaths 48.

GENERAL SYSTEMATIC AND PREVENTIVE DISEASES



Total Incidence 102,531.



Total Deaths 319.

## II—Public Health.

### (a) GENERAL REMARKS.

#### (i)—GENERAL DISEASES.

The health of European officials was on the whole slightly better than the previous year, the total time lost through sickness being considerably less, though, owing to an increase in the invalidings from 9 to 11, the invaliding rate rose from 2·81 per cent. to 3·43 per cent. of the total number resident. The single death was not attributable to residence in the tropics, nor were six of the eleven cases of invaliding. The health of European non-officials appears to have been about the average, but Table III on page....., showing the sick, invaliding and death-rates, is far from representing the proportions in the same way as that for Government officials.

The number shown as sick only represents reported cases; a large number are either treated by private practitioners in their homes, or in other cases not treated by medical men at all. Again in the case of the five deaths, no less than three were sent ashore from various ships to hospital, and died after an average stay of thirteen days, the causes being apoplexy, tuberculosis, and intestinal obstruction.

The invaliding rate for the past ten years is shown below:—

| Year.       | Average Number Resident. | Total Number of Invalidings. | Percentage of Invalidings to Average Resident. | — |
|-------------|--------------------------|------------------------------|--|---|
| 1920 ... .. | 133                      | 10                           | 7·51   |   |
| 1921 ... .. | 144                      | 15                           | 10·41  |   |
| 1922 ... .. | 109                      | 5                            | 4·58   |   |
| 1923 ... .. | 102                      | 14                           | 13·72  |   |
| 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   |   |

*Malaria.*—Forty-two cases were treated as in-patients and eighty-five as out-patients, compared with forty-four and eighty-eight for 1928. The following table shows the relative position of malaria as a cause of time lost through sickness during the past 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. |
|-------|--------------------------|------------------|--|---|---|---|
| 1925  | 180                      | 1,683            | 402  | 1,281   | 23·88                                     | 223   |
| 1926  | 184                      | 1,575            | 487  | 1,088   | 30·92                                     | 264   |
| 1927  | 250                      | 1,816            | 497  | 1,319   | 27·36                                     | 198   |
| 1928  | 280                      | 2,024            | 626  | 1,398   | 30·92                                     | 223   |
| 1929  | 251                      | 1,935            | 435  | 1,500   | 22·48                                     | 173   |

The health of African officials was not up to the usual standard. The average daily number on the sick list rose from 17·5 to 25 and the average sick time to each resident from 6·10 to 7·72. There was no particular outbreak or epidemic to account for the rise. There was, however, a big fall in the invalidings from 25 to 8.

The following table shows the total number of new cases treated:—

| -----  |     |     |     | 1926.  | 1927.  | 1928.  | 1929.   |
|--|-----|-----|-----|--------|--------|--------|---------|
| <b>IN-PATIENTS :</b>                         |     |     |     |        |        |        |         |
| European                                     | ... | ... | ... | 132    | 149    | 157    | 147     |
| African                                      | ... | ... | ... | 3,345  | 3,544  | 3,535  | 4,431   |
| <b>OUT-PATIENTS :</b>                        |     |     |     |        |        |        |         |
| European                                     | ... | ... | ... | 262    | 568    | 532    | 448     |
| African                                      | ... | ... | ... | 64,236 | 76,874 | 83,417 | 97,505  |
| Total  | ... | ... | ... | 67,975 | 81,135 | 87,641 | 102,531 |
| <b>DEATHS :</b>                              |     |     |     |        |        |        |         |
| European                                     | ... | ... | ... | 9      | 6      | 3      | 7       |
| African                                      | ... | ... | ... | 265    | 244    | 278    | 368     |
| Total  | ... | ... | ... | 274    | 250    | 281    | 375     |
| Percentage of deaths to total number treated | ... | ... | ... | .40    | .30    | .32    | .36     |

Showing an increase in the total number treated of 14,890.

Subsequent attendances numbered 247,438, an increase of 53,182 on 1928. The average number of attendances for each out-patient rose very slightly from 2.31 to 2.52.

The following table contrasts the incidence of the prevalent diseases during the past four years.

| -----            |     |     |     | 1926. | 1927. | 1928. | 1929.  |
|------------------|-----|-----|-----|-------|-------|-------|--------|
| Smallpox         | ... | ... | ... | —     | 16    | 1     | 6      |
| Chicken-pox      | ... | ... | ... | 64    | 64    | 135   | 274    |
| Dysentery        | ... | ... | ... | 193   | 299   | 272   | 343    |
| Influenza        | ... | ... | ... | 55    | 21    | 165   | 8      |
| <b>Malaria :</b> |     |     |     |       |       |       |        |
| Tertian          | ... | ... | ... | 136   | 318   | 1     | 145    |
| Quartan          | ... | ... | ... | 11    | 4     | 3     | 12     |
| Aestivo-autumnal | ... | ... | ... | 240   | 4,549 | 5,240 | 1,858  |
| Unclassified     | ... | ... | ... | 3,362 | —     | —     | 3,558  |
| Cachexia         | ... | ... | ... | —     | —     | 10    | 18     |
| Blackwater       | ... | ... | ... | 7     | 9     | 12    | 6      |
| Whooping cough   | ... | ... | ... | 102   | 92    | 84    | 136    |
| Tuberculosis     | ... | ... | ... | 172   | 156   | 97    | 136    |
| Measles          | ... | ... | ... | 6     | 12    | 52    | 112    |
| Yaws             | ... | ... | ... | 427   | 2,035 | 4,088 | 16,927 |
| Pneumonia        | ... | ... | ... | 102   | 179   | 263   | 188    |
| Leprosy          | ... | ... | ... | 37    | 75    | 129   | 431    |

(ii)—COMMUNICABLE DISEASES.

*Malaria.*—The total number of cases treated was 5,597 as against 5,254. Instructions were issued that no case was to be returned as classified unless confirmed by microscopic examination. This explains the difference in tabulation.

*Blackwater Fever.*—Six cases were reported during the year, three Europeans with two deaths and three Syrians with one death. One of the European deaths was that of an independent trader in the bush, who was carried into an out-station in a moribund condition.

*Trypanosomiasis.*—Only two new cases were reported during the year.

*Smallpox.*—Six cases were reported.

*Chicken-pox.*—A total of 274 cases was reported from all stations. The most extensive outbreak was in the Kono District, where a large number of villages was affected. An epidemic with seventy-eight cases was reported from Batkanu.

*Dysentery.*—There was an increase from 272 to 343 in the cases returned for this disease. Of these 144 were diagnosed as amœbic and one as bacillary.

*Tuberculosis.*—136 cases were reported with fifteen deaths. This is an increase on 1928, but still a considerable reduction on previous years.

*Veneral Diseases.*—2,753 cases of gonorrhœa and its complications were treated a slight increase on the previous year. There is a tendency to come forward more freely for treatment, but this disease is still largely neglected by its victims. Syphilis accounts for 895 of the cases treated, of which no less than 779 are returned as tertiary. This compares with that of 1,836 for 1928 and 2,116 for 1927, of which 1,566 and 1,385 respectively were returned as tertiary. The marked reduction in numbers is mainly attributable to a change of diagnosis to that of tertiary yaws, and not to the actual incidence of the disease, which probably remains about the same.

TABLE OF INCIDENCE.

| Disease.            | 1924. | 1925. | 1926. | 1927. | 1928. | 1929. |
|---------------------|-------|-------|-------|-------|-------|-------|
| Tuberculosis ... .. | 131   | 194   | 172   | 156   | 97    | 136   |
| Dysentery ... ..    | 481   | 191   | 193   | 299   | 272   | 343   |
| Gonorrhœa ... ..    | 1,248 | 1,522 | 1,701 | 2,286 | 2,564 | 2,753 |
| Syphilis ... ..     | 919   | 1,005 | 874   | 2,116 | 1,836 | 895   |

*Influenza.*—The country has been singularly free from this malady during the year, only eight sporadic cases having been reported, four of them in Europeans.

*Leprosy.*—Owing to the setting up of clinics for this disease, and the propaganda work carried out by Professor Blacklock during his survey of disease in the Protectorate many more cases are presenting themselves for treatment. It is difficult, however, to induce them to stay long enough to derive much benefit from treatment, and a hint as to formation of a settlement has been sufficient to cause the whole attendance at a clinic to vanish.

*Yaws.*—The most striking item in the year's work has been the rush of the people in the Protectorate to obtain treatment for this disease. Of the total increase of 14,890 persons treated during the year, no less than 12,839 can be attributed to this cause. In the appendix are inserted some comments by medical officers on the results obtained from various drugs tried by them.

*Enteric Group.*—Three cases of paratyphoid were treated in Freetown, and one of the group not identified, at Bo.

#### (b) VITAL STATISTICS.

##### (i)—GENERAL POPULATION.

The 1921 census figures, which are the only ones available, are as follows:—

|                           |     |     |     |           |
|---------------------------|-----|-----|-----|-----------|
| Colony and Protectorate   | ... | ... | ... | 1,541,311 |
| Colony                    | ... | ... | ... | 85,163    |
| Colony excluding Freetown | ... | ... | ... | 41,021    |
| Freetown                  | ... | ... | ... | 44,142    |

Owing to the fact that the last census was taken in 1921, there is probably a considerable error in the above figures. A new census will be taken in 1931.

*Registration.*—There are in the Colony seventeen registration districts and in the Protectorate fifteen. In the Protectorate registration is permissive and at present practically non-existent. In the Colony it is nominally compulsory, but difficult to enforce outside Freetown. Even in Freetown, owing to the floating Protectorate population, registration of births is not fully carried out, but few, if any, deaths escape registration.

By the Births and Deaths Registration (Amendment) Ordinance, passed in December, the duties of registration of births and deaths will be transferred from the Registrar-General to the Deputy Director of Health Service as Chief Registrar of Births and Deaths. With a view to making a beginning with compulsory registration of births and deaths in the Protectorate, the Ordinance provides for the creation in the Protectorate of districts in which the births and deaths of non-natives must be registered. It also empowers the Governor in Council by Order to require the registration of births or deaths in any town or place which has been declared to be a health district under the Public Health (Protectorate) Ordinance.

The new Ordinance will come into force on 1st July, 1930.

The following table gives the birth, death and infant mortality rates in Freetown for the last five years:—

| Year. | Population 1921. | Births Registered. | Birth Rate. | Deaths Registered | Death Rate. | Number of Deaths under Twelve Months. | Infant Mortality Rate. |
|-------|------------------|--------------------|-------------|-------------------|-------------|---------------------------------------|------------------------|
| 1925  | 44,142           | 1,102              | 25          | 1,124             | 25.5        | 321                                   | 291                    |
| 1926  | ..               | 1,047              | 24          | 1,231             | 27.9        | 318                                   | 296                    |
| 1927  | ..               | 1,010              | 22.8        | 1,290             | 29.2        | 355                                   | 351                    |
| 1928  | ..               | 1,036              | 23.5        | 1,389             | 31.5        | 377                                   | 364                    |
| 1929  | ..               | 1,093              | 24.8        | 1,450             | 32.8        | 349                                   | 319                    |

The apparent excess of deaths over births is largely to be accounted for by failure to register births. Another factor of importance is the excess of males over females in the population of Freetown—28.5 per cent. at the 1921 census. This is no doubt due to the number of young labourers without wives who come to Freetown from the Protectorate to work.

There have been no epidemics of any kind in recent years, and the increase in the number of deaths during the last few years may be due to an actual increase in the population by immigration from the Protectorate. Deaths of natives of places outside Freetown occurring in the Freetown hospitals and other institutions are registered in Freetown. More accurate vital statistics will be obtained after the next census in 1931.

The following table gives the births and deaths recorded at all registration districts in the Colony:—

| DISTRICTS.           | BIRTHS. |         |        | DEATHS. |         |        | DEATHS UNDER TWELVE MONTHS. |         |        |
|----------------------|---------|---------|--------|---------|---------|--------|-----------------------------|---------|--------|
|                      | Male.   | Female. | Total. | Male.   | Female. | Total. | Male.                       | Female. | Total. |
| Freetown ...         | 516     | 445     | 961    | 785     | 528     | 1,313  | 176                         | 134     | 310    |
| Cline Town ...       | 72      | 60      | 132    | 80      | 57      | 137    | 26                          | 13      | 39     |
| Banana Islands ...   | 9       | 10      | 19     | 10      | 9       | 19     | 5                           | 2       | 7      |
| Hamilton ...         | 7       | 10      | 17     | 18      | 5       | 23     | —                           | 1       | 1      |
| Hastings ...         | 39      | 28      | 67     | 27      | 16      | 43     | 6                           | 5       | 11     |
| Kent ...             | 17      | 10      | 27     | 9       | 11      | 20     | 4                           | 2       | 6      |
| Kissy ...            | 30      | 24      | 54     | 69      | 51      | 120    | 10                          | 4       | 14     |
| Murray Town ...      | 31      | 30      | 61     | 56      | 37      | 93     | 20                          | 11      | 21     |
| Regent ...           | 19      | 12      | 31     | 20      | 15      | 35     | 9                           | 3       | 12     |
| Sherbro Judicial ... | 37      | 33      | 70     | 58      | 34      | 92     | 7                           | 8       | 15     |
| Songo Town ...       | 66      | 72      | 138    | 71      | 54      | 125    | 11                          | 11      | 22     |
| Tassoh Island ...    | 40      | 25      | 65     | 53      | 37      | 90     | 31                          | 16      | 47     |
| Tombo ...            | 37      | 30      | 67     | 34      | 23      | 57     | 5                           | 5       | 10     |
| Waterloo ...         | 83      | 92      | 175    | 97      | 58      | 155    | 22                          | 17      | 39     |
| Wellington ...       | 23      | 19      | 42     | 21      | 21      | 42     | 6                           | 3       | 9      |
| Wilberforce ...      | 29      | 30      | 59     | 32      | 28      | 60     | 14                          | 5       | 19     |
| York ...             | 17      | 20      | 37     | 24      | 9       | 33     | 3                           | 1       | 4      |
| Total ...            | 1,072   | 950     | 2,022  | 1,464   | 993     | 2,457  | 355                         | 241     | 596    |

## (ii)—HEALTH OF EUROPEAN OFFICIALS (EXCLUDING IMPERIAL FORCES).

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

|   | 1926. | 1927. | 1928. | 1929. |
|---|-------|-------|-------|-------|
| Total number of officials resident ... ..                   | 231   | 300   | 320   | 302   |
| Average number resident ... ..                              | 184   | 250   | 280   | 251   |
| Total number on sick list ... ..                            | 181   | 210   | 247   | 198   |
| Total number of days on sick list ... ..                    | 1,575 | 1,816 | 2,024 | 1,935 |
| Average daily number on sick list ... ..                    | 4·31  | 4·97  | 5·53  | 5·3   |
| Percentage of daily sick to average number resident         | 2·34  | 1·98  | 1·97  | 2·11  |
| Average number of days on sick list to each patient         | 8·70  | 8·64  | 8·19  | 9·77  |
| Average sick time to each resident ... ..                   | 8·55  | 7·26  | 7·22  | 6·40  |
| Total number invalided ... ..                               | 6     | 16    | 9     | 11    |
| Percentage of invalidings to total residents ...            | 2·56  | 5·33  | 2·81  | 3·43  |
| Percentage of invalidings to average number resident ... .. | 3·26  | 6·40  | 3·21  | 4·38  |
| Total number of deaths ... ..                               | 1     | 3     | 1     | 1     |
| Percentage of deaths to total residents ... ..              | ·42   | 1·00  | ·31   | ·31   |
| Percentage of deaths to average number resident             | ·54   | 1·20  | ·35   | ·4    |

Causes of Invalidings and Deaths of European Officials.

| Cause.                             | Invalided. | Died.    |
|------------------------------------|------------|----------|
| Malaria and Cachexia ... ..        | 2          | —        |
| Neurasthenia ... ..                | 2          | —        |
| Anæmia ... ..                      | 2          | —        |
| Peripheral Neuritis ... ..         | 2          | —        |
| Pyrexia of uncertain origin ... .. | 1          | —        |
| Local injuries—Pneumonia ... ..    | 1          | —        |
| Sinuses of left rib ... ..         | 1          | —        |
| Chronic Nephritis .. ..            | —          | 1        |
| <b>Total ... ..</b>                | <b>11</b>  | <b>1</b> |

## (iii)—HEALTH OF EUROPEAN NON-OFFICIALS.

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

|  | 1927. | 1928. | 1929. |
|--|-------|-------|-------|
| Total number of non-officials resident ... ..        | 369   | 380   | 420   |
| Average number resident ... ..                       | 299   | 301   | 325   |
| Total number on sick list ... ..                     | 40    | 51    | 48    |
| Percentage of sick to average number resident ... .. | 13·37 | 16·94 | 15·73 |
| Average number of days on sick list to each patient  | —     | —     | —     |
| Average sick time to each resident ... ..            | —     | —     | —     |
| Total number invalided ... ..                        | 16    | 14    | 17    |
| Percentage of invalidings to total residents ... ..  | 4·32  | 3·68  | 4·14  |
| Percentage of invalidings to average number resident | 5·35  | 4·66  | 5·23  |
| Total deaths ... ..                                  | 5     | 4     | 5     |
| Percentage of deaths to total residents ... ..       | 1·35  | 1·05  | 1·19  |
| Percentage of deaths to average number resident      | 1·67  | 1·32  | 1·53  |

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

| Causes.                              | Invalided. | Died. |
|--------------------------------------|------------|-------|
| Cardiac disease .. .. .              | 1          | —     |
| Blackwater fever .. .. .             | —          | 2     |
| Malaria and debility .. .. .         | 6          | —     |
| Fractures and other injuries .. .. . | 4          | —     |
| Intestinal obstruction .. .. .       | —          | 1     |
| Apoplexy .. .. .                     | —          | 1     |
| Tuberculosis .. .. .                 | 1          | 1     |
| Diabetes .. .. .                     | 1          | —     |
| Pneumonia .. .. .                    | 1          | —     |
| Paratyphoid .. .. .                  | 1          | —     |
| Adenitis .. .. .                     | 1          | —     |
| Total .. .. .                        | 16         | 5     |

## (iv)—HEALTH OF AFRICAN OFFICIALS.

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

|  | 1926. | 1927. | 1928. | 1929. |
|--|-------|-------|-------|-------|
| Total number of officials resident .. .. .                   | 1,200 | 1,200 | 1,265 | 969   |
| Average number resident .. .. .                              | 1,000 | 1,000 | 1,050 | 969   |
| Total number on sick list .. .. .                            | 950   | 933   | 967   | 1,057 |
| Total days on sick list .. .. .                              | 5,375 | 7,919 | 6,415 | 7,486 |
| Average daily number on sick list .. .. .                    | 14·72 | 21·69 | 17·52 | 25    |
| Percentage of daily sick to average number resident .. .. .  | 1·47  | 2·16  | 1·66  | 2·58  |
| Average number of days on sick list to each patient .. .. .  | 5·65  | 8·48  | 6·63  | 7·08  |
| Average sick time to each resident .. .. .                   | 5·37  | 7·91  | 6·10  | 7·72  |
| Total number invalided .. .. .                               | 6     | 20    | 25    | 8     |
| Percentage of invalidings to total resident .. .. .          | ·50   | 1·66  | 1·98  | ·83   |
| Percentage of invalidings to average number resident .. .. . | ·60   | 2·00  | 2·38  | ·83   |
| Total deaths .. .. .   | 4     | 4     | 9     | 6     |
| Percentage of deaths to total residents .. .. .              | ·33   | ·33   | ·71   | ·61   |
| Percentage of deaths to average number resident .. .. .      | ·40   | ·40   | ·85   | ·61   |

*Causes of Invalidings and Deaths of African Officials.*

| Causes.                        | Invalided. | Died. |
|--------------------------------|------------|-------|
| Senility .. .. .               | 2          | —     |
| Cardiac disease .. .. .        | 1          | 2     |
| Apoplexy .. .. .               | —          | 1     |
| Nephritis .. .. .              | —          | 1     |
| Peripheral neuritis .. .. .    | 2          | —     |
| Deafness .. .. .               | 1          | —     |
| Disseminated sclerosis... .. . | 1          | —     |
| Arthritis .. .. .              | 1          | —     |
| Septic absorption .. .. .      | —          | 1     |
| Uræmia, hyperpyrexia .. .. .   | —          | 1     |
| Total .. .. .                  | 8          | 6     |

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

| 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 Invaliding to Average Number. | Total Deaths. | Percentage of Deaths to Average Number. |
|-------|------------------------------|----------------------|---|-------------------------------------|-------------------|---|---------------|---|
| 1920  | 750                          | 1,862                | 5,742                                     | 7.60                                | 23                | 3.06  | 9             | 1.20                                    |
| 1921  | 750                          | 1,248                | 7,780                                     | 10.37                               | 24                | 3.20  | 6             | 1.20                                    |
| 1922  | 750                          | 1,071                | 7,887                                     | 10.38                               | 7                 | 0.93  | 6             | 0.80                                    |
| 1923  | 750                          | 879                  | 7,586                                     | 10.11                               | 13                | 1.73  | 7             | 0.93                                    |
| 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                 | .83   | 6             | .61                                     |



## (v)—HEALTH OF TROOPS AND POLICE.

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

| Average Strength of Battalion in 1929. | Total Number of Deaths. | Death-rate per 1,000. | Total Number of Men on Sick List. | Sick Rate per 1,000 |
|--|-------------------------|-----------------------|-----------------------------------|---------------------|
| 342                                    | 3                       | 8.77                  | 518                               | 1,698               |

*Police.*

| 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. |
|----------------------|-------------------------|-----------------------|-----------------------------------|----------------------|
| 296                  | 2                       | 6.75                  | 302                               | 1,020                |

## (vi)—PRISONERS.

| Freetown Prison.                              |     |     |     | 1927. | 1928. | 1929. |
|---|-----|-----|-----|-------|-------|-------|
| Total number of prisoners admitted            | ..  | ... | ... | 762   | 755   | 851   |
| Average strength                              | ... | ... | ... | 298   | 258   | 243   |
| Total deaths                                  | ... | ... | ... | 8     | 4     | 19    |
| Total number of prisoners on sick list        | ... | ... | ... | 176   | 141   | 246   |
| Daily average number on sick list             | ... | ... | ... | 8     | 5.15  | 6.17  |
| Daily sick rate per 1,000 of average strength | ... | ... | ... | 26.97 | 19.96 | 25.39 |
| Death-rate per 1,000 of average strength      | ... | ... | ... | 26.85 | 15.50 | 78.19 |

The exceptional death rate for 1929 was due to an outbreak of beriberi in the early part of the year. This has been the subject of a detailed investigation and report by Dr. Leitch, Pathologist and Dr. Marion Watson of the Sir Alfred Jones Research Laboratory.

| Prison.      | Daily Average Number in Custody in 1929. | Daily Sick Rate per 1,000 of Average Strength. | Death-rate per 1,000 of Average Strength. |
|--------------|--|--|---|
| Freetown ... | 243                                      | 25.39  | 78.19                                     |
| Kenema ...   | 58                                       | 29.31  | 34.48                                     |
| Moyamba ...  | 34                                       | 11.76  | —   |
| Batkanu ...  | 33                                       | 39.09  | —   |
| Pujehun ...  | 26                                       | 118.0  | —   |

### III—Hygiene and Sanitation.

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

##### 1—PREVENTIVE MEASURES.

##### (a) *Insect-borne Diseases.*

*Malaria.*—Frequent reference has been made in previous annual reports to the necessity for permanent canalization of streams and street drainage in order to get rid of breeding places of *Anopheles costalis (gambiae)*, which is the principal vector of malaria in Freetown.

As funds have permitted, a good deal of very useful street drainage has been done during the last twelve years, but for financial reasons it has hitherto been impossible to embark on any comprehensive scheme. With the assistance of the Colonial Development Fund, approval has now been given to carry out at a cost of £60,000 the complete surface drainage of a considerable portion of the flat western area of Freetown, in which malaria is hyperendemic. The locality to be dealt with is in the vicinity of Sanders Brook. It is proposed to canalize the brook by means of a concrete channel from the municipal boundary to its outfall in Kroo Bay, and to provide permanent surface drainage for the whole area draining into this brook. The district to be dealt with comprises some 250 acres within the municipal area and 290 acres outside it. The work will be commenced early in 1930.

With the co-operation of the Sir Alfred Jones Laboratory, a malaria survey will be made of the area which is about to be canalized and drained, and a similar survey will be made some time after the scheme has been completed. An investigation will be made of the number of anopheline mosquitoes in dwelling-houses within the area, and the infection rate will be determined.

Macdonald (1926) made a very complete and detailed examination of the blood and spleen measurements of school children, and a precisely similar examination will be made after the completion of the proposed anti-malaria measures.

Apart from the malaria survey, it is proposed to estimate the relative number of known and potential yellow fever mosquito vectors which occur in the district under investigation.

Recent work by Gordon and Macdonald (1929)\* strongly confirms the view long held that *Anopheles gambiae* is by far the most important transmitter of malaria in Sierra Leone. These authors have proved that *Anopheles rhodesiensis* can be successfully infected in the salivary glands as a result of feeding on a patient whose blood contains *P. falciparum* gametocytes, but in view of the unwillingness of this species to feed on man, together with its comparative rarity in dwelling-houses, they conclude that it is not an important carrier of malaria in Sierra Leone. They succeeded in experimentally infecting *Anopheles simithii* and considered that this species probably played a small, but very local, part in the transmission of malaria in the vicinity of Freetown.

*Trypanosomiasis.* Two cases of human trypanosomiasis were reported during the year. One was an unknown destitute found in the Streets of Freetown, whose previous movements could not be traced. The other was a youth who had lived at Rotifunk and had recently travelled extensively in the Southern Province.

The work of Sir Alfred Jones Laboratory on trypanosomiasis at the Cape Lighthouse Peninsula, published in previous annual reports, was continued during the year, and a further report by Dr. Gordon and Dr. Davey will be found in Appendix.

Two cases of human trypanosomiasis were discovered in the village of Aberdeen early in 1928, and a number of inhabitants, especially children, were found to have enlarged cervical glands, and in certain cases, other signs and symptoms suggestive of trypanosomiasis. Seventeen of the latter were subjected to gland puncture, but in none of them were trypanosomes found.

Although no certain evidence of infection of fly with the human type of trypanosome was discovered, the proportion infected with the animal types was found to have increased from 5 per cent in 1922 to 19 per cent in 1928.

In 1929 the percentage of fly found infected was found to have fallen to ten, and again no salivary gland infections were discovered. The high proportion of infection amongst the fly was proved to be due to *T. vivax* and *T. congolense*, the former representing the great majority of infections. The authors are of opinion that the domestic sheep on the peninsula are almost certainly responsible for the high proportion of fly infected with *T. vivax* and that the small proportion of *T. congolense* infection is almost certainly derived from dogs. Sheep on which *T. congolense* infected flies were fed failed to become infected.

\*Annals of Tropical Medicine & Parasitology, Vol. XXIV, pages 69 to 80.

The clearing so far accomplished on the Cape Peninsular has reduced very markedly the number of fly in the cleared area, but a considerable extension of the clearing will be necessary in the direction of the village of Aberdeen before the Peninsular can be sufficiently freed from fly to afford any hope of establishing a dairy farm. The work will be continued as rapidly as funds permit.

*Yellow Fever.*—No case was reported during the year. At the instance of the West African Yellow Fever Commission of the International Health Board, a series of protection tests was carried out to ascertain if there was in the children of Freetown any evidence of previous unrecognized yellow fever. Thirty-four specimens were examined from children between the ages of five and ten living in various parts of Freetown who had, so far as could be ascertained, never been outside the Colony.

Two monkeys (*Macacus rhesus*) were used for each specimen, and each of these was infected with 5 c.c. of serum and 0.1 c.c. of virulent blood. By inoculation of controls it was ascertained that the amount of virus used in each test was equal to at least 100,000 minimum lethal doses of yellow fever virus. With one exception, all the tests were negative.

The following extract from the report of the Medical Officer of Health summarizes the measures taken against insect-borne diseases in Freetown :

*House to House Inspection.*—139,545 compounds were inspected during the year. 309 compounds contained mosquito larvæ and the occupants of these compounds were prosecuted. 290 persons were convicted and 19 were dismissed or cautioned. The total amount in fines from these prosecutions was £72 7s. 6d. The types of larvæ found were as follows :—

|           |     |     |     |     |     |
|-----------|-----|-----|-----|-----|-----|
| Stegomyia | ... | ... | ... | ... | 152 |
| Culex     | ... | ... | ... | ... | 151 |
| Anopheles | ... | ... | ... | ... | 6   |
| Total     | ... | ... | ... | ... | 309 |

10,557 notices were served for the cleaning of compounds. For failing to comply with notices 29 persons were prosecuted; 24 convicted and 5 were discharged or cautioned. The total amount in fines from these prosecutions was £5 7s. 0d. 2,217 notices were served for the cleaning or repair of cesspits. 159 persons were prosecuted, 123 were convicted, 8 were cautioned or discharged, and 28 were withdrawn. The fines totalled £28 10s. 6d.

*Oiling of Pools and Gutters.*—The oiling gangs operated from 4th June to 9th December. 61,958 pools and gutters were oiled. A small amount of oiling was also done in the dry season.

*Tree Inspection.*—22,859 trees were inspected, 7,007 holes were chipped and 7,786 trees cemented. 196 holes contained mosquito larvæ as follows :—

|                     |     |     |     |     |     |
|---------------------|-----|-----|-----|-----|-----|
| Stegomyia           | ... | ... | ... | ... | 59  |
| Culex               | ... | ... | ... | ... | 101 |
| Culex and Stegomyia | ... | ... | ... | ... | 35  |
| Culex and Anopheles | ... | ... | ... | ... | 1   |
| Total               | ... | ... | ... | ... | 196 |

*Inspection of Boat and Canoes.*—3,336 boats and canoes were inspected. In only 2 boats were larvæ discovered.

*Mosquito Larvæ.*—This index was ascertained at the end of each quarter. 350 compounds were examined on each occasion. The index was as follows :—

|               |     |     |     |     |             |
|---------------|-----|-----|-----|-----|-------------|
| First quarter | ... | ... | ... | ... | 57 per cent |
| Second "      | ... | ... | ... | ... | 1.4 "       |
| Third "       | ... | ... | ... | ... | .3 "        |
| Fourth "      | ... | ... | ... | ... | .57 "       |

*Temporary Canalization.*—Five brooks, namely Alligator Brook, Nicol's Brook, Granville Brook, Sanders Brook and Moore's Brook, were canalized as usual at the end of the rainy season.

*Cesspits.*—Watery cesspits were oiled regularly throughout the year and dry ones were disinfected.

#### (b) Epidemic Diseases.

*Plague.*—No case was reported during the year. 1,653 rats collected from all parts of Freetown were examined by the Government Pathologist, but in no case was plague infection found. A bounty is paid by the Health Department for all rats brought in, and 94,885 were purchased in this way during the year. From time to time trapping and poisoning are carried out on as large a scale as possible in the area of the wharves and Customs sheds.

Passengers and baggage from plague infected countries are passed through the wharf disinfection station, whenever this is considered necessary by the Medical Officer of Health.

*Smallpox.*—Six cases were reported in the Karene District and six in Kono District, all of a mild type. The subjoined table records the vaccinations performed during the year in the Colony and Protectorate:—

| Place.                    | Total Number.<br>Vaccinated. | Successful. | Unsuccessful. | Not Seen. |
|---------------------------|------------------------------|-------------|---------------|-----------|
| Freetown ... ..           | 2,449                        | 1,694       | 337           | 418       |
| Kent ... ..               | 70                           | 53          | 12            | 5         |
| Regent ... ..             | 102                          | 91          | 6             | 5         |
| York ... ..               | 61                           | 60          | 1             | ...       |
| Waterloo ... ..           | 210                          | 158         | 39            | 13        |
| Daru ... ..               | ...                          | ...         | ...           | ...       |
| Batkanu ... ..            | 276                          | 179         | 55            | 42        |
| Kenema ... ..             | 333                          | 280         | 19            | 34        |
| Njala ... ..              | 70                           | 56          | 2             | 12        |
| Panguma ... ..            | 244                          | 205         | 4             | 35        |
| Pendembu and Segbwema ... | 480                          | 411         | 37            | 32        |
| Sembahun ... ..           | 508                          | 356         | 81            | 71        |
| Sumbuya ... ..            | 366                          | 201         | 66            | 99        |
| Bo ... ..                 | 624                          | 490         | 53            | 81        |
| Bonthe ... ..             | 280                          | 210         | 22            | 48        |
| Makeni ... ..             | 1,282                        | 769         | 214           | 299       |
| Moyamba ... ..            | 1,027                        | 633         | 286           | 108       |
| Port Loko ... ..          | 176                          | 130         | 28            | 18        |
| Pujehun ... ..            | 1,008                        | 568         | 268           | 172       |
| Kabala ... ..             | 319                          | 32          | 5             | 282       |
| Kaiyima ... ..            | 494                          | 157         | 84            | 253       |
| Mano Salija ... ..        | 174                          | 144         | 26            | 4         |
| Kissy ... ..              | ...                          | ...         | ...           | ...       |
| Kanre Lahun ... ..        | 212                          | 95          | 52            | 65        |
| Goderich ... ..           | 144                          | 69          | 33            | 42        |
|                           | 10,909                       | 7,041       | 1,730         | 2,138     |

Out of 8,771 vaccinations inspected, 7,041, 80 per cent. were successful.

*Dysentery.*—Returns from hospitals and dispensaries show a considerable increase in the number of cases treated, but this does not necessarily connote an increased incidence. With the exception of one of bacillary type at Bo, the cases were all returned as amœbic or undetermined.

*The Enteric Group.*—One case of typhoid, one of paratyphoid (clinical), and one of paratyphoid A were notified to the Health Department. A series of agglutination tests was carried out in the Protectorate by Professor Blacklock and Dr. Macdonald of the Sir Alfred Jones Laboratory. Out of a total of 556 persons whose serum was examined the number of positive reactions was 61, namely 28 with *B. typhosus*, 3 with *B. paratyphosus* A, and 30 with *B. paratyphosus* B.

Professor Blacklock concludes that "there is not in all probability any race or any considerable area in Sierra Leone in which infection with *B. typhosus* and *B. paratyphosus* B is not occurring; the positive results with *B. paratyphosus* A are fewer but afford definite evidence of its occurrence."

*Tuberculosis.*—This is not at present a notifiable disease, but cases treated by medical officers in Government service are reported to the Health Department. Eighty-six cases were so reported during the year, 50 in the Colony (including Sherbro) and the remainder in the Protectorate.

In Freetown domiciliary visits are paid by the Medical Officer of Health and his staff; patients and their relatives are advised and instructed to take simple precautions, and necessary disinfection is carried out. There is no reason to believe that this disease is increasing, and the gradual improvement in housing which is taking place in Freetown should do something to reduce its prevalence.

*Leprosy.*—There was again a great increase in the number of lepers presenting themselves for treatment at the various hospitals and dispensaries, the great majority being natives of the Protectorate. There is no doubt that this is due to the popularity and spectacular success of

the injection treatment of yaws. Unfortunately the lepers expect the same rapid results and are apt to discontinue the treatment when they find that progress is slow. The Medical Officer, Daru, where a larger number of cases was treated than at any other centre, reports that the majority of these cases came from French Guinea.

A scheme for the establishment of a leper settlement in the Colony and one in each Province of the Protectorate has had to be postponed for financial reasons.

*Cerebro-spinal Meningitis.*—One fatal case, clinically diagnosed, was reported in October by the Medical Officer in charge of the American Wesleyan Mission Hospital at Kamabai.

#### (c) *Helminthic Diseases.*

*Ankylostomiasis.*—Is very prevalent and widely distributed, but in the absence of intercurrent disease it rarely causes serious symptoms. The sanitary education of the native will need to be much further advanced before any considerable progress can be made in eradicating this disease.

An examination of Bo school boys at the end of 1928 by Dr. G. H. Gallagher showed an infection rate of just over 30 per cent.

Hookworm infections are perhaps commoner in Europeans than is generally supposed. The Medical Officer, Bo, reported that out of nineteen stools of Europeans examined in the course of treatment ankylostomes were found in five, stongyloides in one, and ascaris in one.

*Cysticercus Bovis.*—Is very common in the local cattle, consequently human infestation with *Tania saginata* is of frequent occurrence.

*Schistosomiasis (S. haematobium).*—Is endemic in the Kono District and also in many of the Mendi chiefdoms on each side of the main railway line. The preventive work in the Kono District described at some length in previous reports, which was commenced at Kaiyima in 1924, has been well maintained and extended to a number of other towns in the district.

## 2—GENERAL MEASURES OF SANITATION.

*Sewage Disposal.*—Except for a few private installations in which sewage is dealt with in septic tanks or by discharge directly into the sea, water carriage is non-existent in Sierra Leone. It is to be hoped that Freetown will one day have a proper sewerage system, but before this can be considered a good deal of town planning and reconstruction will be required and a considerable increase of water storage will be necessary to ensure a constant supply. Until an efficient system can be guaranteed it is better to continue the present simple methods, primitive though they be. In the European and some of the better class African houses the pail system is used, the contents being emptied into the sea or disposed of by trenching. The same method is adopted in the various European cantonments and in many of the schools. Combined with an "Otway" pit with fly-trap into which the pails are emptied, this is an admirable system for small communities. In the African quarters of Freetown cesspits are almost universal. The nuisance arising therefrom is less than might be expected and fly-breeding is small.

There are fifteen public latrines in Freetown, the pail system being used.

*Scavenging.*—In Freetown there is house to house collection of domestic refuse in a limited area, but for the most part it is deposited by the inhabitants themselves in public dust-bins, the contents of which are removed daily by motor-lorries. Manual labour is still necessary for the removal of refuse from certain areas that are inaccessible to lorries.

*Refuse Disposal.*—In Freetown refuse is taken by lorries to a special wharf in the eastern part of the town. The readily combustible material is dealt with in a large "drying-hearth" incinerator and the residue is dumped at sea from hopper barges. A tug and two barges are in constant use for this purpose. Incinerators are gradually being provided for the larger towns in the Protectorate.

*Drainage.*—The following new surface drainage was carried out in Freetown by the Public Health Engineer:—

Four streets in the Western Area.

Part of Fura Bay Road.

King Jimmy valley.

An outfall drain was constructed from Westmoreland Street to Sawpit.

In the Protectorate minor drainage was carried out at Bonthe and Port Loko.

*Other Sanitary Improvements.*—Twelve incinerators were erected at some of the more important places in the Protectorate. Slaughterhouses were built at Pujehun and Pendembu.

*Hill Station Sanitation.*

This European residential area was maintained in good sanitary condition throughout the year.

*Conservancy.*—The method of emptying latrine buckets into an "Otway" pit continues to be satisfactory.

*Anti-Mosquito Measures.*—All compounds trees, rocks, gutters and ditches were regularly inspected and mosquito breeding places dealt with in the usual way. Samples of mosquito larvæ were found as follows :—

|                            |     |     |     |     |           |
|----------------------------|-----|-----|-----|-----|-----------|
| <i>Anopheles</i>           | ... | ... | ... | ... | 1         |
| <i>Culex</i>               | ... | ... | ... | ... | 21        |
| <i>Stegomyia</i>           | ... | ... | ... | ... | 42        |
| <i>Culex and Stegomyia</i> | ... | ... | ... | ... | 21        |
| Total                      | ... | ... | ... | ... | <u>85</u> |

These were found in the following situations :—

|   |     |     |     |     |           |
|---|-----|-----|-----|-----|-----------|
| Rock pools                              | ... | ... | ... | ... | 13        |
| Tree holes                              | ... | ... | ... | ... | 17        |
| Tins, bottles, drums, native pots, etc. | ... | ... | ... | ... | 55        |
|   |     |     |     |     | <u>85</u> |

*Disposal of Refuse.*—Refuse is incinerated and non-combustible material is taken to Freetown and dumped at sea.

*Clearing of grass and undergrowth.*—In addition to the regular gang, sixty labourers were employed for a period of two months and they cleared extensive areas of bush at Hill Cot, the Railway Bungalows, the Governor's Lodge and the European Nursing Home.

## WATER SUPPLIES.

Pipe-borne water supplies were provided during the year at Kailahun, Sumbuya, Masanki (Government Oil-palm Plantation) and Newton (Government Experimental Fruit Farm).

At Kailahun water is obtained by damming a stream, the minimum yield of which is approximately 80,000 gallons a day. By means of two 12-h.p. Tangye semi-diesel engines designed to deliver 6,000 gallons an hour each, the water is pumped to a 20,000 gallon steel service tank, from which there is a gravity supply to the Government station and native town.

At Sumbuya there is a small supply for the Government station by means of a hydraulic ram which delivers 500 gallons a day.

At Masanki, by means of a petrol-paraffin 2-h.p. Tangye pump, delivering 1,800 gallons an hour, water is pumped from a well into two 7,200 gallon steel service tanks, whence there is a gravity supply for the nurseries and quarters.

The Newton supply is similar to the one at Masanki except that less storage is necessary.

The Superintendent of Freetown Waterworks reports as follows :—

The year under review will long be remembered for the acute shortage of water supply experienced—the most acute, since the inauguration of the Freetown Waterworks in 1902.

The shortage of water in Freetown lasted from the 22nd of March to the 24th of May. During this period the City was placed on a restricted supply, and this for only certain hours a day.

At the peak of drought the total supply from the intakes, including the pumping station, was about 200,000 gallons per day, whereas the normal consumption was about 550,000 gallons per day. The supply was turned on for only three to four hours at this point.

With the growth of the population of Freetown, and the gradual increase in the number of private services, the consumption of water in the City tends steadily to increase, and sooner or later the Water Authority will be faced with the problem of increasing the water supply during the dry season.

What is required is adequate storage—a storage reservoir of at least 20 million gallons—to store some portion of the superabundant overflow of the Rainy Season for use during the Dry months. This however, would be a very expensive proposition, as it may involve an increase of 1 to 2 per cent. in the rates.

*Public Standposts.*—There were no public standposts erected during the year under review.

*Private Services.*—There were 20 private services laid during the year. The number of private services at present is 436 with 873 taps. One new service was laid to Colonial Government property, making in all 83 Colonial Government services with about 420 taps.

*Distributing Mains.*—During the year 282 yards of 4 inches C. I. Mains with three fire hydrants were laid along Wellington Street and 240 yards were laid along Free Street, making a total of 522 yards of new 4 inches main and 6 fire hydrants.

*Consumption.*—The total quantity of water consumed during the year was 168,561,000 gallons. Of this quantity 3,276,000 gallons were supplied to Shipping, and 5,637,000 gallons to other non-domestic consumers. The balance of 159,648,000 gallons represents the purely domestic consumption. The maximum daily consumption was 688,000 gallons on the 29th July and the minimum 310,000 gallons on the 19th of July.

*Pumping.*—Pumping operations began on the 1st of March and were continued until the 18th of May at the beginning of the rains.

*Fencing George Brook Reservation Area.*—About  $\frac{3}{4}$  mile of barbed wire fencing was erected during the year along the southeastern boundary of the George Brook Reservation to fence it off from Leicester Village and to keep out trespassers. It is proposed next year to fence that portion of the Congo and Lumley Valley Reservations abutting on Hill Station.

The whole of the works during the year were maintained at the usual standard of efficiency.

### 3—SCHOOL HYGIENE.

The report of the School Medical Officer will be found in Appendix. An examination was made of all children up to twelve in Government controlled schools in Freetown and the villages of the Colony and in a number of schools in the Central and Southern Provinces of the Protectorate. Altogether 2,800 children were medically examined.

It is satisfactory to note that since school medical inspection was instituted in 1925 there has been a gradual improvement in the health and sanitary environment of the children. At the same time much remains to be done, especially as regards latrine accommodation. A plan of a simple and inexpensive type of school latrine was prepared by the Public Health Engineer, and was submitted to the Director of Education, with a recommendation that it should be adopted as widely as possible.

A clinic for the treatment of school children will be opened in Freetown early in 1930.

### 4—LABOUR CONDITIONS.

With the exception of labour supplied mainly by the Kroo people for working cargoes of ships at the various ports of West Africa, practically all labour in Sierra Leone is on a daily-wage basis and no special supervision is required. There is no indentured or contract labour. Practically all outward bound vessels engage from sixty to a hundred labourers at Freetown for employment as deck-hands. They are discharged on the homeward voyage after a period of from three to eight weeks. Such labourers on discharge are medically examined by the Port Health Officer to prevent the entry of infectious disease and to control their health conditions. Where necessary they are passed through the wharf disinfection station. Over 20,000 of these deck-hands were medically examined during the year.

Recent discoveries of minerals may affect the labour situation considerably and legislation may be necessary to ensure satisfactory conditions.

### 5—HOUSING AND TOWN PLANNING.

There has been a gradual improvement in the housing conditions of Freetown as a result of the operation of the Freetown Improvement (Amendment) Ordinance passed in 1926, the main provisions of which are given in the Annual Report for 1927. Progress would be more rapid were it not for bad trade and consequent unemployment and poverty. In the "health areas" of the Protectorate housing and town planning are controlled in a simple manner by the Public Health (Protectorate) Ordinance. Revised Rules under this Ordinance were made towards the end of the year.

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

In Freetown and at all stations where there is a Medical Officer, meat is regularly inspected. In Freetown 2,224 bullocks, 723 sheep and 5 pigs were slaughtered in the public slaughterhouse. Regular inspection of imported tinned foodstuffs was carried out.

The City Council is about to provide a covered market in Regent Road, where there has hitherto been a considerable street market. When this is completed the market accommodation in Freetown will be reasonably adequate.

The new Public Health (Protectorate) Rules will give medical officers full powers to deal with the sale of unsound food in the "health areas" of the Protectorate.

There was a serious outbreak of beriberi in Freetown Prison during the early months of the year, which has formed the subject of a special report. The immediate cause appears to have been a shortage of certain foodstuffs, principally tomatoes and green, due to an exceptional prolonged dry season. The Waterworks Engineer, whose report is published elsewhere, has stated that the water shortage was the most acute since the inauguration of the Freetown Waterworks in 1902.

The Committee appointed to investigate the Freetown Prison outbreak found signs of beriberi amongst the semi-destitute class, which is frequently in and out of prison, but apart from this there is little indication of beriberi in the general population.

Wright's observations in Freetown have shown, however, that there is undoubted evidence of ill-health and actual organic disease due to a vitamin "A" deficiency in the ordinary native diet.

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

The School Medical Officer gave a series of lectures and demonstrations in Hygiene to about 170 teachers at the Teachers' Vacation Course in July. Hygiene is a compulsory subject in all schools. As a result of the better training of the teachers the teaching of this subject has much improved and has become far more practical.

Health Week was held in Freetown in the last week in November. The programme was as follows:—

- (1) Sunday 24th November was observed as Health Sunday and reference to health matters was made in most of the churches.
- (2) Leaflets and posters dealing with health subjects were widely circulated both in Freetown and throughout the villages of the Colony. The subjects dealt with were:—Venereal Disease, Consumption, Rats and Plague, Vaccination and Smallpox, Mosquitoes, and Infant Welfare.
- (3) A school essay competition was held, open to all the schools of the Colony, both primary and secondary, and prizes were awarded. Some of the winning essays reached a high standard.
- (4) Three practical demonstrations were given to teachers by the Medical Officer of Health and Sanitary Superintendent. A demonstration on the Freetown water supply was given by the Waterworks Engineer.
- (5) The event of the week was the Mothercraft and Baby Competition, for which there were large entries. The final judging took place in the Victoria Park on Saturday 30th November, and prizes were distributed by Lady Byrne.

#### C—TRAINING OF SANITARY PERSONNEL.

The usual instruction was given to sanitary inspectors and learners by the Training Officer in accordance with the syllabus given in the Annual Report for 1926. It is hoped that one African Inspector will be able to sit for the Sanitary Inspectors' Examination to be held in Lagos next July.

#### D—RECOMMENDATIONS FOR FUTURE WORK.

- (1) A gradual increase in the Sanitary staff in the Protectorate.
- (2) Application of the Public Health (Protectorate) Ordinance to additional areas as increase in staff permits.
- (3) Some attempt to deal with overcrowding and congested areas in Freetown. The census to be taken in about a year will provide valuable data for an inquiry into the matter.

With reference to the recommendations for future work made in the last report, the proposal regarding leper settlements seems likely to be held up for financial reasons. The other recommendations have been or are being carried out.



#### IV—Port Health Work and Administration.

During the year 414 vessels arrived in Freetown harbour from the North, 411 from the South, and 221 sailing vessels and motor-launches from Sherbro and other places in Sierra Leone.

Freetown was never in quarantine during the year.

Owing to the presence of plague, yellow fever, or small-pox at ports both to the northward and southward of Sierra Leone, it was necessary for the Medical Officer of Health to board practically all ships. All passengers landing from infected ports were kept under surveillance and when necessary passed through the Port Disinfecting Station. 1,459 cabin passengers and 1,883 deck passengers disembarked at Freetown during the year.

#### V—Maternity and Child Welfare.

Maternity and child welfare work was well maintained throughout the year. Reports from the medical officers in charge of this branch will be found in the Appendices.

There were 232 labour cases in the Maternity Ward of the Connaught Hospital and 96 at the Princess Christian Mission Hospital a total of 328 for the year, or 30 per cent, of all registered births in Freetown.

Ante-natal Clinics continued to be held at the Princess Christian Mission Hospital and the Campbell Street Infant Welfare Centre. The attendances at the former were 1,012 and at the latter 2,362, a marked increase in each case on the numbers for the previous year.

The three Infant Clinics continued to do excellent work and the attendances again showed an appreciable increase. An extern Midwifery Department is badly needed when trained midwives can be found to undertake this work.

The question of the care of the pre-school child also requires consideration.

(Signed) W. H. PEACOCK,  
*Deputy Director of Sanitary Service.*

#### VI—Hospitals, Dispensaries and Venereal Clinics.

##### CONNAUGHT HOSPITAL.

The opening of a new ward block containing two wards of 14 beds each and 4 cubicles for better class patients, and later of a children's ward of 8 beds, considerably relieved the pressure on the accommodation. The new wards have been put in charge of the Surgical Specialist, and designated Male and Female Surgical Wards. The hospital since then has been several times full to capacity and further extension will be necessary in the future, but at present there is not the frequent turning away of patients which occurred the previous year, although there is a waiting list for operations of election.

The total number of admissions during the year was 2,228 with 93 deaths, as compared with 1,945 with 156 deaths in 1928.

The number of major operations was slightly reduced from over 400 to 373, owing to the Surgical Specialist being on leave during the year. A full report by Mr. Quintin Stewart appears as Appendix A, and notes on cases of special interest in Section IX.

Apart from surgical cases, the most prevalent diseases for which patients were admitted were malaria 164, dysentery 29, venereal 52, ophthalmic 42, pleurisy, pneumonia and acute bronchitis 182, and diarrhoea and enteritis 53.

The total in-patients and maternity in-patients for the past ten years are given in the following table:—

| Year. | Total In-patients. | Maternity In-patients. | Remarks.  |
|-------|--------------------|------------------------|---|
| 1920  | 602                | 133                    | (Hospital burnt—temporary hospital of one male ward and four maternity beds).                                   |
| 1921  | 737                | 142                    | (New hospital opened—four wards in January, including maternity ward of eleven beds. Two more wards in August). |
| 1922  | 1,282              | 169                    |   |
| 1923  | 1,557              | 200                    |   |
| 1924  | 1,862              | 263                    |   |
| 1925  | 1,860              | 214                    |   |
| 1926  | 1,867              | 251                    |   |
| 1927  | 2,046              | 301                    |   |
| 1928  | 1,945              | 311                    |   |
| 1929  | 2,228              | 353                    | New Surgical block, two wards of 14 beds and 4 cubicles.  |

Out-patients at the Connaught Hospital during the last ten years have been as follows :—

| —                      | 1920.  | 1921.  | 1922.  | 1923.  | 1924.  | 1925.  | 1926.  | 1927.  | 1928.  | 1929.  |
|------------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| New cases              | 8,152  | 5,654  | 10,573 | 11,335 | 10,955 | 14,106 | 13,834 | 14,780 | 13,864 | 14,265 |
| Subsequent attendances | 13,270 | 16,209 | 10,443 | 36,985 | 38,475 | 22,335 | 32,176 | 34,780 | 47,040 | 59,441 |
| Total ...              | 21,422 | 21,863 | 21,016 | 48,320 | 49,430 | 36,441 | 46,010 | 49,560 | 60,904 | 73,706 |

#### EUROPEAN HOSPITAL.

Seventy-nine non-officials and fifty-nine officials were treated during the year. Of these twenty-eight non-officials and thirteen officials were admitted with malaria.

There were four deaths ; one blackwater, the other from causes of a non-climatic nature.

|                          | Admissions. | Deaths. |
|--------------------------|-------------|---------|
| Government officials ... | 59          | 1       |
| Non-officials ...        | 79          | 3       |
| Total ...                | 138         | 4       |

#### HOSPITALS AND DISPENSARIES.

A new dispensary was opened at Mabang, on the Central Railway. This serves the populous district and also the staff and labourers at the Masanki Oil-palm Plantation three miles away.

The dispensary at Sembahun, formerly of native construction, was replaced by a permanent building of concrete.

The new Protectorate type hospital at Makeni was opened and is much appreciated by the people of the district.

Two Mission hospitals, staffed by American doctors and nurses, and subsidized by Government, were opened in the remote Kono District and in the Karene District, and have done good work.

There are now nine medical officers serving the Protectorate, and they supervise ten dispensaries, mostly at considerable distances from their stations.

Table showing the total number of new cases treated at all hospitals and dispensaries during the past ten years :—

| —        | 1920.  | 1921.  | 1922.  | 1923.  | 1924.  | 1925.  | 1926.  | 1927.  | 1928.  | 1929.   |
|----------|--------|--------|--------|--------|--------|--------|--------|--------|--------|---------|
| Patients | 51,287 | 48,270 | 51,689 | 50,260 | 53,270 | 64,752 | 67,975 | 81,135 | 87,641 | 102,531 |

### VII—Prisons and Asylums.

#### KISSY LUNATIC ASYLUM.

*Staff* :—Medical Officer-in-charge

First Class Dispenser

Head Attendant

Assistant Head Attendant

12 Male Attendants

Matron

3 Female Attendants

1 Cook

4 Porters.

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

|   | Males. | Females. | Total. |
|---|--------|----------|--------|
| Remaining 31st December, 1928 ... ..                  | 64     | 42       | 106    |
| Admitted under observation in 1929 ... ..             | 32     | 13       | 45     |
| "    "    certificate ... ..                          | 3      | 1        | 4      |
| Discharged after observation in 1929 ... ..           | 19     | 5        | 24     |
| "    as cured ... ..                                  | —      | 1        | 1      |
| "    on trial by Governor's order ... ..              | 5      | —        | 5      |
| Deaths among the certified ... ..                     | 8      | 5        | 13     |
| "    "    the uncertified ... ..                      | 1      | —        | 1      |
| Remaining in the Asylum on 31st December, 1929 ... .. | 66     | 45       | 111    |

Four patients were admitted from Bathurst Gambia, 3 males and 1 female. This is a larger number than usual.

The number of patients escaping from the Asylum was above the average. Six escaped and all were recaptured.

There were 14 deaths all from natural causes 1 less than in 1928 in spite of the greater number of patients treated.

In no instance was mechanical restraint resorted to and no forcible feeding was necessary. However, 33 males and 27 females had to be kept in separate cells generally at night for totals of 365 and 313 days, respectively.

The Visiting Committee paid three visits during the year. In the second half of the year two Lady Visitors were appointed to work among the female lunatics and, already in this short time, have proved of some value. They visit the Asylum once or twice a month and try to gain the confidence of as many of the inmates as possible and to act as a link between them and their friends and relatives. They have made a recommendation that has been carried out namely that the patients on ordinary diet who do not get their first meal till 11 a.m. should be given some form of breakfast earlier in the day. Bread or agidi is now given at 8 a.m.

An impetus has been given to the gardening by the arrival of seeds from the Director of Agriculture, with the promise of regular supplies.

#### REPORT ON THE FREETOWN PRISON FOR THE YEAR 1929.

In the early part of the year Dr. Alexander, Dr. Renner, Dr. Lewis and Dr. Barker were respectively in charge of the prison, till I took over on the 6th May, 1929.

Dispenser Palmer relieved Dispenser Garber. Owing to the increased work consequent on the epidemic outbreak, Second Class Nurse Taylor was sent over to assist at the end of the first quarter. Dispenser Robbin-Coker relieved Dispenser Palmer in October.

#### HEALTH OF PRISON OFFICERS.

*European.*—This is satisfactory: one was treated for Malaria and placed on the sick list for nine days.

*African.*—This is on the whole good. Six were sent to the Connaught Hospital for admission and treatment; and one having varicella was sent to the Infectious Diseases Hospital, Kissy. Of the six admitted, one showed symptom of beriberi and was readmitted to the Prison hospital, where he recovered. Others were treated as out-patients, mostly for malaria, bronchitis, helminthiasis, and gonorrhœa. Two retired from the service on medical grounds.

#### HEALTH OF PRISONERS.

In the second half of the first quarter, there was an epidemic outbreak in the prison with the following characteristic symptoms: dysenteric symptoms, oedema and tachycardia. Of the 55 cases admitted during the period, 36 showed the above symptoms. There were 11 deaths during the period, and post-mortem examination of five cases confirmed beriberi as the cause of death. Dr. Leitch (Government Pathologist) and Dr. Watson of the Sir Alfred Jones Laboratory investigated the illness and concluded definitely in May that it is beriberi. Apart from this epidemic, the general health was good.

There were 246 cases admitted into hospital. The prevalent diseases being :—tachycardia, enteritis, beriberi, helminthic infections, dyspepsia, external injuries, gonorrhoea and malaria. There were 16 cases of varicella and 7 cases of leprosy. The varicella cases were isolated and treated. Towards the end of the year, leper cases were treated with Aleprol injections. In some cases with ulceration, marked effect has been seen. But in the other cases no definite progress has yet been made. 19 deaths occurred in the prison during the year; the chief cases were beriberi (5), valvular disease of the heart (2), dysentery, tuberculosis, pericarditis, bronchitis, pneumonia, hepatitis, cirrhosis of liver. There were ten postmortem examinations performed. Five cases were sent to the Lunatic Asylum, under Emergency Certificates. 2 were detained.

The weight of prisoners ranged from 78 lbs. to 194 lbs. There were 230 vaccinations done, of which 187 were successful. There were 5 executions and 3 corporal punishments.

The total number of new cases at the dispensary was 1,168 and 7,718 subsequent attendances. The sanitary condition of the prison was good.

- Visits.* (1) His Excellency the Governor.  
(2) The Deputy Director of Sanitary Service.

Detailed reference is not made in this report to the epidemic of beriberi which occurred early in the year, as the writer was present only from the beginning of May, from which time no new cases appeared.

A full record was made by Dr. Watson and Dr. Leitch, from whose report the following abstract is taken, in the authors' own words.

"A clinical examination of the cases showed that 166 prisoners out of 252 exhibited signs and symptoms of beriberi. Some of these presumably came into prison with beriberi while others developed the disease after admission. The general physical state of the majority of the prisoners was much below normal. To support our diagnosis of beriberi, meticulous details of clinical findings are given. Pathological and bacteriological examinations supported no infective-theory of origin of the epidemic. Post-mortem findings were typical in early cases owing to their acute course. Morbidity rates, calculated from daily diet requisitions, increased rapidly since October, 1928, but were not shown in quarterly reports submitted to the Honourable Director of Medical and Sanitary Services, and compiled from the sick register. The disparity in these figures added greatly to the difficulty in producing accurate figures on which to base our conclusions. Unauthorised changes in the dietary resulted in a lack of essential food factors. Prisoners were receiving less than authorised weight of certain foodstuffs. The amount and quantity of certain important articles of diet, such as rice and greens, was analysed—the rice, in addition to being of only average quality, was deficient in germ and pericarp and the greens showed a 40 per cent. waste from stalk. In spite of former recommendations, faulty preparation and cooking of the food was still carried out."

From 26th February to 3rd May there were seventeen deaths, of which five were stated to be due to beriberi after post-mortem examination. The other deaths are shown as due to other causes, but were probably due to complications, or were terminal conditions.

Since the amended dietary was adopted in the prison (8th June, 1929), careful records were kept of the weights of the prisoners and a comparison is made with the corresponding period in 1928. The average weight of fifty convicted prisoners in October, 1928, was 130.2 lb. In October, 1929, it was 141.7 lb. This does not necessarily mean that there was an increase of weight in the fifty men actually weighed, as many of the men weighed in 1928 had been discharged before October 1929, and their places taken by new men, but it might be reasonably assumed that the general condition of the convict prisoners had improved. The recordings for the three months are given here for each year.

| 1928.                 |     |          |           |           |
|-----------------------|-----|----------|-----------|-----------|
|                       |     | October. | November. | December. |
| Average weight in lb. | ... | 130.02   | 130.7     | 131.6     |
| 1929.                 |     |          |           |           |
| Average weight        | ... | 141.7    | 142.7     | 140.34    |

The average weight therefore shows a drop of 1.36 lb from October to November 1929, while there was an increase of 1.6 lb over the same period in 1928.

## FREETOWN PRISON.

## STATISTICAL RETURN FOR THE YEAR 1929.

|                                      |     |     |     |     |
|--------------------------------------|-----|-----|-----|-----|
| In hospital at end of December, 1929 | ..  | ... | ... | 9   |
| Admitted during the year             | ... | ... | ... | 246 |

|   | March Quarter. | June Quarter. | September Quarter. | December Quarter. | Total. |
|---|----------------|---------------|--------------------|-------------------|--------|
| Admission ... ..  | 60             | 80            | 48                 | 58                | 246    |
| Cured ... ..  | 28             | 58            | 43                 | 20                | 149    |
| Relieved ... ..   | 6              | 6             | 4                  | 1                 | 17     |
| Not relieved ... ..   | 4              | 10            | 4                  | 2                 | 20     |
| Died ... ..   | 12             | 5             | —                  | 2                 | 19     |
| Remaining in hospital at end of 1929 ... ..                       | —              | —             | —                  | 16                | 16     |
| Under observation and treatment not admitted into hospital ... .. | —              | —             | —                  | —                 | —      |

*Deaths*—Causes are as follows :—

|  |     |     |     |     |   |
|--|-----|-----|-----|-----|---|
| Beriberi ... ..                            | ... | ... | ... | ..  | 5 |
| Amœbic dysentery                           | ... | ... | ... | ... | 1 |
| Laryngeal tuberculosis                     | ... | ... | ... | ... | 1 |
| Paraplegia ... ..                          | ... | ... | ... | ... | 1 |
| Heart diseases (pericarditis, myocarditis) | ... | ... | ... | ... | 5 |
| Acute bronchitis ... ..                    | ... | ... | ... | ... | 2 |
| Pneumonia ... ..                           | ... | ... | ... | ... | 1 |
| Enteritis ... ..                           | ... | ... | ... | ... | 1 |
| Cirrhosis of liver ... ..                  | ... | ... | ... | ... | 1 |
| Hepatitis ... ..                           | ... | ... | ... | ... | 1 |

*Out-Patients.*

|                          | New Cases. | Subsequent Attendants. |
|--------------------------|------------|------------------------|
| March quarter ... ..     | 271        | 1,444                  |
| June quarter ... ..      | 284        | 2,401                  |
| September quarter ... .. | 250        | 2,076                  |
| December quarter ... ..  | 363        | 1,797                  |
| Total ... ..             | 1,168      | 7,718                  |

Daily average number of prisoners ... .. 239.5

|                          | New-comers. | Remands and Trials. | Corporal Punishment. | Execution. |
|--------------------------|-------------|---------------------|----------------------|------------|
| March quarter ... ..     | 169         | 14                  | 2                    | 1          |
| June quarter ... ..      | 226         | 53                  | 2                    | 1          |
| September quarter ... .. | 243         | 40                  | Nil                  | Nil        |
| December quarter ... ..  | 233         | 82                  | Nil                  | 1          |
| Total ... ..             | 871         | 189                 | 4                    | 3          |

## VIII.—Meteorology.

The rainfall for the year at Freetown (Tower Hill)—155·15 inches—was slightly in excess of the forty years' average for the period 1882–1921, which was 152·47 inches. July was the month of heaviest rainfall with a total of 45·11 inches. The maximum in one day was 7·02 inches on the 25th July.

Hill Station, the residential area situated on a ridge immediately to the west of Freetown, always has a heavier rainfall than Tower Hill. The total for the year was 207·71 inches, July with 60·39 inches being the month of heaviest rainfall. The maximum precipitation on one day was 8·09 inches on the 29th July.

Records of temperature, humidity and rainfall at various stations in the Colony and Protectorate will be found in Table IV.

## IX—Scientific.

### A—PATHOLOGIST'S REPORT, CONNAUGHT HOSPITAL LABORATORY.

*General.*—The equipment of the Laboratory of the Connaught Hospital has been increased considerably during the year. Sufficient apparatus and reagents have now been obtained to tackle all routine investigations. The staff has been increased from one African assistant to two, and pathological material is sent in from the Connaught Hospital, European Hospital, Kissy Institutions, Prison, Princess Christian Hospital, School Clinics as well as occasional specimens from the Protectorate and other sources. During the year 6,114 specimens have been examined as against 1,626 specimens in 1928.

*Research.*—In spite of this increase in routine work, a considerable amount of research work has been undertaken. This may be reviewed under three headings.

#### (1) *Beriberi and the Freetown Prison.*

In March an epidemic broke out in the Freetown Prison and Dr. Marion Watson of the Sir Alfred Lewis Jones Research Laboratory joined me in this investigation. Beriberi was proved to be the cause, and a dietary of low caloric value, a shortage of tomatoes and greens, and loss of vitamin B in the preparation and cooking of the food were shown to be etiological factors. Bacteriological work failed to incriminate any infective agency. A new dietary was drawn up and put into use, and the disease disappeared shortly after. No fresh cases have arisen since, and the new dietary seems satisfactory. The full account of the investigation is contained in a Report entitled "Beriberi and the Freetown Prison." by Leitch and Watson. Sierra Leone Government Publication.

#### (2) *Tropical Diets.*

The investigations detailed above suggested further inquiry into the practice of dietetics in the tropics and sub-tropics, and a letter asking for information on various points was circularised to this end. This was fruitful in bringing to light much interesting material which was incorporated with similar matter collected for some years past and also extracted from the literature. From these sources, it is hoped to publish a book shortly to be called "Dietetics in Warm Countries, including Foodstuffs, their Analyses and Role in Disease."

#### (3) *West African Materia Medica and Toxicology.*

Anxiety has been occasioned by the number of deaths apparently due to poisoning by native medicinal herbs, as well as by native poisons administered with criminal intent. The subject bristles with difficulties, but an investigation has been commenced by listing all West African plants known to have medicinal or poisonous properties, together with any information with regard to their action or detection. This is a herculean task and will take many years to complete. So far some 600 plants have been indexed.

*Publications.*—The following books and paper have been published during the year.

"Beriberi and the Freetown Prison." by Leitch and Watson.

"The Use of Standard treatments in the Campaign against Disease in the Tropics." by Leitch, with an introduction by G. C. Low, Messrs. H. K. Lewis & Co.

"Ascariasis." by Leitch, *J. of Trop. Med. & Hyg.* Dec. 1929.

*Routine.*—The following analysis of the 6,114 routine specimens shows the pathological findings.

|   | EUROPEAN.          |                          | AFRICAN.             |
|---|--------------------|--------------------------|----------------------|
|   | European Hospital. | Out-patients Department. | In and Out-patients. |
| <i>Blood Films.</i>                                 |                    |                          |                      |
| Total examined ... ..                               | 63                 | 64                       | 1,996                |
| Plasmodium falciparum ... ..                        | 14                 | 16                       | 479                  |
| vivax ... ..  | 1                  | —                        | 11                   |
| malariae ... ..                                     | 1                  | 1                        | 1                    |
| Trypanosoma gambiense ... ..                        | 1                  | —                        | 1                    |
| Microfilaria bancrofti ... ..                       | —                  | —                        | 8                    |
| <i>Fæces.</i>                                       |                    |                          |                      |
| Total examined ... ..                               | 12                 | 19                       | 814                  |
| Hookworm ova ... ..                                 | —                  | 2                        | 34                   |
| Ascaris ova ... ..                                  | —                  | 1                        | 42                   |
| Tæniidæ ... ..                                      | 1                  | 2                        | 4                    |
| Trichiuris ... ..                                   | —                  | —                        | 19                   |
| Oxyuris ... ..                                      | —                  | —                        | 2                    |
| Strongyloides larvæ ... ..                          | —                  | —                        | 17                   |
| Entamœba histolytica ... ..                         | —                  | —                        | 24                   |
| Entamœba coli ... ..                                | —                  | —                        | 4                    |
| Trichomonas hominis ... ..                          | —                  | —                        | 6                    |
| Giardia intestinalis ... ..                         | —                  | —                        | 2                    |
| Chilomastix mesnili ... ..                          | —                  | —                        | 2                    |
| <i>Sputa.</i>                                       |                    |                          |                      |
| Total examined ... ..                               | 18                 | 3                        | 287                  |
| Tubercle bacilli present ... ..                     | 2                  | —                        | 61                   |
| <i>Urine.</i>                                       |                    |                          |                      |
| Total examined ... ..                               | 54                 | 5                        | 712                  |
| Schistosome ova found ... ..                        | —                  | —                        | 3                    |
| Urea estimations ... ..                             | 1                  | 1                        | 6                    |
| Other estimations ... ..                            | 2                  | 3                        | 10                   |
| Total blood counts ... ..                           | ...                | ...                      | 34                   |
| Differential blood counts ... ..                    | ...                | ...                      | 41                   |
| Kahn Tests—   |                    |                          |                      |
| Total performed ... ..                              | ...                | ...                      | 40                   |
| Number positive ... ..                              | ...                | ...                      | 21                   |
| Smears from suspected cases of venereal diseases—   |                    |                          |                      |
| Gonococci present ... ..                            | ...                | ...                      | 79                   |
| Spirochaeta pallida ... ..                          | ...                | ...                      | 10                   |
| Smears from suspected cases of leprosy              |                    |                          |                      |
| Lepra bacilli present ... ..                        | ...                | ...                      | 36                   |
| Rats examined for plague ... ..                     | ...                | ...                      | 1,695                |
| No evidence of inflection found from spleen smears— |                    |                          |                      |
| Specimens from the Freetown Prison.                 |                    |                          |                      |
| <i>Fæces :—</i>                                     |                    |                          |                      |
| Total examined ... ..                               | ...                | ...                      | 323                  |
| Hookworm ova found ... ..                           | ...                | ...                      | 52                   |
| Ascaris ... ..                                      | ...                | ...                      | 17                   |
| Trichiuris ... ..                                   | ...                | ...                      | 7                    |
| Strongyloides ... ..                                | ...                | ...                      | 9                    |
| Entamœba histolytica ... ..                         | ...                | ...                      | 9                    |
| Entamœba coli ... ..                                | ...                | ...                      | 2                    |
| Schistosome ova ... ..                              | ...                | ...                      | 1                    |
| <i>Urine :—</i>                                     |                    |                          |                      |
| Total examined ... ..                               | ...                | ...                      | 25                   |
| Albumen present ... ..                              | ...                | ...                      | 5                    |
| <i>Sputum :—</i>                                    |                    |                          |                      |
| Total examined ... ..                               | ...                | ...                      | 16                   |
| Tubercle bacilli found ... ..                       | ...                | ...                      | 2                    |
| <i>Blood :—</i>                                     |                    |                          |                      |
| Total examined ... ..                               | ...                | ...                      | 256                  |
| Malignant tertian rings found ... ..                | ...                | ...                      | 10                   |
| GRAND TOTAL OF ABOVE                                |                    |                          | 620                  |

| Post-mortem Examinations.           | General. | Prison. | Asylum. |
|-------------------------------------|----------|---------|---------|
| <i>Causes of death :—</i>           |          |         |         |
| Myocardial degeneration ... ..      | 2        | —       | 2       |
| Poisoning ... ..                    | 6        | —       | —       |
| Pneumonia ... ..                    | 3        | —       | —       |
| Multiple Injuries and Accidents ... | 9        | —       | —       |
| Hæmorrhage from Malignant Growth    |          |         |         |
| and Bladder. ... ..                 | 1        | —       | —       |
| Murderous Assault ... ..            | 3        | —       | —       |
| <i>Tuberculous Infection :—</i>     |          |         |         |
| Lungs ... ..                        | 1        | —       | —       |
| Glands ... ..                       | 1        | —       | —       |
| Laryngitis ... ..                   | —        | 1       | —       |
| General ... ..                      | 1        | —       | —       |
| Round worms ... ..                  | 1        | —       | —       |
| Eclampsia ... ..                    | 1        | —       | —       |
| Bronchitis and Hernia ... ..        | 2        | —       | —       |
| Gunshot wounds ... ..               | 1        | —       | —       |
| Beriberi ... ..                     | 1        | 8       | 2       |
| Rupture of Aorta ... ..             | 1        | —       | —       |
| Chronic Nephritis ... ..            | 1        | —       | —       |
| Cirrhosis of Liver ... ..           | 1        | —       | —       |

In addition to the above work, various chemical investigations were undertaken in connection with Public Health and Toxicology, and the preparation of an Antimony Salt by a special method for use in Schistosome cases, was continued in the laboratory.

The above numerical summary indicates the variety of work undertaken. I should like to extend the routine examinations, especially of European officers and to correlate pathological findings with treatment. It would seem advantageous to all concerned, if routine specimens of all Europeans were examined at the beginning, middle and end of every tour to eliminate incipient infections.

A fertile field for research in routine lies in attempting to standardize treatment and control it by frequent pathological examinations. This thesis is developed in a publication already referred to. It is admitted that in some cases the clinical and pathological findings are diverse, but this should only stimulate interest in elucidating the true nature of the condition.

The appellation "Director of a Research Institute" suggests a limitation of research which is an unhappy one. It is suggested that *all* medical officers be encouraged to pursue some line of enquiry and that all research work in a Colony should be co-ordinated to prevent overlapping and ensure covering as wide a field as possible. A few examples of problems which could be investigated in this way might be cited here.

(1) Treatment of successive malaria cases by various standard methods, comparing and checking results clinically and pathologically.

(2) The extent of filarial infection, the effect of concomitant infections and treatment on the presence of worms in the peripheral blood.

(3) The trial of new drugs in various tropical diseases. Further research on local nutrition problems is indicated and it is suggested that ulcer cases might be investigated as to the effect of dietetic treatment, as has been done elsewhere with marked success.

The lack of milk in the Colony is a serious drawback and it is possible that a herd of cattle kept under constant supervision and tested frequently for trypanosome infection might thrive, even if regular minimal doses of tryparsamide were indicated more or less as a prophylactic.

NEIL LEITCH,  
*Government Pathologist.*



## B—NOTES ON SURGICAL CASES

BY

Q. STEWART, F.R.C.S. (EDIN.),

*Surgical Specialist.*

## 1—A DOUBLE INGUINAL HERNIA WITH COMPLICATIONS.

It is comparatively seldom that one is called upon to operate in West Africa on the simple type of oblique inguinal hernia usually seen in England.

Often the patients are old and decrepit (I have never been able to understand why they leave it so late), the hernia huge, direct and full of matted abdominal contents, and the muscular arrangements in the vicinity of the inguinal canal woefully inadequate.

A hernia operation in this country, then, may often involve a serious and prolonged procedure. It may be necessary in this class of case to resect gut that cannot be returned, and to take special measures to prevent recurrence, such as excising the testicle and cord to enable the canal to be closed, or in younger men to employ the fascial weaving operation of Gallie.

Almost any of the abdominal organs may be found partly or wholly as the contents of an inguinal hernia, and the sliding type where the peritoneum comes down with the organ attached to it, generally the cæcum, is quite common. The bladder is often to be found at the neck of the sac in various degrees of protrusion but I have only found it necessary to resect what had become a diverticulum on two occasions. I have only twice seen the ureter and this was very evident in the case I am about to detail, a case which exemplifies some of the complications which may have to be dealt with.

A Mende man fifty years old came with a double inguinal hernia of many years duration. These hernias were irreducible and enlarged the scrotum almost to the knee. In the region of the left inguinal canal there was a further swelling about the size of an orange. Under spinal the left side was found to contain mostly small intestine which was reduced. In the cord were two large cysts containing brownish thick fluid, and alongside the sac and uncovered by peritoneum was a large diverticulum of the bladder about three inches in length. The musculature was very unsatisfactory and the canal was closed after resecting the testicle and cord with the cysts and the bladder diverticulum.

Nine days later the right side was done. Here was found a sliding hernia of the ileum, cæcum and appendix, ascending colon, and transverse colon; this went right down to the bottom of the scrotum and was adherent to the testicle (congenital type). It was impossible to replace this matted mass in the abdomen and it was resected; a lateral anastomosis being performed between the ileum and transverse colon.

About two and a half inches of the ureter was present in the wound adherent to the medical aspect of the sac.

The canal was closed after resecting testicle and cord.

This elderly man was quite unaffected by these extensive operations and left hospital twelve days later very fit.

## 2—TWO CASES OF ADVANCED GASTRIC CARCINOMA WITH PYLORIC STENOSIS.

A Kroo Seaman 35 years of age came straight off his ship to see me complaining that for the past four months he had been suffering from vomiting, intermittent distension of the upper part of his abdomen, loss of appetite, loss of weight, and more recently stenosis noises and hiccup. The vomiting came on quickly after taking food.

On examination loss of flesh was marked and the presence of anæmia evident. A peristaltic wave of large dimensions could be seen passing along the abdomen from left to right mainly above the umbilicus, where this wave finished in the right hypochondrium an indefinite hard mass was left. Vomiting occurred constantly, no food being retained.

Operation was postponed for a few days in an endeavour to get the patient into better condition by the administration of glucose per rectum, gastric lavage etc.

On opening the abdomen a wide spread growth was discovered evidently originating in the pyloric end of the stomach—it was quite inoperable, secondary nodules being present all over the abdomen. A quick gastroenterostomy was done to relieve the obstruction but the patient gradually sank and died next day. The section report was "carcinoma which is diffuse and has a scirrhus type of stroma."

The points of interest in this case are the comparative youth of the patient, the fact that he came straight from his work with such an advanced condition, and the shortness the history.

A native of Liberia fifty-four years of age was admitted complaining of pain in the abdomen and vomiting. For two months he had lost weight and appetite and now was troubled with continual hiccup.

The history was that he had had "indigestion" for two years; this took the form apparently of pain in the upper abdomen and vomiting—these attacks occurred intermittently. Two months ago his condition began to get worse and the pain became more severe and located in the left iliac region, he now noticed that a wave of distension passed at intervals across the abdomen from left to right.

On examination loss of flesh was seen to be marked and the general condition appeared to be very unsatisfactory. Peristaltic waves could be seen crossing the abdomen from left to right mainly above and to left of the umbilicus—a faint ladder pattern was also evident. At operation a tumour was discovered evidently originating in the pylorus, it was extensive and there were enlarged hard glands in the vicinity with some fluid in the peritoneal cavity. The patient's condition was poor and a quick gastro-enterostomy was done. He did not rally from the operation and died next day.

The section report states :—

"Carcinoma of glandular type with surface ulceration and extending from the mucosa into the muscular coat. There is formation of acinar structures containing mucinous secretion. Some mucinoid (colloid) degeneration."

### 3—SPLENOMEGALY.

A Temne woman aged 28 was referred to me from another hospital with an enlarged spleen so big as to give her considerable discomfort. It had been quite unresponsive to treatment.

On examination the spleen was found to extend downwards to two inches above the pubis and to the right for three inches beyond the umbilicus. It was freely movable and the notch was prominent. The blood picture was inconclusive, the details being :—

| PARASITES.         |     |     |     |     |           |
|--------------------|-----|-----|-----|-----|-----------|
| White count        | ... | ... | ... | ... | 10,000    |
| Polymorphs         | ... | ... | ... | ... | 51        |
| Lymphocytes        | ... | ... | ... | ... | 45        |
| Large mononuclears | ..  | ... | ... | ... | 3         |
| Eosinophils        | ... | ... | ... | ... | 1         |
| Red count          | ... | ... | ... | ... | 3,760,000 |
| H. b.              | ... | ... | ... | ... | 65%       |

Cysts of *Entamoeba histolytica* were reported in the stool, while the urine was negative.

Treatment being unavailing, and the danger of rupture always present, it was decided to remove the spleen—this was done through a left rectus incision. Great care was required in dealing with the pedicle owing to the size of the vessels and the presence of the pancreas which was adherent to the hilum. Markedly enlarged glands were observed in the vicinity and early cirrhosis of the liver with ascites was evident. Several small infarcts were present in the spleen and the cut surface was sago-like.

Recovery was uneventful.

Microscopically "there seems to be great hypertrophy or hyperplasia of malpighian bodies with their characteristic cells. There are areas of fibrosis which would appear to represent perhaps old haemorrhage which has been organized, as there are young blood vessels present and a rim of blood pigment. The evidence of haemorrhage in the shape of pigmented phagocytes is abundant. Blood destruction is active. Parts are necrosed." The section is apparently not typical of Bantis, Gaucher's or Hodgkin's disease. "It may represent Egyptian splenomegaly."

### 4—CARCINOMA OF THE THYROID GLAND.

A Temne woman thirty-five years of age admitted on 23rd August, 1929, complained of a swelling in her neck; the duration was unknown but it had been there for a long time, only causing pain of late.

On examination a smooth round tumour the size of a small orange was found to be present in the situation of the right lobe of the thyroid. It was slightly movable and moved up and down on swallowing. The diagnosis made was adenoma. There were no obvious toxic symptoms except a somewhat fast pulse.

Under colonic ether an hemithyroidectomy was done leaving a thin slice of the lobe posteriorly to safeguard the recurrent laryngeal nerve. The tumour appeared to infiltrate most of the right lobe which was very adherent to the trachea and required careful dissection off that structure. The naked eye appearance on section suggested a cystic adenoma with atrophy and degeneration, but the section report stated :—"The tumour is a carcinoma of a glandular type (malignant adenoma) with alveolar and acinar formation in the meshes of a hyaline stroma. The general appearance of the growth does not suggest a high degree of malignancy."

Breathing was bad at the close of the operation and became of the Cheyne-Stokes type. The pulse was poor at first but later the general condition improved and she became fairly well; however, the same evening she suddenly became worse and died.

## C—NOTES ON WEST AFRICAN POISONS.

BY

J. NEIL LEITCH, M.D. (LONDON)

*Government Pathologist.*

An investigation on this subject is in progress, and it was thought that a few preliminary notes might be of interest and might stimulate others to contribute their knowledge of the various uses to which local herbs are put. Information is especially required as to bush practices and as to what extent ordeal poisoning continues to the present day.

Much incredulity has been expressed with regard to the alleged powers of medicine men, but it is unlikely that they could continue to wield their power had they not an armoury of effective weapons wherewith they could strike terror into the hearts of the recalcitrant. In many parts of Africa there is scant difference between the chief of the tribe and the medicine man, for one individual fills both offices. It is often difficult to assess the contributory powers of

toxicology and psychology in case of death from poison. As an illustration of this may be quoted the case of a slave who died in New Zealand. A chief of that country, high in rank and sanctity had left the remains of his dinner by the wayside. A slave, a stout, hungry fellow, coming up after the chief had gone, saw the unfinished dinner, and ate it up without asking questions. Hardly had he finished when he was informed by a horror-stricken spectator that the food of which he had eaten was the chief's. "I knew the unfortunate delinquent well" says the narrator, he was remarkable for courage, and had signalized himself in the wars of the tribe, but no sooner did he hear the fatal news than he was seized by the most extraordinary convulsions and cramp in the stomach, which never ceased till he died, about sundown the same day. He was a strong man in the prime of life.

With regard to ordeal poisons, the same authority comments on the depopulating effect of this practice and cites a case of a tribe on the Calabar river who, on one occasion, all partook of poison to prove their innocence. About half perished on the spot, and the remnant, still continuing their superstitious practice, must soon become extinct. During the current year a case occurred in Freetown of a woman who took sassay bark (red water) to prove her innocence and fell a victim to its poison. Sassay bark is obtained from the tree *Erythrophleum guineense*. Don. It is a large tree with spreading branches, doubly pinnated leaves, flowers in spike-like racemes, and bears leguminous fruit. The bark is found in pieces, more or less curved, with or without epidermis, in the former case somewhat fissured externally, of a dull red colour, diversified by whitish spots, brittle, presenting when cut transversely numerous fawn-coloured spots surrounded by reddish-brown tissue, nearly inodorous, and of astringent taste. The active principle *erythrophleine* is water soluble.

In the case referred to, the symptoms complained of were constriction of the fauces, diarrhoea and vomiting, pain in the head, coma followed by death within twenty-four hours. The only post-mortem appearances noted were blood-stained vomit around the mouth and some congestion with hæmorrhage from the mucous membrane of the stomach. The bowel contents were fluid. Erythrophleine exercises a digitalis-like action on the circulation causing a slow, strong pulse, with a rise in the arterial pressure. It also has a local anæsthetic effect more pronounced than cocaine, but for various reasons, it cannot be used thus in practice.

Another case of poisoning may be mentioned here. A man reported sick on the morning of 29th July, complaining of vomiting and later of headache, but although examined by three medical officers in consultation, none of them could find any organic lesion to account for this condition, nor evidence of any known poison. The man had no abdominal pain, his heart and lungs were normal; his pupils reacted normally, his knee jerks and other reflexes were normal. At noon on the 31st there was retraction of the head with considerable mental excitement and incoherence. In an attempt to eliminate hysteria or any obscure psychological condition, light chloroform anæsthesia was induced at 3 p.m. As soon as his movements were controlled and muscles relaxed, chloroform administration was stopped. On recovery from anæsthesia, his condition appeared to be improved, his speech was rational and there was no violence. There was a mask-like stare of his eyes with some affectation of blindness, but this was more apparent than real, as tests showed that he could discern various objects. By 9 p.m. the symptoms had returned and he was so violent that he had to be restrained. No urine was passed for 24 hours before death, but the patient vomiting on the evenings of the 30th and 31st, the vomit being grass green in colour. He died at 10.50 a.m. on August 1st.

At the post-mortem on the day of death, no evidence of any disease was found with the exception of areas of hæmorrhage in the right precentral gyrus of the cerebrum, the lower part of both frontal lobes, and scattered throughout the substance of the pons. The man had been exceptionally healthy and strong, and had had no previous illness. Inquiry elicited the following story: The deceased had recently taken a second wife of a different tribe to the first wife. The first wife had resented this and threatened to "make him eat dry foofoo"—this apparently

being a threat to poison him. From other data it seems probable that the poison used was derived from a species of strophanthus growing wild in the neighbourhood. It is a bushy tree and the fruits, usually sessile and at right angles to each other, resemble cucumbers externally and are 12-15 inches long. When ripe (June-August) the seeds in the containing pod are covered with downy hairs; the poison is obtained by cooking the seeds in water. Many specimens are rich in calcium oxalate crystals, but these are said to be almost absent in *S. kombe* and *S. hispidus*.

Poisoning by arrows contaminated with *S. hispidus* is very rapid. Between the receipt of the wound and the onset of symptoms is a period varying between ten minutes and one and a half hours. Prodromal signs are muscular weakness, and irregular pulse. In fatal cases, tremors convulsions and dyspnoea are marked. Maniacal excitement sometimes mistaken for hysteria has been reported in several cases, while grass-green vomit also occurs in poisoning from digitalis. A case of murder by strophanthin was recorded recently from Germany. Here too, the symptoms were mistaken for hysteria but the real cause was ultimately proved beyond dispute.

In the Freetown market, some three or four men regularly sell their bundles of roots, stems and leaves, at an average price of a penny bundle. The potency of these remedies may be judged by the fact that a decoction of many of them, administered to a dog, will prove fatal within twenty-four hours. Broke-back beans (*Chailletia toxicaria*) may be readily purchased. Dogs eaten fish sprinkled with the powdered beans show in a few minutes great excitement and distress, they vomit, rush about frantically, then become paralysed, have a few convulsions and die.

Gbangba root, sold for treating jaundice, should have the outer layer scraped off before use. If not, it gives rise to "wonderful gripes", and a man who failed to observe this precaution died recently near Freetown of acute gastro-enteritis. A small piece was boiled in water and the decoction, mixed with food, given to a dog. In twelve hours, the dog was apparently in severe pain with mucous dribbling from the mouth, diarrhoea and dyspnoea. Shortly after, it had convulsions and was chloroformed when about to die. Post-mortem there was intense congestion of the mucous membrane of the stomach and intestines.

*Gloriosa superba*—African honeysuckle, is a favourite in tropical gardens on account of its handsome flowers. Its tuberous root is known to possess poisonous properties and it is believed that it was by this means that the Burmese in their retreat before the British in 1842 attempted to poison the water supplies. Its action so resembles aconite that it goes by the name of wild aconite. The symptoms are tingling, then numbness in the lips, tongue and throat, burning pain in the stomach, numbness of the skin in various parts of the body; intense nausea followed by vomiting, diarrhoea with blood-stained motions, giddiness with loss of power in the limbs, photophobia, dyspnoea, feeble, rapid pulse, convulsions and loss of consciousness. Post-mortem examination reveals general congestion of the viscera with some hæmorrhages.

Poisoning by bitter cassava (*Manihot utilissima*) is not uncommon especially among children. The symptoms are collapse and apparent drunkenness, thready pulse, dilated pupils, and slow respiration. It is said to contain 0.027 per cent. of hydrocyanic acid.

A specimen of *Dieffenbachia* known as the dumb cane, has a juice which, if it touches the tongue will cause the latter to swell and thus make the victim dumb for several days. The mashed leaves of *Calliandra portoricensis*, Benth are put on a dying man's eyes to test sensation. If the patient does not feel the pain, death is certain.

Faust isolated a poisonous secretion from a salamander's skin as a crystalline salt which causes restlessness and convulsions, ending in total paralysis in experimental animals. A spider poison, isolated by Sachs, was found to have a powerful hæmolytic action upon the blood of rabbits and cats.

In conclusion, reference may be made to the interesting subject of poisoning through distance, and delayed poisoning. No case of the former kind has occurred locally but as an example that described by Bequaert 3 may be mentioned. On one occasion when travelling in Central Africa, he found a large fungus on a bamboo. As his guides refused to cut it, he did so himself and placed it in a sack and on the head of one of the porters to his extreme disgust. The reason did not appear, as the language was not known. On arrival in camp, the sack was put in that author's tent under his bed. In the night he was seized with violent colic and vomiting, diarrhoea and pain in the joints, and these symptoms persisted through the following day, during which he remained in bed. Soon to his other ills was added violent headache; there was no fever. The next day the symptoms continued till news was brought that the native who carried the specimen was similarly attacked and the cause was attributed by the villagers to the fungus, which they knew well and considered very dangerous. Bequaert was quickly convinced of the truth of this explanation, and had the sack and its contents dumped in a ravine some distance from the camp. The next day, he was able to move camp, and soon he was quite recovered. The fungus was thought to be *Engleromyces Goetzii*. Henn.

Scarcely less uncanny is the sui poisoning from fine needles prepared from the ground-up paste of seeds of *Abrus precatorius*. The active principle, abrin, is harmless when eaten, but beneath the skin the lethal dose is 0.00001 gm. per kilo of body weight. Usually it is rapidly fatal, but in the case of one man, he was awakened by feeling something pricking his cheek. He extracted the sui immediately but died two days later. The "needles" which are very small may be directed through a blow-pipe or planted in the skin by a light flick with a stick to which they are previously attached.

The possibility of delayed poisoning has been denied by some, but the findings in a case occurring in Sierra Leone open up a fresh avenue of thought. An alleged poison employed with criminal intent was found to be but human faeces, but, nevertheless, the specimen showed a high content of hookworm eggs. Professor Gordon of the Sir Alfred Lewis Jones Research Laboratory suggested the possibility to me. What more potent delayed-poison than an intense infestation with hookworm? The intestinal discomfort, the bronchitis, the progressive anaemia and wasting added to the brooding fear of "juju" and the thralldom of tradition bring the victim by slow and painful steps to an early death. Is it not possible that experience accumulating over long years may have taught the medicine man that there is some lethal principle in such specimens, perhaps not always hookworm, but some other parasite? It seems a toxicologist's nightmare to suggest being done to death by worms, long or short, fat or thin, by schistosomes or tapeworms, yet surely potential doom might lurk in such weapons. After slow months of sickness, who could lay such a death at the door of the perpetrator? Poisoning in West Africa and elsewhere in the tropics demands greater consideration than heretofore.

#### References.

1. Frazer. Golden Bough. Pt. 11. 134.
2. Ibid. Pt. 111. 197.
3. Bequaert. Bull. Soc. Path. Exot. 1920. July 7. Vol. 13. No. 7. 486-89.

## D—NOTES ON LEPROSY

BY

M. C. F. EASMON, M.D.

During the year 1929 a record number of patients have been under treatment for leprosy namely 127; of these 109 were out-patients and 18 in-patients. In 1927 for the whole Colony and Protectorate only 80 cases were reported.

The following table shows the statistics of the in-patients :—

| Remaining in Hospital, 1st January, 1929 | Admitted 1929. | Total Treated 1929. | Died 1929. | Discharged 1929. | Remaining in Hospital, 1st January, 1930. |
|--|----------------|---------------------|------------|------------------|---|
| 12                                       | 6              | 18                  | 3          | 2                | 13  |

*Treatment.*—The modern treatment of leprosy at Kissy (*see* the Annual Medical Report for that year) started in 1922 when the two cases, then in the Leper Ward received injections of Moogral with marked ameliorations of symptoms. It is interesting to note, in view of the proposed scheme for tackling the leper problem, that in the annual report for 1914, when 22 cases (6 in Kissy) were reported for the whole year two full pages are devoted to the leper problem, a comparison being made with other West African colonies. In 1929, in addition to the routine hygienic and dietetic treatment of an organized institution, the lepers received the following specific treatment :—

- (1) Injections of Moogral in the first half of the year.
- (2) Injections of Alepol in the first half of the year.
- (3) Painting the reddish brown patches with Trichloroacetic Acid in the second half of the year.
- (4) In a few cases injections of the Chloroform, Chaulmoogra oil, and Acid Carbohc Mixture as used so successfully by Dr. Wood on two cases in the Prisons, Freetown, during 1923 (*vide* Annual Report, page 65).

The treatment was given twice a week on Tuesdays and Fridays at 11 a.m., after the return of the Medical Officer from Wellington. In the case of the paintings these were done every ten days.

14 leper in-patients received 908 treatments, averaging 64·8 per patient.

|     |   |                   |   |       |   |   |      |   |   |
|-----|---|-------------------|---|-------|---|---|------|---|---|
| 109 | „ | out-patients      | „ | 846   | „ | „ | 7·7  | „ | „ |
| 123 | „ | in & out-patients | „ | 1,754 | „ | „ | 14·1 | „ | „ |

In the case of the paintings with trichloroacetic acid the average treatment were in-patients 16 and out-patients 3. From these figures it will be seen that the treatment given to out-patients is quite inadequate and hardly worth the time and trouble as an average of 7·7 injections of howsoever potent a drug is not going to make much impression on a disease so tenacious as leprosy. 99·9 per cent. of the cases are Protectorate natives, Temnes from the Bullom Shore, and they came in the first instance to see the new treatment, perhaps mixing it with the dramatic effects of Bismuth in Yaws. After one or two visits the majority are never seen again, disappointed perhaps in not having been speedily cured. No lasting good will be done with such patients until proper colonies or treatment centres are started in the respective districts and close to tribal groups.

In the report for 1928 it is stated that no lepra bacilli were found in the nasal smears. During 1929 117 persons were examined, all showing clinical evidence of leprosy. Nasal and skin smears were taken in each case and sent to the Pathological Department of the Connaught Hospital for examination and report. Out of 117 cases we find the following :—

|                                |     |     |               |
|--------------------------------|-----|-----|---------------|
| No Lepra bacilli found in      | ... | ... | 90 patients   |
| L. Bacilli in nasal smear only | ... | ... | 11 „          |
| „ „ skin smear only            | ... | ... | 9 „           |
| „ „ both nose and skin smears  | ... | ... | 7 „           |
|                                |     |     | 117 patients. |

The Pathologist pointed out to me that in the great majority of slides, either there were no acid fat bacilli or that the specimen was full of them.

*Results of Treatment.*

These are not very encouraging and the newer methods of treatment, judging from our in-patients do not seem to be as rapid as their originators had led us to expect.

The treatment of the reddish brown areas on the skin and nodules with Trichloroacetic Acid require numerous paintings. We had not yet had with over sixteen applications the complete disappearance of a patch, though in some there is obvious improvement. Similarly with the nodules.

With regard to the injection treatment there are eleven cases who have had continuous treatment for two years (1928 and 1929) and on the whole they are not very much improved as regards their leprosy, though their general physical condition is excellent.

Two young Temne boys were admitted in 1928 (February) with very doubtful patches and thickenings of the ears. One had bacilli in the skin and the other was negative. After two years' treatment bacilli are still present in the skin of the one and in both there are considerable area of reddish brown patches, which appeared during treatment. In 1928 they had a long course in Dr. Wood's chaulmoogra oil mixture.

Now these were early cases from whom one would expect to get good results, the majority of the others are old cases with permanent atrophied lesions.

Two cases were admitted in 1929 the skin and nasal smears being full of bacilli early cases acute and highly infective. At the end of the year, while there was only slight improvement clinically, lepra bacilli are now found in the skin only and none in the nose.

M. C. F. EASMON.

*Medical Officer.*

## E—NOTES ON TREATMENT OF YAWS

BY

## MEDICAL OFFICERS.

## 1.—ACETYLARSAN.

I have used a good deal of Acetylarsan since I have been here and have found it to be an ideal drug. Not only is it an elegant preparation but is also a very efficacious one. The results are rapid, there is no pain with it except that of the prick of the needle and I have never noticed any ill effects after its administration, not even the slight vomiting, that the makers warn one about. The temperature may, or may not rise a point in the evening, but this is of no importance and does not inconvenience the patient.

Hitherto I have only given Acetylarsan by the subcutaneous method and my point of election is high up on the buttock. As 3 c.c.'s. is a large subcutaneous dose, and as some of the drug may be lost by its oozing through the needle hole while under pressure, I usually divide the dose and give half into either hip at one sitting.

I think that Acetylarsan is the DRUG for children, though I had none of the ampoules for juveniles and just divided my adult ampoule between two or three children according to age and weight; my results were good and no untoward accident happened.

Children will cry, but the crying is more from fright than from pain. This however is not so when one has to give them intramuscular B.S.P.T.

The following are two cases that I treated with Acetylarsan, and I have chosen these cases because they were the worst cases that I had ever seen, their bodies were absolutely covered with Yaws.

*Case (1).*—Demur Bangura, Temne female, aged twenty-four years lives at Maboma—the patient has had yaws with pains in her joints for the past five months—

1.3.29 subcutaneous Acetylarsan 3 cc.; 4.3.29. no pain at sight of injection, no induration, an improvement in the yaws; 11.3.29. Yaws completely gone.

*Case (2).*—Mormoh Sanda, Temne male, thirty-five years lived at Makomri. The patient has had yaws for the past seven months, but without pains on the joints—

27.3.29. Subcutaneous Acetylarsan 3 cc.; 7.4.29. Yaws completely gone.

I don't say for one moment that this is a cure but it shows what one injection of Acetylarsan will do. I purposely only gave one dose to see its effects on these 2 cases. In my opinion one or two more injections would, perhaps, have cured the yaws but unfortunately the patients went to their farms thoroughly satisfied. That is the trouble with the natives the moment the yaws goes, they think they are cured.

F. V. HILL,  
*Medical Officer.*

## 2.—HALARSOL.

I have used the Halarsol supplied in a number of cases of yaws at various ages and in various stages. In all it was administered intramuscularly in the doses recommended by the makers. My impressions of its use are as follows:—

1. It appears to be effective in all classes of cases; but in standard doses its action is very much slower than that of standard doses of Neosalvarsan, Acetylarsan or B. S. P. T. Thus in an average case of secondary yaws the improvement in one week after Neosalvaran 0.6 gm., or Acetylarsan 5 c.c. or B. S. P. T. gr. IV is very much greater than after halarsol 4 c.c. Of course I understand that a standard dose of halarsol contains a relatively small proportion of arsenic, and I have not been able to experiment with larger doses.
2. The pains on intramuscular injection is nearly as severe as that following B. S. P. T. but soon passes off. It is much more severe than that following Acetylarsan or Sulpharsenol.
3. I observed no toxic effects after its use.
4. Ampoules containing 10 c.c. would be more convenient to use than the 2 c.c. with double ends, and would involve less waste.

G. L. ALEXANDER,  
*Medical Officer.*



## 3.—HALARSOL.

During the month of March halarsol injections were given in twenty-four patients in order to test—

- (1) its curative properties
- (2) the local and general reaction
- (3) the persence or absence of pain at the site of injections.

*Method of Injection.*

Intramuscular in the gluteal region.

*Dosage.*

- 1-2 c.c. in adults ;  
0.5 c.c. in children ;

Interval between injections three to four days.

In one case in which four injections were given the patient received in all 8 cc. ms. including one dose of 3 cc. ms.

Two patients received four injections, one of which had 8 cc. ms. the other 4 cc. ms.

Seven patients received three injections each ; eight patients received two injections each ; seven patients received one injection each.

Out of the twenty-four patients, seven were old cases who had been under bismuth sodium Potassium tartrate treatment, their improvement was not more rapid than it would have been if the B.S.P.T. had not been discontinued ; these patients were selected particularly to know whether they experienced less pain with the Halarsol injections ; all of these readily admitted the absence of pain, and that the injections were far more comfortable than that of the Bismuth salt.

There was no tenderness, induration or inflammation around the area injected.

One patient, a female adult, complained of dullness on the injected limb and she experienced frontal headache after each injection. Omitting this case, there was no other instance in which a patient complained of any inconvenience ; there was no stomatitis nor any other side effects.

Of the seventeen new cases, ten were children, the complete absence of pain was also noticed.

*Curative Effect.*

There was nothing remarkable in the healing progress of the yaws lesions, not taking into consideration the enthusiasm one unconsciously has over a new preparation. I believe, in the few cases treated, Halarsol is in no way superior to bismuth sodium tartrate.

In the mass treatment of yaws, sometimes with a hundred injections to be accomplished single handed in the morning's work, the constant filling of these 2 c.c. ampoules would of necessity waste time ; this would be obviated if the preparation were put up in bottles of 25 and 50 cc. ms.

*Conclusions.*

1. Its curative properties are not superior to those of B. S. P. T. and decidedly less than the other synthetical arsenic preparations.
2. There is no reaction after injection.
3. Pain is absent.

I am asking for another supply of Halarsol as I intend making further experiments with it, especially on children.

E. TAYLOR CUMMINGS,  
*Medical Officer.*

J. C. S. McDOUALL,  
*Director of Medical and Sanitary Services.*

## Tables.

## I—STAFF.

## MEDICAL STAFF.

| Office.                                      | Name.                 | Absent on Leave. |    |    |    |    |    | Remarks.   |
|--|-----------------------|------------------|----|----|----|----|----|--|
|  |                       | From             |    |    | To |    |    |  |
| Director of Medical and Sanitary Service ... | J. C. S. McDouall ... | 21               | 4  | 29 | 16 | 10 | 29 |  |
| Surgical Specialist ...                      | Q. Stewart ...        | 7                | 4  | 29 | 5  | 9  | 29 |  |
| Pathologist ...                              | J. N. Leitch ...      |                  |    |    |    |    |    | Appointed 16-1-29.   |
| Senior Medical Officer                       | D. T. Birt ...        | 10               | 2  | 29 |    |    |    | Did not return to the Colony. Transferred to Gambia, 6-3-29. |
| "  | G. H. Gallagher ...   |                  |    |    |    |    |    |  |
| "  | A. C. Paterson ...    |                  |    |    |    |    |    | Appointed 6-3-29 in place of Dr. Birt, transferred.          |
| Medical Officer ...                          | J. D. Dimock ...      |                  |    |    | 22 | 2  | 29 |  |
| "  | E. S. Walls ...       | 7                | 4  | 29 | 30 | 11 | 29 | Invalidated.   |
| "  | J. W. Hartley ...     | 16               | 6  | 29 |    |    |    | Invalidated.   |
| "  | W. A. A. Malone ...   | 20               | 2  | 29 |    |    |    | Resigned, 6-7-29.  |
| "  | A. W. Lewis ...       |                  |    |    |    |    |    |  |
| "  | C. B. Jennings ...    |                  |    |    | 2  | 5  | 29 |  |
| "  | R. F. Campbell ...    | 1                | 1  | 29 | 20 | 7  | 29 |  |
| "  | F. V. Hill ...        |                  |    |    |    |    |    |  |
| "  | G. L. Alexander ...   | 5                | 5  | 29 | 14 | 11 | 29 |  |
| "  | H. J. Birmingham ...  | 24               | 2  | 29 | 13 | 9  | 29 |  |
| "  | D. D. Barker ...      | 22               | 9  | 29 |    |    |    |  |
| "  | W. Allan ...          | 8                | 9  | 29 |    |    |    | Invalidated.   |
| "  | R. B. Henderson ...   |                  |    |    |    |    |    | Appointed 14-8-29.   |
| "  | H. R. F. Tweedy ...   |                  |    |    |    |    |    | " 28-8-29.   |
| Lady Medical Officer                         | Mrs. M. G. Blacklock  | 30               | 10 | 29 |    |    |    | Resigned.  |
| African Medical Officer                      | E. J. Wright ...      |                  |    |    |    |    |    |  |
| "  | M. C. F. Easmon ...   | 1                | 1  | 29 | 28 | 1  | 29 |  |
| "  | E. H. T. Cummings     | 1                | 1  | 29 | 1  | 4  | 29 |  |
| "  | G. N. Metzger ...     | 23               | 8  | 29 | 27 | 8  | 29 |  |
| "  | E. A. Renner ...      | 4                | 10 | 29 | 31 | 12 | 29 |  |
| "  | E. A. Renner ...      | 15               | 5  | 29 | 14 | 10 | 29 |  |
| "  | W. B. E. Hughes ...   |                  |    |    |    |    |    |  |
| "  | W. F. O. Taylor ...   |                  |    |    |    |    |    |  |
| "  | M. A. S. Margai ...   |                  |    |    |    |    |    |  |

## SANITARY STAFF.

|  |                     |    |    |    |    |    |    |  |
|--|---------------------|----|----|----|----|----|----|--|
| Deputy Director of Health Service ...            | Major W. H. Peacock | 1  | 1  | 29 | 23 | 1  | 29 |  |
| Senior Health Officer                            | J. M. MacKay ...    | 30 | 10 | 29 | 31 | 12 | 29 |  |
| Medical Officer of Health ...                    | <i>Vacant.</i>      |    |    |    |    |    |    |  |
| Sanitary Superintendent and Training Officer ... | G. V. Herd ...      | 5  | 5  | 29 | 30 | 10 | 29 |  |
| Superintendent Sanitary Inspector ...            | A. E. Wilkinson ... |    |    |    |    |    |    |  |
| "  | P. Osment ...       | 1  | 1  | 29 | 18 | 4  | 29 |  |

## NURSING STAFF.

|                       |                         |    |   |    |    |    |    |              |
|-----------------------|-------------------------|----|---|----|----|----|----|--------------|
| Senior Nursing Sister | Miss C. Littlewood      | 30 | 6 | 29 |    |    |    | Retired.     |
| "                     | Miss A. E. MacMaster    | 2  | 6 | 29 | 9  | 11 | 29 |              |
| Nursing Sister ...    | Miss C. H. B. Goodwin   |    |   |    |    |    |    |              |
| "                     | Miss M. A. Henry ...    | 1  | 1 | 29 | 7  | 3  | 29 |              |
| "                     | Miss L. D. S. Mc Petrie | 13 | 1 | 29 | 16 | 5  | 29 |              |
| "                     | Miss G. V. Brewer       |    |   |    |    |    |    |              |
| "                     | Miss E. D. Stoneman     | 22 | 9 | 29 |    |    |    | Invalidated. |

## AFRICAN MEDICAL SUBORDINATE STAFF.

| Office.                            | Name.               | Absent on Leave. |          |  | Remarks. |
|------------------------------------|---------------------|------------------|----------|--|----------|
|                                    |                     | From             | To       |  |          |
| Chief Dispenser ...                | I. H. Wright ...    | 7 10 29          | 31 12 29 |  |          |
| Assistant Chief Dispenser ...      | M. O. Frazer ...    | —                | —        |  |          |
| Hospital Warden ...                | P. Q. A. John ...   | —                | —        |  |          |
| First Class Dispenser              | O. E. Nylander ...  | 28 6 29          | 27 9 29  |  |          |
| "                                  | H. E. Frazer ...    | 20 7 29          | 19 9 29  |  |          |
| "                                  | P. J. John ...      | —                | 2 1 29   |  |          |
| "                                  | M. P. Neville ...   | —                | —        |  |          |
| "                                  | I. B. Doherty ...   | —                | —        |  |          |
| "                                  | T. M. T. Scott ...  | —                | —        |  |          |
| "                                  | J. C. May ...       | —                | —        |  |          |
| "                                  | S. B. Williams ...  | —                | —        |  |          |
| "                                  | E. W. Cole ...      | —                | —        |  |          |
| "                                  | G. C. Heroe ...     | —                | —        |  |          |
| Second Class Dispensers            | Ten                 | —                | —        |  |          |
| Third Class Dispensers             | Fifteen             | —                | —        |  |          |
| Laboratory Assistant ...           | E. J. Cole ...      | —                | —        |  |          |
| "                                  | C. H. R. Greene ... | —                | —        |  |          |
| Male Nurses and Apprentices ...    | Thirty-three        | —                | —        |  |          |
| Female Nurses and Probationers ... | Twenty-seven        | —                | —        |  |          |

## AFRICAN SANITARY SUBORDINATE STAFF.

|  |  |         |        |  |
|--|--|---------|--------|--|
| Health Visitors ...                              | { Miss B. M. Johnson<br>Mrs. V. S. Macfoy ...<br>and one other } | —       | —      |  |
| Dispenser Infant Welfare Clinic ...              | M. B. King ...   | —       | —      |  |
| Fourth Grade Sanitary Inspector ...              | W. E. J. Corkson ...   | 10 4 29 | 9 5 29 |  |
| Fifth Grade Sanitary Inspectors and Learners ... | Thirty-nine  | —       | —      |  |

## MEDICAL AND SANITARY CLERICAL STAFF.

|                                 |                       |        |         |                                      |
|---------------------------------|-----------------------|--------|---------|--------------------------------------|
| Chief Clerk ...                 | S. G. Randall ...     | —      | —       |                                      |
| Second Grade Clerk ...          | M. St. George Auber   | 1 1 29 | 11 1 29 | Promoted First Grade Clerk, 23-7 29. |
| " " " "                         | E. O. V. Macauley ... | —      | —       |                                      |
| Senior " Third Grade Clerks ... | Nine                  | —      | —       |                                      |
| Junior Third Grade Clerks ...   | Six                   | —      | —       |                                      |

## MEDICAL STORE-KEEPING STAFF.

|                        |                   |        |         |  |
|------------------------|-------------------|--------|---------|--|
| Chief Store-keeper ... | K. A. King ...    | 2 9 29 | 1 11 29 |  |
| Assistant Store-keeper | E. J. Beale ...   | —      | —       |  |
| " "                    | D. G. Kawaley ... | 7 6 29 | 6 7 29  |  |



## III—METEOROLOGICAL RETURNS.

FREETOWN (TOWER HILL).

Longitude 13° 13' 55" W.

Latitude 8° 29' 30" N.

| MONTH.    | Solar Maximum. | Minimum on Grass. | Shade Maximum. | Shade Minimum. | Range. | Mean. | RAINFALL.         |                     | WINDS.             |                |
|-----------|----------------|-------------------|----------------|----------------|--------|-------|-------------------|---------------------|--------------------|----------------|
|           |                |                   |                |                |        |       | Amount in inches. | Degree of Humidity. | General Direction. | Average Force. |
| January   | ...            | ...               | 86             | 72             | 14     | 79    | ...               | 76.5                | ...                | ...            |
| February  | ...            | ...               | 88             | 74             | 14     | 81    | ...               | 72                  | ...                | ...            |
| March     | ...            | ...               | 88             | 74             | 14     | 81    | .53               | 71.5                | ...                | ...            |
| April     | ...            | ...               | 89             | 75             | 14     | 82    | .63               | 73                  | ...                | ...            |
| May       | ...            | ...               | 87             | 75             | 12     | 81    | 8.44              | 81.5                | ...                | ...            |
| June      | ...            | ...               | 84             | *              | ...    | ...   | 27.10             | 88                  | ...                | ...            |
| July      | ...            | ...               | 82             | 73             | 9      | 77.5  | 45.11             | 88                  | ...                | ...            |
| August    | ...            | ...               | 81             | 72             | 9      | 76.5  | 29.00             | 87.5                | ...                | ...            |
| September | ...            | ...               | 83             | 72             | 11     | 77.5  | 27.23             | 88.5                | ...                | ...            |
| October   | ...            | ...               | 85             | 72             | 13     | 78.5  | 10.69             | 85                  | ...                | ...            |
| November  | ...            | ...               | 85.8           | 73.8           | 12.0   | 79.8  | 6.32              | 81.4                | ...                | ...            |
| December  | ...            | ...               | 86.5           | 72.9           | 13.6   | 79.7  | 0.1               | 75.8                | ...                | ...            |
| Year      | ...            | ...               | 85.4           | 73.2           | 12.3   | 79.4  | 155.15            | 80.7                | ...                | ...            |

\* 0 omitted being inaccurate.

Eleven months averages.

BATKANU.

Latitude 9° 4" N.

Longitude 12° 26' W.

| MONTH.    | Solar Maximum. | Minimum on Grass. | Shade Maximum. | Shade Minimum. | Range. | Mean. | RAINFALL.         |                     | WINDS.             |                |
|-----------|----------------|-------------------|----------------|----------------|--------|-------|-------------------|---------------------|--------------------|----------------|
|           |                |                   |                |                |        |       | Amount in inches. | Degree of Humidity. | General Direction. | Average Force. |
| January   | ...            | ...               | 96             | 68             | 28     | 82    | ...               | 63                  | ...                | ...            |
| February  | ...            | ...               | 99             | 73             | 26     | 86    | ...               | 61                  | ...                | ...            |
| March     | ...            | ...               | 100            | 72             | 28     | 86    | 2.60              | 62                  | ...                | ...            |
| April     | ...            | ...               | 99             | 72             | 27     | 85.5  | 5.03              | 64                  | ...                | ...            |
| May       | ...            | ...               | 95             | 73             | 22     | 84    | 13.01             | 73                  | ...                | ...            |
| June      | ...            | ...               | 93             | 70             | 23     | 81.5  | 25.14             | 78                  | ...                | ...            |
| July      | ...            | ...               | 88             | 71             | 17     | 79.5  | 16.52             | 81                  | ...                | ...            |
| August    | ...            | ...               | 86             | 71             | 15     | 78.5  | 16.81             | 83                  | ...                | ...            |
| September | ...            | ...               | 89             | 71             | 18     | 80    | 25.73             | 83                  | ...                | ...            |
| October   | ...            | ...               | 92             | 71             | 21     | 81.5  | 15.03             | 78                  | ...                | ...            |
| November  | ...            | ...               | 93             | 72             | 21     | 82.5  | 1.49              | 77                  | ...                | ...            |
| December  | ...            | ...               | 95             | 65             | 30     | 80    | ...               | 68                  | ...                | ...            |
| Year      | ...            | ...               | 93.7           | 70.7           | 23     | 82.2  | 121.36            | 72.5                | ...                | ...            |

BONTHE (SHERBRO).

Latitude 7° 32' N.

Longitude 12° 30' W.

| MONTH.    | Solar, Maximum. | Minimum on Grass. | Shade, Maximum. | Shade, Minimum. | Range. | Mean. | RAINFALL.         |                     | WINDS.             |                |
|-----------|-----------------|-------------------|-----------------|-----------------|--------|-------|-------------------|---------------------|--------------------|----------------|
|           |                 |                   |                 |                 |        |       | Amount in inches. | Degree of Humidity. | General Direction. | Average Force. |
| January   | ...             | ...               | 89              | 71              | 18     | 80    | .44               | 74                  | ...                | ...            |
| February  | ...             | ...               | 89              | 73              | 16     | 81    | .84               | 75                  | ...                | ...            |
| March     | ...             | ...               | 89              | 74              | 15     | 81.5  | 4.36              | 73                  | ...                | ...            |
| April     | ...             | ...               | 90              | 75              | 15     | 82.5  | 4.72              | 70                  | ...                | ...            |
| May       | ...             | ...               | 88              | 75              | 13     | 81.5  | 15.24             | 75                  | ...                | ...            |
| June      | ...             | ...               | 85              | 74              | 11     | 79.5  | 25.84             | 81                  | ...                | ...            |
| July      | ...             | ...               | 82              | 73              | 9      | 77.5  | 25.64             | 82                  | ...                | ...            |
| August    | ...             | ...               | 82              | 73              | 9      | 77.5  | 22.76             | 84                  | ...                | ...            |
| September | ...             | ...               | 83              | 73              | 10     | 78    | 17.54             | 84                  | ...                | ...            |
| October   | ...             | ...               | 85              | 73              | 12     | 79    | 17.84             | 79                  | ...                | ...            |
| November  | ...             | ...               | 87              | 73              | 14     | 80    | 5.12              | 78                  | ...                | ...            |
| December  | ...             | ...               | 87              | 73              | 14     | 80    | 1.56              | 75                  | ...                | ...            |
| Year      | ...             | ...               | 86.3            | 73              | 13     | 79.8  | 141.90            | 77.5                | ...                | ...            |

Bo.

Latitude 7° 56' N.

Longitude 11° 47' W.

| MONTH.     | Solar,<br>Maximum. | Minimum<br>on Grass. | Shade,<br>Maximum. | Shade,<br>Minimum. | Range. | Mean. | RAINFALL.            |                        | WINDS.                |                   |
|------------|--------------------|----------------------|--------------------|--------------------|--------|-------|----------------------|------------------------|-----------------------|-------------------|
|            |                    |                      |                    |                    |        |       | Amount<br>in inches. | Degree of<br>Humidity. | General<br>Direction. | Average<br>Force. |
| January    | ...                | ...                  | 93                 | 62                 | 31     | 77.5  | .87                  | 73                     | ...                   | ...               |
| February   | ...                | ...                  | 97                 | 58                 | 39     | 77.5  | 2.92                 | 75                     | ...                   | ...               |
| March ...  | ...                | ...                  | 95                 | 67                 | 28     | 81    | 2.43                 | 66                     | ...                   | ...               |
| April ...  | ...                | ...                  | 97                 | 70                 | 27     | 83.5  | 3.65                 | 65                     | ...                   | ...               |
| May ...    | ...                | ...                  | 96                 | 70                 | 26     | 83    | 12.76                | 73                     | ...                   | ...               |
| June ...   | ...                | ...                  | 90                 | 70                 | 20     | 80    | 20.65                | 83                     | ...                   | ...               |
| July ...   | ...                | ...                  | 87                 | 69                 | 18     | 78    | 16.89                | 86                     | ...                   | ...               |
| August ... | ...                | ...                  | 89                 | 69                 | 20     | 79    | 17.79                | 89                     | ...                   | ...               |
| September  | ...                | ...                  | 89                 | 70                 | 19     | 79.5  | 27.67                | 85                     | ...                   | ...               |
| October    | ...                | ...                  | 90                 | 68                 | 22     | 79    | 11.41                | 74                     | ...                   | ...               |
| November   | ...                | ...                  | 92                 | 64                 | 28     | 78    | 5.30                 | 69                     | ...                   | ...               |
| December   | ...                | ...                  | 91                 | 68                 | 23     | 79.5  | .90                  | 79                     | ...                   | ...               |
| Year       | ...                | ...                  | .92                | 67                 | 25     | 79.6  | 123.24               | 76                     | ...                   | ...               |



## KABALA.

Longitude 11° 31' W.

Latitude 9° 34' N.

| MONTH.     | Solar,<br>Maximum. | Minimum<br>on Grass. | Shade,<br>Maximum. | Shade,<br>Minimum. | Range. | Mean. | RAINFALL.            |                        | WINDS.                |                   |
|------------|--------------------|----------------------|--------------------|--------------------|--------|-------|----------------------|------------------------|-----------------------|-------------------|
|            |                    |                      |                    |                    |        |       | Amount<br>in Inches. | Degree of<br>Humidity. | General<br>Direction. | Average<br>Force. |
| January    | ...                | ...                  | 91                 | 60                 | 31     | 75.5  | ...                  | 53                     | ...                   | ...               |
| February   | ...                | ...                  | 96                 | 67                 | 29     | 81.5  | ...                  | 54                     | ...                   | ...               |
| March ...  | ...                | ...                  | 96                 | 70                 | 26     | 83    | 4.44                 | 60                     | ...                   | ...               |
| April ...  | ...                | ...                  | 94                 | 71                 | 23     | 82.5  | 4.35                 | 68                     | ...                   | ...               |
| May ...    | ...                | ...                  | 91                 | 71                 | 20     | 81    | 6.61                 | 76                     | ...                   | ...               |
| June ...   | ...                | ...                  | 86                 | 69                 | 17     | 77.5  | 12.02                | 79                     | ...                   | ...               |
| July ...   | ...                | ...                  | 83                 | 68                 | 15     | 75.5  | 9.36                 | 87                     | ...                   | ...               |
| August ... | ...                | ...                  | 82                 | 68                 | 14     | 75    | 13.91                | 88                     | ...                   | ...               |
| September  | ...                | ...                  | 86                 | 68                 | 18     | 77    | 14.62                | 85                     | ...                   | ...               |
| October    | ...                | ...                  | 88                 | 68                 | 20     | 78    | 12.59                | 82                     | ...                   | ...               |
| November   | ...                | ...                  | 90                 | 66                 | 24     | 78    | .39                  | 73                     | ...                   | ...               |
| December   | ...                | ...                  | 90                 | 58                 | 32     | 74    | ...                  | 48                     | ...                   | ...               |
| Year       | ...                | ...                  | 89.4               | 67                 | 22.4   | 78.2  | 78.29                | 71                     | ...                   | ...               |

PUJEHUN.

Latitude 7° 20' N.

Longitude 11° 43' W.

| MONTH.    | Solar,<br>Maximum. | Minimum<br>on Grass. | Shade,<br>Maximum. | Shade,<br>Minimum. | Range. | Mean. | RAINFALL.            |                        | WINDS.                |                   |
|-----------|--------------------|----------------------|--------------------|--------------------|--------|-------|----------------------|------------------------|-----------------------|-------------------|
|           |                    |                      |                    |                    |        |       | Amount<br>in Inches. | Degree of<br>Humidity. | General<br>Direction. | Average<br>Force. |
| January   | ...                | ...                  | 93                 | 68                 | 25     | 80.5  | 0.22                 | 73                     | ...                   | ...               |
| February  | ...                | ...                  | 94                 | 70                 | 24     | 82    | 1.33                 | 72                     | ...                   | ...               |
| March     | ...                | ...                  | 94                 | 72                 | 22     | 83    | 5.49                 | 72                     | ...                   | ...               |
| April     | ...                | ...                  | 94                 | 72                 | 22     | 83    | 10.62                | 70                     | ...                   | ...               |
| May       | ...                | ...                  | 93                 | 72                 | 21     | 82.5  | 18.25                | 75                     | ...                   | ...               |
| June      | ...                | ...                  | 91                 | 71                 | 20     | 81    | 17.94                | 76                     | ...                   | ...               |
| July      | ...                | ...                  | 91                 | 70                 | 21     | 80.5  | 19.63                | 83                     | ...                   | ...               |
| August    | ...                | ...                  | 90                 | 69                 | 21     | 79.5  | 22.87                | 87                     | ...                   | ...               |
| September | ...                | ...                  | 90                 | 70                 | 20     | 80    | 27.33                | 85                     | ...                   | ...               |
| October   | ...                | ...                  | 91                 | 70                 | 21     | 80.5  | 11.83                | 83                     | ...                   | ...               |
| November  | ...                | ...                  | 92                 | 71                 | 21     | 81.5  | 4.31                 | 79                     | ...                   | ...               |
| December  | ...                | ...                  | 92                 | 68                 | 24     | 80    | ...                  | 75                     | ...                   | ...               |
| Year      | ...                | ...                  | 92                 | 70.2               | 21.83  | 81.12 | 139.82               | 77.5                   | ...                   | ...               |

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

| Diseases.   | IN-PATIENTS.                                   |                     |                           |         |  | OUT-PATIENTS.            |                            |
|---|--|---------------------|---------------------------|---------|--|--------------------------|----------------------------|
|   | Remaining<br>in Hospital<br>at end of<br>1928. | Total<br>Admission. | Total<br>Cases<br>treated | Deaths. | Remaining<br>in Hospital<br>at end of<br>1929. | New<br>Cases<br>treated. | Subsequent<br>Attendances. |
| <b>I—EPIDEMIC, ENDEMIC, AND INFECTIOUS DISEASES</b> |  |                     |                           |         |  |                          |                            |
| Enteric Group :                                     |  |                     |                           |         |  |                          |                            |
| (a) Typhoid fever ...                               |  |                     |                           |         |  |                          |                            |
| (b) Paratyphoid A. ...                              |  |                     |                           |         |  |                          |                            |
| (c) Paratyphoid B. ...                              |  |                     |                           |         |  |                          |                            |
| (d) Type not defined ...                            |  |                     |                           |         |  |                          |                            |
| Typhus ...  |  |                     |                           |         |  |                          |                            |
| Relapsing fever ...                                 |  |                     |                           |         |  |                          |                            |
| Undulant fever ...                                  |  |                     |                           |         |  |                          |                            |
| Malaria :   |  |                     |                           |         |  |                          |                            |
| (a) Tertian ...                                     | ...  | ...                 | ...                       | ...     | ...  | 5                        |                            |
| (b) Quartan ...                                     | ...  | 4                   | 4                         | ...     | ...  | ...                      |                            |
| (c) Aestivo-autumnal ...                            | ...  | 33                  | 33                        | ...     | ...  | 24                       |                            |
| (d) Unclassified ...                                | ...  | 4                   | 4                         | ...     | ...  | 54                       |                            |
| (e) Cachexia ...                                    | ...  | 1                   | 1                         | ...     | ...  | 2                        |                            |
| (f) Blackwater ...                                  | ...  | 2                   | 2                         | 2       | ...  | 1                        |                            |
| Smallpox :  |  |                     |                           |         |  |                          |                            |
| Alastrim ...  |  |                     |                           |         |  |                          |                            |
| Measles ...   |  |                     |                           |         |  |                          |                            |
| Scarlet fever ...                                   |  |                     |                           |         |  |                          |                            |
| Whooping cough ...                                  |  |                     |                           |         |  |                          |                            |
| Diphtheria ...                                      |  |                     |                           |         |  |                          |                            |
| Influenza ...                                       | ...  | 4                   | 4                         | ...     | ...  | ...                      |                            |
| Miliary fever ..                                    |  |                     |                           |         |  |                          |                            |
| Mumps ...   |  |                     |                           |         |  |                          |                            |
| Cholera ...   | ...  | ...                 | ...                       | ...     | ...  | 1                        |                            |
| Epidemic diarrhoea ...                              |  |                     |                           |         |  |                          |                            |
| Dysentery :   |  |                     |                           |         |  |                          |                            |
| (a) Amœbic ...                                      | ...  | 3                   | 3                         | ...     | ...  | 4                        |                            |
| (b) Bacillary ...                                   |  |                     |                           |         |  |                          |                            |
| (c) Undefined or due to<br>other causes ...         | ...  | ...                 | ...                       | ...     | ...  | 1                        |                            |
| Plague :  |  |                     |                           |         |  |                          |                            |
| (a) Bubonic ...                                     |  |                     |                           |         |  |                          |                            |
| (b) Pneumonic ...                                   |  |                     |                           |         |  |                          |                            |
| (c) Septicæmic ...                                  |  |                     |                           |         |  |                          |                            |
| (d) Undefined ...                                   |  |                     |                           |         |  |                          |                            |
| Yellow fever ...                                    |  |                     |                           |         |  |                          |                            |
| Spirochaetosis<br>ictero-hæmorrhagica               |  |                     |                           |         |  |                          |                            |
| Leprosy ...   |  |                     |                           |         |  |                          |                            |
| Erysipelas ...                                      |  |                     |                           |         |  |                          |                            |
| Carried forward ...                                 | ...  | 51                  | 51                        | 2       | ...  | 92                       |                            |

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<br>in Hospital<br>at end of<br>1928. | Total<br>Admission. | Total<br>Cases<br>treated. | Deaths. | Remaining<br>in Hospital<br>at end of<br>1929. | New<br>Cases<br>treated. | Subsequent<br>Attendances. |
| Brought forward ..   | ...  | 51                  | 51                         | 2       | ...  | 92                       |                            |
| <b>I—EPIDEMIC, ENDEMIC,<br/>AND INFECTIOUS<br/>DISEASES—continued.</b> |  |                     |                            |         |  |                          |                            |
| Acute poliomyelitis ...  |  |                     |                            |         |  |                          |                            |
| Encephalitis lethargica ...  |  |                     |                            |         |  |                          |                            |
| Epidemic cerebro-spinal<br>fever ... ..                                |  |                     |                            |         |  |                          |                            |
| Other Epidemic Diseases :  |  |                     |                            |         |  |                          |                            |
| (a) Rubeola (German<br>measles) ... ..                                 |  |                     |                            |         |  |                          |                            |
| (b) Varicella (chicken-<br>pox) ... ..                                 | ...  | 1                   | 1                          | ...     | ...  | ...                      |                            |
| (c) Kala-azar ...  |  |                     |                            |         |  |                          |                            |
| (d) Phlebotomus fever  |  |                     |                            |         |  |                          |                            |
| (e) Dengue ... ..  |  |                     |                            |         |  |                          |                            |
| (f) Epidemic dropsy ...  |  |                     |                            |         |  |                          |                            |
| (g) Yaws ... ..  |  |                     |                            |         |  |                          |                            |
| (h) Trypanosomiasis ...  |  |                     |                            |         |  |                          |                            |
| Glanders ... ..  |  |                     |                            |         |  |                          |                            |
| Anthrax ... ..   |  |                     |                            |         |  |                          |                            |
| Rabies ... ..  |  |                     |                            |         |  |                          |                            |
| Tetanus ... ..   |  |                     |                            |         |  |                          |                            |
| Mycosis ... ..   |  |                     |                            |         |  |                          |                            |
| Tuberculosis, pulmonary<br>and laryngeal ... ..                        | ...  | 2                   | 2                          | ...     | ...  | ...                      |                            |
| Tuberculosis of the menin-<br>ges or central nervous<br>system ... ..  |  |                     |                            |         |  |                          |                            |
| Tuberculosis of the<br>intestines or peritoneum                        |  |                     |                            |         |  |                          |                            |
| Tuberculosis of the ver-<br>tebral column ... ..                       |  |                     |                            |         |  |                          |                            |
| Tuberculosis of bones and<br>joints ... ..                             |  |                     |                            |         |  |                          |                            |
| Tuberculosis of other<br>Organs :                                      |  |                     |                            |         |  |                          |                            |
| (a) Skin or subcutaneous<br>tissue (Lupus) ... ..                      |  |                     |                            |         |  |                          |                            |
| (b) Bones ... ..   |  |                     |                            |         |  |                          |                            |
| (c) Lymphatic system   |  |                     |                            |         |  |                          |                            |
| (d) Genito-urinary ... ..  |  |                     |                            |         |  |                          |                            |
| (e) Other organs ... ..  |  |                     |                            |         |  |                          |                            |
| Tuberculosis, Disseminated :   |  |                     |                            |         |  |                          |                            |
| (a) Acute ... ..   |  |                     |                            |         |  |                          |                            |
| (b) Chronic ... ..   | ...  | 1                   | 1                          | 1       | ...  | ...                      |                            |
| Carried forward ...  | ...  | 55                  | 55                         | 3       | ...  | 92                       |                            |

## EUROPEAN—continued.

| Diseases.   | IN-PATIENTS.                                   |                     |                           |         |  | OUT-PATIENTS.            |                            |
|---|--|---------------------|---------------------------|---------|--|--------------------------|----------------------------|
|   | Remaining<br>in Hospital<br>at end of<br>1928. | Total<br>Admission. | Total<br>Cases<br>treated | Deaths. | Remaining<br>in Hospital<br>at end of<br>1929. | New<br>Cases<br>treated. | Subsequent<br>Attendances. |
| Brought forward ...   | ...  | 55                  | 55                        | 3       | ...  | 92                       |                            |
| I—EPIDEMIC, ENDEMIC,<br>AND INFECTIOUS<br>DISEASES—continued.                     |  |                     |                           |         |  |                          |                            |
| Syphilis :  |  |                     |                           |         |  |                          |                            |
| (a) Primary ...   |  |                     |                           |         |  |                          |                            |
| (b) Secondary ...   |  |                     |                           |         |  |                          |                            |
| (c) Tertiary ...  | ...  | ...                 | ...                       | ...     | ...  | 1                        |                            |
| (d) Hereditary ...  |  |                     |                           |         |  |                          |                            |
| (e) Period not indicated  |  |                     |                           |         |  |                          |                            |
| Soft chancre ...  |  |                     |                           |         |  |                          |                            |
| A.—Gonorrhœa and its<br>complications ...   | ...  | ...                 | ...                       | ...     | ...  | 3                        |                            |
| B.—Gonorrhœal ophthalmia  |  |                     |                           |         |  |                          |                            |
| C.—Gonorrhœal arthritis...  | ...  | 1                   | 1                         | ...     | ...  | ...                      |                            |
| D.—Granuloma venereum ...   |  |                     |                           |         |  |                          |                            |
| Septicæmia ...  |  |                     |                           |         |  |                          |                            |
| Other infectious diseases ...   |  |                     |                           |         |  |                          |                            |
| II—GENERAL DISEASES<br>NOT MENTIONED ABOVE.                                       |  |                     |                           |         |  |                          |                            |
| Cancer or other malignant<br>tumours of the buccal<br>cavity ...                  |  |                     |                           |         |  |                          |                            |
| Cancer or other malignant<br>tumours of the stomach<br>or liver ...               | ...  | 1                   | 1                         | 1       | ...  | ...                      |                            |
| Cancer or other malignant<br>tumours of the peritoneum,<br>intestines, rectum ... |  |                     |                           |         |  |                          |                            |
| Cancer or other malignant<br>tumours of the female<br>genital organs ...          |  |                     |                           |         |  |                          |                            |
| Cancer or other malignant<br>tumours of the breast ...                            |  |                     |                           |         |  |                          |                            |
| Cancer or other malignant<br>tumours of the skin ...                              |  |                     |                           |         |  |                          |                            |
| Cancer or other malignant<br>tumours of organs not<br>specified ...               |  |                     |                           |         |  |                          |                            |
| Tumours, non-malignant ...  | ...  | ...                 | ...                       | ...     | ...  | 1                        |                            |
| Acute rheumatism ...  | ...  | ...                 | ...                       | ...     | ...  | 2                        |                            |
| Chronic rheumatism ...  | ...  | 1                   | 1                         | ...     | ...  | 5                        |                            |
| Scurvy (including Barlow's<br>disease) ...  |  |                     |                           |         |  |                          |                            |
| Pellagra ...  |  |                     |                           |         |  |                          |                            |
| Beriberi ...  |  |                     |                           |         |  |                          |                            |
| Rickets ...   |  |                     |                           |         |  |                          |                            |
| Diabetes (not including<br>insipidus) ...   |  |                     |                           |         |  |                          |                            |
| Carried forward ...   | ...  | 58                  | 58                        | 4       | ...  | 104                      |                            |

## EUROPEAN—continued.

| Diseases.  | IN-PATIENTS.                                   |                     |                            |         |  | OUT-PATIENTS.            |                            |
|--|--|---------------------|----------------------------|---------|--|--------------------------|----------------------------|
|  | Remaining<br>in hospital<br>at end of<br>1928. | Total<br>Admission. | Total<br>Cases<br>treated. | Deaths. | Remaining<br>in Hospital<br>at end of<br>1929. | New<br>Cases<br>treated. | Subsequent<br>Attendances. |
| Brought forward ...  | ...  | 58                  | 58                         | 4       | ...  | 104                      |                            |
| <b>II—GENERAL DISEASES<br/>NOT MENTIONED ABOVE,<br/>continued.</b>                   |  |                     |                            |         |  |                          |                            |
| Anæmia :   |  |                     |                            |         |  |                          |                            |
| (a) Pernicious ...   |  |                     |                            |         |  |                          |                            |
| (b) Other anæmias and<br>chlorosis ...   | ...  | 6                   | 6                          | ...     | ...  | 12                       |                            |
| Diseases of the pituitary<br>body ...  |  |                     |                            |         |  |                          |                            |
| Diseases of the Thyroid<br>Gland :   |  |                     |                            |         |  |                          |                            |
| (a) Exophthalmic goitre  |  |                     |                            |         |  |                          |                            |
| (b) Other diseases of the<br>thyroid gland,<br>myxœdema ...                          |  |                     |                            |         |  |                          |                            |
| Diseases of the parathyroid<br>glands ...  |  |                     |                            |         |  |                          |                            |
| Diseases of the thymus ...   |  |                     |                            |         |  |                          |                            |
| Diseases of supra-renal<br>glands ...  |  |                     |                            |         |  |                          |                            |
| Diseases of the spleen ...   | ...  | ...                 | ...                        | ...     | ...  | 1                        |                            |
| Leukæmia :   |  |                     |                            |         |  |                          |                            |
| (a) Leukæmia ...   |  |                     |                            |         |  |                          |                            |
| (b) Hodgkin's disease  |  |                     |                            |         |  |                          |                            |
| Alcoholism ...   | ...  | 2                   | 2                          | ...     | ...  | ...                      |                            |
| Chronic poisoning by min-<br>eral substances (lead,<br>mercury, etc.) ...            |  |                     |                            |         |  |                          |                            |
| Chronic poisoning by<br>organic substances (mor-<br>phia, cocaine, etc.) ...         |  |                     |                            |         |  |                          |                            |
| Other General Diseases :   | ...  | 1                   | 1                          | 1       | ...  | 5                        |                            |
| Auto-intoxication ...  | ...  | ...                 | ...                        | ...     | ...  | 1                        |                            |
| Purpura hæmorrhagica   |  |                     |                            |         |  |                          |                            |
| Hæmophilia ...   |  |                     |                            |         |  |                          |                            |
| Diabetes insipidus ...   |  |                     |                            |         |  |                          |                            |
| <b>III—AFFECTIONS OF THE<br/>NERVOUS SYSTEM AND<br/>ORGANS OF THE SENSES.</b>        |  |                     |                            |         |  |                          |                            |
| Encephalitis (not including<br>encephalitis lethargica)                              |  |                     |                            |         |  |                          |                            |
| Meningitis (not including<br>tuberculous meningitis or<br>cerebro-spinal meningitis) |  |                     |                            |         |  |                          |                            |
| Carried forward ...  | ...  | 67                  | 67                         | 5       | ...  | 123                      |                            |

EUROPEAN—*continued.*

| Diseases.   | IN-PATIENTS.                                   |                     |                            |         |  | OUT-PATIENTS.            |                            |
|---|--|---------------------|----------------------------|---------|--|--------------------------|----------------------------|
|   | Remaining<br>in Hospital<br>at end of<br>1928. | Total<br>Admission. | Total<br>Cases<br>treated. | Deaths. | Remaining<br>in Hospital<br>at end of<br>1929. | New<br>Cases<br>treated. | Subsequent<br>Attendances. |
| Brought forward ...   |  | 67                  | 67                         | 5       |  | 123                      |                            |
| III—AFFECTIONS OF THE<br>NERVOUS SYSTEM AND<br>ORGANS OF THE SENSES,<br><i>continued.</i> |  |                     |                            |         |  |                          |                            |
| Locomotor ataxia ...  |  |                     |                            |         |  |                          |                            |
| Other affections of the<br>spinal cord ...  |  |                     |                            |         |  |                          |                            |
| Apoplexy :  | ...  | 1                   | 1                          | 1       | ...  | ...                      |                            |
| (a) Hæmorrhage ...  | ...  | ...                 | ...                        | ...     | ...  | 1                        |                            |
| (b) Embolism ...  |  |                     |                            |         |  |                          |                            |
| (c) Thrombosis ...  |  |                     |                            |         |  |                          |                            |
| Paralysis :   |  |                     |                            |         |  |                          |                            |
| (a) Hemiplegia ...  |  |                     |                            |         |  |                          |                            |
| (b) Other paralysis ...   |  |                     |                            |         |  |                          |                            |
| General paralysis of the<br>insane ...  |  |                     |                            |         |  |                          |                            |
| Other forms of mental<br>alienation ...   | ...  | ...                 | ...                        | ...     | ...  | 1                        |                            |
| Epilepsy ...  |  |                     |                            |         |  |                          |                            |
| Eclampsia, convulsions (non-<br>puerperal) 5 years<br>or over ...                         |  |                     |                            |         |  |                          |                            |
| Infantile convulsions ...   |  |                     |                            |         |  |                          |                            |
| Chorea ...  |  |                     |                            |         |  |                          |                            |
| A.—Hysteria ...   |  |                     |                            |         |  |                          |                            |
| B.—Neuritis ...   | ...  | 1                   | 1                          | ...     | ...  | 1                        |                            |
| C.—Neurasthenia ...   | ...  | 3                   | 3                          | ...     | 1  | 3                        |                            |
| Cerebral softening ...  |  |                     |                            |         |  |                          |                            |
| Other affections of the<br>nervous system, such as<br>paralysis agitans ...               | ...  | 1                   | 1                          | ...     | ...  | 2                        |                            |
| Affections of the Organs of<br>Vision :   |  |                     |                            |         |  |                          |                            |
| (a) Diseases of the eye ...   | ...  | 1                   | 1                          | ...     | ...  | ...                      |                            |
| (b) Conjunctivitis ...  | ...  | ...                 | ...                        | ...     | ...  | 4                        |                            |
| (c) Trachoma ...  |  |                     |                            |         |  |                          |                            |
| (d) Tumours of the eye ...  |  |                     |                            |         |  |                          |                            |
| (e) Other affections of<br>the eye ...  | ...  | 2                   | 2                          | ...     | ...  | 8                        |                            |
| Affections of the ear or<br>mastoid sinus ...   | ...  | ...                 | ...                        | ...     | ...  | 11                       |                            |
| Carried forward ...   |  | 76                  | 76                         | 6       | 1  | 154                      |                            |

## EUROPEAN—continued.

| Diseases   | IN-PATIENTS.                                   |                     |                            |         |  | OUT-PATIENTS.            |                           |
|--|--|---------------------|----------------------------|---------|--|--------------------------|---------------------------|
|  | Remaining<br>in Hospital<br>at end of<br>1928. | Total<br>Admission. | Total<br>Cases<br>treated. | Deaths. | Remaining<br>in Hospital<br>at end of<br>1929. | New<br>Cases<br>treated. | Subsequent<br>Attendances |
| Brought forward ...                                    |  | 76                  | 76                         | 6       | 1  | 154                      |                           |
| <b>IV—AFFECTIONS OF THE CIRCULATORY SYSTEM.</b>        |  |                     |                            |         |  |                          |                           |
| Pericarditis ... ..                                    |  |                     |                            |         |  |                          |                           |
| Acute endocarditis, or<br>myocarditis ... ..           |  |                     |                            |         |  |                          |                           |
| Angina pectoris ... ..                                 |  |                     |                            |         |  |                          |                           |
| Other Diseases of the Heart ...                        | ...  | 1                   | 1                          | ...     | ...  | ...                      |                           |
| (a) Valvular :   |  |                     |                            |         |  |                          |                           |
| Mitral ... ..  | ...  | ...                 | ...                        | ...     | ...  | 1                        |                           |
| Aortic ... ..  | ...  | ...                 | ...                        | ...     | ...  | ...                      |                           |
| Tricuspid ... ..                                       | ...  | ...                 | ...                        | ...     | ...  | ...                      |                           |
| Pulmonary ... ..                                       | ...  | ...                 | ...                        | ...     | ...  | ...                      |                           |
| (b) Myocarditis ... ..                                 | ...  | 1                   | 1                          | ...     | ...  | ...                      |                           |
| Diseases of the Arteries :                             |  |                     |                            |         |  |                          |                           |
| (a) Aneurism ... ..                                    | ...  | ...                 | ...                        | ...     | ...  | ...                      |                           |
| (b) Arterio-sclerosis ... ..                           | ...  | ...                 | ...                        | ...     | ...  | ...                      |                           |
| (c) Other diseases ... ..                              | ...  | ...                 | ...                        | ...     | ...  | ...                      |                           |
| Embolism or thrombosis<br>(non-cerebral) ... ..        | ...  | ...                 | ...                        | ...     | ...  | ...                      |                           |
| Diseases of the Veins :                                |  |                     |                            |         |  |                          |                           |
| Hæmorrhoids ... ..                                     | ...  | 1                   | 1                          | ...     | ...  | 2                        |                           |
| Varicose veins ... ..                                  | ...  | ...                 | ...                        | ...     | ...  | 1                        |                           |
| Phlebitis ... ..                                       | ...  | 2                   | 2                          | ...     | ...  | 1                        |                           |
| Diseases of the Lymphatic<br>System :                  |  |                     |                            |         |  |                          |                           |
| Lymphangitis ... ..                                    | ...  | ...                 | ...                        | ...     | ...  | 1                        |                           |
| Lymphadenitis, bubo (non-<br>specific) ... ..          | ...  | 2                   | 2                          | ...     | ...  | 1                        |                           |
| Hæmorrhage of undeter-<br>mined cause ... ..           | ...  | ...                 | ...                        | ...     | ...  | ...                      |                           |
| Other affections of the cir-<br>culatory system ... .. | ..   | 1                   | 1                          | ...     | ...  | 2                        |                           |
| <b>V—AFFECTIONS OF THE RESPIRATORY SYSTEM.</b>         |  |                     |                            |         |  |                          |                           |
| Diseases of the Nasal<br>Passages ... ..               |  |                     |                            |         |  |                          |                           |
| Adenoids ... ..  | ...  | ...                 | ...                        | ...     | ...  | ...                      |                           |
| Polypus ... ..   | ...  | ...                 | ...                        | ...     | ...  | ...                      |                           |
| Rhinitis ... ..  | ...  | ...                 | ...                        | ...     | ...  | 2                        |                           |
| Coryza ... ..  | ...  | ...                 | ...                        | ...     | ...  | 15                       |                           |
| Affections of the Larynx :                             |  |                     |                            |         |  |                          |                           |
| Laryngitis ... ..                                      | ...  | ...                 | ...                        | ...     | ...  | 1                        |                           |
| Carried forward ...                                    |  | 84                  | 84                         | 6       | 1  | 181                      |                           |



## EUROPEAN—continued.

| Diseases.   | IN-PATIENTS.                                   |                     |                            |         |  | OUT-PATIENTS.            |                            |
|---|--|---------------------|----------------------------|---------|--|--------------------------|----------------------------|
|   | Remaining<br>in Hospital<br>at end of<br>1928. | Total<br>Admission. | Total<br>Cases<br>treated. | Deaths. | Remaining<br>in Hospital<br>at end of<br>1929. | New<br>Cases<br>treated. | Subsequent<br>Attendances. |
| Brought forward ...                                       |  | 84                  | 84                         | 6       | 1  | 181                      |                            |
| <b>V—AFFECTIONS OF THE RESPIRATORY SYSTEM, continued.</b> |  |                     |                            |         |  |                          |                            |
| Bronchitis :  |  |                     |                            |         |  |                          |                            |
| (a) Acute ... ..  | ...  | ...                 | ...                        | ...     | ...  | 16                       |                            |
| (b) Chronic ... ..  | ...  | ...                 | ...                        | ...     | ...  | 3                        |                            |
| Broncho-pneumonia ... ..                                  | ...  | 1                   | 1                          | ...     | ...  | ...                      |                            |
| Pneumonia :   |  |                     |                            |         |  |                          |                            |
| (a) Lobar ... ..  | ...  | 1                   | 1                          | ...     | ...  | ...                      |                            |
| (b) Unclassified ... ..                                   | ...  | ...                 | ...                        | ...     | ...  | ...                      |                            |
| Pleurisy, empyema ... ..                                  | ...  | 1                   | 1                          | ...     | ...  | 1                        |                            |
| Congestion of the lungs ..                                | ...  | ...                 | ...                        | ...     | ...  | ...                      |                            |
| Gangrene of the lungs ... ..                              | ...  | ...                 | ...                        | ...     | ...  | ...                      |                            |
| Asthma ... ..   | ...  | ...                 | ...                        | ...     | ...  | 1                        |                            |
| Pulmonary emphysema ... ..                                | ...  | ...                 | ...                        | ...     | ...  | ...                      |                            |
| Other affections of the lungs ... ..                      | ...  | 1                   | 1                          | ...     | ...  | 5                        |                            |
| Pulmonary spirochaetosis ...                              | ...  | ...                 | ...                        | ...     | ...  | ...                      |                            |
| <b>VI—DISEASES OF THE DIGESTIVE SYSTEM.</b>               |  |                     |                            |         |  |                          |                            |
| A.—Diseases of the Teeth or Gums :                        |  |                     |                            |         |  |                          |                            |
| Caries, pyorrhœa, etc. ... ..                             | ...  | ...                 | ...                        | ...     | ...  | 5                        |                            |
| B.—Other Affections of the Mouth :                        |  |                     |                            |         |  |                          |                            |
| Stomatitis ... ..   | ...  | ...                 | ...                        | ...     | ...  | ...                      |                            |
| Glossitis, etc. ... ..                                    | ...  | ...                 | ...                        | ...     | ...  | ...                      |                            |
| Affections of the Pharynx or Tonsils :                    |  |                     |                            |         |  |                          |                            |
| Tonsillitis ... ..  | ...  | 1                   | 1                          | ...     | ...  | 5                        |                            |
| Pharyngitis ... ..  | ...  | ..                  | ...                        | ...     | ...  | 3                        |                            |
| Affections of the Oesophagus                              |  |                     |                            |         |  |                          |                            |
| A.—Ulcer of the Stomach                                   |  |                     |                            |         |  |                          |                            |
| B.—Ulcer of the duodenum                                  |  |                     |                            |         |  |                          |                            |
| Other Affections of the Stomach :                         |  |                     |                            |         |  |                          |                            |
| Gastritis ... ..  | ...  | ...                 | ...                        | ...     | ...  | 12                       |                            |
| Dyspepsia, etc. ... ..                                    | ...  | 6                   | 6                          | ...     | ...  | 27                       |                            |
| Diarrhœa and Enteritis :                                  |  |                     |                            |         |  |                          |                            |
| Under two years ... ..                                    | ...  | ...                 | ...                        | ...     | ...  | ...                      |                            |
| Two years and over ... ..                                 | ...  | 4                   | 4                          | ...     | ...  | 15                       |                            |
| Colitis ... ..  | ...  | 1                   | 1                          | ...     | ...  | ...                      |                            |
| Ulceration ... ..   | ...  | ...                 | ...                        | ...     | ...  | ...                      |                            |
| Sprue ... ..  | ...  | ...                 | ...                        | ...     | ...  | ...                      |                            |
| Ankylostomiasis ... ..                                    | ...  | ...                 | ...                        | ...     | ...  | 4                        |                            |
| Carried forward ...                                       |  | 100                 | 100                        | 6       | 1  | 278                      |                            |

## EUROPEAN—continued.

| Diseases.                                    | IN-PATIENTS.                                   |                     |                            |         | OUT-PATIENTS.                                  |                          |                            |
|--|--|---------------------|----------------------------|---------|--|--------------------------|----------------------------|
|  | Remaining<br>in Hospital<br>at end of<br>1928. | Total<br>Admission. | Total<br>Cases<br>treated. | Deaths. | Remaining<br>in Hospital<br>at end of<br>1929. | New<br>Cases<br>treated. | Subsequent<br>Attendances. |
| Brought forward ...                          |  | 100                 | 100                        | 6       | 1  | 278                      |                            |
| VI—DISEASES OF THE DIGESTIVE SYSTEM—contd.   |  |                     |                            |         |  |                          |                            |
| Diseases due to intestinal Parasites :       |  |                     |                            |         |  |                          |                            |
| (a) Cestoda (taenia) ...                     | ...  | 1                   | 1                          | ...     | ...  | 2                        |                            |
| (b) Trematoda (flukes) ...                   |  |                     |                            |         |  |                          |                            |
| (c) Nematoda (other than Ankylostoma)—       |  |                     |                            |         |  |                          |                            |
| Ascaris ...                                  | 1  | 2                   | 3                          | ...     | ...  | 3                        |                            |
| Trichocephalus dispar ...                    |  |                     |                            |         |  |                          |                            |
| Trichina ...                                 |  |                     |                            |         |  |                          |                            |
| Dracunculus ...                              |  |                     |                            |         |  |                          |                            |
| Strongylus ...                               | ...  | ...                 | ...                        | ...     | ...  | 1                        |                            |
| Oxyuris ...                                  |  |                     |                            |         |  |                          |                            |
| (d) Coccidia ...                             |  |                     |                            |         |  |                          |                            |
| (e) Other parasites ...                      |  |                     |                            |         |  |                          |                            |
| (f) Unclassified ...                         | ...  | 1                   | 1                          | ...     | ...  | ...                      |                            |
| Appendicitis ...                             | ...  | 3                   | 3                          | ...     | ...  | ...                      |                            |
| Hernia ...                                   |  |                     |                            |         |  |                          |                            |
| A.—Affections of the Anus, fistula, etc. ... | 1  | ...                 | 1                          | ...     | ...  | ...                      |                            |
| B.—Other Affections of the Intestines :      |  |                     |                            |         |  |                          |                            |
| Enteroptosis ...                             | ...  | ...                 | ...                        | ...     | ...  | 1                        |                            |
| Constipation ...                             | ...  | ...                 | ...                        | ...     | ...  | 12                       |                            |
| Acute yellow atrophy of the liver ...        |  |                     |                            |         |  |                          |                            |
| Hydatid of the liver ...                     |  |                     |                            |         |  |                          |                            |
| Cirrhosis of the liver—                      |  |                     |                            |         |  |                          |                            |
| (a) Alcoholic ...                            |  |                     |                            |         |  |                          |                            |
| (b) Other forms ...                          |  |                     |                            |         |  |                          |                            |
| Biliary calculus ...                         |  |                     |                            |         |  |                          |                            |
| Other Affections of the liver :              |  |                     |                            |         |  |                          |                            |
| Abscess ...                                  | ...  | ...                 | ...                        | ...     | ...  | 2                        |                            |
| Hepatitis ...                                | ...  | 2                   | 2                          | ...     | ...  | 2                        |                            |
| Cholecystitis ...                            | ...  | 1                   | 1                          | ...     | ...  | ...                      |                            |
| Jaundice ...                                 | ...  | 2                   | 2                          | ...     | ...  | 1                        |                            |
| Diseases of the pancreas ...                 |  |                     |                            |         |  |                          |                            |
| Peritonitis (of unknown cause) ...           |  |                     |                            |         |  |                          |                            |
| Other Affections of the digestive system ... | ...  | ...                 | ...                        | ...     | ...  | 4                        |                            |
| Carried forward ...                          | 2  | 112                 | 114                        | 6       | 1  | 306                      |                            |

## EUROPEAN—continued.

| Diseases.   | IN-PATIENTS.                                   |                     |                            |         | OUT-PATIENTS.                                  |                          |                            |
|---|--|---------------------|----------------------------|---------|--|--------------------------|----------------------------|
|   | Remaining<br>in Hospital<br>at end of<br>1928. | Total<br>Admission. | Total<br>Cases<br>treated. | Deaths. | Remaining<br>in Hospital<br>at end of<br>1929. | New<br>Cases<br>treated. | Subsequent<br>Attendances. |
| Brought forward ...                                       | 2  | 112                 | 114                        | 6       | 1  | 306                      |                            |
| VII—DISEASES OF THE GENITO-URINARY SYSTEM (NON-VENEREAL). |  |                     |                            |         |  |                          |                            |
| Acute nephritis ...                                       | ...  | ...                 | ...                        | ...     | ...  | 2                        |                            |
| Chronic ...   | ...  | 1                   | 1                          | ...     | ...  | ...                      |                            |
| A.—Chyluria ...   | ...  |                     |                            |         |  |                          |                            |
| B.—Schistosomiasis ...                                    | ...  |                     |                            |         |  |                          |                            |
| Other affections of the Kidneys :                         |  |                     |                            |         |  |                          |                            |
| Pyelitis, etc. ...  | ...  |                     |                            |         |  |                          |                            |
| Urinary calculus ...                                      | ...  | ...                 | ..                         | ...     | ...  | 2                        |                            |
| Diseases of the Bladder :                                 |  |                     |                            |         |  |                          |                            |
| Cystitis ...  | ...  | 1                   | 1                          | ...     | ...  | ...                      |                            |
| Diseases of the Urethra :                                 |  |                     |                            |         |  |                          |                            |
| (a) Stricture ...   | ...  |                     |                            |         |  |                          |                            |
| (b) Other ...   | ...  | ...                 | ...                        | ...     | ...  | 4                        |                            |
| Diseases of the Prostate :                                |  |                     |                            |         |  |                          |                            |
| Hypertrophy ...   | ...  |                     |                            |         |  |                          |                            |
| Prostatitis ...   | ...  | ...                 | ...                        | ...     | ...  | 1                        |                            |
| Diseases (non-venereal) of the Genital Organs of man :    |  |                     |                            |         |  |                          |                            |
| Epididymitis ...  | ...  |                     |                            |         |  |                          |                            |
| Orchitis ...  | ...  | ...                 | ...                        | ...     | ...  | 1                        |                            |
| Hydrocele ...   | ...  | 1                   | 1                          | ...     | ...  | ...                      |                            |
| Ulcer of penis ...  | ...  |                     |                            |         |  |                          |                            |
| Cysts or other non-malignant tumours of the ovaries ...   | ...  |                     |                            |         |  |                          |                            |
| Salpingitis :   |  |                     |                            |         |  |                          |                            |
| Abscess of the pelvis ...                                 | ...  |                     |                            |         |  |                          |                            |
| Uterine tumours (non-malignant) ...                       | ...  |                     |                            |         |  |                          |                            |
| Uterine hæmorrhage (non-puerperal) ...                    | ...  |                     |                            |         |  |                          |                            |
| A.—Metritis ...   | ...  |                     |                            |         |  |                          |                            |
| B.—Other Affections of the Female Genital Organs :        |  |                     |                            |         |  |                          |                            |
| Displacements of uterus                                   |  |                     |                            |         |  |                          |                            |
| Amenorrhœa ...  | ...  |                     |                            |         |  |                          |                            |
| Dysmenorrhœa ...  | ...  |                     |                            |         |  |                          |                            |
| Leucorrhœa ...  | ...  |                     |                            |         |  |                          |                            |
| Diseases of the Breast (non-puerperal) :                  |  |                     |                            |         |  |                          |                            |
| Mastitis ...  | ...  |                     |                            |         |  |                          |                            |
| Abscess of breast ...                                     | ...  |                     |                            |         |  |                          |                            |
| Carried forward ...                                       | 2  | 115                 | 117                        | 6       | 1  | 316                      |                            |

## EUROPEAN—continued.

| Diseases.   | IN-PATIENTS.                                   |                     |                            |         |  | OUT-PATIENTS.            |                            |
|---|--|---------------------|----------------------------|---------|--|--------------------------|----------------------------|
|   | Remaining<br>in Hospital<br>at end of<br>1928. | Total<br>Admission. | Total<br>Cases<br>treated. | Deaths. | Remaining<br>in Hospital<br>at end of<br>1929. | New<br>Cases<br>treated. | Subsequent<br>Attendances. |
| Brought forward ...   | 2  | 115                 | 117                        | 6       | 1  | 316                      |                            |
| VIII—PUERPERAL STATE.   |  |                     |                            |         |  |                          |                            |
| A.—Normal labour ...  |  |                     |                            |         |  |                          |                            |
| B.—Accidents of Preg-<br>nancy :  |  |                     |                            |         |  |                          |                            |
| (a) Abortion ...  |  |                     |                            |         |  |                          |                            |
| (b) Ectopic gestation ...   |  |                     |                            |         |  |                          |                            |
| (c) Other accidents of<br>pregnancy ...   |  |                     |                            |         |  |                          |                            |
| Puerperal hæmorrhage ...  |  |                     |                            |         |  |                          |                            |
| Other accidents of parturi-<br>tion ...   |  |                     |                            |         |  |                          |                            |
| Puerperal septicæmia ...  |  |                     |                            |         |  |                          |                            |
| Phlegmasia dolens ...   |  |                     |                            |         |  |                          |                            |
| Puerperal eclampsia ...   |  |                     |                            |         |  |                          |                            |
| Sequæ of labour ...   |  |                     |                            |         |  |                          |                            |
| Puerperal affections of the<br>breast ...   |  |                     |                            |         |  |                          |                            |
| IX—AFFECTIONS OF THE<br>SKIN AND CELLULAR<br>TISSUES.                             |  |                     |                            |         |  |                          |                            |
| Gangrene ...  |  |                     |                            |         |  |                          |                            |
| Boil :  |  |                     |                            |         |  |                          |                            |
| Carbuncle ...   |  | 1                   | 1                          |         |  | 11                       |                            |
| Abscess :   |  |                     |                            |         |  |                          |                            |
| Whitlow ...   |  | 1                   | 1                          |         |  | 1                        |                            |
| Cellulitis ...  |  | 3                   | 3                          |         |  | 4                        |                            |
| A.—Tinea ...  |  |                     |                            |         |  | 10                       |                            |
| B.—Scabies ...  |  |                     |                            |         |  | 5                        |                            |
| Other Diseases of the Skin :  |  | 1                   | 1                          |         |  | 5                        |                            |
| (a) Erythema ...  |  |                     |                            |         |  | 3                        |                            |
| (b) Urticaria ...   |  |                     |                            |         |  | 2                        |                            |
| (c) Eczema ...  |  | 1                   | 1                          |         |  | 13                       |                            |
| (d) Herpes ...  |  |                     |                            |         |  | 2                        |                            |
| (e) Psoriasis ...   |  |                     |                            |         |  |                          |                            |
| (f) Elephantiasis ...   |  |                     |                            |         |  |                          |                            |
| (g) Myiasis ...   |  |                     |                            |         |  |                          |                            |
| (h) Chigoes ...   |  |                     |                            |         |  |                          |                            |
| (i) Cutaneous Leishman-<br>iasis ...  |  |                     |                            |         |  |                          |                            |
| (j) Ulcer ...   | 1  | 2                   | 3                          |         |  | 1                        |                            |
| X—DISEASES OF BONES<br>AND ORGANS OF LOCO-<br>MOTION (OTHER THAN<br>TUBERCULOUS.) |  |                     |                            |         |  |                          |                            |
| Diseases of Bones—<br>Osteitis ...  |  |                     |                            |         |  |                          |                            |
| Carried forward ...   | 3  | 124                 | 127                        | 6       | 1  | 375                      |                            |

## EUROPEAN—continued.

| Diseases.   | IN-PATIENTS.                                   |                     |                            |         | OUT-PATIENTS.                                  |                          |                            |
|---|--|---------------------|----------------------------|---------|--|--------------------------|----------------------------|
|   | Remaining<br>in Hospital<br>at end of<br>1928. | Total<br>Admission. | Total<br>Cases<br>treated. | Deaths. | Remaining<br>in Hospital<br>at end of<br>1929. | New<br>Cases<br>treated. | Subsequent<br>Attendances. |
| Brought forward ...   | 3  | 124                 | 127                        | 6       | 1  | 375                      |                            |
| <b>X—DISEASES OF BONES AND ORGANS OF LOCOMOTION (OTHER THAN TUBERCULOUS)—contd.</b> |  |                     |                            |         |  |                          |                            |
| Diseases of Joints :  |  |                     |                            |         |  |                          |                            |
| Arthritis ... ..  | ...  | ...                 | ...                        | ...     | ...  | 1                        |                            |
| Synovitis ... ..  | ...  | 1                   | 1                          | ...     | ...  | 3                        |                            |
| Other diseases of bones or organs of locomotion ...                                 | ...  | ...                 | ...                        | ...     | ...  | 8                        |                            |
| <b>XI—MALFORMATIONS.</b>  |  |                     |                            |         |  |                          |                            |
| Malformations :   |  |                     |                            |         |  |                          |                            |
| Hydrocephalus ...   |  |                     |                            |         |  |                          |                            |
| Hypospadias ...   |  |                     |                            |         |  |                          |                            |
| Spina bifida, etc. ...  |  |                     |                            |         |  |                          |                            |
| <b>XII—DISEASES OF INFANCY.</b>   |  |                     |                            |         |  |                          |                            |
| Congenital debility ...   |  |                     |                            |         |  |                          |                            |
| Premature birth ...   |  |                     |                            |         |  |                          |                            |
| Other affections of infancy   |  |                     |                            |         |  |                          |                            |
| Infant neglect (infants of three months or over) ...                                |  |                     |                            |         |  |                          |                            |
| <b>XIII—AFFECTIONS OF OLD AGE.</b>  |  |                     |                            |         |  |                          |                            |
| Senility :  |  |                     |                            |         |  |                          |                            |
| Senile dementia ...   |  |                     |                            |         |  |                          |                            |
| <b>XIV—AFFECTIONS PRODUCED BY EXTERNAL CAUSES.</b>                                  |  |                     |                            |         |  |                          |                            |
| Suicide by poisoning ...  |  |                     |                            |         |  |                          |                            |
| Corrosive poisoning (intentional) ...   |  |                     |                            |         |  |                          |                            |
| Suicide by gas poisoning  |  |                     |                            |         |  |                          |                            |
| Suicide by hanging or strangulation ...   |  |                     |                            |         |  |                          |                            |
| Suicide by drowning ...   |  |                     |                            |         |  |                          |                            |
| Suicide by firearms ...   |  |                     |                            |         |  |                          |                            |
| Suicide by cutting or stabbing instruments ...                                      |  |                     |                            |         |  |                          |                            |
| Suicide by jumping from a height ...  |  |                     |                            |         |  |                          |                            |
| Suicide by crushing ...   |  |                     |                            |         |  |                          |                            |
| Other suicides ...  |  |                     |                            |         |  |                          |                            |
| Food poisoning :  |  |                     |                            |         |  |                          |                            |
| Botulism ... ..   |  |                     |                            |         |  | 1                        |                            |
| Carried forward ...   | 3  | 125                 | 128                        | 6       | 1  | 388                      |                            |

## EUROPEAN—continued.

| Diseases.   | IN-PATIENTS.                                   |                     |                            |         |  | OUT-PATIENTS.            |                            |
|---|--|---------------------|----------------------------|---------|--|--------------------------|----------------------------|
|   | Remaining<br>in Hospital<br>at end of<br>1928. | Total<br>Admission. | Total<br>Cases<br>treated. | Deaths. | Remaining<br>in Hospital<br>at end of<br>1929. | New<br>Cases<br>treated. | Subsequent<br>Attendances. |
| Brought forward ...                                   | 3  | 125                 | 128                        | 6       | 1  | 388                      |                            |
| XIV—AFFECTIONS PRODUCED BY EXTERNAL CAUSES—contd.     |  |                     |                            |         |  |                          |                            |
| Attacks of poisonous Animals:                         |  |                     |                            |         |  |                          |                            |
| Snake bite ... ..                                     | ...  | ...                 | ...                        | ...     | ..   | 1                        |                            |
| Insect bite ... ..                                    | ...  | 1                   | 1                          | ...     | ...  | 4                        |                            |
| Other accidental poisonings                           | ...  | ...                 | ...                        | ...     | ...  | 1                        |                            |
| Burns (by fire) ... ..                                |  |                     |                            |         |  |                          |                            |
| Burns (other than by fire)                            |  |                     |                            |         |  |                          |                            |
| Suffocation (accidental) ..                           | 1  | 1                   | 2                          | ...     | ...  | ...                      |                            |
| Poisoning by gas (accidental) ... ..                  |  |                     |                            |         |  |                          |                            |
| Drowning (accidental) ...                             |  |                     |                            |         |  |                          |                            |
| Wounds (by firearms, war excepted) ... ..             |  |                     |                            |         |  |                          |                            |
| Wounds (by cutting or stabbing instruments) ...       | ...  | ...                 | ...                        | ...     | ...  | 3                        |                            |
| Wounds (by fall) ... ..                               | ...  | ...                 | ...                        | ...     | ...  | 1                        |                            |
| Wounds (in mines or quarries) ... ..                  | ...  | ...                 | ...                        | ...     | ...  | 1                        |                            |
| Wounds (by machinery) ...                             | ...  | 1                   | 1                          | ...     | ...  | 1                        |                            |
| Wounds (crushing, e.g. railway accidents, etc.) ...   | ...  | ...                 | ...                        | ...     | ...  | 2                        |                            |
| Injuries inflicted by animals, bites, kicks, etc. ... |  |                     |                            |         |  |                          |                            |
| Wounds inflicted on active service ... ..             |  |                     |                            |         |  |                          |                            |
| Executions of civilians by belligerents ... ..        |  |                     |                            |         |  |                          |                            |
| A.—Over fatigue ... ..                                |  |                     |                            |         |  |                          |                            |
| B.—Hunger or thirst ... ..                            |  |                     |                            |         |  |                          |                            |
| Exposure to cold, frost bite, etc. ... ..             |  |                     |                            |         |  |                          |                            |
| Exposure to Heat:                                     |  |                     |                            |         |  |                          |                            |
| Heat stroke ... ..                                    | ...  | ...                 | ...                        | ...     | ...  | 1                        |                            |
| Sunstroke ... ..                                      | ...  | ...                 | ...                        | ...     | ...  | 1                        |                            |
| Lightning stroke ... ..                               |  |                     |                            |         |  |                          |                            |
| Electric shock ... ..                                 |  |                     |                            |         |  |                          |                            |
| Murder by firearms ... ..                             |  |                     |                            |         |  |                          |                            |
| Murder by cutting or stabbing instruments ...         |  |                     |                            |         |  |                          |                            |
| Murder by other means ...                             |  |                     |                            |         |  |                          |                            |
| Infanticide (murder of an infant under one year)      |  |                     |                            |         |  |                          |                            |
| A.—Dislocation ... ..                                 | ...  | ...                 | ...                        | ...     | ...  | 6                        |                            |
| B.—Sprain ... ..                                      | ...  | ...                 | ...                        | ...     | ...  | ...                      |                            |
| C.—Fracture ... ..                                    | ...  | 4                   | 4                          | ...     | 2  | ...                      |                            |
| Carried forward ...                                   | 4  | 132                 | 136                        | 6       | 3  | 410                      |                            |

EUROPEAN—*continued.*

| Diseases.   | IN-PATIENTS.                                   |                     |                            |         |  | OUT-PATIENTS.            |                            |
|---|--|---------------------|----------------------------|---------|--|--------------------------|----------------------------|
|   | Remaining<br>in Hospital<br>at end of<br>1928. | Total<br>Admission. | Total<br>Cases<br>treated. | Deaths. | Remaining<br>in Hospital<br>at end of<br>1929. | New<br>Cases<br>treated. | Subsequent<br>Attendances. |
| Brought forward ...   | 4  | 132                 | 136                        | 6       | 3  | 410                      |                            |
| <b>XIV—AFFECTIONS PRODUCED BY EXTERNAL CAUSES—<i>contd.</i></b> |  |                     |                            |         |  |                          |                            |
| Other external injuries ...                                     | ...  | 5                   | 5                          | ...     | ...  | 15                       |                            |
| Deaths by violence of unknown cause ...                         | ...  |                     |                            |         |  |                          |                            |
| <b>XV—ILL-DEFINED DISEASES.</b>                                 |  |                     |                            |         |  |                          |                            |
| Sudden death (cause unknown) ...                                |  |                     |                            |         |  |                          |                            |
| A.—Diseases not already specified or ill-defined:               |  |                     |                            |         |  |                          |                            |
| Ascites ...   |  |                     |                            |         |  |                          |                            |
| Edema ...   |  |                     |                            |         |  |                          |                            |
| Asthenia ...  | ...  | 1                   | 1                          | ...     | ...  | 22                       |                            |
| Shock ...   |  |                     |                            |         |  |                          |                            |
| Hyper-pyrexia ...   | ...  | ...                 | ...                        | ...     | ...  | 1                        |                            |
| B.—Malingering ...  |  |                     |                            |         |  |                          |                            |
| Pyrexia of uncertain origin                                     | 1  | 4                   | 5                          | ...     | 1  | ...                      |                            |
| Total ...   | 5  | 142                 | 147                        | 6       | 4  | 448                      |                            |

## RETURN OF DISEASES AND DEATHS—AFRICAN.

| Diseases   | IN-PATIENTS.                                   |                     |                            |         | OUT-PATIENTS.                                  |                          |                            |
|--|--|---------------------|----------------------------|---------|--|--------------------------|----------------------------|
|  | Remaining<br>in Hospital<br>at end of<br>1928. | Total<br>Admission. | Total<br>Cases<br>treated. | Deaths. | Remaining<br>in Hospital<br>at end of<br>1929. | New<br>Cases<br>treated. | Subsequent<br>Attendances. |
| <b>I—EPIDEMIC, ENDEMIC AND INFECTIOUS DISEASES</b> |  |                     |                            |         |  |                          |                            |
| Enteric Group :                                    | ...  | 1                   | 1                          | 1       | ...  | ...                      |                            |
| (a) Typhoid fever ...                              | ...  | 1                   | 1                          | ...     | ...  | ...                      |                            |
| (b) Paratyphoid A. ...                             | ...  | 1                   | 1                          | ...     | ...  | ...                      |                            |
| (c) Paratyphoid B. ...                             | ...  | 2                   | 2                          | ...     | ...  | ...                      |                            |
| (d) Type not defined ...                           | ...  | 2                   | 2                          | ...     | ...  | ...                      |                            |
| Typhus ...   | ...  |                     |                            |         |  |                          |                            |
| Relapsing fever ...                                | ...  |                     |                            |         |  |                          |                            |
| Undulant fever ...                                 | ...  |                     |                            |         |  |                          |                            |
| Malaria :  |  |                     |                            |         |  |                          |                            |
| (a) Tertian ...                                    | ...  | 53                  | 53                         | 1       | ...  | 87                       |                            |
| (b) Quartan ...                                    | ...  | 6                   | 6                          | ...     | ...  | 2                        |                            |
| (c) Aestivo-autumnal ...                           | ...  | 100                 | 100                        | ...     | 1  | 1,701                    |                            |
| (d) Unclassified ...                               | ...  | 126                 | 126                        | 4       | 3  | 3,374                    |                            |
| (e) Cachexia ...                                   | 1  | 6                   | 7                          | 1       | ...  | 8                        |                            |
| (f) Blackwater ...                                 | ...  | ...                 | ...                        | ...     | ...  | 3                        |                            |
| Smallpox :   | ...  | 4                   | 4                          | ...     | ...  | 2                        |                            |
| Alastrim ...                                       | ...  |                     |                            |         |  |                          |                            |
| Measles ...  | 1  | 15                  | 16                         | ...     | ...  | 97                       |                            |
| Scarlet fever ...                                  | ...  |                     |                            |         |  |                          |                            |
| Whooping cough ...                                 | ...  | 4                   | 4                          | 1       | ...  | 132                      |                            |
| Diphtheria ...                                     | ...  |                     |                            |         |  |                          |                            |
| Influenza ...                                      | ...  | ...                 | ...                        | ...     | ...  | 4                        |                            |
| Miliary fever ...                                  | ...  |                     |                            |         |  |                          |                            |
| Mumps ...  | ...  | 1                   | 1                          | ...     | ...  | 34                       |                            |
| Cholera ...  | ...  | ...                 | ...                        | ...     | ...  | 1                        |                            |
| Epidemic diarrhoea ...                             | ...  |                     |                            |         |  |                          |                            |
| Dysentery :  |  |                     |                            |         |  |                          |                            |
| (a) Amœbic ...                                     | 4  | 34                  | 38                         | 5       | ...  | 137                      |                            |
| (b) Bacillary ...                                  | ...  | 1                   | 1                          | ...     | ...  | ...                      |                            |
| (c) Undefined or due to<br>other causes ...        | ...  | 21                  | 21                         | 5       | ...  | 139                      |                            |
| Plague :   |  |                     |                            |         |  |                          |                            |
| (a) Bubonic ...                                    | ...  |                     |                            |         |  |                          |                            |
| (b) Pneumonic ...                                  | ...  |                     |                            |         |  |                          |                            |
| (c) Septicæmic ...                                 | ...  |                     |                            |         |  |                          |                            |
| (d) Undefined ...                                  | ...  |                     |                            |         |  |                          |                            |
| Yellow fever ...                                   | ...  |                     |                            |         |  |                          |                            |
| Spirochaetosis ictero-<br>hemorrhagica ...         | ...  |                     |                            |         |  |                          |                            |
| Leprosy ...  | 13   | 13                  | 26                         | 3       | 13   | 418                      |                            |
| Erysipelas ...                                     | ...  | ...                 | ...                        | ...     | ...  | 2                        |                            |
| Acute poliomyelitis ...                            | ...  |                     |                            |         |  |                          |                            |
| Encephalitis lethargica ...                        | ...  |                     |                            |         |  |                          |                            |
| Epidemic cerebro-spinal<br>fever ...               | ...  |                     |                            |         |  |                          |                            |
| Carried forward ...                                | 19   | 388                 | 407                        | 21      | 17   | 6,141                    |                            |

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<br>in Hospital<br>at end of<br>1928. | Total<br>Admission | Total<br>Cases<br>treated. | Deaths. | Remaining<br>in Hospital<br>at end of<br>1929. | New<br>Cases<br>treated. | Subsequent<br>Attendances. |
| Brought forward ...   | 19   | 388                | 407                        | 21      | 17   | 6,141                    |                            |
| <b>I—EPIDEMIC, ENDEMIC,<br/>AND INFECTIOUS DISEASES,<br/>continued.</b> |  |                    |                            |         |  |                          |                            |
| Other Epidemic Diseases :   |  |                    |                            |         |  |                          |                            |
| (a) Rubeola (German<br>measles) ... ..                                  |  |                    |                            |         |  |                          |                            |
| (b) Varicella (chicken-<br>pox) ... ..                                  | 12   | 209                | 221                        | ...     | 2  | 52                       |                            |
| (c) Kala-azar ... ..  |  |                    |                            |         |  |                          |                            |
| (d) Phlebotomus fever ...   |  |                    |                            |         |  |                          |                            |
| (e) Dengue ... ..   |  |                    |                            |         |  |                          |                            |
| (f) Epidemic dropsy ...   |  |                    |                            |         |  |                          |                            |
| (g) Yaws ... ..   | 3  | 86                 | 89                         | ...     | 6  | 16,838                   |                            |
| (h) Trypanosomiasis ...   | 2  | 1                  | 3                          | 2       | ...  | 1                        |                            |
| Glanders ... ..   |  |                    |                            |         |  |                          |                            |
| Anthrax ... ..  |  |                    |                            |         |  |                          |                            |
| Rabies ... ..   |  |                    |                            |         |  |                          |                            |
| Tetanus ... ..  | ...  | 13                 | 13                         | 3       | 1  | 1                        |                            |
| Mycosis ... ..  |  |                    |                            |         |  |                          |                            |
| Tuberculosis, pulmonary<br>and laryngeal ... ..                         | 1  | 34                 | 35                         | 14      | 1  | 76                       |                            |
| Tuberculosis of the meninges<br>or central nervous system               |  |                    |                            |         |  |                          |                            |
| Tuberculosis of the intes-<br>tines or peritoneum ...                   | ...  | 2                  | 2                          | 1       | ...  | ...                      |                            |
| Tuberculosis of the verte-<br>bral column ... ..                        | ...  | ...                | ...                        | ...     | ...  | 4                        |                            |
| Tuberculosis of bones and<br>joints ... ..                              | ...  | ...                | ...                        | ...     | ...  | 7                        |                            |
| Tuberculosis of other<br>Organs :                                       | ...  | ...                | ...                        | ...     | ...  | 2                        |                            |
| (a) Skin or subcutane-<br>ous tissue (Lupus) ...                        | ...  | 1                  | 1                          | ...     | ...  | ...                      |                            |
| (b) Bones ... ..  | ...  | 2                  | 2                          | 1       | ...  | 1                        |                            |
| (c) Lymphatic system ...  | ...  | 1                  | 1                          | ...     | ...  | 2                        |                            |
| (d) Genito-urinary ..   |  |                    |                            |         |  |                          |                            |
| (e) Other organs ...  |  |                    |                            |         |  |                          |                            |
| Tuberculosis Disseminated :   |  |                    |                            |         |  |                          |                            |
| (a) Acute ... ..  |  |                    |                            |         |  |                          |                            |
| (b) Chronic ... ..  |  |                    |                            |         |  |                          |                            |
| Syphilis :  |  |                    |                            |         |  |                          |                            |
| (a) Primary ... ..  | ...  | 10                 | 10                         | ...     | 2  | 56                       |                            |
| (b) Secondary ... ..  | ...  | ...                | ...                        | ...     | ...  | 22                       |                            |
| (c) Tertiary ... ..   | 3  | 33                 | 36                         | ...     | 4  | 743                      |                            |
| (d) Hereditary ... ..   | ...  | 1                  | 1                          | ...     | 1  | 12                       |                            |
| (e) Period not indicated  | ...  | 2                  | 2                          | ...     | ...  | 12                       |                            |
| Carried forward ...   | 40   | 783                | 823                        | 42      | 34   | 23,970                   |                            |

## AFRICAN—continued.

| Diseases.  | IN-PATIENTS.                                   |                     |                            |         |  | OUT-PATIENTS.            |                            |
|--|--|---------------------|----------------------------|---------|--|--------------------------|----------------------------|
|  | Remaining<br>in Hospital<br>at end of<br>1928. | Total<br>Admission. | Total<br>Cases<br>treated. | Deaths. | Remaining<br>in Hospital<br>at end of<br>1929. | New<br>Cases<br>treated. | Subsequent<br>Attendances. |
| Brought forward ...  | 40   | 783                 | 823                        | 42      | 34   | 23,970                   |                            |
| <b>I—EPIDEMIC, ENDEMIC AND INFECTIOUS DISEASES, continued.</b>                 |  |                     |                            |         |  |                          |                            |
| Soft chancre ... ..  | 8  | 5                   | 13                         | ...     | ...  | 127                      |                            |
| A.—Gonorrhœa and its complications ... ..                                      | 3  | 63                  | 66                         | ...     | 1  | 2,532                    |                            |
| B.—Gonorrhœal ophthalmia ... ..  | ...  | 6                   | 6                          | ...     | 1  | 18                       |                            |
| C.—Gonorrhœal arthritis ... ..   | ..   | 16                  | 16                         | ...     | ...  | 111                      |                            |
| D.—Granuloma venereum ... ..   | ...  | 2                   | 2                          | ...     | 1  | 2                        |                            |
| Septicæmia ... ..  | ...  | 2                   | 2                          | 2       | ...  | ...                      |                            |
| Other infectious diseases ... ..   | ...  | 3                   | 3                          | ...     | ...  | 14                       |                            |
| <b>II—GENERAL DISEASES NOT MENTIONED ABOVE.</b>                                |  |                     |                            |         |  |                          |                            |
| Cancer or other malignant tumours of the buccal cavity ... ..                  | ...  | 4                   | 4                          | 1       | ...  | 2                        |                            |
| Cancer or other malignant tumours of the stomach or liver ... ..               | ...  | 7                   | 7                          | 3       | ...  | 2                        |                            |
| Cancer or other malignant tumours of the peritoneum, intestines, rectum ... .. | 2  | 1                   | 3                          | 1       | ...  | ...                      |                            |
| Cancer or other malignant tumours of the female genital organs ... ..          | ...  | 1                   | 1                          | ...     | ...  | 2                        |                            |
| Cancer or other malignant tumours of the breast ... ..                         | ...  | 2                   | 2                          | ...     | ...  | 2                        |                            |
| Cancer or other malignant tumours of the skin ... ..                           | ...  | 1                   | 1                          | ...     | ...  | 3                        |                            |
| Cancer or other malignant tumours of organs not specified ... ..               | ...  | 18                  | 18                         | 3       | 3  | 7                        |                            |
| Tumours, non-malignant ... ..  | ...  | 37                  | 37                         | ...     | 12   | 148                      |                            |
| Acute rheumatism ... ..  | ...  | 15                  | 15                         | ...     | ..   | 799                      |                            |
| Chronic rheumatism ... ..  | 4  | 33                  | 37                         | ...     | 2  | 4,617                    |                            |
| Scurvy (including Barlow's disease) ... ..                                     | ...  | ...                 | ...                        | ...     | ...  | ...                      |                            |
| Pellagra ... ..  | ...  | ...                 | ...                        | ...     | ...  | ...                      |                            |
| Beriberi ... ..  | ...  | 16                  | 16                         | 8       | ...  | 1                        |                            |
| Rickets ... ..   | ...  | ..                  | ...                        | ...     | ...  | 11                       |                            |
| Diabetes (not including insipidus) ... ..                                      | ...  | 1                   | 1                          | 1       | ..   | 3                        |                            |
| Anæmia :   | ...  | 2                   | 2                          | ...     | ...  | 57                       |                            |
| (a) Pernicious ... ..  | ...  | ...                 | ...                        | ...     | ...  | 1                        |                            |
| (b) Other anæmias and chlorosis ... ..   | 1  | 8                   | 9                          | 2       | ...  | 651                      |                            |
| Carried forward ...  | 58   | 1,026               | 1,084                      | 63      | 54   | 33,080                   |                            |

## AFRICAN—continued.

| Diseases.  | IN-PATIENTS.                                   |                     |                            |         |  | OUT-PATIENTS.            |                            |
|--|--|---------------------|----------------------------|---------|--|--------------------------|----------------------------|
|  | Remaining<br>in Hospital<br>at end of<br>1928. | Total<br>Admission. | Total<br>Cases<br>treated. | Deaths. | Remaining<br>in Hospital<br>at end of<br>1929. | New<br>Cases<br>treated. | Subsequent<br>Attendances. |
| Brought forward ...  | 58   | 1,026               | 1,084                      | 63      | 54   | 33,080                   |                            |
| <b>GENERAL DISEASES NOT MENTIONED ABOVE—contd.</b>                                 |  |                     |                            |         |  |                          |                            |
| Diseases of the pituitary body ...   |  |                     |                            |         |  |                          |                            |
| Diseases of the Thyroid Gland:   |  |                     |                            |         |  |                          |                            |
| (a) Exophthalmic goitre ...  | ...  | 1                   | 1                          | ...     | 1  | 11                       |                            |
| (b) Other diseases of the thyroid gland, myxœdema ...                              | ...  | 1                   | 1                          | ...     | ...  | 17                       |                            |
| Diseases of the parathyroid glands ...   |  |                     |                            |         |  |                          |                            |
| Diseases of the thymus ...   | ...  | ...                 | ...                        | ...     | ...  | 14                       |                            |
| Diseases of the super-renal glands ...   |  |                     |                            |         |  |                          |                            |
| Diseases of the spleen ...   | ...  | 15                  | 15                         | ...     | ...  | 263                      |                            |
| Leukæmia:  |  |                     |                            |         |  |                          |                            |
| (a) Leukæmia ...   | ...  |                     |                            |         |  |                          |                            |
| (b) Hodgkin's disease ...  | ...  |                     |                            |         |  |                          |                            |
| Alcoholism ...   | ...  | 3                   | 3                          | 1       | ...  | ...                      |                            |
| Chronic poisoning by mineral substances (lead, mercury, etc.) ...                  |  |                     |                            |         |  |                          |                            |
| Chronic poisoning by organic substances (morphia, cocaine, etc.) ...               |  |                     |                            |         |  |                          |                            |
| Other General Diseases ...   | ...  | 22                  | 22                         | 1       | 1  | 201                      |                            |
| Auto-intoxication ...  | ...  | 1                   | 1                          | 1       | ...  | 73                       |                            |
| Purpura hæmorrhagica   |  |                     |                            |         |  |                          |                            |
| Hæmophilia ...   | ...  |                     |                            |         |  |                          |                            |
| Diabetes insipidus ...   | ...  | 1                   | 1                          | ...     | ...  | ...                      |                            |
| <b>III—AFFECTIONS OF THE NERVOUS SYSTEM AND ORGANS OF THE SENSES.</b>              |  |                     |                            |         |  |                          |                            |
| Encephalitis (not including encephalitis lethargica) ...                           | ...  | 1                   | 1                          | 1       | ...  | ...                      |                            |
| Meningitis (not including tuberculous meningitis or cerebro-spinal meningitis) ... | ...  | ...                 | ...                        | ...     | ...  | 28                       |                            |
| Locomotor ataxia ...   | ...  | ...                 | ...                        | ...     | ...  | 9                        |                            |
| Other affections of the spinal cord ...  | 1  | 2                   | 3                          | ...     | 1  | 1                        |                            |
| Apoplexy:  |  |                     |                            |         |  |                          |                            |
| (a) Hæmorrhage ...   | ...  | 3                   | 3                          | 2       | ...  | 1                        |                            |
| (b) Embolism ...   | ...  |                     |                            |         |  |                          |                            |
| (c) Thrombosis ...   | ...  |                     |                            |         |  |                          |                            |
| Carried forward ...  | 59   | 1,077               | 1,136                      | 69      | 57   | 33,698                   |                            |

AFRICAN—*continued.*

| Diseases.  | IN-PATIENTS.                                   |                     |                            |         |  | OUT-PATIENTS.            |                            |
|--|--|---------------------|----------------------------|---------|--|--------------------------|----------------------------|
|  | Remaining<br>in Hospital<br>at end of<br>1928. | Total<br>Admission. | Total<br>Cases<br>treated. | Deaths. | Remaining<br>in Hospital<br>at end of<br>1929. | New<br>Cases<br>treated. | Subsequent<br>Attendances. |
| Brought forward ...  | 59   | 1,077               | 1,136                      | 69      | 57   | 33,698                   |                            |
| III—AFFECTIONS OF THE NERVOUS SYSTEM AND ORGANS OF THE SENSES— <i>continued.</i> |  |                     |                            |         |  |                          |                            |
| Paralysis :  | ...  | ...                 | ...                        | ...     | ...  | 5                        |                            |
| (a) Hemiplegia ...   | 7  | 30                  | 37                         | 12      | 9  | 84                       |                            |
| (b) Other paralysis ...  | 6  | 22                  | 28                         | 7       | 8  | 66                       |                            |
| General paralysis of the insane ...  | ...  | 1                   | 1                          | ...     | ...  | 1                        |                            |
| Other forms of mental alienation ...   | 4  | 17                  | 21                         | 3       | 6  | 18                       |                            |
| Epilepsy ...   | 1  | 13                  | 14                         | 4       | 2  | 29                       |                            |
| Eclampsia, convulsions, (non-puerperal) 5 years or over ...                      | ...  | ...                 | ...                        | ...     | ...  | 8                        |                            |
| Infantile convulsions ...  | ...  | 1                   | 1                          | ...     | ...  | ...                      |                            |
| Chorea ...   | ...  | ...                 | ...                        | ...     | ...  | 10                       |                            |
| A.—Hysteria ...  | 2  | 6                   | 8                          | ...     | 2  | 163                      |                            |
| B.—Neuritis ...  | 1  | 4                   | 5                          | ...     | 3  | 53                       |                            |
| C.—Neurasthenia ...  | ...  | ...                 | ...                        | ...     | ...  | ...                      |                            |
| Cerebral softening ...   | ...  | ...                 | ...                        | ...     | ...  | ...                      |                            |
| Other affections of the nervous system, such as paralysis agitans ...            | ...  | 5                   | 5                          | ...     | 1  | 198                      |                            |
| Affections of the Organs of Vision :   |  |                     |                            |         |  |                          |                            |
| (a) Diseases of the eye ...  | 2  | 16                  | 18                         | ...     | ...  | 36                       |                            |
| (b) Conjunctivitis ...   | 1  | 36                  | 37                         | ...     | 2  | 977                      |                            |
| (c) Trachoma ...   | ...  | ...                 | ...                        | ...     | ...  | 26                       |                            |
| (d) Tumours of the eye ...   | ...  | ...                 | ...                        | ...     | ...  | 366                      |                            |
| (e) Other affections of the eye ...  | 4  | 12                  | 16                         | 1       | 5  | ...                      |                            |
| Affections of the ear or mastoid sinus ...                                       | ...  | 13                  | 13                         | ...     | ...  | 282                      |                            |
| IV—AFFECTIONS OF THE CIRCULATORY SYSTEM.   |  |                     |                            |         |  |                          |                            |
| Pericarditis ...   | ...  | ...                 | ...                        | ...     | ...  | ...                      |                            |
| Acute endocarditis, or myocarditis ...   | ...  | 2                   | 2                          | 2       | ...  | 5                        |                            |
| Angina pectoris ...  | ...  | ...                 | ...                        | ...     | ...  | ...                      |                            |
| Other Diseases of the Heart :  |  |                     |                            |         |  |                          |                            |
| (a) Valvular :   | 1  | 6                   | 7                          | ...     | ...  | 44                       |                            |
| (a) Valvular :   | ...  | 4                   | 4                          | 4       | ...  | 10                       |                            |
| Mitral ...   | ...  | 32                  | 32                         | 8       | 1  | 145                      |                            |
| Aortic ...   | ...  | 17                  | 17                         | 3       | ...  | 23                       |                            |
| Tricuspid ...  | ...  | ...                 | ...                        | ...     | ...  | 1                        |                            |
| Pulmonary ...  | ...  | ...                 | ...                        | ...     | ...  | 22                       |                            |
| (b) Myocarditis ...  | ...  | 9                   | 9                          | 4       | ...  | ...                      |                            |
| Carried forward ...  | 88   | 1,323               | 1,411                      | 117     | 96   | 36,270                   |                            |

## AFRICAN—continued.

| Diseases.  | IN-PATIENTS.                                   |                     |                            |         |  | OUT-PATIENTS.            |                            |
|--|--|---------------------|----------------------------|---------|--|--------------------------|----------------------------|
|  | Remaining<br>in Hospital<br>at end of<br>1928. | Total<br>Admission. | Total<br>Cases<br>treated. | Deaths. | Remaining<br>in Hospital<br>at end of<br>1929. | New<br>Cases<br>treated. | Subsequent<br>Attendances. |
| Brought forward ...  | 88   | 1,323               | 1,411                      | 117     | 96   | 36,270                   |                            |
| IV—AFFECTIONS OF THE<br>CIRCULATORY SYSTEM,<br><i>continued.</i> |  |                     |                            |         |  |                          |                            |
| Diseases of the Arteries :                                       |  |                     |                            |         |  |                          |                            |
| (a) Aneurism ...   | ...  | 3                   | 3                          | 1       | ...  | 8                        |                            |
| (b) Arterio-sclerosis ...  | ...  | 2                   | 2                          | ...     | ...  | 18                       |                            |
| (c) Other diseases ...   | ...  | 2                   | 2                          | ...     | ...  | 12                       |                            |
| Embolism or thrombosis<br>(non-cerebral) ...                     | ...  |                     |                            |         |  |                          |                            |
| Diseases of the Veins :  |  |                     |                            |         |  |                          |                            |
| Hæmorrhoids ...  | ...  | 5                   | 5                          | ...     | ...  | 56                       |                            |
| Varicose veins ...   | ...  | 1                   | 1                          | ...     | ...  | 9                        |                            |
| Phlebitis ...  | ...  | ...                 | ...                        | ...     | ...  | 3                        |                            |
| Diseases of the Lymphatic<br>System :                            |  |                     |                            |         |  |                          |                            |
| Lymphangitis ...   | ...  | 1                   | 1                          | ...     | ...  | 90                       |                            |
| Lymphadenitis, bubo<br>(non-specific) ...                        | 1  | 64                  | 65                         | ...     | 3  | 498                      |                            |
| Hæmorrhage of undeter-<br>mined cause ...                        | ...  |                     |                            |         |  |                          |                            |
| Other affections of the<br>circulatory system ...                | 4  | 22                  | 26                         | 11      | ...  | 128                      |                            |
| V—AFFECTIONS OF THE<br>RESPIRATORY SYSTEM.                       |  |                     |                            |         |  |                          |                            |
| Diseases of the Nasal<br>Passages ...                            |  |                     |                            |         |  |                          |                            |
| Adenoids ...   | ...  | ...                 | ...                        | ...     | ...  | 5                        |                            |
| Polypus ...  | ...  | ...                 | ...                        | ...     | ...  | 14                       |                            |
| Rhinitis ...   | ...  | ...                 | ...                        | ...     | ...  | 5                        |                            |
| Coryza ...   | ...  | 5                   | 5                          | ...     | ...  | 58                       |                            |
| Affections of the Larynx :                                       |  |                     |                            |         |  | 952                      |                            |
| Laryngitis ...   | ...  | 5                   | 5                          | 2       | ...  | 93                       |                            |
| Bronchitis :   |  |                     |                            |         |  |                          |                            |
| (a) Acute ...  | 2  | 88                  | 90                         | 3       | 2  | 5,874                    |                            |
| (b) Chronic ...  | 1  | 12                  | 13                         | 1       | ...  | 3,076                    |                            |
| Broncho-pneumonia ...  | 1  | 27                  | 28                         | 9       | 1  | 24                       |                            |
| Pneumonia :  |  |                     |                            |         |  |                          |                            |
| (a) Lobar ...  | ...  | 35                  | 35                         | 10      | ...  | 20                       |                            |
| (b) Unclassified ...   | 1  | 73                  | 74                         | 26      | 1  | 57                       |                            |
| Carried forward ...  | 98   | 1,668               | 1,766                      | 180     | 103  | 47,270                   |                            |

## AFRICAN—continued.

| Diseases.   | IN-PATIENTS.                                   |                     |                           |         |  | OUT-PATIENTS.            |                           |
|---|--|---------------------|---------------------------|---------|--|--------------------------|---------------------------|
|   | Remaining<br>in Hospital<br>at end of<br>1928. | Total<br>Admission. | Total<br>Cases<br>treated | Deaths. | Remaining<br>in Hospital<br>at end of<br>1929. | New<br>Cases<br>treated. | Subsequent<br>Attendances |
| Brought forward ...   | 98   | 1,668               | 1,766                     | 180     | 103  | 47,270                   |                           |
| V—AFFECTIONS OF THE<br>RESPIRATORY SYSTEM,<br><i>continued.</i> |  |                     |                           |         |  |                          |                           |
| Pleurisy, empyema ...   | 1  | 37                  | 38                        | 2       | 3  | 149                      |                           |
| Congestion of the lungs ...                                     |  |                     |                           |         |  |                          |                           |
| Gangrene of the lungs ...                                       | ...  |                     |                           |         |  |                          |                           |
| Asthma ...  | 1  | 5                   | 6                         | 3       | ...  | 113                      |                           |
| Pulmonary emphysema ...   | ...  | ...                 | ...                       | ...     | ...  | 1                        |                           |
| Other affections of the<br>lungs                                | ...  | ...                 | ...                       | ...     | ...  | 631                      |                           |
| Pulmonary spirochaetosis  |  |                     |                           |         |  |                          |                           |
| VI—DISEASES OF THE<br>DIGESTIVE SYSTEM.                         |  |                     |                           |         |  |                          |                           |
| A.—Diseases of Teeth or<br>Gums :                               |  |                     |                           |         |  |                          |                           |
| Caries, pyorrhœa, etc. ...                                      | ...  | 14                  | 14                        | ...     | ...  | 1,746                    |                           |
| B.—Other affections of the<br>mouth :                           |  |                     |                           |         |  |                          |                           |
| Stomatitis ...  | ...  | 9                   | 9                         | ...     | ...  | 332                      |                           |
| Glossitis, etc. ...   | ...  | ...                 | ...                       | ...     | ...  | 60                       |                           |
| Affections of the Pharynx<br>or Tonsils :                       |  |                     |                           |         |  |                          |                           |
| Tonsillitis ...   | ...  | 9                   | 9                         | 1       | ...  | 251                      |                           |
| Pharyngitis ...   | ...  | 2                   | 2                         | ...     | ...  | 256                      |                           |
| Affections of the œsophagus                                     |  |                     |                           |         |  |                          |                           |
| A.—Ulcer of the stomach ...                                     | ...  | ...                 | ...                       | ...     | ...  | 1                        |                           |
| B.—Ulcer of the duodenum ...                                    | ...  | 1                   | 1                         | ...     | ...  | ...                      |                           |
| Other affections of the<br>Stomach :                            |  |                     |                           |         |  |                          |                           |
| Gastritis ...   | ...  | 10                  | 10                        | ...     | ...  | 494                      |                           |
| Dyspepsia, etc. ...   | ...  | 25                  | 25                        | ...     | ...  | 3,439                    |                           |
| Diarrhœa and Enteritis :  |  |                     |                           |         |  |                          |                           |
| Under two years ...   | ...  | 9                   | 9                         | 1       | ...  | 221                      |                           |
| Diarrhœa and Enteritis :  |  |                     |                           |         |  |                          |                           |
| Two years and over ...  | ...  | 92                  | 92                        | 15      | 2  | 1,007                    |                           |
| Colitis ...   | 1  | 4                   | 5                         | 1       | ...  | 40                       |                           |
| Ulceration ...  | ...  |                     |                           |         |  |                          |                           |
| Sprue ...   | ...  |                     |                           |         |  |                          |                           |
| Ankylostomiasis ...   | 1  | 22                  | 23                        | 4       | ...  | 58                       |                           |
| Carried forward ...   | 103  | 1,910               | 2,013                     | 210     | 108  | 56,114                   |                           |

## AFRICAN—continued.

| Diseases  | IN-PATIENTS.                                   |                     |                            |         | OUT-PATIENTS.                                  |                          |                           |
|---|--|---------------------|----------------------------|---------|--|--------------------------|---------------------------|
|   | Remaining<br>in Hospital<br>at end of<br>1928. | Total<br>Admission. | Total<br>Cases<br>treated. | Deaths. | Remaining<br>in Hospital<br>at end of<br>1929. | New<br>Cases<br>treated. | Subsequent<br>Attendances |
| Brought forward ...                                       | 103  | 1,910               | 2,013                      | 210     | 108  | 56,114                   |                           |
| VI—DISEASES OF THE DIGESTIVE SYSTEM,<br><i>continued.</i> |  |                     |                            |         |  |                          |                           |
| Diseases due to Intestinal Parasites :                    |  |                     |                            |         |  |                          |                           |
| ... ..  | ...  | ...                 | ..                         | ..      | ...  | 9                        |                           |
| (a) Cestoda (taenia) ...                                  | ...  | 18                  | 18                         | ...     | ...  | 254                      |                           |
| (b) Trematoda (flukes) ...                                | ...  | ...                 | ...                        | ...     | ...  | 11                       |                           |
| (c) Nematoda (other than ankylostoma)—                    | ...  | ...                 | ...                        | ...     | ...  | 7                        |                           |
| Ascaris ... ..  | ...  | 15                  | 15                         | 1       | 1  | 3,937                    |                           |
| Trichocephalus dispar                                     | ...  |                     |                            |         |  |                          |                           |
| Trichina ... ..   | ...  |                     |                            |         |  |                          |                           |
| Dracunculus ... ..  | ...  |                     |                            |         |  |                          |                           |
| Strongylus ... ..   | ...  |                     |                            |         |  |                          |                           |
| Oxyuris ... ..  | ...  | ...                 | ...                        | ...     | ...  | 2                        |                           |
| (d) Coccidia ... ..                                       | ...  | ...                 | ...                        | ...     | ...  | 6                        |                           |
| (e) Other parasites ...                                   | ...  | 2                   | 2                          | 1       | ...  | 1                        |                           |
| (f) Unclassified ... ..                                   | ...  | 1                   | 1                          | 1       | ...  | 1                        |                           |
| Appendicitis ... ..                                       | 8  | 158                 | 166                        | 3       | 8  | 283                      |                           |
| Hernia ... ..   | 1  | 17                  | 18                         | ...     | 1  | 70                       |                           |
| A.—Affections of the anus, fistula, etc. ...              |  |                     |                            |         |  |                          |                           |
| B.—Other Affections of the Intestines :                   | ...  | 1                   | 1                          | 1       | ...  | 65                       |                           |
| Enteroptosis ... ..                                       | ...  | 6                   | 6                          | ...     | 1  | 7,865                    |                           |
| Constipation ... ..                                       | ...  |                     |                            |         |  |                          |                           |
| Acute yellow atrophy of the liver ... ..                  | ...  |                     |                            |         |  |                          |                           |
| Hydatid of the liver ...                                  | ...  |                     |                            |         |  |                          |                           |
| Cirrhosis of the liver :                                  | ...  | 2                   | 2                          | ...     | ...  | 2                        |                           |
| (a) Alcoholic ... ..                                      | ...  | 3                   | 3                          | 1       | ...  | ...                      |                           |
| (b) Other forms ... ..                                    | ...  |                     |                            |         |  |                          |                           |
| Biliary calculus ... ..                                   | ...  |                     |                            |         |  |                          |                           |
| Other Affections of the Liver :                           | ...  |                     |                            |         |  |                          |                           |
| Abscess ... ..  | ...  | 7                   | 7                          | 1       | ...  | 8                        |                           |
| Hepatitis ... ..  | ...  | 16                  | 16                         | ...     | ...  | 71                       |                           |
| Cholecystitis ... ..                                      | ...  | 13                  | 13                         | 2       | ...  | 29                       |                           |
| Jaundice ... ..   | ...  |                     |                            |         |  |                          |                           |
| Diseases of the pancreas                                  | ...  |                     |                            |         |  |                          |                           |
| Peritonitis (of unknown cause) ... ..                     | ...  | 5                   | 5                          | 4       | ...  | 1                        |                           |
| Other affections of the digestive system ...              | 1  | 13                  | 14                         | 1       | ...  | 379                      |                           |
| Carried forward ...                                       | 113  | 2,187               | 2,300                      | 226     | 119  | 69,115                   |                           |

## AFRICAN—continued.

| Diseases.   | IN-PATIENTS.                                   |                     |                            |         |  | OUT-PATIENTS.            |                            |
|---|--|---------------------|----------------------------|---------|--|--------------------------|----------------------------|
|   | Remaining<br>in Hospital<br>at end of<br>1928. | Total<br>Admission. | Total<br>Cases<br>treated. | Deaths. | Remaining<br>in Hospital<br>at end of<br>1929. | New<br>Cases<br>treated. | Subsequent<br>Attendances. |
| Brought forward ...   | 113  | 2,187               | 2,300                      | 226     | 119  | 69,115                   |                            |
| VII—DISEASES OF THE<br>GENITO-URINARY SYSTEM<br>(NON-VEREREAL). |  |                     |                            |         |  |                          |                            |
|   |  |                     | 13                         |         |  |                          |                            |
| Acute nephritis ...   | ...  | 13                  | 14                         | 3       | ...  | 55                       |                            |
| Chronic ...   | 1  | 13                  |                            | 2       | ...  | 79                       |                            |
| A.—Chyluria ...   | ...  |                     | 9                          |         | ...  |                          |                            |
| B.—Schistosomiasis ...  | 1  | 8                   |                            | ...     | 1  | 42                       |                            |
| Other Affections of the<br>Kidneys :                            |  |                     | 7                          |         |  |                          |                            |
| Pyelitis, etc. ...  | ...  | 7                   | 2                          | 2       | ...  | 29                       |                            |
| Urinary calculus ...  | ...  | 2                   | 2                          | ...     | ...  | 27                       |                            |
| Urinary calculus ...  | ...  | 2                   |                            | ...     | ...  | 4                        |                            |
| Diseases of the Bladder :                                       |  |                     | 5                          |         |  |                          |                            |
| Cystitis ...  | ...  | 5                   | 4                          | ...     | ...  | 111                      |                            |
| Diseases of the Urethra :                                       |  |                     | 68                         |         |  |                          |                            |
| (a) Stricture ...   | 2  | 66                  | 9                          | 7       | 5  | 101                      |                            |
| (b) Other ...   | ...  | 9                   |                            | ...     | ...  | 81                       |                            |
| Diseases of the Prostate :                                      |  |                     | 2                          |         |  |                          |                            |
| Hypertrophy ...   | ...  | 2                   | 5                          | 1       | ...  | ...                      |                            |
| Prostatitis ...   | 1  | 4                   |                            | 1       | ...  | 4                        |                            |
| Diseases (non-venereal) of the<br>Genital Organs of Man :       | ...  | ...                 | ...                        | ...     | ...  | ...                      |                            |
| Other Diseases of Male<br>Genital Organs ...                    | 1  | 30                  | 7                          | ...     | 3  | 44                       |                            |
| Epididymitis ...  | ...  | 7                   | 22                         | ...     | ...  | 45                       |                            |
| Orchitis ...  | ...  | 22                  | 54                         | ...     | ...  | 316                      |                            |
| Hydrocele ...   | 3  | 51                  | 16                         | ...     | 2  | 134                      |                            |
| Ulcer of penis ...  | ...  | 16                  |                            | ...     | ...  | 118                      |                            |
| Cysts or other non-malignant<br>tumours of the<br>ovaries ...   | ...  | 3                   | 3                          | ...     | ...  | 5                        |                            |
| Salpingitis ...   | 1  | 8                   | 9                          | ...     | 1  | 6                        |                            |
| Abscess of the pelvis ...                                       | ...  |                     |                            | ...     |  |                          |                            |
| Uterine tumours (non-malignant,<br>...)                         | 2  | 30                  | 32                         | 1       | 1  | 17                       |                            |
| Uterine hæmorrhage (non-<br>puerperal) ...                      | ...  | 1                   | 13                         | ...     | ...  | 22                       |                            |
| A.—Metritis ...   | 1  | 12                  |                            | 1       | ...  | 93                       |                            |
| B.—Other affections of the<br>female genital organs :           |  |                     | 12                         |         |  |                          |                            |
| Displacements of uterus ...                                     | ...  | 12                  | 2                          | 3       | 2  | 156                      |                            |
| Amenorrhœa ...  | ...  | 2                   |                            | ...     | ...  | 546                      |                            |
| Carried forward ...   | 126  | 2,516               | 2,642                      | 247     | 134  | 71,151                   |                            |



## AFRICAN—continued.

| Diseases.   | IN-PATIENTS.                                   |                     |                            |         |  | OUT-PATIENTS.            |                            |
|---|--|---------------------|----------------------------|---------|--|--------------------------|----------------------------|
|   | Remaining<br>in hospital<br>at end of<br>1928. | Total<br>Admission. | Total<br>Cases<br>treated. | Deaths. | Remaining<br>in Hospital<br>at end of<br>1929. | New<br>Cases<br>treated. | Subsequent<br>Attendances. |
| Brought forward ...   | 126  | 2,516               | 2,642                      | 247     | 134  | 71,151                   |                            |
| VII—DISEASES OF THE<br>GENITO-URINARY SYSTEM<br>(NON-VENEREAL)— <i>contd.</i> |  |                     |                            |         |  |                          |                            |
| Dysmenorrhœa ...  | ...  | 4                   | 4                          | ...     | ...  | 208                      |                            |
| Leucorrhœa ...  | ...  | 4                   | 4                          | ...     | ...  | 68                       |                            |
| Diseases of the Breast<br>(Non-puerperal):                                    |  |                     |                            |         |  |                          |                            |
| Mastitis ...  | ...  | 5                   | 5                          | ...     | ...  | 65                       |                            |
| Abscess of breast ...   | ...  | 4                   | 4                          | ...     | ...  | 25                       |                            |
| VIII—PUERPERAL STATE.   |  |                     |                            |         |  |                          |                            |
| A.—Normal labour ...  | 2  | 242                 | 244                        | ...     | 4  | 19                       |                            |
| B.—Accidents of Preg-<br>nancy:   |  |                     |                            |         |  |                          |                            |
| (a) Abortion ...  | ...  | 2                   | 2                          | ...     | ...  | 5                        |                            |
| (b) Ectopic gestation ...   | ...  | 14                  | 14                         | ...     | 1  | 70                       |                            |
| (c) Other accidents of<br>pregnancy ...                                       | 2  | 85                  | 87                         | 1       | 2  | 88                       |                            |
| Puerperal hæmorrhage ...  | ...  | ...                 | ...                        | ...     | ...  | 2                        |                            |
| Other accidents of par-<br>turation ...                                       |  |                     |                            |         |  |                          |                            |
| Puerperal septicæmia ...  | 1  | 2                   | 3                          | 3       | ...  | 2                        |                            |
| Phlegmasia dolens ...   | ...  | 1                   | 1                          | ...     | ...  | 3                        |                            |
| Puerperal eclampsia ...   | 1  | 7                   | 8                          | 4       | ...  | 1                        |                            |
| Sequela of labour ...   | ...  | ...                 | ...                        | ...     | ...  | 5                        |                            |
| Puerperal affections of the<br>breast ...                                     | ...  | 1                   | 1                          | ...     | ...  | 3                        |                            |
| IX—AFFECTIONS OF THE<br>SKIN AND CELLULAR<br>TISSUES.                         |  |                     |                            |         |  |                          |                            |
| Gangrene ...  | ...  | 1                   | 1                          | 1       | ...  | ...                      |                            |
| Boil—   |  |                     |                            |         |  |                          |                            |
| Carbuncle ...   | ...  | 14                  | 14                         | ...     | ...  | 374                      |                            |
| Abscess—  | 4  | 95                  | 99                         | 1       | 3  | 514                      |                            |
| Whitlow ...   | ...  | 19                  | 19                         | ...     | 1  | 361                      |                            |
| Cellulitis ...  | 3  | 82                  | 85                         | ...     | 4  | 413                      |                            |
| A.—Tinea ...  |  |                     |                            |         |  |                          |                            |
| B.—Scabies ...  | ...  | 3                   | 3                          | ...     | ...  | 341                      |                            |
| ...   | ...  | 6                   | 6                          | ...     | ...  | 1,410                    |                            |
| Other Diseases of the Skin—   |  |                     |                            |         |  |                          |                            |
| (a) Erythema ...  | ...  | 6                   | 6                          | ...     | ...  | 378                      |                            |
| (b) Urticaria ...   | ...  | ...                 | ...                        | ...     | ...  | 4                        |                            |
| (c) Eczema ...  | 1  | 2                   | 3                          | ...     | ...  | 15                       |                            |
| (d) Herpes ...  | ...  | 2                   | 2                          | ...     | ...  | 349                      |                            |
| (e) Psoriasis ...   | ...  | ...                 | ...                        | ...     | ...  | 36                       |                            |
| (f) Elephantiasis ...   | 6  | 37                  | 43                         | ...     | 2  | 23                       |                            |
| ...   | ...  | ...                 | ...                        | ...     | ...  | 148                      |                            |
| Carried forward ...   | 146  | 3,175               | 3,321                      | 263     | 152  | 76,188                   |                            |

AFRICAN—*continued.*

| Diseases.   | IN-PATIENTS.                                   |                     |                            |         | OUT-PATIENTS.                                  |                          |                            |
|---|--|---------------------|----------------------------|---------|--|--------------------------|----------------------------|
|   | Remaining<br>in Hospital<br>at end of<br>1928. | Total<br>Admission. | Total<br>Cases<br>treated. | Deaths. | Remaining<br>in Hospital<br>at end of<br>1929. | New<br>Cases<br>treated. | Subsequent<br>Attendances. |
| Brought forward ...   | 146  | 3,175               | 3,321                      | 263     | 152  | 76,188                   |                            |
| IX—AFFECTIONS OF THE<br>SKIN AND CELLULAR<br>TISSUES— <i>contd.</i>               |  |                     |                            |         |  |                          |                            |
| Other Diseases of the Skin—<br><i>continued.</i>                                  |  |                     |                            |         |  |                          |                            |
| (g) Myiasis ...   |  |                     |                            |         |  |                          |                            |
| (h) Chigoes ...   | ...  | 2                   | 2                          | 1       | ...  | 32                       |                            |
| (i) Cutaneous Leishmani-<br>asis ...  |  |                     |                            |         |  |                          |                            |
| (j) Ulcer ...   | 27   | 278                 | 305                        | 19      | 20   | 6,868                    |                            |
| X—DISEASES OF BONES<br>AND ORGANS OF LOCO-<br>MOTION (OTHER THAN<br>TUBERCULOUS). |  |                     |                            |         |  |                          |                            |
| Diseases of Bones :   |  |                     |                            |         |  |                          |                            |
| Osteitis ...  | 3  | 8                   | 11                         | 4       | ...  | 337                      |                            |
| Diseases of Joints :  |  |                     |                            |         |  |                          |                            |
| Arthritis ...   | ...  | 44                  | 44                         | ...     | 3  | 2,726                    |                            |
| Synovitis ...   | 2  | 20                  | 22                         | ...     | ...  | 168                      |                            |
| Other diseases of bones or<br>organs of locomotion ...                            | 2  | 39                  | 41                         | ...     | ...  | 2,764                    |                            |
| XI—MALFORMATIONS.   |  |                     |                            |         |  |                          |                            |
| Malformations :   |  |                     |                            |         |  |                          |                            |
| Hydrocephalus ...   |  |                     |                            |         |  |                          |                            |
| Hypospadias ...   |  |                     |                            |         |  |                          |                            |
| Spina bifida, etc. ...  | ...  | 2                   | 2                          | ...     | ...  | ...                      |                            |
| XII—DISEASES OF<br>INFANCY.   |  |                     |                            |         |  |                          |                            |
| Congenital debility ...   | ...  | ...                 | ...                        | ...     | ...  | 1                        |                            |
| Premature birth ...   |  |                     |                            |         |  |                          |                            |
| Other affections of infancy ...   | ...  | 8                   | 8                          | 5       | ...  | 11                       |                            |
| Infant neglect (infants of<br>three months or over) ...                           | ...  | ...                 | ...                        | ...     | ...  | 1                        |                            |
| XIII—AFFECTIONS OF<br>OLD AGE.  |  |                     |                            |         |  |                          |                            |
| Senility :  |  |                     |                            |         |  |                          |                            |
| Senile dementia ...   | 1  | 11                  | 12                         | 3       | 1  | 47                       |                            |
|   | ...  | ...                 | ...                        | ...     | ...  | 2                        |                            |
| Carried forward ...   | 181  | 3,587               | 3,768                      | 295     | 176  | 89,145                   |                            |

## AFRICAN—continued.

| Diseases.  | IN-PATIENTS.                                   |                     |                            |         |  | OUT-PATIENTS.            |                            |
|--|--|---------------------|----------------------------|---------|--|--------------------------|----------------------------|
|  | Remaining<br>in Hospital<br>at end of<br>1928. | Total<br>Admission. | Total<br>Cases<br>treated. | Deaths. | Remaining<br>in Hospital<br>at end of<br>1929. | New<br>Cases<br>treated. | Subsequent<br>Attendances. |
| Brought forward ...  | 181  | 3,587               | 3,768                      | 295     | 176  | 89,145                   |                            |
| XIV—AFFECTIONS<br>PRODUCED BY EXTERNAL<br>CAUSES.          |  |                     |                            |         |  |                          |                            |
| Suicide by poisoning ...                                   |  |                     |                            |         |  |                          |                            |
| Corrosive poisoning (inten-<br>tional) ...                 |  |                     |                            |         |  |                          |                            |
| Suicide by gas poisoning                                   |  |                     |                            |         |  |                          |                            |
| Suicide by hanging or<br>strangulation ...                 |  |                     |                            |         |  |                          |                            |
| Suicide by drowning ...                                    |  |                     |                            |         |  |                          |                            |
| Suicide by firearms ...                                    |  |                     |                            |         |  |                          |                            |
| Suicide by cutting or stab-<br>bing instruments ...        | ...  | ...                 | ...                        | ...     | ...  | 1                        |                            |
| Suicide by jumping from<br>a height ...                    |  |                     |                            |         |  |                          |                            |
| Suicide by crushing ...                                    |  |                     |                            |         |  |                          |                            |
| Other suicides ...   |  |                     |                            |         |  |                          |                            |
| Food poisoning :   |  |                     |                            |         |  |                          |                            |
| Botulism ...   | ...  | 4                   | 4                          | ...     | ...  | ...                      |                            |
| Attacks of Poisonous Ani-<br>mals :                        |  |                     |                            |         |  |                          |                            |
| Snake bite ...   | ...  | 7                   | 7                          | ...     | ...  | 37                       |                            |
| Insect bite ...  | ...  | 1                   | 1                          | ...     | ...  | 41                       |                            |
| Other accidental poisonings                                | ...  | ...                 | ...                        | ...     | ...  | 2                        |                            |
| Burns (by fire) ...  | 2  | 10                  | 12                         | 2       | ...  | 90                       |                            |
| Burns (other than by fire)                                 | ...  | 13                  | 13                         | ...     | ...  | 81                       |                            |
| Suffocation (accidental) ...                               |  |                     |                            |         |  |                          |                            |
| Poisoning by gas (accid-<br>ental) ...                     |  |                     |                            |         |  |                          |                            |
| Drowning (accidental) ...                                  | ...  | ...                 | ...                        | ...     | ...  | 1                        |                            |
| Wounds (by firearms, war<br>excepted) ...                  | 1  | 14                  | 15                         | 2       | 1  | 13                       |                            |
| Wounds (by cutting or<br>stabbing instruments) ...         | 4  | 54                  | 58                         | ..      | 4  | 1,177                    |                            |
| Wounds (by fall) ...                                       | 1  | 33                  | 34                         | ...     | 1  | 503                      |                            |
| Wounds (in mines or<br>quarries) ...                       | ...  | 1                   | 1                          | ...     | ...  | 2                        |                            |
| Wounds (by machinery) ...                                  | ...  | 4                   | 4                          | ...     | ...  | 22                       |                            |
| Wounds (crushing, e.g.<br>railway accidents, etc.) ...     | ...  | 7                   | 7                          | 2       | ...  | 28                       |                            |
| Injuries inflicted by ani-<br>mals, bites, kicks, etc. ... | 1  | 23                  | 24                         | 1       | 1  | 155                      |                            |
| Wounds inflicted on active<br>service ...                  | ...  | 1                   | 1                          | ...     | ...  | 1                        |                            |
| Executions of civilians by<br>belligerents ...             | ...  | ...                 | ...                        | ...     | ...  | 3                        |                            |
| A.—Overfatigue ...   | ...  | 14                  | 14                         | 10      | ...  | 5                        |                            |
| B.—Hunger or thirst ...                                    | ...  | 6                   | 6                          | 3       | 3  | 6                        |                            |
| Exposure to cold, frost-<br>bite, etc. ...                 | ...  | 6                   | 6                          | 3       | 3  | 6                        |                            |
| Carried forward ...  | 190  | 3,779               | 3,969                      | 315     | 186  | 91,313                   |                            |

## AFRICAN—continued.

| Diseases.   | IN-PATIENTS.                                   |                     |                            |         | OUT-PATIENTS.                                  |                          |                            |
|---|--|---------------------|----------------------------|---------|--|--------------------------|----------------------------|
|   | Remaining<br>in Hospital<br>at end of<br>1928. | Total<br>Admission. | Total<br>Cases<br>treated. | Deaths. | Remaining<br>in Hospital<br>at end of<br>1929. | New<br>Cases<br>treated. | Subsequent<br>Attendances. |
| Brought forward ...                                     | 190  | 3,779               | 3,969                      | 315     | 186  | 91,313                   |                            |
| XIV—AFFECTIONS<br>PRODUCED BY EXTERNAL<br>CAUSES—contd. |  |                     |                            |         |  |                          |                            |
| Exposure to Heat:                                       |  |                     |                            |         |  |                          |                            |
| Heat stroke ...   | ...  | ...                 | ...                        | ...     | ...  | ...                      | ...                        |
| Sunstroke ...   | ...  | ...                 | ...                        | ...     | ...  | ...                      | ...                        |
| Lightning stroke ...                                    | ...  | ...                 | ...                        | ...     | ...  | 2                        | ...                        |
| Electric shock ...                                      | ...  | 2                   | 2                          | ...     | ...  | 2                        | ...                        |
| Murder by firearms ...                                  | ...  | ...                 | ...                        | ...     | ...  | ...                      | ...                        |
| Murder by cutting or stab-<br>bing instruments ...      | ...  | ...                 | ...                        | ...     | ...  | ...                      | ...                        |
| Murder by other means ...                               | ...  | ...                 | ...                        | ...     | ...  | 1                        | ...                        |
| Infanticide (murder of an<br>infant under one year) ... | ...  | ...                 | ...                        | ...     | ...  | ...                      | ...                        |
| A.—Dislocation ...                                      | 1  | 4                   | 5                          | ...     | ...  | 14                       | ...                        |
| B.—Sprain ...   | ...  | 23                  | 23                         | ..      | 1  | 539                      | ...                        |
| C.—Fracture ...   | 6  | 65                  | 71                         | 5       | 7  | 78                       | ...                        |
| Other external injuries ...                             | 4  | 168                 | 172                        | ...     | 9  | 4,355                    | ...                        |
| Deaths by violence of un-<br>known cause ...            | ...  | ...                 | ...                        | ...     | ...  | ...                      | ...                        |
| XV—ILL-DEFINED<br>DISEASES.                             |  |                     |                            |         |  |                          |                            |
| Sudden death (cause un-<br>known) ...                   | ...  | ...                 | ...                        | ...     | ...  | 2                        | ...                        |
| A.—Diseases not already<br>specified or ill-defined ... | ...  | 2                   | 2                          | ...     | ...  | 54                       | ...                        |
| Ascites ...   | ...  | 11                  | 11                         | 1       | 1  | 33                       | ...                        |
| Edema ...   | ...  | 15                  | 15                         | 1       | ...  | 123                      | ...                        |
| Asthenia ...  | 17   | 49                  | 66                         | 16      | 16   | 647                      | ...                        |
| Shock ...   | ...  | ...                 | ...                        | ...     | ...  | 1                        | ...                        |
| Hyper-pyrexia ...                                       | ...  | ...                 | ...                        | ...     | ...  | 4                        | ...                        |
| B.—Malingering ...                                      | ...  | 1                   | 1                          | ...     | ...  | 18                       | ...                        |
| Undiagnosed ...   | ...  | 14                  | 14                         | ...     | 14   | 51                       | ...                        |
| No appreciable disease ...                              | 1  | 58                  | 59                         | ...     | 4  | 227                      | ...                        |
| Pyrexia of uncertain origin ...                         | ...  | 20                  | 20                         | ...     | ...  | 41                       | ...                        |
| Coma ...  | ...  | 1                   | 1                          | 1       | ...  | ...                      | ...                        |
| Total ...   | 219  | 4,212               | 4,431                      | 339     | 238  | 97,505                   |                            |

## Appendices.

### A.—REPORT OF THE SURGICAL SPECIALIST, CONNAUGHT HOSPITAL.

Leave intervened to break the sequence of the year's surgical work. During the five months I was absent from the Colony, I took the opportunity to study certain aspects of surgery at Budapest and Vienna; in the progressive clinics of these well known medical centres, I found much to interest me and learned things that in their application to our own clinic have led, I think, to increased efficiency.

The work of my department at the Connaught Hospital has progressed reasonably smoothly during 1929. I have been able to have continuity of service in my Ward Master, Mr. Smith, and my assistant Mr. Davies; they have both supported me well.

A new block for surgical cases comprising fourteen beds for men and fourteen beds for women has been opened; four single cubicles have been included and they are, I believe, appreciated by that section of the community for whom they were intended. This block, although necessarily conforming outwardly to the older portion of the hospital, is of a better design, and the lighting, ventilation, and sanitary conveniences have been much improved. While this additional accommodation has relieved the pressure on beds, it has not yet provided the number requisite to the needs of the country.

Various improvements have been carried out during the year—such as the provision of a children's ward, a re-decoration of the theatre, and an enlargement and addition to the theatre block. Several new instruments and appliances have been added to the establishment. It has been necessary to use the room planned as a children's ward for acute European surgical cases on several occasions; this lends weight to my views on the provision of beds for Europeans at the Connaught Hospital.

Statistics of operative work and notes on cases of interest are appended. I am indebted for the section reports to Mr. D. M. Greig, F.R.C.S., Conservator of the Royal College of Surgeons Museum, Edinburgh.

Q. STEWART,  
*Surgical Specialist.*

#### OPERATIONS AT THE CONNAUGHT HOSPITAL IN 1929.

| (1) <i>Abdominal:</i>  | Cured. | Relieved. | Unrelieved. | Died. |
|--|--------|-----------|-------------|-------|
| Herniotomy inguinal ... ..   | 124    | ...       | ...         | ...   |
| Herniotomy for strangulated inguinal hernia ... ..                 | 1      | ...       | ...         | 1     |
| Gastro-enterostomy for pyloric obstruction due to carcinoma ... .. | ...    | ...       | ...         | 2     |
| Laparotomy for gun shot wounds of liver ... ..                     | ...    | 1         | ...         | ...   |
| Exploratory laparotomy for carcinoma of liver ... ..               | ...    | ...       | 1           | ...   |
| Drainage of liver for liver abscess                                | 1      | ...       | ...         | ...   |
| Closure of faecal fistula ... ..                                   | 1      | ...       | ...         | ...   |
| Drainage of pelvic abscess ... ..                                  | 1      | ...       | ...         | ...   |
| Ileo-colostomy for tuberculous peritonitis with obstruction ... .. | ...    | ...       | ...         | 1     |
| Splenectomy for splenomegaly ... ..                                | 1      | ...       | ...         | ...   |
| <br>(2) <i>Ano-Rectal:</i>   |        |           |             |       |
| Excision of fistula in ano ... ..                                  | 7      | ...       | ...         | ...   |
| Excision of hæmorrhoids ... ..                                     | 2      | ...       | ...         | ...   |
| Sigmoidoscopy ... ..   | ...    | ...       | 2           | ...   |
| <br>(3) <i>Ear, Nose and Throat:</i>                               |        |           |             |       |
| Sarcoma of nose ... ..   | ...    | ...       | 1           | ...   |
| Removal of foreign bodies from ear                                 | 5      | ...       | ...         | ...   |
| Tracheotomy for foreign body ... ..                                | ...    | ...       | ...         | 1     |
| Enucleation of tonsils ... ..                                      | 2      | ...       | ...         | ...   |
| Paracentesis ... ..  | 2      | ...       | ...         | ...   |
| Schwartz's operation for otitis media                              | 1      | ...       | ...         | ...   |

(4) *Eyes:*

|                                     |     |     |     |     |     |
|-------------------------------------|-----|-----|-----|-----|-----|
| Needling of cataract ... ..         | ... | ... | ... | 1   | ... |
| Extraction of cataract ... ..       | ... | 2   | ... | ... | ... |
| Iridectomy for prolapsed iris ...   | ... | 2   | ... | ... | ... |
| Excision of eyeball ... ..          | ... | 1   | ... | ... | ... |
| Excision of cyst of eyelid ... ..   | ... | 1   | ... | ... | ... |
| Extraction of foreign bodies ... .. | ... | 2   | ... | ... | ... |

(5) *Genito-Urinary (Male):*

|  |     |     |     |     |     |
|--|-----|-----|-----|-----|-----|
| Cystoscopy ... ..                                    | ... | ... | ... | 6   | ... |
| Excision of scrotum for elephantiasis ... ..         | ... | 29  | ... | ... | ... |
| Radical cure of hydrocele ... ..                     | ... | 52  | ... | ... | ... |
| Suprapubic prostatectomy for hypertrophy ... ..      | ... | 1   | ... | ... | ... |
| Cauterising of penile ulceration ...                 | ... | 1   | ... | ... | ... |
| Suprapubic cystostomy for drainage of bladder ... .. | ... | 3   | ... | ... | 3   |
| Suprapubic cystotomy for retention ...               | ... | 2   | ... | ... | ... |
| Dilatation of stricture ... ..                       | ... | ... | 77  | ... | 1   |
| Perineal urethrotomy ... ..                          | ... | 1   | ... | ... | 1   |
| Excision of urethral sinuses ... ..                  | ... | 5   | ... | ... | ... |
| Drainage for extravasation of urine ...              | ... | 4   | ... | ... | 1   |
| Vasostomy ... ..                                     | ... | ... | 1   | ... | ... |
| Circumcision ... ..                                  | ... | 26  | ... | ... | ... |
| Orchidectomy:—                                       |     |     |     |     |     |
| for abscess or fibrosis ... ..                       | ... | 4   | ... | ... | ... |

(6) *Gynaecological:*

|  |     |                    |     |     |     |
|--|-----|--------------------|-----|-----|-----|
| Hysterectomy for fibroids ... ..                     | 15  | ...                | ... | ... | 1   |
| Hysterectomy for salpingitis ... ..                  | 2   | ...                | ... | ... | ... |
| Myomectomy ... ..                                    | 4   | ...                | ... | ... | ... |
| Curettage ... ..                                     | 8   | ...                | ... | ... | ... |
| Induction of abortion for pernicious vomiting ... .. | ... | ...                | ... | 1   | ... |
| Trachelorrhaphy ... ..                               | 1   | ...                | ... | ... | ... |
| Excision of vulval elephantiasis ... ..              | 1   | ...                | ... | ... | ... |
| Excision of portion of cervix for diagnosis ... ..   | ... | ...                | ... | 1   | ... |
| Radical cure of cystocele ... ..                     | 1   | ...                | ... | ... | ... |
| Colpo-perineorrhaphy for prolapse ...                | 1   | ...                | ... | ... | ... |
| Excision of broad ligament cyst ... ..               | 1   | ...                | ... | ... | 3   |
| Salpingo-cophorectomy ... ..                         | 1   | ...                | ... | ... | ... |
| Posterior colpotomy ... ..                           | 1   | ...                | ... | ... | ... |
| Plastic operation for vesico-vaginal fistula ... ..  | ... | ...                | 1   | ... | ... |
| Plastic operation for recto-vaginal fistula          | 1   | ...                | ... | ... | ... |
| Excision of cyst of breast ... ..                    | 1   | ...                | ... | ... | ... |
| Excision of breast for carcinoma ... ..              | 1   | (provi-<br>sional) | ... | ... | ... |

(7) *Head and Neck:*

|   |     |     |     |     |     |
|---|-----|-----|-----|-----|-----|
| Exploratory operation on epithelioma of mouth ... ..                | ... | ... | ... | 1   | ... |
| Cisternal puncture ... ..   | ... | ... | ... | 1   | ... |
| Esmarch's operation for ankylosis of temporo-maxillary joint ... .. | 1   | ... | ... | ... | ... |
| Excision of goundou ... ..  | 1   | ... | ... | ... | ... |
| Excision of follicular odontome ... ..                              | 1   | ... | ... | ... | ... |
| Excision of epulis of mandible ... ..                               | 6   | ... | ... | ... | ... |
| Excision of mixed tumour of parotid ...                             | 2   | ... | ... | ... | ... |
| Plastic operation for hare lip ... ..                               | 1   | ... | ... | ... | ... |
| Hemithyroidectomy for carcinoma ... ..                              | ... | ... | ... | ... | 1   |
| Hemithyroidectomy for cystic adenoma ...                            | 1   | ... | ... | ... | ... |
| Excision of branchial cyst of neck ... ..                           | 2   | ... | ... | ... | ... |
| Drainage of parotid cyst ... ..                                     | 1   | ... | ... | ... | ... |
| Excision of sarcoma of neck ... ..                                  | ... | ... | ... | 2   | ... |
| Removal of bullet in neck ... ..                                    | 1   | ... | ... | ... | ... |

(8) *Miscellaneous :*

|  |     |     |     |     |
|--|-----|-----|-----|-----|
| Drainage of septic conditions ...      | 120 | ... | ... | ... |
| Excision of sinuses ...                | 2   | 1   | 1   | ... |
| Suture of wounds ...                   | 12  | ... | ... | ... |
| Drainage of empyema ...                | 1   | ... | ... | ... |
| Extraction of teeth ...                | 37  | ... | ... | ... |
| Injection of varicose veins ...        | 1   | ... | ... | ... |
| Examination under anæsthesia ...       | ... | ... | 2   | ... |
| Aspiration of tubercular abscesses ... | ... | 3   | ... | ... |

(9) *Orthopædics :*

|   |     |     |     |     |
|---|-----|-----|-----|-----|
| Reduction of fractures and separated epiphysis ...  | 20  | ... | ... | ... |
| Reduction of dislocations ...                       | 6   | ... | ... | ... |
| Open operations for fractures :—                    |     |     |     |     |
| (a) Fractured tibia ...                             | 1   | ... | ... | ... |
| (b) Bone graft for ununited fracture of humerus ... | 1   | ... | ... | ... |
| Extension of fractures by means of pins             | 3   | ... | ... | ... |
| Excision of elbow joint for ankylosis ...           | ... | 1   | ... | ... |
| Excision of scapula for sarcoma ...                 | ... | ... | ... | 1   |
| Drainage and sequestrectomy for osteomyelitis ...   | 4   | ... | ... | ... |
| Drainage of arthritis ...                           | 5   | ... | ... | ... |
| Breaking down of adhesions in joint ...             | 2   | ... | ... | ... |
| Astragalectomy for talipes equino varus             | 1   | ... | ... | ... |
| Suture of cut tendons ...                           | 1   | ... | ... | ... |
| Amputation of leg ...                               | 4   | ... | ... | ... |
| „ toes ...  | 6   | ... | ... | ... |
| „ arm ...   | 3   | ... | ... | ... |
| „ fingers ...                                       | 2   | ... | ... | ... |
| Reamputation for ulcer of stump                     | 1   | ... | ... | ... |
| Excision of elephantiasis of foot                   | ... | ... | 1   | ... |
| Plaster cases ...                                   | 5   | ... | ... | ... |

(10) *Skin and Subcutaneous Tissues :*

|   |    |               |     |     |
|---|----|---------------|-----|-----|
| Excision of melanoma of foot and groin glands ... | 1  | (provisional) | ... | ... |
| Excision of ulcers ...                            | 5  | ...           | ... | ... |
| Excision of keloids ...                           | 2  | ...           | ... | ... |
| Skin grafting ...                                 | 11 | ...           | ... | ... |
| Removal of foreign bodies ...                     | 2  | ...           | ... | ... |
| Removal of finger nail ...                        | 1  | ...           | ... | ... |
| Excision of sebaceous cysts ...                   | 2  | ...           | ... | ... |
| Excision of dermoid cysts ...                     | 2  | ...           | ... | ... |
| Excision of corns ...                             | 2  | ...           | ... | ... |
| Excision of ganglia ...                           | 2  | ...           | ... | ... |
| Excision of lipomata ...                          | 7  | ...           | ... | ... |
| Excision of fibromata ...                         | 1  | ...           | ... | ... |

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|           |     |    |    |    |
|-----------|-----|----|----|----|
| Total ... | 616 | 85 | 21 | 18 |
|-----------|-----|----|----|----|

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Of the 21 operations marked unrelieved 14 were diagnostic procedures.

## OPERATIONS PERFORMED ON EUROPEANS IN 1929.

|   | Cured.    | Relieved. | Unrelieved. | Died.    |
|---|-----------|-----------|-------------|----------|
| Appendicectomy ... ..   | 2         | ...       | ...         | ...      |
| Caecostomy for carcinoma of colon<br>with obstruction ... ..              | ...       | ...       | ...         | 1        |
| Excision of wound and pin<br>extension in compound fracture<br>leg ... .. | 1         | ...       | ...         | ...      |
| Excision of hæmorrhoids ... ..  | 1         | ...       | ...         | ...      |
| Excision of fistula-in-ano ... ..   | 1         | ...       | ...         | ...      |
| Removal of toe nails ... ..   | 2         | ...       | ...         | ...      |
| Drainage of abscess ... ..  | 1         | ...       | ...         | ...      |
| Radical cure of hydrocele ... ..  | 1         | ...       | ...         | ...      |
| Removal of scrotal hæmatoma ... ..  | 1         | ...       | ...         | ...      |
| Cystoscopic examination ... ..  | ...       | ...       | 1           | ...      |
| Extraction of teeth ... ..  | 6         | ...       | ...         | ...      |
| Removal of foreign bodies in eye ... ..                                   | 2         | ...       | ...         | ...      |
| Excision of sebaceous cyst ... ..   | 1         | ...       | ...         | ...      |
| <b>Total ... ..</b>   | <b>19</b> | <b>—</b>  | <b>1</b>    | <b>1</b> |

|                   |                   |                       |
|-------------------|-------------------|-----------------------|
| Major Operations. | Minor Operations. | Percentage of Deaths. |
| 373               | 388               | 2.4                   |

| Number of Operations in | Year | ...  | ... | ... | ... | ... |
|-------------------------|------|------|-----|-----|-----|-----|
| Number of Operations in | 1926 | ...  | ... | ... | ... | 29  |
| "                       | "    | 1927 | ... | ... | ... | 257 |
| "                       | "    | 1928 | ... | ... | ... | 755 |
| "                       | "    | 1929 | ... | ... | ... | 761 |

*Anæsthetics :*

|  |     |     |     |     |            |
|--|-----|-----|-----|-----|------------|
| Spinal ... ..                                | ... | ... | ... | ... | 314        |
| Ethyl chloride ... ..                        | ... | ... | ... | ... | 173        |
| Chloroform ... ..                            | ... | ... | ... | ... | 118        |
| Local ... ..                                 | ... | ... | ... | ... | 36         |
| Colonic ether ... ..                         | ... | ... | ... | ... | 4          |
| <b>Total ... ..</b>                          |     |     |     |     | <b>645</b> |
| Intravenous injections given in wards ... .. | ... | ... | ... | ... | 196        |
| Fractures treated in wards ... ..            | ... | ... | ... | ... | 40         |

LIST OF SURGICAL OPERATIONS PERFORMED ELSEWHERE  
REPORTED BY MEDICAL OFFICERS.

| STATIONS.           | Number.    | Cured.                           | Relieved. | Unrelieved. | Died.    |
|---------------------|------------|----------------------------------|-----------|-------------|----------|
| Bo ... ..           | 36         | 29                               | 2         | ...         | 2        |
| Bonthe ... ..       | 16         | 16                               | ...       | ...         | ...      |
| Daru ... ..         | 46         | 34                               | 3         | 3           | 5        |
| Kabala ... ..       | 6          | 6                                | ...       | ...         | ...      |
| Kaiyima ... ..      | 3          | 3                                | ...       | ...         | ...      |
| Kissy ... ..        | 4          | minor operations were performed. |           |             |          |
| Pujehun ... ..      | 3          | do.                              |           |             |          |
| Makeni ... ..       | 22         | 20                               | 1         | ...         | 1        |
| Sumbuya ... ..      | 4          | 4                                | ...       | ...         | ...      |
| <b>Total ... ..</b> | <b>140</b> | <b>112</b>                       | <b>6</b>  | <b>3</b>    | <b>8</b> |



## B—MATERNITY WARD—CONNAUGHT HOSPITAL.

There is only one ward of the Connaught Hospital in use for Maternity work—consequently ante-natal cases and others have to be admitted to this ward.

During the year 353 patients were admitted; 232 labour cases and 121 complicated pregnancies or puerperiums. Of the labour cases, 90 were primiparæ and 142 multiparæ. These parturients gave birth to 237 children which includes six twin labours, but one child being still-born before admission is not counted.

There were 73 abnormal labour cases—sixteen of which had only a torn perineum, eight required suturing.

The result of the five twin labours, not counting the one sent in with the second twin transverse and arm prolapsed, was as follows:—

Two Vertex and Breech } All born alive except a  
Three Vertex and Vertex } pair of premature twins.

The 232 labour cases consisted of the following peoples; the figures for the preceding two years are given by way of contrast—

|                   | 1927. | 1928. | 1929. |
|-------------------|-------|-------|-------|
| Creoles ... ..    | 131   | 148   | 171   |
| Kroos ... ..      | 35    | 36    | 45    |
| Temenes ... ..    | 5     | 2     | 2     |
| Mendes ... ..     | 4     | 1     | 8     |
| Mandingoes ... .. | 1     | 3     | 2     |
| Fulabs ... ..     | 1     | 0     | 1     |
| Limbahs ... ..    | 0     | 0     | 3     |

It will be seen that although the increase in the total number of labour cases was forty-two, a true increase took place in the number of Mendes and Limbahs, i. e. eleven against one the previous year, the remaining increase was evenly spread out among the other sections of the community. The average stay in hospital of each labour case was 6.5 days.

The following table in which each case is designated under its most salient abnormality, gives details of the 73 abnormal cases.

| Designation.           | Number. | Fate of Child—Remarks etc.  |
|------------------------|---------|---|
| Ante-partum eclampsia  | 1       | Premature birth   |
| Intra partum eclampsia | 3       | (i) Pneumonia, malaria, premature rupture of membranes, forceps extraction, torn perineum.<br>(ii) Forceps extraction<br>(iii) Maternal and foetal death. |
| Breech                 | 6       | One still-birth, two with extended legs (one torn perineum).  |
| Dead-born              | 7       | No remarks.   |
| Still-born             | 3       | One Asphyxia pallida.   |
| Post-partum hæmorrhage | 1       | No remarks.   |
| Forceps                | 11      | Seven flat pelvis (two torn perineum), two premature rupture of membranes, one episiotomy.  |
| Placenta prævia        | 2       | Both lateral—one footling, one premature and still-born.  |
| Twins                  | 5       | Two vertex and footling (one set premature dead), three vertex and vertex—all born alive.   |
| Transverse             | 2       | Both internal podalic version. (one second twin neglected shoulder, with maternal death on third day of puerperium).                                      |
| Prolapse fuins         | 1       | Still-born.   |
| Craniotomy             | 1       | Neglected impacted head—maternal death from exhaustion.   |
| Torn Perineum          | 16      | Eight sutured.  |
| Premature              | 11      | Two dead-born (one foetal ascites), one maternal pneumonia.   |
| Ante-partum Hæmorrhage | 3       | One premature birth died.   |
| Total ...              | 73      |   |

There were six deaths among labour cases—two were sent to hospital in a hopeless condition—one a neglected impacted head, and the other an impacted shoulder. Three deaths were directly due to eclampsia and one to septicæmia on the eleventh day.

The following table gives details of the 121 complicated pregnancies :—

| Cases admitted during pregnancy and the puerperium, but not giving birth in Hospital and Sunday cases admitted in emergency. |     |     |     |       |     |     |
|--|-----|-----|-----|-------|-----|-----|
| Bronchitis   | ... | ... | ... | ...   | ... | 1   |
| False pains and observation  |     | ... | ... | ...   | ... | 45  |
| Abortion—threatened  | ... | ... | ... | ...   | ... | 1   |
| ,, incomplete  | ..  | ... | ... | ...   | ... | 4   |
| ,, complete  | ... | ... | ... | ...   | ... | 5   |
| Oedema legs  | ... | ... | ... | ...   | ... | 2   |
| Albuminuria  | ... | ... | ... | ...   | ... | 10  |
| Pre eclampsia  | ... | ... | ... | ...   | ... | 1   |
| Toxæmia of pregnancy   | ... | ... | ... | ...   | ... | 1   |
| Miscarriage—complete   | ... | ... | ... | ...   | ... | 3   |
| Malaria  | ... | ... | ... | ...   | ... | 8   |
| Puerperal fever  | ..  | ... | ... | ...   | ... | 1   |
| Puerperium   | ... | ... | ... | ...   | ... | 3   |
| Hyperemesis gravidarum   | ... | ... | ... | ...   | ... | 3   |
| Parametritis   | ... | ... | ... | ..    | ... | 1   |
| Ante-partum hæmorrhage   | ... | ... | ... | ...   | ... | 1   |
| Rheumatism   | ... | ... | ... | ...   | ... | 1   |
| Pyrexia  | ... | ... | ... | ...   | ... | 1   |
| Pulmonary tuberculosis   | ... | ... | ... | ...   | ... | 1   |
| Splenomegaly   | ... | ... | ... | ...   | ... | 1   |
| Amœbic dysentery   | ... | ... | ... | ...   | ... | 1   |
| Baby born before admission   |     | ... | ... | ...   | ... | 6   |
| Multiple arthritis   | ... | ... | ... | ...   | ... | 1   |
| Avitaminosis   | ... | ... | ... | ...   | ... | 14  |
| Pseudocyesis   | ... | ... | ... | ...   | ... | 2   |
| Medical cases  | ... | ... | ... | ...   | ... | 3   |
|  |     |     |     | Total | ... | 121 |

There were five deaths among these cases :—One miscarriage ; one puerperal fever ; one pre-eclampsia—pyrexia—cardiac failure ; one toxæmia of pregnancy ; one pneumonia—miscarriage.

Of the 237 children born there were 33 lost as follows :—

| Dead-births (13).               | Still-births (5) | Infant Deaths (16).               |
|---------------------------------|------------------|-----------------------------------|
| Fœtal ascites                   | Asphyxia pallida | Premature twins                   |
| Craniotomy                      | Premature        | Lateral placenta prævia           |
| Ante-partum hæmorrhage          | Prolapsus fuins  | Intra-partum eclampsia            |
| Maternal pyrexia—premature      | Two—no feature   | Two forceps—flat pelvis           |
| Neglected shoulder presentation |                  | One breech                        |
| Eclampsia premature             |                  | Ante-partum hæmorrhage—premature. |
| Premature                       |                  | Transverse                        |
| Six cases—no feature            |                  | Three premature                   |
|                                 |                  | Four—no feature                   |

E. J. WRIGHT,  
Medical Officer-in-Charge.

C.—INTERIM REPORT ON TRYPANOSOMIASIS AT THE CAPE LIGHT  
HOUSE PENINSULA, SIERRA LEONE, FOR THE YEAR 1929.

BY

R. M. GORDON (*Director*),

AND

T. H. DAVY (*Research Assistant*).

FROM THE SIR ALFRED LEWIS JONES, RESEARCH LABORATORY, FREETOWN.

The report which follows is a direct continuation of the work already carried out by Gordon and Aidin in 1928 and published in 1930. It should therefore be read in conjunction with it and all geographical references noted on the map which accompanies that report.

We propose in the present paper to state the results obtained by us in 1929 and the early part of 1930 and briefly to discuss these results as regards their bearing on local problems of trypanosomiasis; it is hoped in the future to continue the investigation and furnish further reports.

As a result of our 1928 survey we came to the conclusion that the following were the points which most urgently required investigation.

- (I) Was the high rate of infection among the flies being maintained.
- (II) What were the trypanosomes responsible for the infection, in the flies.
- (III) From what source were the flies obtaining their infection.
- (IV) To what extent had the area so far cleared resulted in a local or general fly reduction.
- (V) Were the flies breeding in the cleared area and if so at what season of the year.

We propose to show in the paper which follows that the facts obtained from our recent investigations and experiments have enabled us to supply a definite answer to some of these questions and in the remaining instances to formulate a probable hypothesis.

The main portion of our work was carried out from 31st August, to 30th September, 1929 during which period we lived in the rest-house at the Cape Lighthouse Peninsula; we left the Cape at the end of September but the work of feeding and dissecting flies, captured by trained fly-boys, was continued throughout October, while the work of collecting pupa cases during the dry season was carried out in February, 1930.

*I—Proportion of flies infected with trypanosomes.*

All the flies recorded below in Table I. were captured by trained fly-boys on the Cape Peninsula, the majority being taken in or around the village of Aberdeen. Flies thus captured were examined as to their species; all of these proved to be *G. palpalis*. They were then either immediately dissected, or else transferred to clean "feeding bottles" and, after 24—48 hours starvation, fed on experimental animals which had been proved free of trypanosomes infection; after the completion of their feed they were again starved for 24—48 hours and then dissected.

TABLE I

Showing the percentage of infected flies noted by different observers, during various periods, on the Cape Lighthouse Peninsula.

| Authority and Date.           | Period of Year. | No. of Flies Dissected. | Total Flies Found Infected. | Percentage of Flies Found Infected. |
|-------------------------------|-----------------|-------------------------|-----------------------------|-------------------------------------|
| Yorke and Blacklock (1915)... | Dec.—Feb.       | 400                     | 21                          | 5.2                                 |
| Blacklock (1923) ...          | July—Aug.       | 471                     | 28                          | 5.9                                 |
| Gordon and Adin (1928) ...    | July—Aug.       | 209                     | 40                          | 19.1                                |
| Gordon and Davey (1929) ...   | Sept.           | 986                     | 96                          | 9.7                                 |

These figures show a considerable fluctuation in the proportion of the infected flies in different years, but there would appear to be a definite increase in the percentage of trypanosome infection during the more recent years. This increase is probably due to the importation of non-immune domestic animals to the Peninsula, although we obtained no definite evidence in support of this theory. The proportion of 1 in 10 infected flies is a dangerously high one and it is obvious that cattle must be constantly subjected to the danger of infection.

II—Species of trypanosomes occurring in infected flies.

The total number of *G. palpalis* examined by us during the year 1929 was 986 flies of which 8.3 per cent. were infected in the proboscis alone, 1.1 per cent in the gut and proboscis, and 0.3 per cent. in the gut alone. As on the previous occasion no gland infection was recorded. We summarize these figures and those of previous observers in Table II below.

TABLE II

Showing the percentage of infections occurring in the proboscis alone, proboscis and gut, and gut alone, amongst the flies dissected by different observers during various periods on the Cape Lighthouse Peninsula.

| Authority and Date.         | Total Flies Examined. | Percentage of Flies Found Infected (other than Salivary Gland Infections). | Percentage of Flies with Proboscis Infection alone i.e. <i>T. vivax</i> Type. | Percentage of Flies with Proboscis and Gut Infections i.e. <i>T. congolense</i> Type. | Percentage of Flies with Gut Infection Alone i.e. <i>Gambiense-congolense</i> Type. |
|-----------------------------|-----------------------|--|---|---|---|
| Yorke and Blacklock (1915b) | 400                   | 5.25   | 3.73  | 1.0   | 0.5   |
| Blacklock (1922) .. ...     | 471                   | 5.7*   | —   | —   | —   |
| Gordon and Aidin (1928) ... | 209                   | 19.1   | 16.7  | 1.0   | 1.4   |
| Gordon and Davey (1929) ... | 986                   | 9.7  | 8.3   | 1.1   | 0.3   |

\* Gut infections omitted.

It will be seen from Table II that the large increase in the percentage of infected flies, occurring in the years 1928 and, to a lesser extent, 1929, is of the proboscis type, i.e. the main cause of infection and the increase in the percentage of infection in recent years is of the *T. vivax* type, but it appeared to us essential to determine the type of infection with certainty. During 1929, therefore, we extended our investigations and attempted to transmit the different types of infection to sheep and dogs, and also made a careful morphological examination of the trypanosomes found in the infected flies.

(1) *Experiments in the transmission of the fly infections to sheep and dogs.*—Four lambs and three puppies were used in the experiments. In the case of the lambs 10cc of the blood were centrifuged and examined before feeding experiments on the animal were commenced, and in the case of the puppies numerous fresh preparations; all were found to be negative. The animals were examined by means of fresh films for various periods after fly had been allowed to feed on them. 922 flies were fed on the animals and subsequently dissected. The results of the experiments are shown in Table III.

TABLE III

Showing the results of feeding 922 *G. palpalis*, caught on the Cape Lighthouse Peninsula, on lambs and puppies.

| No. | Animal. | From where Obtained. | Total Flies Fed. | No. of Flies with Proboscis Infection. | No. of Flies with Proboscis and Gut Infections. | Result of Feeding Infected Flies.  |
|-----|---------|----------------------|------------------|--|---|--|
| 1   | Lamb    | Tsetse free area     | 40               | 3                                      | 2   | Developed <i>T. vivax</i> and died 25 days later.  |
| 2   | Lamb    | Tsetse free area     | 64               | 3                                      | 2   | Developed <i>T. vivax</i> and died 35 days later.  |
| 3   | Lamb    | Tsetse free area     | 35               | 2                                      | 1   | Developed no infection during 35 days observation then injected with infected blood from lamb No. 1 developed <i>T. vivax</i> 11 days later. |
| 4   | Lamb    | Infected area        | 39               | 3                                      | 0   | Developed no infection for 21 days subsequent to last infective fly feed.  |
| 5   | Puppy   | Tsetse free area     | 136              | 14                                     | 0   | Developed no infection (observed 1 month).   |
| 6   | Puppy   | Tsetse free area     | 374              | 36                                     | 6   | Developed <i>T. congolense</i> infection.  |
| 7   | Puppy   | Tsetse infected area | 234              | 15                                     | 0   | Developed no infection (Observed 1 month).   |

The large number of flies used in the puppy experiments was necessitated by the unexpected scarcity of gut infected flies which happened to occur at the time that these experiments were in progress.

(2.) *Morphological appearances.*—Lloyd and Johnson (1924) state that *T. vivax* infections in the fly may be sharply differentiated from *T. congolense* by the fact that *T. vivax* obtained from the hypopharynx always possesses a free flagellum whereas in *T. congolense* infections of the same site the flagellum is invariably absent. Our examination of ninety-six infected flies is in agreement with their statement i. e. in no case where a proboscis infection was accompanied by a gut infection did we find trypanosomes with a free flagellum in the hypopharynx. The entire absence of salivary gland infections precludes the possibility of the presence of *T. gambiense* or *T. brucei* amongst the flies dissected.

These transmission experiments and the morphological examinations of trypanosomes occurring in infected flies, show clearly that the species of trypanosomes occurring in *G. palpalis* on the Cape Lighthouse Peninsula are *T. vivax* and *T. congolense*. The small proportion of flies infected in the gut alone may possibly be carrying *T. grayi*; but the absence of crocodiles renders this unlikely.

### (3.) *The sources of T. vivax and T. congolense infection.*

In our 1928 report we stated we were in agreement with previous observations that, with the exception of monkeys, squirrels, iguanas, etc, the larger forms of wild life appear comparatively rare on the Peninsula, but deer undoubtedly exist in small numbers, and during 1929 one Harness antelope and its kid were living in the cleared area. By means of a game drive in late 1928 consisting of about two-hundred beaters, an attempt was made to drive wild life from the Peninsula through the narrow isthmus at Man o' War Bay, but owing to the denseness of the bush, the drive was not successful and only one deer was seen. No further attempt was made to examine the blood of wild animals, as their rarity in comparison with the relatively large numbers of sheep, goats and dogs, which as we have shown are capable of being infected by flies, renders it unlikely that they form any important source of infection.

In order to account for the very high proportion of flies infected with *T. vivax*, it is obvious that there must exist on the Peninsula a larger number of animals capable of carrying on the infection in the fly. It would appear that sheep and goats are unlikely to be the cause, as judged by our failure to discover trypanosomes in the peripheral blood of the sixty-seven adult animals examined in 1928 by means of a single "fresh film." This apparent absence of trypanosomes from the peripheral blood of sheep and goats is, however probably accounted for by these animals becoming infected when very young and developing a partial immunity. Such an immunity would reduce the number of trypanosomes appearing in their peripheral blood to so low a figure that a single fresh film preparation would fail to reveal their presence in this or subsequent infections. In one instance, namely lamb number 1 referred to in Table IV, we have observed this phenomenon. This animal developed a *T. vivax* infection as a result of fly being fed on it. The disease rapidly developed so that four or five trypanosomes were easily found in a single coverslip preparation. For some weeks afterwards, however, the concentration of the trypanosomes diminished until even the examination of several "fresh films" failed to reveal their presence, but at this time a coverslip preparation from a centrifuged specimen of 10c.c. of venous blood showed a large number of trypanosomes. It is obvious that such an animal, although apparently negative when examined by means of a few fresh films, would still be capable of infecting a high proportion of the *Glossina* which fed upon it. Pomeroy and Robinson (1929) have observed a similar state of affairs in bullocks infected with *T. vivax* in the Gold Coast.

We are therefore of the opinion that the domestic sheep on the Peninsula are almost certainly responsible for the high proportion of flies infected with *T. vivax*. The small proportion of *T. congolense* infections are almost certainly derived from dogs. Our failure to infect sheep by feeding *T. congolense* infected flies upon them is of interest and suggests that they do not form a reservoir in this district. Goats may be a source of *T. vivax* and *T. congolense* infection, but we carried out no transmission experiments with them.

### (4.) *The results of bush-clearing in reducing the number of flies.*—

In our 1928 report we showed that the local clearing had been associated with a marked reduction of the number of flies occurring throughout the Peninsula but that, contrary to expectation, this reduction was only general and that flies were as numerous on the completely cleared as on the partially cleared and even uncleared areas; we therefore determined to re-estimate the number of flies occurring in the two areas in 1929. But before considering the results of these investigations it is necessary to recapitulate not only the 1928 results but also those of much earlier observers.

The clearing of the Cape Lighthouse Peninsula was not commenced until 1923 from which date till the present time it has been continued when ever labour and funds are available. The main clearing has been from the extreme western portion of the Peninsula towards the village of Aberdeen situated at its eastern extremity, but certain disconnected clearings of intensely infested areas near the village have also been made. The map attached to the 1928 report shows the extent of the main clearing which had then been accomplished. From this it will be seen that the entire western extremity and the western one-third of the isthmus connecting it to the mainland had been cleared. At the time when we started our investigation in September, 1929, the remaining two-thirds of the isthmus had also been completely cleared. It did not appear probable to us that this further small clearing would have produced any great reduction in the number of flies, but our figures which follow, prove that the general reduction has been maintained and also that the completely cleared area is now almost free of flies. This satisfactory state of affairs is further supported, later in this report, by the great decrease in the number of pupæ found not only in the cleared area but also, though to a lesser extent, in the uncleared area.

Our examinations carried out during 1928 and 1929 were undertaken in July, August and September, in order to coincide, so far as possible with the periods of survey of previous workers. A comparison of these surveys is simplified by the fact that, as already recorded, *G. palpalis* is the only species of tsetse occurring in the district. Below in Table IV we show the results obtained by ourselves in 1928 and 1929 and compare these figures with those of Blacklock in 1922 before the clearing had commenced and in 1924 some time after its commencement. We omit the records of Yorke and Blacklock (1915) who stated that flies were common round the Peninsula, but did not express this numerically.

TABLE IV

Showing the number of flies captured per boy per hour, as noted by different observers during various periods, on the Cape Lighthouse Peninsula.

| Authority and Date.  | Uncleared Area.            |                       | Cleared Area.              |                       | Flies per Boy per Hour Captured in the Uncleared Area. | Flies per Boy per hour Captured in the Cleared Area. |
|--|----------------------------|-----------------------|----------------------------|-----------------------|--|--|
|  | Total Time Spent in Hours. | Total Flies Captured. | Total Time Spent in Hours. | Total Flies Captured. |  |  |
| Blacklock (1923) Before clearing commenced ...             | 57                         | 272                   | —                          | —                     | 4.8  |  |
| Blacklock (1924) a few months after clearing commenced ... | 20                         | 83                    | 72                         | 0                     | 4.2  | 0  |
| Gordon and Aidin (1928)                                    | 123                        | 236                   | 30                         | 62                    | 1.9  | 2.1  |
| Gordon and Davey (1929)                                    | 283                        | 745                   | 290                        | 50                    | 2.6  | 0.17   |

This table would appear to prove that the clearing has reduced the number of flies occurring in the cleared area as compared with the uncleared area. We can offer no explanation of the relatively large proportion of flies captured on the cleared to flies captured on the uncleared area during the 1928 investigation. During 1929 we found that far fewer flies were obtainable on the cleared than on the uncleared area, and our actual figures for flies per boy per hour approximate to Blacklock's figures obtained in 1924 immediately after the commencement of clearing.

The Table also shows that since our 1928 investigation no further reduction has taken place in the number of flies occurring in the uncleared area (2.6 flies per boy per hour, as compared with 1.9 in 1928), but in the same period shows a definite reduction of the flies in the cleared area. Probably the great majority of the flies taken in the cleared area in 1928 were "following fly" attracted by natives using the well shaded path over the isthmus joining the cleared area to the main body of the Peninsula. Since then, clearing has been extended to include the whole isthmus and this extension, we believe, explains the discrepancy between our figures for the cleared area in 1928 and in 1929.

It is important to note that, coincident with the reduction in the number of flies in the cleared area, a similar though lesser reduction has occurred throughout the whole Peninsula.

We have demonstrated that the very small clearing so far effected has resulted in a most remarkable reduction in the number of flies in the cleared as compared with the uncleared areas. It remains to be shown if a further extension will reduce the number of flies occurring on this area to a figure of negligible importance. This involves a consideration of the local breeding habits of *G. palpalis* and the effects upon them of bush clearing.

VI.—*Local Breeding Habits of G. Palpalis and the Effects upon Them of Bush-clearing.*

Yorke and Blacklock (1915a) proved clearly that the breeding places of *G. palpalis* on the Cape Lighthouse Peninsula are almost exclusively confined to the shade of the oil-palm (*Elois guineensis*) where pupæ were to be found in very large numbers. Their observations were confined exclusively to the dry season. A subsequent observation by Blacklock (1924) of a small portion of this area, which had been recently cleared, failed to reveal any pupæ, but for the reasons already given, he did not carry out any control observations in the uncleared area. It is important to note that this investigation, in contradistinction to that of 1915, was carried out during the wet season. During 1928 no observations were made on the breeding habits of *G. palpalis* and the remarks that follow refer exclusively to our work in 1929.

On various occasions, during the dry seasons of the past four years, we have confirmed Yorke and Blacklock's observation of 1915 regarding the finding of pupæ under the shade of the oil-palm, although we never succeeded in collecting nearly so many pupæ as these authors recorded. During September, 1929 (i.e., during the rains) we examined for pupæ various likely sites on the cleared area. The method we employed was as follows: A suitable site, usually a young oil-palm which had escaped the notice of the clearing gang and which had the lower petioles intact, was selected, the neighbouring bush cut away and finally the surrounding earth or sand for a distance of two to three feet was removed to a depth of one inch. This earth was placed in a receptacle, labelled, brought back to the laboratory and subsequently examined by scattering it over white enamel trays. All work was carried out under our personal supervision, and we found it essential to make use of natives whom we had carefully trained, in order to avoid any unnecessary trampling or removing too deep a layer of earth.

That a considerable quantity of ground suitable for breeding places, was examined in this thorough manner is shown by the fact that it required about four hours to examine the material collected from a single site and that twelve such sites were examined on the cleared area. Our results completely confirmed Blacklock's observation in 1924; not a single pupa was discovered.

In order to control this result we next proceeded to examine, in an exactly similar manner, ten selected sites on the uncleared area, including several sites which on previous occasions, when examined during the dry season, had yielded pupæ. Contrary to our expectations, we found not a single pupa in nine of the selected sites and only a solitary pupa in the remaining one. Assuring that the sites we selected were suitable ones, and previous experience convinced us that such was the case, only two explanations for the absence of pupæ are possible. Either flies were no longer breeding on the Peninsula, or else they were not larvipositing up to the time that we made our observations. In view of the large number of flies which we have shown still to be present in this area, and that flies on the neighbouring mainland are far less numerous than on the Peninsula, the first explanation appeared to us to be highly improbable. In order to be sure that flies were still breeding on the uncleared area, and also to ascertain to what extent they were breeding on the cleared area, we examined similar sites selected from the same districts of the cleared and uncleared areas during the dry season of 1930 with the following results.

During February, 1930, using an exactly similar technique to that already described, we examined ten likely site on the cleared area. At this time the clearing was so complete that these ten sites represented, in our opinion, all the suitable breeding places. This examination only resulted in the finding of two pupa cases. In distinction to this an exactly similar examination of twenty sites on the remaining uncleared area yielded thirty-one pupa cases. Five of the thirty-three pupa cases contained living pupæ which eventually hatched in the Laboratory.

Thirty-two of the thirty-three pupa cases were found under unstripped young oil-palms, although the earth below shrubs, fallen logs and in rock crevices was also examined. The remaining pupa case was found in the earth inside a hollow baobab tree in which Yorke and Blacklock in 1915 recorded the finding of eighteen puparia.

This restriction of larvipositing to the dry season, on the part of *G. palpalis* in Sierra Leone, is extremely interesting and is further confirmed by certain other observations made during 1928 and 1929 on the proportion of female fly which contained larvæ. During July and August, 1928, and the first half of September 1929, not a single larva was recorded amongst the flies dissected, but from the second half of September to the close of our observations at the end of October, a more or less steady increase in the proportion of female flies containing ova was noted. These results are shown in the following graph.

Graph showing the increase in the proportion of pregnant *G. palpalis* towards the conclusion of the wet season, as noted on the Cape Lighthouse Peninsula in 1929.

It is of interest to record that third instar larvæ were only observed *in utero* during the latter half of October.

In view of these results we are inclined to think that *G. palpalis* does not breed on the Cape Peninsula during the wet season. We have proved that they certainly do not breed during the later months of the wet season, but further observations are required to discover if this inhibition extends throughout the wet season, and also to show for how long during the dry season the larviposition continues. Johnson and Lloyd (1923), discussing the breeding habits of *G. palpalis* in Northern Nigeria, write as follows:—

“Although this fly is prevalent in many places that we have visited, it was really numerous only on the Niger at the end of the rains, on the large rivers of Nassarawa, and on the Benue about Abinsi, consequently searches for pupæ revealed only small numbers. They were collected in twenty positions, in every case in sand, with or without vegetable debris overlying it. These were always very close to water. In fourteen instances there was shrubby undergrowth about the pupæ or closely backing the sand-bank in which they were found; twice (eighteen and one pupæ respectively) they were below sloping tree-trunks; once (thirteen pupæ) focussed around a very small upright dead stump with thin shade twenty feet above; and once (two empty cases) very exposed with the scantiest of high shade above them. In eighteen cases there was high thin evergreen shade and in two instances this was lacking, there being shrub shade only. The positions are thus quite similar to those described for this specie in East Africa. Particularly favourable sites were the high sand-banks thrown up where a small stream joins a larger one. In one such spot 140 pupæ were collected by two searchers in a few minutes.

“During the rains the searches failed to reveal any pupæ beyond an occasional old case, all the normal breeding grounds being then inundated or water-logged. There was also a little evidence obtained by dissections that the rate of breeding is restrained in the height of the rains and at their close. In the late rains (September and October) out of fifty-nine females examined only thirteen (22 per cent.) were pregnant; while in the dry season (December, January, March) and early rains (April) out of 172 females dissected 117 (68 per cent.) contained larvæ.”

It would appear, therefore, that *G. palpalis* larviposits at similar periods of the year in Sierra Leone and Northern Nigeria. The sites of larviposition, however, appear to be different. In Sierra Leone the finding of pupæ is almost exclusively confined to the shade of young oil-palms, sometimes far from water; in Nigeria, on the other hand, the main object of the fly appears to be to deposit its larva near water, and in order to achieve this it will accept almost any available type of shade. Our observations in Sierra Leone clearly invalidate any conclusions regarding the effect of clearing, based on the absence of *G. palpalis* pupæ from suitable breeding sites examined during the wet season. On the other hand, our investigations conducted during the dry season appear to show that far fewer fly are larvipositing in the cleared than in the uncleared areas, and that the clearing has reduced the number of pupæ occurring in both the cleared and uncleared areas at the Cape Lighthouse Peninsula.

#### Summary.

The percentage of flies (10 per cent.) found infected in 1929 is less than in 1928 (19 per cent.), but is still at a much higher level than before clearing was commenced (5 to 6 per cent.).

As in most previous reports no salivary gland infections were recorded amongst the flies dissected. The total number of flies dissected by ourselves and other observers at the Peninsula, up to date is over 2,000 and of these only one, recorded by Blacklock in 1922, was found infected in the glands.

As result of a series of observations involving transmission experiments with sheep and dogs, and the morphological examination of stained preparations made from infected flies, it is proved that this high proportion of infection amongst the flies is due to *T. vivax* and *T. congolense*, the former representing the great majority of infections and being mainly responsible for the marked rise in the infection rate observed by us during the years 1928 and 1929.

Similarly experiments with puppies show that dogs are probably responsible for *T. congolense* type of infection. We failed to infect lambs with this type of trypanosome by feeding infected flies on them, but it is possible that goats are susceptible, to both *T. vivax* and *T. congolense* and it is hoped to carry out similar transmission experiments with these animals at a future date.

We found that lambs, when they became infected with *T. vivax*, showed at first very numerous trypanosomes in their peripheral blood but subsequently, if they did not die at the height of the infection, these trypanosomes became greatly reduced in numbers so that ordinary fresh film preparations failed to reveal them. That they were still, however, present in sufficient numbers to infect tsetse was shown by the examination of the animals' centrifuged blood. We consider that this probably explains the apparent anomaly recorded by us in 1928 when we found that although flies were numerous and a high proportion of them infected with *T. vivax* yet the sheep and goats from which they were almost certainly obtaining this infection failed to reveal trypanosomes when examined by ordinary “fresh film” preparations.



The clearing so far accomplished on the Cape Peninsula has resulted in a marked reduction in the number of flies on the cleared area; thus the average figure for the number of flies captured per boy per hour before clearing (1922 to 1924) was 4.8 while our figures for 1929 show an average of only 0.17 flies on the cleared area. In our 1928 report we showed that the local clearing appeared to have also reduced the number of flies on the remaining uncleared area; thus the number of flies per boy per hour prior to clearing was 4.8, after local clearing the number obtainable on the remaining uncleared area was 1.9. This satisfactory state of affairs has been found still to exist, for during 1929 the flies obtained by trained boys on the uncleared area were only 2.6 per boy per hour.

We record the numbers of pupæ collected on the cleared and uncleared areas and show that *G. palpalis* rarely larviposits in the cleared area, while larviposition on the remaining uncleared, or partially cleared, area has been greatly reduced.

As a result of a series of observations on the number of pupæ found during the wet and dry seasons and on the state of pregnancy of female flies dissected during a part of the period, we are in a position to state that although the selected sites of larviposition appear to be essentially different from those described for Nigeria, yet the breeding habits of *G. palpalis* on the Cape Peninsula, Sierra Leone are similar, that is to say larviposition is almost exclusively confined to the dry season.

#### Recommendations.

Our report proves that a significant number of *G. palpalis* still exists on the Peninsula and that a high proportion of these flies are infected with *T. vivax* and *T. congolense*. It also shows that the clearing so far accomplished is proving highly successful.

In view of these two facts it is obvious that the clearing should be continued and our recent investigation has convinced us that the present system of driving successive traverses through the bush and clearing the undergrowth between each traverse and the already cleared area, is the most successful method of accomplishing this.

#### Acknowledgments.

We desire to acknowledge the assistance of the Medical Department in supplying transport and labour and our indebtedness to Major W. H. Peacock for much personal help and advice.

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## D—REPORT ON INFANT WELFARE.

## (a) CONNAUGHT HOSPITAL AND CAMPBELL STREET.

As in the previous years this work has been carried out in the out-patients department of the Connaught Hospital and at 99, Campbell Street in the basement of a private house rented for the purpose by Government.

Nurse Macfoy has been in charge of these centres throughout the year assisted by a pupil Health Visitor.

The total number of Infant Welfare attendances during the year was 7,101 and that of new individuals 578.

The total attendances exceeded the figures for last year by 521.

The following table shows the number of monthly attendances at each Clinic.

TABLE I  
INFANT WELFARE CLINIC.

| CONNAUGHT HOSPITAL. |            |            |        | CAMPBELL STREET. |            |            |        |
|---------------------|------------|------------|--------|------------------|------------|------------|--------|
| Date.               | Old Cases. | New Cases. | Total. | Date.            | Old Cases. | New Cases. | Total. |
| January ...         | 145        | 19         | 164    | January ...      | 265        | 39         | 304    |
| February ...        | 157        | 13         | 170    | February ...     | 276        | 22         | 298    |
| March ...           | 176        | 18         | 194    | March ...        | 271        | 22         | 293    |
| April ...           | 152        | 16         | 168    | April ...        | 291        | 39         | 330    |
| May ...             | 156        | 13         | 169    | May ...          | 333        | 43         | 276    |
| June ...            | 193        | 30         | 223    | June ...         | 328        | 15         | 343    |
| July ...            | 118        | 23         | 141    | July ...         | 465        | 35         | 500    |
| August ...          | 208        | 30         | 238    | August ...       | 338        | 32         | 370    |
| September ...       | 248        | 19         | 267    | September ...    | 486        | 33         | 519    |
| October ...         | 237        | 18         | 255    | October ...      | 565        | 31         | 596    |
| November ...        | 305        | 14         | 319    | November ...     | 457        | 18         | 475    |
| December ...        | 160        | 23         | 183    | December ...     | 193        | 13         | 206    |
|                     | 2,255      | 236        | 2,491  |                  | 4,268      | 342        | 4,610  |

Total new cases for the year 578. Total number of attendances for the year 7,101.

The percentage of nationalities of new cases attending the Clinics in 1929 are given below with those of the previous two years.

|      | Creoles.     | Aborigines.  | Kroos.       | Various.    |
|------|--------------|--------------|--------------|-------------|
| 1927 | 60 per cent. | 27 per cent. | 12 per cent. | 1 per cent. |
| 1928 | 52 per cent. | 36 per cent. | 11 per cent. | 1 per cent. |
| 1929 | 58 per cent. | 26 per cent. | 16 per cent. | —           |

These figures show that the Aborigines have not maintained their promising attendance of the previous year. I am confident that this is entirely due to their not having been rounded up as much as before. The great increase in the amount of ante-natal work, as was feared last year, is quite likely an explanation of the Health Visitor not having the time to visit these people as hitherto. It should be noted that the attendances at the Clinics are less likely to be affected by a lack of visiting among the creole element than among the Aborigines, who being illiterate have but the spoken word to remind them about attending these Clinics.

The following table is a record of the visits paid by the District Nurse month by month during the year.

TABLE II.  
INFANT WELFARE—DISTRICT RETURNS FOR 1929.

| Date.            | Newly Born. | New Cases. | Repeated Visits. |
|------------------|-------------|------------|------------------|
| January ... ..   | 45          | 36         | 217              |
| February ... ..  | 27          | 44         | 278              |
| March ... ..     | 40          | 50         | 309              |
| April ... ..     | 50          | 48         | 210              |
| May ... ..       | 42          | 35         | 254              |
| June ... ..      | 22          | 38         | 165              |
| July ... ..      | 19          | 29         | 252              |
| August ... ..    | 37          | 50         | 288              |
| September ... .. | 38          | 46         | 256              |
| October ... ..   | 48          | 30         | 312              |
| November ... ..  | 32          | 55         | 258              |
| December ... ..  | 44          | 49         | 299              |
|                  | 444         | 510        | 3,098            |

Compared with 1928 there is an increase of repeated visits 3,098 against 2,506 last year. The number of new cases visited shows a decrease of 90, but the number of newly born is about the same.

It is not possible to give an analysis of the disease treated, on account of the variety and sometimes symptomatic nature of the ailments. As usual fever, chiefly malaria, tops the list. Bronchitis and other chest complaints and thrush, eczema, constipation and rickets are all frequently seen.

There were registered in Freetown during the year 968 births and the following Table III gives an analysis of them month by month and for the different elements of the population.

TABLE III.  
ANALYSIS OF BIRTHS—*i.e.* BORN AND REGISTERED  
IN FREETOWN ONLY.

JANUARY TO DECEMBER, 1929.

| Date.            | Creoles. | Aborigines. | Kroos. | Various. | Total. |
|------------------|----------|-------------|--------|----------|--------|
| January ... ..   | 58       | 12          | 8      | 2        | 80     |
| February ... ..  | 37       | 18          | 9      | —        | 64     |
| March ... ..     | 62       | 26          | 3      | 5        | 96     |
| April ... ..     | 55       | 32          | 11     | 5        | 103    |
| May ... ..       | 43       | 24          | 13     | 3        | 83     |
| June ... ..      | 47       | 25          | 5      | 2        | 79     |
| July ... ..      | 35       | 21          | 8      | 1        | 65     |
| August ... ..    | 31       | 19          | 6      | 2        | 58     |
| September ... .. | 38       | 20          | 12     | 7        | 77     |
| October ... ..   | 51       | 21          | 17     | 1        | 90     |
| November ... ..  | 51       | 15          | 10     | —        | 76     |
| December ... ..  | 50       | 24          | 21     | 2        | 97     |
|                  | 558      | 257         | 123    | 30       | 968    |

The infant mortality rate for the year is 337 which is better than last year which was 364.

The infant mortality rate has again been worked out for the three sections of the Community and is given below with the figures for the two preceding years.

|             | Creoles. | Aborigines. | Kroos. | Total. |
|-------------|----------|-------------|--------|--------|
| 1927 ... .. | 204      | 708         | 447    | 357    |
| 1928 ... .. | 247      | 632         | 339    | 364    |
| 1229 ... .. | 242      | 549         | 423    | 337    |

The information which can be gathered from this table is on the whole satisfactory. doubt very much whether there will ever be a marked further reduction in these figures until the people are better fed. All the information so far gathered goes to show that under feeding and badly balanced diets are the fundamental causes of the high infant death-rate—more than half of which has been traced to deaths during the first month of life and which are undoubtedly mostly due to congenital debility.

Table IV attached gives an analysis of deaths under twelve months and from one to three years, month by month, for each of the three above-mentioned communities registered in Freetown from January to December, 1929.

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TABLE IV

ANALYSIS OF DEATHS UNDER TWELVE MONTHS AND FROM ONE TO THREE YEARS, MONTH BY MONTH, FOR EACH OF THE THREE ABOVE-MENTIONED COMMUNITIES REGISTERED IN FREETOWN FROM JANUARY TO DECEMBER, 1929.

| Month     | Deaths under 12 months |                            |                            | Deaths from 1 to 3 years |                            |                            |
|-----------|------------------------|----------------------------|----------------------------|--------------------------|----------------------------|----------------------------|
|           | Number                 | Rate per 1,000 live births | Percentage of total deaths | Number                   | Rate per 1,000 live births | Percentage of total deaths |
| January   | 15                     | 12.5                       | 15.0                       | 10                       | 8.3                        | 10.0                       |
| February  | 12                     | 10.0                       | 12.0                       | 8                        | 6.7                        | 8.0                        |
| March     | 10                     | 8.3                        | 10.0                       | 7                        | 5.8                        | 7.0                        |
| April     | 8                      | 6.7                        | 8.0                        | 5                        | 4.2                        | 5.0                        |
| May       | 7                      | 5.8                        | 7.0                        | 4                        | 3.3                        | 4.0                        |
| June      | 6                      | 5.0                        | 6.0                        | 3                        | 2.5                        | 3.0                        |
| July      | 5                      | 4.2                        | 5.0                        | 2                        | 1.7                        | 2.0                        |
| August    | 4                      | 3.3                        | 4.0                        | 1                        | 0.8                        | 1.0                        |
| September | 3                      | 2.5                        | 3.0                        | 1                        | 0.8                        | 1.0                        |
| October   | 2                      | 1.7                        | 2.0                        | 1                        | 0.8                        | 1.0                        |
| November  | 1                      | 0.8                        | 1.0                        | 1                        | 0.8                        | 1.0                        |
| December  | 1                      | 0.8                        | 1.0                        | 1                        | 0.8                        | 1.0                        |
| Total     | 100                    | 8.3                        | 100.0                      | 60                       | 5.0                        | 60.0                       |

TABLE IV.  
ANALYSIS OF DEATHS REGISTERED IN FREETOWN ONLY—JANUARY—DECEMBER, 1929.

| MONTH.             | CREOLES.         |                           | ABORIGINES.      |                           | KROOS.           |                           | VARIOUS.   |                           | TOTALS. |
|--------------------|------------------|---------------------------|------------------|---------------------------|------------------|---------------------------|--|---------------------------|---------|
|                    | Under 12 months. | 1 year and up to 3 years. | Under 12 months. | 1 year and up to 3 years. | Under 12 months. | 1 year and up to 3 years. | Under 12 months.                                 | 1 year and up to 3 years. |         |
|                    | January ...      | 13                        | —                | 13                        | 8                | 2                         | 1  | —                         |         |
| February ...       | 12               | 2                         | 10               | 3                         | 6                | —                         | —  | —                         | 33      |
| March ...          | 4                | 3                         | 9                | 3                         | 1                | —                         | —  | —                         | 20      |
| April ...          | 8                | 1                         | 9                | 2                         | 3                | —                         | —  | —                         | 23      |
| May ...            | 6                | 5                         | 9                | 3                         | 3                | —                         | —  | —                         | 26      |
| June ...           | 15               | 2                         | 12               | 2                         | 9                | 1                         | —  | —                         | 41      |
| July ...           | 14               | 9                         | 16               | 4                         | 5                | 1                         | —  | —                         | 49      |
| August ...         | 12               | 4                         | 14               | 4                         | 3                | —                         | —  | —                         | 37      |
| September ...      | 15               | 2                         | 13               | 6                         | 4                | 2                         | —  | —                         | 42      |
| October ...        | 18               | 2                         | 6                | 1                         | 8                | 1                         | —  | —                         | 46      |
| November ...       | 9                | 5                         | 11               | 2                         | 6                | 1                         | 1  | —                         | 35      |
| December ...       | 9                | 4                         | 9                | 2                         | 2                | —                         | —  | —                         | 26      |
| Total ...          | 135              | 39                        | 141              | 40                        | 52               | 7                         | 1  | —                         | 415     |
| Mortality rate ... | 242.1            | 69.8                      | 548.6            | 155.6                     | 422.7            | 56.9                      | Total mortality rate under 12 months old = 336.7 | —                         | —       |

The annual Mother Craft and Baby Competition was held in the Victoria Park in December and prizes were given to the most deserving children in the various classes.

## E—ANTE-NATAL CLINIC—CAMPBELL STREET CENTRE.

This Clinic started its third year on the 5th of April, 1929. The usual weekly session was held on Tuesday mornings. The attendances were very satisfactory and even an improvement on last year as will be seen from the accompanying table, which gives a record of the attendances month by month during the year:—

TABLE I.  
ANTE-NATAL CLINIC, 1929.

| Date.            | Old Cases. | New Cases | Total. |
|------------------|------------|-----------|--------|
| January ... ..   | 153        | 42        | 195    |
| February ... ..  | 152        | 28        | 180    |
| March ... ..     | 135        | 29        | 164    |
| April ... ..     | 179        | 35        | 214    |
| May ... ..       | 171        | 37        | 208    |
| June ... ..      | 123        | 30        | 153    |
| July ... ..      | 185        | 33        | 218    |
| August ... ..    | 158        | 29        | 187    |
| September ... .. | 167        | 40        | 207    |
| October ... ..   | 233        | 49        | 282    |
| November ... ..  | 144        | 32        | 176    |
| December ... ..  | 160        | 18        | 178    |
|                  | 1,960      | 402       | 2,362  |

There were 402 individuals on the register and of this number 350 were pregnant. It will be seen that there were fifty-two spurious cases.

It should be noted that 1,093 births were registered in Freetown for the year, so this Clinic saw a very satisfactory proportion of pregnant women in the town.

Of the 350 ante-natal cases, 252 were multigravidæ and ninety-eight primiparæ.

The 252 multigravidæ had given birth before attending the Clinic to 591 children, 358 being alive at the date of their first attendance and 233 dead.

There were previous twenty-four abortions and five still-births among them—I place no reliance on these figures as the majority of the patients are naturally reluctant to give information about their still-births, any miscarriage born alive is liable to be classed as a live-birth, and when it dies to be called an infantile death.

So far as we are able to trace the cases we find that eighty-six ante-natal cases delivered in Hospital, and 105 at home. The deficiency disease (A and B avitaminosis) described in 1927 Annual Report, was seen frequently throughout the year although many advanced cases were not seen. As usual they were treated with Cod Liver Oil and Marmite. A few were given Radiostoleum.

This condition is so readily cured by dietetic treatment that patients who previously refused the oil were pleased to ask for it. As usual the pelvis was measured in every case and in primiparæ or those cases with a doubtful obstetric history an internal examination was made.

The mouths of the prospective mothers were inspected as a routine and the result of this survey is given in the appended Table II.

TABLE II.  
ROUTINE EXAMINATION OF TEETH IN ANTE-NATAL CLINIC.

| Number of Teeth Decayed. | Number of Patients. | Total Number of Decayed Teeth. |
|--------------------------|---------------------|--------------------------------|
| 0                        | 271                 | Nil                            |
| 1                        | 10                  | 10                             |
| 2                        | 19                  | 38                             |
| 3                        | 5                   | 15                             |
| 4                        | 9                   | 36                             |
| 6                        | 7                   | 42                             |
| 7                        | 1                   | 7                              |
| 8                        | 3                   | 24                             |
| 10                       | 1                   | 10                             |
| 14                       | 1                   | 14                             |
|                          | 327                 | 196                            |

Average .59 carious teeth per person.

F—SCHOOL MEDICAL INSPECTION, 1929.

The amalgamation of schools has rendered medical inspection of the school-children in Freetown much easier. From January to October this year it has been possible to examine all children up to twelve in Government controlled schools in Freetown and in addition children in a number of schools in the Southern and Central Provinces and in the villages in the Colony Districts.

TABLE I.

*Schools Examined with Numbers.*

|                                     |     |     |           |              |
|-------------------------------------|-----|-----|-----------|--------------|
| <i>Freetown</i> —Holy Trinity ...   | ... | ... | ...       | 198          |
| St. Joseph's Convent ...            | ... | ... | ...       | 264          |
| St. Anthony's ...                   | ... | ... | ...       | 203          |
| Brookfields Infants ...             | ... | ... | ...       | 37           |
| Christ Church ...                   | ... | ... | ...       | 64           |
| Tabernacle ...                      | ... | ... | ...       | 79           |
| Ebenezer ...                        | ... | ... | ...       | 89           |
| Bathurst St. ...                    | ... | ... | ...       | 113          |
| Samaria ...                         | ... | ... | ...       | 61           |
| Govt. Model ...                     | ... | ... | ...       | 177          |
| Bethel Infants ...                  | ... | ... | ...       | 63           |
| Mad. Sulaimania ...                 | ... | ... | ...       | 62           |
| Mad. Islamia ...                    | ... | ... | ...       | 64           |
| Mad. Amaria ...                     | ... | ... | ...       | 72           |
| St. Edwards Boys' ...               | ... | ... | ...       | 185          |
| Cline Town Infants ...              | ... | ... | ...       | 34           |
| Buxton Amalgamated ...              | ... | ... | ...       | 192          |
| Cathedral ...                       | ... | ... | ...       | 207          |
| <i>Rural</i> —Govt. Wilberforce ... | ... | ... | ...       | 107          |
| Kissy Amalgamated ...               | ... | ... | ...       | 136          |
| York Amalgamated ...                | ... | ... | ...       | 52           |
| Kent Amalgamated ...                | ... | ... | ...       | 25           |
| Russel Amalgamated ...              | ... | ... | ...       | 45           |
| Tombo Infants ...                   | ... | ... | ...       | 24           |
| <i>Protectorate</i> —Mongheri ...   | ... | ... | ...       | 15           |
| Tikonko ...                         | ... | ... | ...       | 28           |
| Koribundo ...                       | ... | ... | ...       | 12           |
| Kpeyama ...                         | ... | ... | ...       | 14           |
| Sumbuya ...                         | ... | ... | ...       | 45           |
| Jimmi ...                           | ... | ... | ...       | 24           |
| Bandajuma ...                       | ... | ... | ...       | 19           |
| Futa ...                            | ... | ... | ...       | 26           |
| Pujehun ...                         | ... | ... | ...       | 25           |
| Gobaru ...                          | ... | ... | ...       | 20           |
| Gbangema ...                        | ... | ... | ...       | 19           |
|                                     |     |     |           |              |
|                                     |     |     | Total ... | <u>2,800</u> |

A comparison of records kept since 1925—the year when school inspection first started—shows a gradual improvement in the health and in the sanitary environment of the children.

Grossly enlarged spleens are now rare although attacks of malarial fever are still very common. The prevalence of scabies, impetigo, and jigger flea infestation, is diminished and there is a striking reduction in the number of ulcers on legs and feet; one practically never sees the large so-called “tropical ulcer” which used to be so common on the legs of school children here.

These improvements, I think, are due partly to medical treatment following school inspection, but more especially to the general enlightenment of the parents with regard to the necessity for, and early treatment of, such conditions.

TABLE II.

*Height and Weight Records, England and Freetown.*

|   | 1925      | 1929.     |
|---|-----------|-----------|
| Average Height of Freetown children aged 4—12 | 118·7 cm. | 118·1 cm. |
| Average Weight of Freetown children aged 4—12 | 21·0 kgm. | 21·5 kgm. |

*Average Height and Weight of Freetown and English children.*

| Male.           | Freetown<br>Height. | English<br>Height. |
|-----------------|---------------------|--------------------|
| 4—6             | 103·85 cm.          | 100·6 cm.          |
| 6—8             | 113·28 „            | 111·3 „            |
| 8—10            | 123·32 „            | 122·0 „            |
| 10—12           | 133·69 „            | 134·4 „            |
|                 | Weight.             | Weight.            |
| 4—6             | 16·3 kgm.           | 16·8 kgm.          |
| 6—8             | 19·2 „              | 20·2 „             |
| 8—10            | 22·2 „              | 23·9 „             |
| 10—12           | 27·8 „              | 30·1 „             |
| Female.         | Height.             | Height.            |
| 4—6             | 100·65 cm.          | 100·3 cm.          |
| 6—8             | 113·03 „            | 110·7 „            |
| 8—10            | 128·82 „            | 120·6 „            |
| 10—12           | 134·15 „            | 134·0 „            |
|                 | Weight.             | Weight.            |
| 4—6             | 15·4 kgm.           | 16·4 kgm.          |
| 6—8             | 18·4 „              | 19·5 „             |
| 8—10            | 23·4 „              | 23·4 „             |
| 10—12           | 28·3 „              | 29·9 „             |
| Average Height. | English.            | Freetown.          |
|                 | 116·8 cm.           | 118·1 cm.          |
| Weight.         | 22·2 kgm.           | 21·5 kgm.          |

A comparison of height and weight records for 1929 with 1925 shows a very slight average gain in weight although the weight is still below that of children of similar age in England; the average height is a little above that of English children. This latter point was also seen in 1925—whether it is due to errors in estimate of age of the children or due to earlier growth in tropical countries is difficult to say.

Owing to the registration of births now in force it is possible to get more accurate information on the age of new entrants to schools in Freetown. These new entrants should also show the benefit of the Infant Welfare work which started about the time of their birth; but I doubt if much improvement in the physique of the older children can take place till active steps are taken to extend knowledge of the necessity for and to cause the production of a marketable cheap supply of vegetables, and animal food.

More attention is now being given to physical exercises and games both in the infant and standard schools; already I think there is an improvement in the development of the children and they present a less listless appearance and more quickness of movement.

A few of the children examined showed extreme malnutrition and on investigation some of these children were found to be adopted children, either parentless children adopted by relatives or protectorate native children adopted to assist in housework in return for education. Further investigation showed that a very great number of the Freetown school children are not living in their parents home, and that this adoption of protectorate children by Freetown people is a very prevalent custom.



I have satisfied myself that this custom is not wholly to be condemned. In many cases the children are happy and well fed, and on questioning them told me that they much prefer to be in their adopted homes in Freetown. There are, however, homes in which the treatment is not so good, and it can be seen that such an arrangement is liable to much abuse.

The Ordinance of 1926 to prevent cruelty to children is of use in punishing guardians guilty of cruelty, but the detection of such cruelty, more especially when the guardians do not send the children to school, is difficult. I think all adopted children in Freetown should be registered and arrangements for their periodical inspection should be made.

*Sanitary Conditions of the Schools.*—Year by year a gradual improvement in the school buildings and furniture is apparent. Playground accommodation however, is still often inadequate and in some cases absent; while in spite of repeated reports on the defective nature of the latrines there are still schools with insanitary latrines and a few schools with no latrine accommodation at all. I feel that this is a matter which is not receiving sufficient attention from the Education Authorities. Unless special attention is given to this by the school inspectors and supervising teachers the importance of this matter will not be realized by the school managers and teachers. Mr. Campbell's death this year is a great loss, as he was so keenly interested and enthusiastic in promoting more sanitary school conditions. I would suggest that grants should be withheld from schools where the sanitary conditions are such as actually to produce illness in the children.

*Teaching of Hygiene, Child Welfare and Domestic Science.*—Hygiene is now a compulsory subject in all schools; in many schools it is being excellently taught and an attempt is made to bring it into practice in the school life—an important point which is sadly neglected in some of the schools.

In January, 1930, the much needed clinic for the treatment of school children will be opened, to which children recommended for treatment by the School Medical Officer and those noticed by teachers to be suffering from some defect of health are to be sent and where medical treatment will be given.

Another innovation this year is the keeping of a Health Record Form giving all details of health, weight, height, illnesses, etc. This record is revised from time to time and so a check kept on any developing ill-health which might otherwise be overlooked.

The secondary girls schools have been making rapid strides in education, in Child Welfare and Domestic Science. At St. Joseph's Convent these subjects are given particular attention and the teaching is excellent. The diet also of the girls at this school has been carefully thought out and on re-examining the boarders this year I found not only that their physical condition was very good but that their gain in weight compared favourably with girls in better class schools in England.

*School Medical Inspection in Colony Villages.*—In these villages the children while showing a rather better physique than Freetown children had a high spleen-rate and also all of the children were either suffering from a generalized yaws eruption or showed evidence of previous infection, most commonly on the soles of the feet. Treatment was given to these children but further treatment is required.

*School Medical Inspection in the Protectorate.*—Owing to the sparse population scattered throughout the Protectorate, schools there consist largely of boarders and as a result of this a rather serious situation has arisen.

In some mission schools a vague arrangement has been made by the mission authorities with the local chiefs that the chief should supply food for the children and in return the mission authorities will open and staff a school in the town. At some such schools the children were found to be almost starving and at others the managers had been forced to send the children home as no food could be obtained for them. The education supplied at these schools was almost entirely literary though in some a small school garden was kept and the school compound was generally in a well kept condition. There was seldom any latrine however, and water was either obtained from an uncovered shallow well or from a river.

It would appear necessary that the Government, through the Medical and Sanitary Authorities, should have more power in supervising the conditions of all schools in the Protectorate.

M. G. BLACKLOCK.

## G—VENEREAL DISEASES CLINIC.

| Name of Disease.             | New Cases. |     |     |        | Subsequent Attendances. |     |     |        |
|------------------------------|------------|-----|-----|--------|-------------------------|-----|-----|--------|
|                              | G. O.      | M.  | F.  | Total. | G. O.                   | M.  | F.  | Total. |
| Gonorrhoea ...               | 39         | 102 | 7   | 148    | 65                      | 250 | 11  | 326    |
| Gonorrhoeal epididymitis ... | ...        | 1   | ... | 1      | ...                     | 3   | ... | 3      |
| Gonorrhoeal orchitis ...     | 1          | 4   | ... | 5      | 2                       | 3   | ... | 5      |
| Gonorrhoeal rheumatism ...   | 6          | 12  | 5   | 23     | 17                      | 29  | 10  | 56     |
| Gonococcal ulcer ...         | 1          | ... | ... | 1      | 4                       | ... | ... | 4      |
| Urethritis ...               | ...        | 7   | ... | 7      | ...                     | 16  | ... | 16     |
| Urethral stricture ...       | 1          | 4   | ... | 5      | ...                     | 11  | ... | 11     |
| Spasmodic stricture ...      | 1          | ... | ... | 1      | 6                       | ... | ... | 6      |
| Urinary fistula ...          | ...        | 1   | ... | 1      | ...                     | 5   | ... | 5      |
| Primary syphilis ...         | 2          | 8   | ... | 10     | 6                       | 18  | 1   | 25     |
| Secondary syphilis ...       | 2          | 6   | ... | 8      | 6                       | 18  | ... | 24     |
| Tertiary syphilis ...        | 6          | 18  | 9   | 33     | 13                      | 39  | 29  | 81     |
| Vulvitis ...                 | ...        | ... | 2   | 2      | ...                     | ... | 9   | 9      |
| Vaginitis ...                | ...        | ... | 3   | 3      | ...                     | ... | 6   | 6      |
| Vaginal ulcer ...            | ...        | ... | 1   | 1      | ...                     | ... | 3   | 3      |
| Periostitis ...              | 1          | 2   | ... | 3      | 4                       | 3   | ... | 7      |
| Osteitis ...                 | 2          | 4   | 1   | 7      | 11                      | 11  | 1   | 23     |
| Ganglion ...                 | ...        | 5   | ... | 5      | ...                     | 15  | 3   | 18     |
| Phagademic ulcer penis ...   | ...        | 2   | ... | 2      | ...                     | 11  | ... | 11     |
| Penile abrasions ...         | 1          | ... | ... | 1      | ...                     | ... | ... | ...    |
| Oedema penis ...             | ...        | 1   | ... | 1      | ...                     | 10  | ... | 10     |
| Cystitis ...                 | ...        | 2   | 1   | 3      | ...                     | 4   | ... | 4      |
| Orchitis ...                 | 8          | 4   | ... | 12     | 13                      | 10  | ... | 23     |
| Inguinal aderritis ...       | 1          | 2   | ... | 3      | ...                     | 6   | ... | 6      |
| Tropical ulcers ...          | ...        | 11  | 5   | 16     | ...                     | 32  | 8   | 40     |
| Leprosy ...                  | ...        | 1   | ... | 1      | ...                     | 4   | ... | 4      |
| Yaws ...                     | 7          | 89  | 83  | 179    | 12                      | 124 | 164 | 300    |
| Chancres ...                 | 15         | 17  | ... | 32     | 51                      | 23  | ... | 74     |
| Multiple penile chancres ... | ...        | 2   | ... | 2      | ...                     | 4   | ... | 4      |
| Eczema ...                   | ...        | 1   | ... | 1      | ...                     | 6   | ... | 6      |
| Elephantiasis foot ...       | ...        | 1   | ... | 1      | ...                     | 6   | ... | 6      |
| Iritis ...                   | 2          | ... | ... | 2      | 5                       | ... | ... | 5      |
| Synovitis ...                | 1          | ... | ... | 1      | 6                       | ... | ... | 6      |
| Goundou ...                  | ...        | ... | 1   | 1      | ...                     | ... | 1   | 1      |
| Tinea ...                    | ...        | 1   | ... | 1      | ...                     | ... | ... | ...    |
| Trypanosomiasis ...          | ...        | 1   | ... | 1      | ...                     | 10  | ... | 10     |
| Rhinitis ...                 | 1          | ... | ... | 1      | 5                       | ... | ... | 5      |
| Chronic pleurisy ...         | 1          | ... | ... | 1      | 1                       | ... | ... | 1      |
| Cephalgia ...                | 1          | ... | ... | 1      | 1                       | ... | ... | 1      |
| Hemicrania ...               | 1          | ... | ... | 1      | 2                       | ... | ... | 2      |
| Undiagnosed ...              | 22         | 33  | 13  | 68     | 15                      | 38  | 9   | 62     |
| Grand Total ...              | 123        | 342 | 131 | 596    | 245                     | 709 | 255 | 1,209  |

This clinic was started on 8th June, 1925, since when it has been held continuously. There are three sessions a week. Monday afternoon is devoted to females, Tuesdays and Fridays to males.

A great number of cases appear at the clinic with diseases not of venereal origin. As all these cases have to be recorded in the Department Register they appear in the returns, thus the list includes tinea, pleurisy, eczema, elephantiasis foot, trypanosomiasis, etc; this last case was treated at the clinic with tryparsamide for convenience. No attempt has been made to draw all the diagnosis into line they have merely been sorted and listed as originally diagnosed and registered.

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*Medical Officer.*

## H—SCHICK-TESTING IN SIERRA LEONE.

BY

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Before recording the results obtained in Schick-testing of 570 Creoles and natives in Freetown, Sierra Leone, it is appropriate to analyse the results of others who have done similar work in parts of the world where diphtheria has attracted little attention. In Table I much of this information has been collected, but, as far as the present author is aware no Schick-testing has hitherto been carried out in West Africa, and clinical diphtheria has but infrequently been reported. The following figures are available as to the number of cases of diphtheria occurring in Nairobi.

TABLE II.

|             | Cases. | European. | African. | Asiatics. |
|-------------|--------|-----------|----------|-----------|
| 1924 ... .. | 11     | 6         | 3        | 2         |
| 1925 ... .. | 2      | 2         | 0        | 0         |
| 1926 ... .. | 5      | 0         | 1        | 4         |
| 1927 ... .. | 4      | 3         | 1        | 0         |
| 1928 ... .. | 14     | 12        | 2        | 0         |
| 1229 ... .. | 14     | 12        | 2        | 0         |

In the opinion of Dr. Gilks, the Director of Medical and Sanitary Services, there is little doubt that diphtheria is endemic in the country, but cases either do not present themselves for treatment or are missed. Recent cases, however, have been typical and some severe.

In the Federated Malay States, up to 1916, diphtheria was scarcely reported. On the supposition that non-exposure to infection was synonymous with a high degree of susceptibility, it is strange that such sporadic cases did not form the starting point of an epidemic. Since 1916, cases have been more common, and as in other places, the origin of a case was undoubtedly a carrier, and examination of throat-swabs of children in schools and of others among the general poorer population revealed the fact that a considerable number were harbouring diphtheria bacilli, and the bacilli might be very numerous and persist for long periods in the throats of patients clinically recovered. Again, the further fact that the proportion of cases was much greater in the young points to an acquired immunity, since in an unprotected community all ages would suffer. Of eighty-eight cases examined, sixty-five were under ten years old.

In view of the rarity of cases of faucial diphtheria, the question arose as to whether this immunity might have resulted from infection of some other part of the body. Veldt sore of South Africa is associated with the Klebs-Loeffler organism, and certain ulcerative conditions in the Sudan show closely allied bacilli.

Several patients undergoing treatment for ulcers in the district hospital at Kuala Lumpur were examined and *C. diphtheria* or bacilli resembling them culturally and morphologically were isolated from twenty-six out of 115 cases. The strains isolated, however, were non-toxigenic to guinea pig, though it has been demonstrated that even non-virulent strains will give rise to weak antitoxin.

This investigation is worthy of being repeated in other tropical countries. "Ulcers constitute a very large proportion of the cases treated both as in-patients and out-patients, and at present they form a large and ill-defined group; some are probably fundamentally dietetic, others traumatic with secondary infections others specific (under this title being included syphilitic, tuberculous, leishmanial, framboesial etc.) and bacterial. A wide application of the Schick test and examination of the ulcerous conditions might serve the dual purpose of determining the cause of the relative immunity of native races to diphtheria of the usual types, and at the same time relegating some of the ulcerative conditions to their proper categories."

An interesting analogy of a throat infection occurring elsewhere as a skin infection may be mentioned in passing. In the mountains between Assam and Burma, the natives are affected by peculiarly chronic ulcers, occurring chiefly on the legs and arising it is believed, from trauma. Well established lesions invariably show infection with the organisms of Vincent's angina, namely the fusiform bacillus and spirochaetes. Throat lesions of this character are unknown in the locality and the possibility arises as to whether both organisms may not have originally predominated as skin infectors in warm climates, and have sought, in an effort of adaptation to more temperate zones, the warmer environs of the throat. Site selection of other infective agencies for different countries is not unknown, and another remarkable example is Leishmaniasis which occurs as a cutaneous malady around the Mediterranean basin and as a visceral invader in India and China.

The results obtained by the present author may now be recorded. The tests were done in April, 1930; the undiluted toxin was mixed with 10 c.c. of the buffer saline solution, and the results obtained on injection of each batch appeared to be consistent. Messrs. Burroughs, Wellcome & Co.'s products were used. They were shipped from England in the Vegetable Cool Room of a mail boat, arriving after ten days passage. On arrival they were kept in the hospital ice chest until used, and the last batch remained in stock for ten days.

Table III shows the type of cases tested. The rural school was situated in a village ten miles from Freetown. The urban school was in the heart of the city. The rural school gave 15.6 per cent. positive results, while the urban school gave 16.2 per cent. positive. Of the children tested in the Infant Welfare Clinic, *i.e.* under three years of age, 71.5 per cent. were positive. Of all the children examined under the age of fifteen years, 35.2 per cent. were positive. There appears to be little difference in infection pressure rate between the rural and urban areas.

The 48 prisoners examined can be divided into two groups, of which the first, numbering 19 had been in prison over eighteen months and in some cases for many years; of this group 10.5 per cent. were Schick positive; the second group had been in prison less than eighteen months, the majority being of only one or two months' duration, and 17.2 per cent. of these were Schick positive. This seems to indicate that infection pressure in the prison is higher than in the community at large. Of 85 lunatics examined, 16.4 per cent. were positive, and of the 69 Infirmary patients 13 per cent. were positive.

It is significant that of 19 lepers tested, 18 were negative, and 4 yaws cases in the ulcerative stage were also negative. Further, of 45 ulcer cases, 44 were negative and one gave a pseudo-positive reaction. These three findings lend support to the hypothesis that diphtheria immunity can arise from a latent cutaneous infection. Table IV gives a summary of the results obtained in the different types of cases. Table V is an attempt to show the rising immunity occurring in the first two years of life. The number of reactions noted is too small to allow of percentages being of value, but it is remarkable that there should be so little evidence of inherited immunity exhibited during the first few months of life, yet acquired immunity does not occur till later.

TABLE V.  
SCHICK REACTIONS IN CHILDREN AGED 0—2 YEARS.

| Months. | Positive. | Negative. | Pseudo Positive. | Pseudo Negative. | Months. | Positive. | Negative. | Pseudo Positive. | Pseudo Negative. |
|---------|-----------|-----------|------------------|------------------|---------|-----------|-----------|------------------|------------------|
| 1.      | 2         | 1         | 0                | 0                | 13      | 2         | 0         | 0                | 0                |
| 2.      | 1         | 3         | 1                | 0                | 14      | 1         | 0         | 0                | 0                |
| 3.      | 1         | 3         | 0                | 0                | 15      | 0         | 0         | 0                | 0                |
| 4.      | 3         | 0         | 0                | 0                | 16      | 0         | 0         | 0                | 0                |
| 5.      | 3         | 0         | 0                | 0                | 17      | 2         | 1         | 0                | 0                |
| 6.      | 3         | 0         | 0                | 0                | 18      | 1         | 1         | 0                | 0                |
| 7.      | 3         | 0         | 0                | 0                | 19      | 1         | 0         | 0                | 0                |
| 8.      | 2         | 0         | 0                | 0                | 20      | 0         | 0         | 0                | 0                |
| 9.      | 0         | 0         | 0                | 0                | 21      | 0         | 0         | 0                | 0                |
| 10.     | 5         | 0         | 0                | 0                | 22      | 0         | 0         | 0                | 0                |
| 11.     | 0         | 0         | 0                | 0                | 23      | 0         | 1         | 0                | 0                |
| 12.     | 1         | 0         | 0                | 0                | 24      | 2         | 0         | 0                | 0                |

24            7            1 in first year.                            9            3 in second year.

TOTAL TESTED            ...            32 in first year, 12 in second year.            GRAND TOTAL 44.

Table VI analyzes the whole of the results obtained, grouping them under age and sex, while that section of Table I dealing with Sierra Leone summarizes these findings. Figure 1 suggests the extent of infection pressure prevailing in the various types of "herds" investigated, and the degree of immunity arising therefrom. These figures have been suggested by and based on, Dudley's conception of the ecology of immunisation.

These results are in agreement with those from other parts of the world where clinical diphtheria is absent or unrecognized, and stress the perplexity of the problem as to how this immunity arises. As infants have been shown to be relatively insusceptible to toxins which show marked reactions in children and adults, it would seem that further experimental work would have to be done to determine the exact degree of skin sensibility at different ages among

various races in the tropics. It is well known that the coloured skin has established a resistance to sunerythema, but practical experience leads the present author to believe that no difference is manifested between white and coloured skin in reaction to irritants such as vesicants, plant toxins (nettles) animal toxins (stings of insects), or drugs, such as quinine. The application of any of these excite inflammatory response quite readily in the coloured skin.

It would seem therefore, that none of these errors account for the lack of reactions, but, on the contrary, that there is genuine immunity present. We must, therefore fall back on the explanations already suggested, and attribute the immunity to latent throat infection which is seldom, if ever recognized as clinical diphtheria, or to skin or other extra-faecial infection.

In conclusion I have to thank the Honourable Director of Medical and Sanitary Services, Sierra Leone, for the supply of the reagents used.

TABLE I—INCIDENCE OF DIPHTHERIA AS JUDGED BY THE SCHICK TEST.

| Country.              | Number Examined.                           | Age Group.  | Schick Test per cent.   |   | Carriers per cent.  | Authority.                      | Reference Number to Notes.  | Reference Number to Bibliography. |
|-----------------------|--|---|---|---|---|---------------------------------|-----------------------------|-----------------------------------|
|                       |  |   | Positive.   | Negative.   |   |                                 |                             |                                   |
| Manchurian Railway    | 1,559<br>1,204                             | —<br>—  | —<br>35   | —<br>65   | 0·83  | Nakadate ...                    | 1                           | 1                                 |
| Baku ...              | 27,000                                     | 0 to 3 months<br>4 " 6 "<br>7 " 12 "<br>1 " 3 years<br>4 " 6 "<br>7 " 10 "<br>11 " 14 "   | 5<br>24·2<br>36·8<br>60·5<br>42·5<br>22·1<br>13·5   | —<br>—<br>—<br>—<br>—<br>—<br>—   | —   | Sdrodowski and<br>Chalapina ... | —                           | 2                                 |
| South Africa ...      | 1,700                                      | —   | 44·56   | —   | —   | Dunn ...                        | 2                           | 3                                 |
| Sierra Leone ...      | 570  | 1st year<br>2nd year<br>1 to 5 years<br>6 " 10 "<br>11 " 15 "<br>16 " 20 "<br>20 " 25 "<br>26 " 30 "<br>31 " 35 "<br>36 " 40 "<br>41 " 45 "<br>46 " 50 "<br>51 " 55 "<br>56 " 60 "<br>61 " 65 "<br>66 " 70 "<br>Over 70 " | 75·<br>75·<br>49·<br>20·<br>33·<br>17·<br>12·5<br>25·<br>21·<br>5·<br>12·<br>25·<br>0·<br>7·<br>10·<br>14·<br>10· | —<br>—<br>—<br>—<br>—<br>—<br>—<br>—<br>—<br>—<br>—<br>—<br>—<br>—<br>—<br>—<br>— | } (Of the Grand Total, 29 per cent. are Schick positive.) | Present Author                  | —                           | —                                 |
| Greenland ...         | —  | 0 to 5 years<br>6 " 10 "<br>11 " 15 "<br>16 " 20 "<br>21 " 30 "<br>31 " 70 "  | —<br>—<br>—<br>—<br>—<br>—  | 28·<br>15·<br>—<br>49·<br>53·<br>59·  |   | —                               | Bay Schmith ...             | 3                                 |
| Dutch East Indies     | 300 men<br>200 women<br>100 children       | —<br>—<br>—   | 2·<br>8·<br>41·   | —<br>—<br>—   | —   | Smits ...                       | 4                           | 5                                 |
| India :               |  |   |   |   |   |                                 |                             |                                   |
| (1) Central Provinces | 7<br>8<br>12<br>45<br>28<br>36<br>38<br>12 | 1 to 3 months<br>3 " 6 "<br>6 " 12 "<br>1 " 3 years<br>3 " 6 "<br>7 " 10 "<br>11 " 14 "<br>15 " 20 "  | 14·<br>0·<br>66·6<br>62·<br>10·7<br>14·<br>2·6<br>0·  | —<br>—<br>—<br>—<br>—<br>—<br>—<br>—  | —   | Rambo ...                       | 5                           | 6                                 |
|                       |  | (7 examined over that age.  | all Schick Negative)  |   |   |                                 |                             |                                   |
| (2) Kasauli ...       | 1,000                                      | —   | —   | —   | 4·9   | Vardon ...                      | 6                           | —                                 |
| (3) Assam ...         | 11<br>97<br>137<br>6<br>271                | 1 to 5 years<br>5 " 10 "<br>Over 20 "<br>10 to 15 "   | 54·5<br>51·5<br>41·6<br>66·6<br>46·1  | 0·<br>3·<br>5·<br>2·<br>12·   | } Number of Pseudo-reactors                               | Fox, etc. ...                   | 7                           | 7                                 |
| South America ...     | 1,217<br>1,222                             | —<br>—  | —<br>—  | 78·2<br>(Negative)  |   | 2·7                             | Doull ...<br>Gomez & Navano | 8<br>9                            |
| Fed. Malay States     | 276  | —   | 25·7  | —   | —   | —                               | 10                          | —                                 |

## NOTES TO TABLE I.

- (1) Contrary to the view generally held that children over seven years of age become progressively less susceptible to diphtheria, no difference was found, here, between seven and twelve years of age.
- (2) The percentage positive among coloured people was lower, at all ages, than of Europeans.
- (3) These were Eskimos in the remote parts of Greenland, where, according to the writer, diphtheria had never penetrated.
- (4) In 1923 only 249 cases of diphtheria were notified among the large population of Java and South Sumatra.
- (5) Eleven cases were reported from Bilaspur District, of whom eight were children; three deaths occurred. V. C. Rambo is convinced that diphtheria is an ever present danger in India.
- (6) Quoted by Doull. (see 8 for Ref.)
- (7) Although as many as 40 cases of diphtheria in one year occurred in Shillong, there was no tendency for the disease to spread among the Indian children in an epidemic form, although at the same time sporadic cases appeared among the Indian school population.
- (8) In Rio, during 1920-1921 the mortality from diphtheria per 100,000 was 5·3 and 5·0 per annum.
- (9) Quoted by Doull, (see 8 above.)
- (10) These were children; of 92 between the ages of five and ten years, 36 or 39 per cent., were positive.



TABLE IV.

## SIERRA LEONE SCHICK TESTING.

## SUMMARY OF RESULTS OBTAINED IN DIFFERENT CLASSES.

| Class.                          | Number Examined. | Per cent. Schick Negative. |
|---------------------------------|------------------|----------------------------|
| Ulcer cases ... ..              | 45               | 100·                       |
| Yaws cases ... ..               | 4                | 100·                       |
| Lepers ... ..                   | 19               | 95·                        |
| Long sentence prisoners ... ..  | 19               | 89·5                       |
| Infirmary ... ..                | 69               | 87·                        |
| Rural school children ... ..    | 83               | 84·4                       |
| Urban school children ... ..    | 44               | 84·1                       |
| Lunatics ... ..                 | 85               | 83·6                       |
| Short sentence prisoners ... .. | 29               | 82·8                       |
| Adults in hospital ... ..       | 87               | 72·5                       |
| Children under 16 ... ..        | 213              | 64·8                       |
| Infants ... ..                  | 86               | 36·1                       |



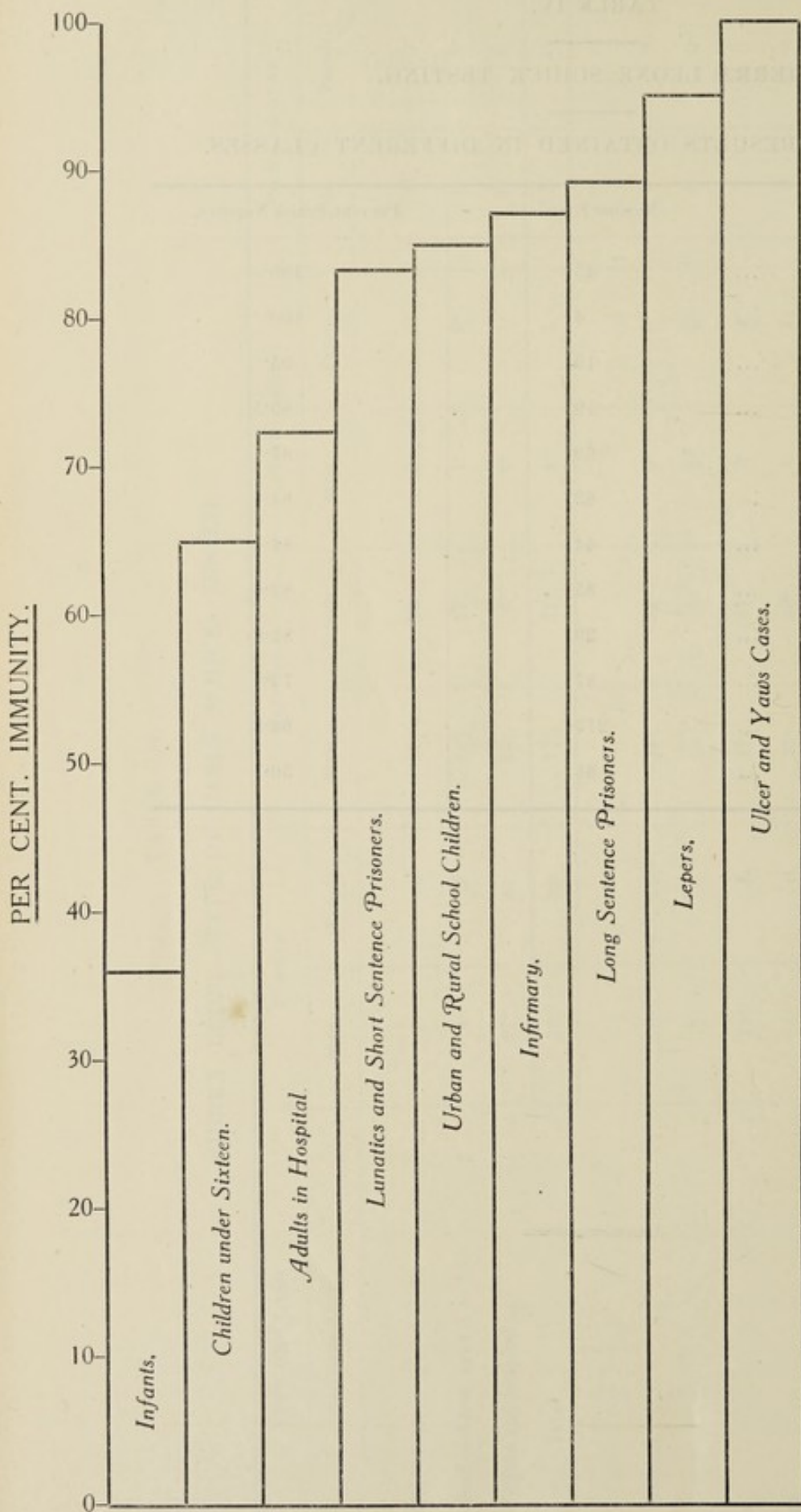


TABLE IVA.

|                            |
|----------------------------|
| <u>HERD IMMUNITY.</u>      |
| <u>INFECTION PRESSURE.</u> |
| <u>ENVIRONMENT.</u>        |

TABLE VI.

## SIERRA LEONE—SCHICK REACTIONS ACCORDING TO AGE AND SEX.

| Years.      | Positive. |         | Negative. |         | Pseudo-positive. |         | Pseudo-negative. |         |
|-------------|-----------|---------|-----------|---------|------------------|---------|------------------|---------|
|             | Male.     | Female. | Male.     | Female. | Male.            | Female. | Male.            | Female. |
| 1           | 12        | 12      | 4         | 3       | 1                | 0       | 0                | 0       |
| 2           | 4         | 5       | 2         | 1       | 0                | 0       | 0                | 0       |
| 3           | 1         | 2       | 3         | 4       | 0                | 0       | 0                | 0       |
| 4           | 2         | 3       | 9         | 6       | 0                | 0       | 0                | 0       |
| 5           | 2         | 1       | 4         | 6       | 0                | 0       | 0                | 0       |
| Total 1-5   | 21        | 23      | 22        | 20      | 1                | 0       | 0                | 0       |
| 6           | 1         | 0       | 7         | 3       | 0                | 0       | 0                | 0       |
| 7           | 1         | 2       | 9         | 2       | 0                | 0       | 0                | 0       |
| 8           | 0         | 2       | 7         | 4       | 0                | 0       | 1                | 0       |
| 9           | 4         | 2       | 3         | 3       | 0                | 0       | 0                | 0       |
| 10          | 1         | 2       | 11        | 8       | 0                | 1       | 0                | 0       |
| Total 6-10  | 7         | 8       | 37        | 20      | 0                | 1       | 1                | 0       |
| 11          | 2         | 3       | 6         | 4       | 0                | 0       | 0                | 0       |
| 12          | 1         | 0       | 2         | 3       | 0                | 0       | 0                | 0       |
| 13          | 2         | 3       | 1         | 4       | 0                | 0       | 0                | 0       |
| 14          | 3         | 1       | 2         | 3       | 0                | 0       | 0                | 0       |
| 15          | 0         | 1       | 5         | 3       | 0                | 0       | 0                | 0       |
| Total 11-15 | 8         | 8       | 16        | 17      | 0                | 0       | 0                | 0       |
| 16          | 1         | 0       | 6         | 2       | 0                | 0       | 0                | 0       |
| 17          | 1         | 2       | 3         | 0       | 0                | 0       | 0                | 0       |
| 18          | 0         | 0       | 5         | 4       | 0                | 0       | 0                | 0       |
| 19          | 0         | 1       | 4         | 0       | 0                | 0       | 0                | 0       |
| 20          | 4         | 1       | 7         | 8       | 0                | 0       | 0                | 0       |
| Total 16-20 | 4         | 4       | 25        | 14      | 0                | 0       | 0                | 0       |
| 20-25       | 1         | 4       | 21        | 12      | 0                | 0       | 0                | 0       |
| 26-30       | 7         | 5       | 15        | 18      | 1                | 0       | 1                | 0       |
| 31-35       | 7         | 3       | 28        | 8       | 0                | 1       | 0                | 0       |
| 36-40       | 3         | 0       | 39        | 15      | 3                | 0       | 0                | 0       |
| 41-45       | 4         | 0       | 9         | 16      | 1                | 1       | 0                | 0       |
| 46-50       | 4         | 5       | 8         | 17      | 0                | 1       | 0                | 0       |
| 51-55       | 0         | 0       | 6         | 5       | 0                | 0       | 0                | 0       |
| 56-60       | 1         | 0       | 10        | 3       | 0                | 0       | 0                | 0       |
| 61-65       | 1         | 0       | 6         | 2       | 1                | 0       | 0                | 0       |
| 66-70       | 1         | 0       | 4         | 2       | 0                | 0       | 0                | 0       |
| Over 70     | 1         | 0       | 5         | 4       | 0                | 0       | 0                | 0       |
| Total ...   | 30        | 17      | 151       | 102     | 6                | 3       | 1                | 1       |
| Grand Total | 70        | 60      | 251       | 173     | 7                | 4       | 2                | 1       |

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I—REPORT ON THE WORK OF THE PRINCESS CHRISTIAN  
MISSION HOSPITAL.

Accommodation—45 beds—arranged as follows:—

|                               |     |     |     |                               |
|-------------------------------|-----|-----|-----|-------------------------------|
| 1. General Ward               | ... | ... | ... | 16 beds (12 beds and 4 cots). |
| 2. Gynæcological Ward         | ... | ... | ... | 10 beds                       |
| 3. Maternity Ward             | ... | ... | ... | 10 beds (6 beds and 4 cots).  |
| 4. Private Wards for Africans | ... | ... | ... | 6 beds (3 beds and 3 cots).   |
| 5. European Ward              | ... | ... | ... | 3 beds (2 beds and 1 cot).    |

There is a small labour ward, a dressing theatre and an operating theatre.

|                              | 1928. | 1929. |
|------------------------------|-------|-------|
| Total number of out-patients | 8,028 | 8,556 |
| Admissions                   | 476   | 618   |
| Deaths                       | 31    | 19    |
| Births                       | 92    | 96    |
| Operations                   | 71    | 101   |
| Infant welfare clinic        | 8,085 | 9,804 |
| Ante-natal clinic            | 851   | 1,013 |

R. A. ELLIOTT.

It is of interest to note that since writing the above report, I have had a case of severe laryngeal diphtheria in this Hospital. The patient a child aged two-and-a-half years was brought here on the fifth day of illness practically moribund and it was necessary to perform tracheotomy immediately he was given 9,000 units of antitoxin intramuscularly on that day and a further 5,000 units twenty-four hours late. As he was too ill for removal to the Isolation Hospital he was nursed on a verandah here and made an excellent recovery.

All contacts at home and in Hospital gave negative throat swabs but unfortunately there was no opportunity of schich testing any of these.

Such an isolated case gives rise to much surmise as to its origin and one is inclined to think that diphtheria is endemic in the country in a mild form for which treatment is unsought but that on occasion, it becomes very virulent as in this case.

My thanks are due to Dr. Marion Watson who made the bacteriological examinations.

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