Annual medical and sanitary report / Nigeria.

NIGERIA:

COLONY AND SOUTHERN PROVINCES.

ANNUAL

MEDICAL AND SANITARY REPORT

FOR THE

YEAR ENDING 31ST DECEMBER, 1918.

Annual Medical and Sanitary Report for the Colony and Southern Provinces for the year ending 31st December, 1918.

I.—ADMINISTRATIVE.

STAFF.

Medical Staff.

EUROPEAN.

1 Principal Medical Officer.
2 Deputy Principal Medical Officers.
2 Provincial Medical Officers.
7 Senior Medical Officers.
58 Medical Officers.

Promotion—Nil.

Transfer—

1 Medical Officer, Dr. H. M. Newport, to Sierra Leone.

Invalided—Nil.

Death—

1 Medical Officer, Dr. T. H. Beale-Browne (lost at sea).

Retirements—

2 Medical Officers, Drs. A. W. Smythe and R. C. Macpherson.

Appointments—Nil.

Seconded—Nil.

NATIVE.

5 Medical Officers.

Sanitary Staff.

EUROPEAN.

1 Senior Sanitary Officer.
3 Sanitary Officers.
4 „ Inspectors.

Promotion—Nil.

Transfer—Nil.

Termination of Appointment—Nil.

Appointment—Nil.

NATIVE.

1 First Class Clerk.
1 Registrar of Vital Statistics.
2 Second Class Clerks.
2 Third Class Clerks.
1 Deputy Registrar of Vital Statistics.
84 Sanitary Inspectors—Nominal full strength never attained.

Resignations—
6 Sanitary Inspectors.

Dismissals—
9 Sanitary Inspectors.

Termination of Appointments—
6 Sanitary Inspectors.

Transfers to other Departments—
1 Second Class Clerk.
1 Sanitary Inspector.

Appointments—
30 Sanitary Inspectors.

Death—
1 Sanitary Inspector.

Nursing Staff.

EUROPEAN.

6 Senior Nursing Sisters.
8 Nursing Sisters.

New Appointments—
2 Nursing Sisters.

Appointment terminated—
1 Nursing Sister.

Seconded—
1 Senior Nursing Sister to East Africa.
1 Nursing Sister to East Africa.

NATIVE.

6 Dressers.
26 First Class Nurses.
38 Second Class Nurses.
25 Nurses-in-training.

New Appointments—
10 Nurses-in-training.

Promotions—
4 Nurses-in-training to be Second Class Nurses.

Dismissal—
1 Second Class Nurse.

Resignation—
1 Second Class Nurse.

Death—
1 Senior Attendant.

Storekeeping and Dispensing Staff.

EUROPEAN.

1 Medical Storekeeper.

NATIVE.

1 Storekeeper and Warden, Lagos Hospital.
3 Storekeepers.
1 Assistant Storekeeper.
1 Chief Dispenser.
1 Senior Dispenser.
10 First Class Dispensers.
41 Second Class Dispensers.
11 Dispensers-in-training.

New Appointments—
Four.

Promotions—
2 Second Class Dispensers to be First Class Dispensers.

Resignations –
1 First Class Dispenser.
1 Second Class Dispenser.

Dismissal—
1 First Class Dispenser.

Deaths—
2 Second Class Dispensers.

Clerical Staff.

EUROPEAN.

Nil.

NATIVE.

1 Senior First Class Clerk.
3 First Class Clerks.
10 Second Class Clerks.
19 Third Class Clerks.

New Appointments—
1 Second Class Clerk.
3 Third Class Clerks.

Transfers—
1 Third Class Clerk to Police Department.
1 „ „ „ „ Political „
1 „ „ „ „ Prison „

Resignations—
1 Second Class Clerk.
1 Third Class Clerk.

Termination of Appointments—
7 Third Class Clerks, due to reduction of staff.

FINANCIAL.

Statement of Revenue and Expenditure for the year 1918.

	£	s.	d.
Total Revenue	3,437	5	2

Total Expenditure:—	£	s.	d.
a. Personal Emoluments	56,145	11	5
b. Other Charges	20,132	4	8
Total	£76,277	16	1

II.—PUBLIC HEALTH.

(*a*).—GENERAL REMARKS.

The Returns show a decrease in the number of cases treated at the various hospitals, viz., 130,909 as compared with 132,878 in 1917 or a difference of 1,969 cases and this in spite of the fact that the country was visited by the great Influenza Pandemic which accounted for 16,735 cases; so that the cases treated would really have been less by 18,721 if Influenza is excluded. This falling off cannot be ascribed to an improvement in the general health of the community since the death-rate has risen from 6·8 per 1,000 in 1917 to 7·5 for the year under review, exclusive of deaths caused by Influenza; or if influenza be included to 12·8 per 1,000. The decline in the incidence of all diseases with a rise in the death-rate as shown by the Returns is difficult to account for. Depletion of the staff cannot be assigned as the reason since in 1917 with a depleted staff also, there was a proportionately larger increase over 1916 in cases treated; and the more so as a reference to the returns from large stations like Lagos and Calabar, where the staff has been constant, shows a decline in the cases treated. There has been, however, an increase of 190,966 attendances at the Dispensaries.

On the whole the general health of the community compares unfavourably with previous years.

The number of Europeans who came under treatment for all causes exceeded those in 1917 by 605 or, if Influenza be excluded, by 187.

The number of Surgical operations performed has fallen by 280. This can be easily accounted for by the depletion of staff. There has been a decrease of 19,097 in the number of vaccinations performed.

Among the Native population the most prevalent diseases, excluding Influenza, were affections of the digestive system, the total number of which amounts to one-sixth of all other ailments, the mortality from these causes is low, ·8%; diseases of the Respiratory System about one-tenth of all others and from which the mortality is ·4%; Infective diseases (excluding Influenza) about one-ninth and a mortality of ·3%; Venereal Disease at a little over a sixtieth of all diseases treated gives but a very inadequate idea of its prevalence. The bulk of the balance is made up by Rheumatic and Skin Affections.

(1).—General Diseases.

Anæmia is the most prevalent and is responsible for a great deal of ill-health and invaliding. Gout among both Europeans and Natives is fairly common. 9 cases were recorded in the former and 57 in the latter.

(2).—Communicable Diseases.

Insect-borne Diseases.

There were only 9,506 cases of Malaria in 1918 as compared with 11,804 in 1917. The case mortality was 30 deaths as compared with 21 in 1917.

Two cases of Yellow Fever occurred, one European and one Native. Both were fatal.

One case of Trypanosomiasis in a European was treated at Ibadan and one at Lagos. The Ibadan case was imported from the Northern Provinces where it was first observed.

The Lagos case was an old one which had been under treatment in England.

There were 29 cases of Blackwater Fever in Europeans with 4 deaths as against 22 cases with 11 deaths last year. One Native had this disease and recovered.

Infectious and Epidemic Diseases.

2,231 cases of Chicken Pox, which is endemic and from time to time epidemic, were recorded with 10 deaths—a high rate of mortality for this disease.

There were 439 cases of Small-pox with 74 deaths or a case mortality of 168·0 per 1,000. There were small epidemics of Small-pox throughout the country principally in the Agbor–Ishan country as occurred last year. Nothing approaching a serious outbreak of the disease occurred. The incidence of Small-pox is principally confined to the dry season.

Influenza.—The great Pandemic reached Nigeria towards the end of September, raged during October, and declined rather abruptly in November. Imported into Lagos by sea from the Gold Coast, in spite of Herculean efforts on the part of the Sanitary Authorities, it was but a matter of time till the disease had spread all over the country. Calabar was the last to suffer owing to the infrequency of the shipping service between there and ports to windward and the epidemic was at its height there when it had practically died out in Lagos. The epidemic did not present any features different from those observed in other parts of the world unless it was in its severity. Gastro-intestinal types were noted but in the great majority of the cases the brunt of the disease fell upon the respiratory system. All the deaths among Europeans were due to septic broncho-pneumonia.

It is difficult to estimate either the incidence of the disease or the mortality.

In Lagos, where there is a properly organised Health Department and where registration is compulsory, it is possible to arrive at a vague estimate. From statistics taken from such sources as Prisons, Police Force, West African Frontier Force, and Government employes a case incidence of 50% with a mortality of 5% would probably be a low estimate. Among the poor and intensely ignorant both the incidence and mortality must have been very much higher. It is estimated from the Register of Deaths and a comparison of the death rate during the epidemic with the same periods in previous years, that 1·5% of the population of Lagos died of Influenza.

418 Europeans came under treatment of whom 15 died, a mortality of 3·5%. This is, however, a very low estimate of the incidence of the disease as many suffered in remote districts where Medical aid was not available.

Influenza was the cause of invaliding of 9 European Government Officials and the death of 12.

5,887 Natives of all classes were treated for Influenza as in-patients at the hospitals with a mortality of 11%.

Dysentery.—Is for the most part of the amœbic variety. Among Europeans the case incidence is practically the same as last year. 40 cases are recorded but this gives but a low estimate of the number who are carriers of the amœba. *Emetine* and *Alcresta Ipecac* have given good results in the treatment.

In Natives 920 cases are recorded with a mortality of 16·3% against 1,059 with a mortality of 11·2% in 1917.

Helminthic Diseases.

There is nothing unusual to record under this heading.

(*b*)—EUROPEAN OFFICIALS.

Total number on Sick List	938
Total number of days on Sick List	7,673
Total number Invalided	94
Total Deaths	16

In previous years it has been customary to regard an officer as "Invalided" only in the event of his being recommended by a Medical Board to leave the country before he had completed a normal tour of 12 months. Under present conditions it has been thought that a more accurate idea of the health of Europeans would be obtained if all instances in which an officer was obliged to proceed on leave owing to ill-health were included.

An accurate estimate of the incidence of sickness among European Officials in Lagos is difficult as many prefer to be attended when ill by a private Medical Practitioner and consequently do not always come into the official records.

TABLE SHOWING THE CAUSES OF INVALIDING AND DEATHS.

(EUROPEAN OFFICIALS.)

Cause.	Invalided.	Died.
Dysentery, Amœbic	3	...
Gonorrhœa	1	...
Influenza	9	12
Malaria, Aestivo-Autumnal	8	...
Malaria, Chronic	1	...
Blackwater Fever	6	1
Pneumonia	1	...
Syphilis, Primary	1	...
Tuberculosis	2	...
Alcoholism	...	1
Anæmia	15	...
Neuritis	2	...
Paralysis	1	...
Neuralgia	3	...
Delusional Insanity	1	...
Neurasthenia	9	...
Keratitis	1	...
Astigmatism	1	...
Heart Affections	4	...
Varicose Veins	1	...
Bronchitis	2	...
Caries of teeth	4	..
Pyorrhœa Alveolaris	3	. .
Dilatation of Stomach	2	...
Hernia	1	...
Hæmorrhoids	2	...
Hepatitis, Acute	2	...
Abscess of Liver	...	1
Cirrhosis of Liver	2	...
Inflammation of Lymphatic Gland	3	...
Urethritis	1	...
Boils, etc.	2	...
Injuries	...	1
Total	94	16

(*c*)—NATIVE OFFICIALS.

Total number on Sick List	2,418
Total number of days on Sick List	22,273
Total number Invalided	14
Total Deaths	13

The large increase of ineffectiveness—more than double that of previous years—can be attributed to Influenza.

Influenza was the cause of death in 8 cases. The incidence of Influenza among Native Officials, including Government Employes, was 47·7% and case mortality 1·6%.

TABLE SHOWING INVALIDING AND DEATHS OF NATIVE OFFICIALS.

Cause.	Invalided.	Died.
Gonorrhœa	1	...
Influenza	...	8
Pneumonia	...	2
Tuberculosis	4	...
Apoplexy	...	1
Neurasthenia	2	...
Epilepsy	1	...
Delusional Insanity	1	...
Valvular Disease of Heart	1	1
Abscess of Lung	1	...
Hæmorrhoids	1	...
Ischio-rectal Abscess	...	1
Ascites	1	...
Stricture, Urethra	1	...
Total	14	13

(*d*)—SOLDIERS.

Average strength	1,203
Average sick rate per 1,000	975·89
Average death rate per 1,000	24·94

In Lagos the incidence of Influenza among soldiers was 31·2 and case mortality 2·0%

(*e*)—POLICE.

Average strength	1,435
Average sick rate per 1,000	86·41
Average death rate per 1,000	29·26

The incidence of Influenza among the Police Force in Lagos was 31·6%, practically the same as for soldiers. The soldiers live in Barracks while the Police do not but are scattered throughout the town. The death rate was 7·2%.

(*f*)—PRISONERS.

Total number of prisoners passed through the Registers	35,531
Daily average number of prisoners	6,953
Sick rate per 1,000 (daily average)	1·35
Death rate per 1,000	17·19

In the Lagos Prison the incidence of Influenza was 18·6% and the death-rate 3·2%.

(*g*)—NON-OFFICIAL EUROPEAN POPULATION.

Reliable figures under this head are very difficult to get.

The following are the most accurate obtainable:—

Estimated population	1,600
Total number on Sick List	558
Total number of days on Sick List	4,527
Total number Invalided	27
Total number of Deaths	29

INVALIDING AND DEATHS.

EUROPEAN NON-OFFICIALS.

Cause.	Invalided.	Died.
Influenza	2	14
Blackwater Fever	...	5
Malaria, Aestivo-Autumnal	8	4
Pneumonia	...	1
Yellow Fever	...	1
Arthritis	1	1
Delusional Insanity	1	...
Abscess Mastoid	...	1
Fracture Skull	...	1
Nephritis	...	1
Abscess	1	...
Cardiac Valvular Disease	1	...
Gastritis	1	...
Phthisis Pulmonalis	6	...
Anæmia	1	...
Bronchitis	1	...
Dysentery	1	...
Neurasthenia	3	...
Total	27	29

(*h*)—NON-OFFICIAL NATIVE POPULATION.

The total estimated population of the Colony and Southern Provinces is based on the census of 1911 and is as follows:—

Africans	7,856,000
East Indians	99
Mixed and Coloured	487
Total	7,856,586

Registration is compulsory in the Township and Ebute Metta only. The statistics are as follows:—

Total Births	2,514
Total Deaths	3,228
Total Deaths of Infants under one year	830
Total Still-births	151
Infant Mortality per 1,000 Births	330·1

III.—SANITATION.

(A).—GENERAL REVIEW OF WORK DONE, LAWS PASSED AND PROGRESS MADE.

(I).—ADMINISTRATIVE.

1. This report covers the sanitary work conducted during the last year of the war.

2. The existing conditions adverse to any striking sanitary progress, as mentioned in the report for 1917, have continued, nevertheless routine sanitary work has been carried out and the sanitary condition of stations well maintained with the staff and money available.

3. *Work done by Sanitary Officers.*—Normally the staff of Sanitary Officers is four:—

One Senior Sanitary Officer and three Sanitary Officers.

Owing to the shortage of Medical Officers the services of one Sanitary Officer, viz., Dr. Pirie, were placed at the disposal of the medical branch for the whole of the year under review. This, though limiting the sphere of his work as a Sanitary Officer to three stations, viz., Calabar, Opobo and Port Harcourt, proved advantageous in other respects from the sanitary aspect and more especially during the last three months of the year when the threatened advent of Influenza into Port Harcourt had to be combated and was successfully stayed for some time as a result of vigorous sanitary activities in the way of precautionary measures that were enforced

4. Dr. Dalziel, Sanitary Officer, whose services are usually lent to the Town Council as Medical Officer of Health, Lagos, was on leave from March to November, and hence during this major part of the year Dr. Beringer, Sanitary Officer, took the place of Dr. Dalziel as Medical Officer of Health, Lagos.

5. This drain on the services of the sanitary staff left the Senior Sanitary Officer single-handed and restricted his energies mainly to office work at headquarters and even this routine office work was much handicapped by the outbreak of Influenza, due not only to the absence of all the clerical staff from illness—a lot common to all the Government offices, but owing to the urgency of the situation which demanded the devotion of energy by each and all of the senior members of the medical and sanitary staff to the care and treatment of the sick so as to tide the very grave and anxious time that everyone went through when Influenza with its attendant mortality, swept rapidly through Lagos and the whole of Nigeria.

6. So great was the need for medical and sanitary reinforcement during the Influenza Epidemic in Lagos that the services of Dr. Inness, Sanitary Officer, Northern Provinces, were obtained temporarily by the Director of Medical and Sanitary Services for a period of one month.

7. Notwithstanding the foregoing, during intervals when facilities existed, tours of inspection were made by Sanitary Officers and many places were visited and sanitary advice given locally.

8. Many stations were visited with a view to the selection of sites for the layout of a township on sanitary lines. Such townships with the application of the principles of segregation and efficient sanitary control will prove of great value and they will in themselves when properly organised forward the sanitary cause locally. At present those formed are in their infancy and much has to be done to enable them to develop into sanitary efficiency.

9. The supervision of the office of Registrar of Vital Statistics is a duty that is conducted by the Senior Sanitary Officer in the capacity of Principal Registrar. The utility of registration of deaths in Lagos, including that of natives, was very forcibly brought out in the initial phase of an epidemic like Influenza when the sudden and obvious rise in the deaths in September led to investigation of sudden and obscure deaths, which, by means of post-mortem examinations, enabled the sanitary authorities to ascertain that Influenza had made its initial advent and so permitted of early action to be taken with a view to combating the disease.

10. The necessity of increasing the staff of Sanitary Officers is an urgent one so as to permit:—

(*a*) of the Senior Sanitary Officer getting adequate assistance in his office at times of stress; all manner of minor matters keep his time occupied to the detriment of the more important sanitary problems that need his attention and full consideration and prevent his making more frequent tours of inspection.

(*b*) of the Senior Sanitary Officer or his deputy in the office proceeding on tour while the other attends to routine office work and matters of urgency that arise. It is only by inspection that the sanitary needs can be ascertained and this is only possible when an adequate staff of Sanitary Officers are available in the country.

(*c*) to permit of relief without unduly interfering with the work of inspection of outstations at more regular intervals.

This question has already received some attention as a result of the report rendered for 1917, but its importance is great in the interests of sanitation and hence it has again been put forward in this light.

Seeing that one Sanitary Officer is always seconded to the Town Council as Medical Officer of Health and that a second Sanitary Officer has to relieve the Medical Officer of Health when on leave, for a period of at least six months the services of the remaining staff are quite inadequate to allow of the efficient conduct of work in the office so as to permit of the regular inspection of all outstations, the inspection of new sites for the layout of proposed European Reservation and townships, the investigation of outbreaks of disease and other new sanitary problems, for leave periods have to be considered, since they form a break in the continuity of the tour of each sanitary officer and hence reliefs need to be provided for.

11. *Sanitary Staff.*—Besides the staff of sanitary officers referred to in the opening paragraph of section 3 there are four European Sanitary Inspectors. One of these four, viz., Sergeant Prince, was seconded for service with the military in East Africa during the whole of the war. The services of one European Sanitary Inspector were lent to the Health Department of the Town Council and the energies of the two remaining were divided between Calabar and Port Harcourt; the sanitary needs of the latter, which is growing rapidly, demanded the greater share and attention.

The Native Staff was composed of 80 members: of these 7 form the Clerical Staff and 73 are Sanitary Inspectors.

12. *Clerical Staff.*—The changes in staff comprise one transfer of Mr. Williams, a Second-class Clerk, to the office of the Resident of the Colony and Mr. Agbebi, a Second-class Clerk from the Northern Provinces, took his place on transfer.

13. *Native Sanitary Inspectors.*—Of the 73 Native Sanitary Inspectors 6 resigned, 9 were dismissed, in the case of 6 their appointments were terminated.

The death of one Sanitary Inspector is recorded. Thirty new Sanitary Inspectors were selected for employment as temporary men and were subject to a course of training for 3 months at the end of which 20 were found suitable and retained as Sanitary Inspectors temporary for outstations; 9 were found unsuitable and dispensed with during training and one was transfered to the Health Department of the

Town Council. The steady weeding out of undesirable Sanitary Inspectors continues and a better class of men is being selected to replace the vacancies caused thereby.

14. *Sanitary Inspectors-in-Training.*—During 1917, ten men were appointed as Sanitary Inspectors-in-Training; of these one was dismissed in December, 1917, so that 9 remained under tuition, but of these two were dismissed during the year as undesirable to the service; one new man was taken on and 8 then remained to continue their training to the end of the year.

15. *Regrading of Sanitary Inspectors.*—Regrading of the first Class Sanitary Inspectors on a scale of salary £96–6–150 came into effect on 1st January, 1918. This fact in itself will draw candidates of a higher standard of education for the sanitary service. Recommendations were submitted for making the three highest grades, viz., the first, second and third Class of Sanitary Inspectors pensionable. This will add still a greater attraction to a better class of candidates.

16. *Legislation.*—The following legislation was enacted which directly or indirectly influences the cause of sanitation and tends to advance it to the good of all concerned:—

Sanitary Ordinances, Orders-in-Council, Regulations, Rules, Bye-Laws and Government Notices.

ORDINANCES PASSED.

I.—The Liquor (Amendment) Ordinance, 1918.

Amending the Liquor Ordinance, 1917, sections 13, 22 and 24.

II.—The Crown Lands Ordinance, 1918.

An Ordinance to make further and better provision for the management and disposal of Crown Lands. Sections 19 and 22 directly concern public health as they provide for the reservation of water supplies and for land necessary for the laying of sewers, drains and water pipes; section 24 provides for roads and thoroughfares.

III.—The Native Liquor (Manufacture) Ordinance, 1918.

An Ordinance to prohibit or regulate the manufacture of Native Liquor.

IV.—The Native Authority (Amendment) Ordinance, 1918.

This Ordinance is to be read and construed as one with the Native Authority Ordinance, 1916. It permits of a Native Authority making rules for various purposes that would promote the welfare of the natives.

V.—The Medical Practitioners and Dentists (Amendment) Ordinance, 1918.

This Ordinance amends section 6 of the Ordinance No. 7 of 1916; it also corrects verbal omissions in section 14 of that Ordinance.

ORDERS-IN-COUNCIL MADE:—

I.—Under the Townships Ordinance, 1917.

No. 4 of 1918 provides for the closing of certain streets in Lagos.

II.—Under the Townships Ordinance, 1917.

No. 8 of 1918 declares the following places to be townships of the third class:—

Abak, Ahoada, Arochuku, Ife, Ondo, Ubiaja, Uyo, Obubra, Okwoga, Benin, Eket, Ikot-Ekpene, Ijebu-Ode.

III.—Under the Public Health Ordinance.

No. 9 of 1918 applies the whole of the Ordinance to the Colony and certain sections only to all third class townships in the Southern Provinces and to certain towns and villages with defined areas.

IV.—Under the Births, Deaths and Burials Ordinance, 1917.

No. 10 of 1918 provides for the registration of all births and deaths amongst natives in the township of Lagos.

V.—Under the Townships Ordinance, 1917.

No. 12 of 1918 provides for the closing of a road leading from near Carter Bridge to Ijora village, in the township of Lagos.

VI.—Under the Townships Ordinance, 1917.

No. 21 of 1918 declaring the following towns to be townships of the third class:—

Omohia, Osuakoli.

VII.—Under the Public Health Ordinance, 1917.

No. 22 of 1918 applying the provisions of the Public Health Ordinance to all townships of the third class in the Southern Provinces, and providing for the general application of certain sections of Rules 2 to all such townships.

VIII.—Under the Liquor Ordinance, 1917.

No. 25 of 1918 declaring the following places to be licensed areas:—

(a) The Township and Native Town of Ijebu-Ode.

(b) The Township and Native Town of Abeokuta.

IX.—Under the Townships Ordinance, 1917.

No. 27 of 1918 provides for the closing of Olujare Street in the Township of Lagos.

X.—Under the Public Health Ordinance, 1917.

No. 29 of 1918 applies sections 19, 20 and 21 of the Ordinance to the premises of all non-natives within the towns or villages of Abo, Abonnema, Bakana, Buguma, Creek Town, Ilushi, Oguta and Orlu.

REGULATIONS FRAMED:—

No. 7 of 1918 under the Diseases of Animals Ordinance, 1917.

No. 10 of 1918 under the Mineral Ordinance, 1916.

No. 11 of 1918 under the Vaccination Ordinance, 1917.

No. 18 of 1918 under the Births, Deaths and Burials Ordinance, 1917.

No. 21 of 1918 under the Water Works Ordinance, 1915.

No. 25 of 1918 under the Prisons Ordinance, 1916.

No. 28 of 1918 under the Hospital Fees Ordinance, 1917.

No. 30 of 1918 under the Liquor Ordinance, 1917.

No. 31 of 1918 under the Liquor Ordinance, 1917.

No. 57 of 1918 under the Liquor Ordinance, 1917.

THE FOLLOWING RULES WERE PASSED:—

No. 5 OF 1918 UNDER THE TOWNSHIPS ORDINANCE, 1917.

No. 6 OF 1918 UNDER THE TOWNSHIPS ORDINANCE, 1917.

No. 7 OF 1918 UNDER THE TOWNSHIPS ORDINANCE, 1917.

No. 8 OF 1918 UNDER THE MARKETS ORDINANCE, 1917.

No. 11 OF 1918 UNDER THE TOWNSHIPS ORDINANCE, 1917.

No. 12 OF 1918 UNDER SECTION 45 OF THE PUBLIC HEALTH ORDINANCE, 1917.

These Rules apply to Second Class Townships and regulate the removal and disposal of nightsoil within them.

No. 13 OF 1918 UNDER THE TOWNSHIPS ORDINANCE, 1917.

THE FOLLOWING BYE-LAWS WERE MADE:—

BYE-LAWS MADE UNDER THE PUBLIC HEALTH ORDINANCE, 1917, AND DATED 15TH MAY, 1918.

These Bye-laws appertain to the following in the Township of Lagos:—

(*a*) Slaughter House.

(*b*) Digging of wells and rendering them mosquito proof.

(*c*) Regulation of the disposal of nightsoil within the Township of Lagos.

GOVERNMENT NOTICES:—

NOTICE No. 57 IN THE NIGERIA GAZETTE EXTRAORDINARY, DATED 30TH MARCH, 1918.

Under section 4 of the Births, Deaths and Burials Ordinance the following appointments were made by His Excellency the Governor-General:—

I.—Registry offices for the registration of Births and Deaths of non-natives in:—

The Colony
Southern Provinces
Northern Provinces.

II.—Registrars of non-natives' Births and Deaths in:—

The Colony
Southern Provinces
Northern Provinces.

III.—Registry offices for the registration of Births and Deaths of natives in the Township of Lagos at the office of the Senior Sanitary Officer in Lagos.

IV.—Registrar of native Births and Deaths:—

The Senior Sanitary Officer for Southern Provinces and in his absence the Registrar of Vital Statistics to be Deputy Registrar.

V.—Principal Registrar for both Southern and Northern Provinces:—

The Senior Sanitary Officer of the Southern Provinces.

VI.—Public Notice dated 3rd September, 1918, under the Public Health Ordinance, declared Influenza to be an infectious disease.

VII.—Public Notice dated 25th September, 1918, under the Public Health Ordinance, section 22, declared the Township and Port of Lagos to be infected areas.

17. *Tours of Inspection.*—Tours were conducted as far as it was possible. The following places were inspected from the sanitary point of view:—

Obubra, Afikpo and Calabar.

The following places were inspected primarily with a view to the inspection of suitable sites for the layout of Townships with an European segregation area as apart from the Native Location:—

Ibadan, Abeokuta, Oyo, Ogbomosho, Oshogbo, Ilesha and Ife.

18. *Plans.*—Segregation plans for townships were passed by the Sanitary Authorities for:—

(*a*) Enugu.
(*b*) Aba.
(*c*) Ibadan.

19. *Estimates.*—The Estimates for the expenditure directed by the sanitary office amounted to £20,103, a decrease of £1,131 on that of 1917.

(II).—Preventive Measures.

(*1*). —*Mosquito and Insect-borne Diseases.*

20. *Malaria.*—In Europeans 600 cases were treated as compared with 617 cases in 1917, with 544 in 1916 and 498 cases in 1915.

Of the 600 cases treated 586 are recorded as of the Aestivo-Autumnal type and the one death recorded is due to this type.

In Natives 8,905 cases were treated for Malaria as compared with 11,187 cases in 1917, with 8,197 in 1916 and 5,018 in 1915.

Of the cases treated 8,657 are recorded as of the Aestivo-Autumnal type and of the 29 deaths recorded 28 are due to this type and 1 due to chronic Malaria.

The total cases of Malaria treated in both Europeans and Natives amount to 9,505 with a case mortality of 30 as compared to 11,804 cases in 1917 with a case mortality of 21.

The total cases treated for all causes in 1918 amount to 130,909 of which the Influenza cases formed 16,735.

If now Influenza, which was an exceptional epidemic, be excluded, the rest of the cases treated amount to 114,174, and of this figure the cases treated for Malaria form 8·3 per cent.

This closely approximates the figure of 8·8% for 1917.

21. *Anti-Mosquito Work.*—At nearly all outstations this is carried out as a routine measure against mosquitoes and the spread of Malaria. Sanitary gangs are maintained to carry out this work under the supervision of Sanitary Inspectors and under the direction of Medical Officers. The shortage of Medical Officers still continues and where one Medical Officer has to look after more than one station there is naturally not such good supervision of the work of the sanitary gang during his absence.

Lagos.—The occurrence of mosquito larvæ, as stated by the Medical Officer of Health, on premises, streets, pools, drains, etc. amounted to 9,855 in 1918 as compared to 15,039 in 1917, the average for the preceding five years being 18,032.

The larvæ Index for premises was 1·6%. This figure is probably low owing to the fall in the number of inspections carried out in the last quarter of the year when the measures against Influenza claimed the energies of all the medical and sanitary staff to the partial neglect of routine anti-mosquito measures. Wells and pools form the main sources of mosquito breeding. Wells are being dealt with more rigorously and the recent Bye-Laws passed, as seen from section 16, "Legislation," of this report, will enable wells to be dealt with more effectively.

22. *Quinine Prophylaxis.*—It is fortunate that those who do not believe in the use of quinine as a prophylactic are comparatively few. In West Africa, speaking for Nigeria, the taking of Quinine, combined with the carrying out of other anti-malarial measures such as the use of the mosquito net and mosquito boots combined with care by the individual in looking after the general health, is essential for keeping free from attacks of malaria.

In a recent issue of the Journal of Tropical Medicine and Hygiene, in an original communication on Blackwater Fever, the author in dealing with the question of return of patients, who have suffered from Blackwater Fever, to an endemic area, states:—

> "The return should be conditional upon an undertaking being "given to faithfully observe the conditions necessary for the "prophylaxis of Malaria, *e.g.*, the taking of quinine as a "prophylactic according to a recognised system and the "proper use of a mosquito net. Otherwise there is the grave "liability to a second attack which would probably prove "fatal; and further, people who hold, as the above patients "did, that it is not necessary to take quinine systematically "in West Africa are, by spreading their pernicious doctrine, "a danger to other Europeans."

I may here add that such persons are themselves liable to be a direct centre of infection for others, especially when several men are quartered in the same house.

The necessity of taking quinine daily, and to the greatest advantage in solution, needs to be ingrained into all young European officials who are coming out to serve in Nigeria.

The following table shows the issue of quinine as a prophylactic:—

QUININE PROPHYLAXIS.

	1910 Grains.	1911 Grains.	1912 Grains.	1913 Grains.	1914 Grains.	1915 Grains.	1916 Grains.	1917 Grains.	1918 Grains.
Western District	1,206,000	1,530,100	1,344,000	915,001	593,423	770,333	844,786	862,718	768,510
Central „	140,532	299,963	355,448	407,484	597,574	53,281	326,066	442,865	407,024
Eastern „	400,671	586,384	301,286	625,845	900,733	651,749	426,452	596,986	817,478
Total ...	1,747,203	2,416,447	2,000,734	1,948,330	2,165,732	1,475,363	1,597,304	1,902,569	1,993,012

23. *Blackwater Fever.*—In Europeans there were 29 cases admitted for treatment with 4 deaths, a case mortality of 13·7%, very much lower than the case mortality in 1917 of 50%.

BLACKWATER FEVER IN EUROPEANS.

	1907.	1908.	1909.	1910.	1911.	1912.	1913.	1914.	1915.	1916.	1917.	1918.
Number of Cases ...	57	48	31	34	26	23	26	20	11	19	22	29
Case mortality rate per cent.	11·5	16·6	32·2	20·6	30·7	17·4	23·0	25·0	18·2	15·8	50·0	13.7

One case of Blackwater Fever, with recovery, is recorded in a native.

The prevention of Blackwater Fever is fully summed up in section 22, viz., Quinine Prophylaxis, which is a preventive measure against Malaria and consequently against Blackwater Fever.

24. *Trypanosomiasis.*—Two cases in Europeans are recorded for 1918; of these one case occurred in a European at Ibadan and one case was imported from the Northern Provinces.

25. *Yellow Fever.*—Two cases of Yellow Fever, both fatal, are recorded for 1918; one in a European at Forcados and one in a native at Benin.

Yellow Fever cases were reported to have occurred at the following places out of Nigeria:—

One imported case at Freetown, Sierra Leone, in August, 1918.

One case in a European at Lome in May, 1918.

One case in a European at Axim in August, 1918, and

One case in a native at Salt Pond in September, 1918.

At such times all the necessary precautions to prevent importation of the disease are taken not only in Lagos but all Nigerian ports.

26. *Filariasis.*—In Europeans 4 cases are recorded and 85 in natives. The majority of these are due to *Loa loa* in regions where the chrysops are prevalent. In natives 43 cases of Elephantiasis are recorded.

27. *Pappataci Fever*—One case in a native is recorded.

(2).—*Epidemic Diseases.*

28. *Plague.*—No infection of plague occurred nor were any cases reported from the Gold Coast or elsewhere.

29. *Destruction of Rats and Mice.*—This was carried out as a routine measure against the possible advent of plague with the following results as shown by this table:—

DESTRUCTION OF RATS AND MICE.

	1912.	1913.	1914.	1915.	1916.	1917.	1918.
Rats ...	18,528	16,488	13,352	13,305	15,197	20,713	12,356
Mice ...	8,346	8,279	6,817	8,087	9,102	9,871	5,489
Total ...	26,874	24,767	20,169	21,392	24,299	30,584	17,845

30. *Small-pox.*—In natives 439 cases were recorded with 74 deaths, a case mortality of 16·8%, which is a very low figure for Small-pox case mortality. These figures do not by any means represent the degree of infection that is prevalent when outbreaks occur.

The main seats of prevalence were in the Agbor district: at Abavo and Agenebode, where the case mortality amounted to 35·8%. This was heavy owing to the disease prevailing chiefly amongst children who are much more vulnerable than adults; at Epe and Gbekebo, in the Onitsha district of Okigwi division; at Ilaro in the province of Abeokuta; at Yenogoa, near Burutu, and at Gakem in the province of Ogoja.

The outbreaks were most severe in the Agbor district and Onitsha Province.

In each case rigorous measures to prevent spread were adopted and vaccination widely enforced wherever possible; unfortunately the natives in the Awka division of the province of Onitsha did not take kindly to it.

Lagos was particularly free from Small-pox in 1918; only one case occurred.

31. *Vaccinations.*—In Lagos quite a good staff of Vaccinators are maintained to conduct systematic vaccinations every day under the supervision of a Government Medical Officer, who also trains Vaccinators who are sent to outstations after a period of training covering three months.

The following table shows the number of vaccinations conducted during the year:—

VACCINATION.

	1910.	1911.	1912.	1913.	1914.	1915.	1916.	1917.	1918.
Total number vaccinated ...	135,647	166,394	243,316	168,491	149,273	101,467	136,279	152,803	133,706
Successful	88,579	113,657	176,944	121,102	99,260	71,716	87,963	96,675	72,982
Percentage of success	65·3	68·3	72·7	71·8	66·5	70·6	64·5	63·2	54·5

32. *Vaccine Lymph.*—Extra lymph was provided for during the year to meet the requirements of the Native Administrations of Oyo and Abeokuta. The supply for these two Administrations will be still further augmented in 1919. The preservation of child life is all-important with a view to not only maintaining the population but also materially assisting it to steadily increase.

The annual expenditure on lymph for the Southern Provinces alone for 1920 will amount to £2,000, and together with the £750 spent by the Northern Provinces on lymph it makes the total annual outlay £2,750 on vaccine lymph for Nigeria.

With the close of the war and the increase of staff every effort will be made to advance vaccination, which is one of the most potent means at our disposal for preservation of child life and population.

In view of the foregoing it would be as well to consider again the question of the advantages of local production of lymph by the establishment of a Vaccine Lymph farm in Nigeria which was well to the fore in 1914 but was laid aside owing to the outbreak of war.

The initial outlay would be heavy but there would be no limit to the output to meet future requirements, and if such a Vaccine Lymph farm were established for the supply of lymph to all the West African Colonies the financial gain on current annual expenditure may prove worth it.

33. *Chicken Pox.*—The total number of cases treated were 2,231. The disease is fairly general throughout the country. It occurred at Onitsha, Enugu, Warri and Forcados and many other places in the Eastern Province. In Lagos 39 cases were admitted to the Infectious Diseases Hospital.

34. *Cholera.*—Fortunately this disease has not been introduced into the country.

35. *Cerebospinal Fever.*—Four cases are reported as treated, with three deaths.

36. *Beri Beri.*—Thirteen cases were admitted for treatment with one death.

37. *Tetanus.*—During 1918 twenty-five cases were treated with 11 deaths, a case mortality of 44%.

TETANUS.

	1907.	1908.	1909.	1910.	1911.	1912.	1913.	1914.	1915.	1916.	1917.	1918.
Cases ...	29	26	27	29	25	29	24	46	33	34	19	25
Deaths	10	11	15	?	16	15	12	23	12	17	7	11
Mortality per cent.	34·5	42·3	55·5	?	64	51	50	50	36	50	36	44

The foregoing figures do not comprise deaths certified as due to Tetanus by private practitioners in Lagos, where the total certified deaths from Tetanus amount to 29 as compared to 22 in 1917.

38. *Rabies.*—No cases recorded.

39. *Venereal Diseases.*—The following figures shew the cases treated for Gonorrhœa and Syphilis.

VENEREAL DISEASE.

	1907.	1908.	1909.	1910.	1911.	1912.	1913.	1914.	1915.	1916.	1917.	1918.
Gonorrhœa	1,174	1,524	1,637	1,977	1,785	1,991	1,913	1,605	1,669	2,482	2,449	1,685
Syphilis ...	224	214	176	171	269	303	202	215	266	400	371	278

This fall in the figures given for 1918 is by no means indicative of the degree of prevalence and as, in the case of other diseases, figures for Venereal Diseases participate in "the decline in the incidence of all diseases" as stated in the general remarks on Public Health which forms the opening paragraph of the medical section of this Annual Report.

40. *Leprosy.*—106 cases of Leprosy were treated with 22 deaths as compared to 114 cases treated in 1917.

The segregation of lepers as a preventive measure to be of value must be effective and universal.

To inaugurate and maintain such segregation money and supervision are essential. Under present conditions of shortage of officers in both the Political and Medical services it is hardly expedient to tax their energies by adding to their burdens.

When, however, the time comes for carrying out segregation each province should have its own leper settlement under adequate supervision which would prove of more value than if one or two large so-called Leper Asylums were established. In this way each province would be responsible for its own lepers and the settlement, being under the care of the Medical Officer, would afford facilities for research in experimental medical treatment to those who wished to take advantage of the facilities which would otherwise be denied some who are desirous of prosecuting such experimental work. Such leper settlements would be far more acceptable to those suffering from the disease when they know that they would continue to live in their own country and be looked after by people of their own native land.

41. *Tuberculosis.*—The following figures show the number of cases recorded as treated by Medical Officers but they do not cover those treated by private medical practitioners in Lagos:—

TUBERCULOSIS.

1913.	1914.	1915.	1916.	1917.	1918.
159	109	168	181	178	140

Amongst the 140 cases treated there were recorded 34 deaths, which gives some idea as to the fatality caused by the disease.

In Lagos 74 certified deaths from Tuberculosis were registered as against 55 in 1917 and 34 in 1916.

The figure for 1918 shows a marked rise due in part to increased incidence of the disease and in part to rise in the number of certified deaths registered.

The total certified deaths registered for Lagos in 1918 amount to 931. These are inclusive of 244 certified deaths from Influenza. The normal number of certified deaths for the year, exclusive of those due to Influenza, which constituted an exceptional epidemic unknown in other years, amount to 687.

The true percentage of certified deaths from Tuberculosis of all forms is struck from the ratio of the number of certified deaths from Tuberculosis, viz., 74 to the normal number of total certified deaths, viz., 687, and amounts to 10·78% as compared to 9·5% in 1917.

As an issue of the remarks submitted under section 40 "Tuberculosis" of the Annual Sanitary Report for 1917, in which reference was made to the insanitary housing conditions in Lagos which aid the spread of Tuberculosis and the necessity of an improvement scheme, the Director of the Medical and Sanitary Services directed that a conference should be held to discuss the alleged increase of Tuberculosis in Lagos. The Acting Senior Sanitary Officer, Dr. Beringer, conferred with Dr. Dalziel, Medical Officer of Health, and Dr. Sapara, a native Government Medical Officer. I attach to this report a copy of their deliberations entitled:—

"THE ALLEGED INCREASE OF PHTHISIS IN LAGOS TOWN."

Wherein in paragraph 12 is a summary of important recommendations, I to VI, made by them.

AS REGARDS THESE RECOMMENDATIONS:—

I. *Isolation.*—The conclusion expressed speaks for itself that it is not practicable.

II. *Notification* of cases by medical men has not been carried out but it was suggested that the introduction of registration should wait "until times become normal." The procedure that has been adopted to meet the situation in place of notification is that the Medical Officer of Health is informed by the Registrar of Vital Statistics as to all deaths certified as due to Tuberculosis and the addresses where such deaths have occurred; the Medical Officer of Health then inspects the premises and advises as to ventilation and carries out necessary disinfection and takes action under the following sections of the Public Health Ordinance:—

"Section 7. Nuisances which may be abated summarily "The following shall be deemed to be nuisance:—

"(2) Any premises which are so dark or so ill-ventilated "or so damp or in such a condition of dilapidation as "to be dangerous or prejudicial to the health of the "persons living or employed therein."

"(11) Any premises certified by the Health Officer to be so "overcrowded as to be injurious or dangerous to the health "of inmates."

"Rule 49 (under the Public Health Ordinance).

"A room used exclusively or partially as a dwelling room "shall be deemed to be overcrowded when the vacant floor "space available for each adult is less than 30 square feet "or the cubic capacity less than 300 cubic feet of free air: "two children under 10 years of age counting as one "adult."

Action under the foregoing laws by the Medical Officer of Health are very sound but its benefits cannot compare with the beneficial results that would accrue by notification of all cases of Tuberculosis, which would amount to dealing with the infection in its infancy before it has had time to mature and become disseminated to the detriment of many others who have become infected before the case has terminated fatally and after which, if action is taken by the Medical Officer of Health, the best advantage would be derived.

If measures against Tuberculosis are to prove of value it is now when, so to say, the spread of infection in Lagos is in its infancy, that all available means should be adopted and a move in the direction of notification would now, with the return to normal times, be an advancement.

III. *Microscopic Examination.*—The Director of the Medical Research Institute at Yaba was willing to undertake the examination of specimens sent him in addition to all the work at the Institute that he had to conduct single handed. There is little doubt that the need of a pathologist with a laboratory to deal with the immense amount of material available from clinical cases in the Lagos Hospital, and from Infectious cases as Tuberculosis, would prove of the utmost value in diagnosis and a source of greater interest in medical men, who are often dealing with obscure cases when no pathological and bacteriological diagnosis are available as an aid to the clinical aspect of cases. It would be well if this matter received consideration.

IV. *Education.*—The recommendation made was carried out. A leaflet on Tuberculosis was drawn up by Dr. Sapara, the Medical Officer of Health, and Senior Sanitary Officer for free circulation to the public. In Lagos the Medical Officer of Health has supplied all the schools with these for the instruc-

tion of the young. Copies are distributed at the office of the Registrar of Vital Statistics to relatives who come to register deaths. Apart from this copies are being distributed through the Director of Education to all schools, Government or otherwise, throughout the Southern Provinces.

The leaflet was also translated into Yoruba by Dr. Sapara and printed copies are being distributed freely, in the same way as the one in English, for the benefit of those educated in the vernacular.

V. *Health Visitors.*—The appointment of a woman Sanitary Inspector was recommended so as to get into touch with the women folk of the homes and advise them, a duty that is essentially one for a woman to carry out to be of the best advantage, and it is a matter now to be kept in view with the return of more normal times.

VI. *The Housing Problem.*—Of the three recommendations put forward under this head there is not the slightest doubt that the one embodied in (c) is the one great solution, viz.:

> "That the layout of new townships in the neighbourhood "be considered."

In handling this subject the Director of Medical and Sanitary Services recognised the need of tackling the housing question when he said:—

> "I am sceptical as to any good results accruing from such "a campaign until the housing problem in Lagos is dealt "with in a practical manner."

At the present time the housing problem as a whole in Lagos is now receiving consideration, both for Europeans and for natives. A scheme for the layout of a new native location at Apapa is in hand and a scheme for the layout of an extension for natives, between Ebute Metta and Yaba, is in view with the object of providing accommodation and relieving the existing congestion in Lagos as well as for meeting the needs for increased commercial enterprise, which promises rapid strides in the future, and this must be kept in view.

Hence recommendation (b):

> "That the question of building tenement houses be "considered"

is one also for due consideration so as to provide adequate sanitary accommodation on model lines for the working classes which can also then be kept under the best sanitary control.

Such tenements for artisans, mill-hands, and others are provided in large centres, as the suburbs of Bombay, etc.

Hopes are now entertained that in the near future the medical and sanitary authorities will be able to report as to material advance having been made in the prospect of improved housing schemes for both Europeans and natives and that the new layout at Apapa and of an extension towards Yaba for natives will be an accomplished fact, progressing favourably.

42. *Dysentery.*—In Europeans, 40 cases were treated with no deaths as compared to 34 cases treated in 1917. Amoebic Dysentery formed 85% of the cases.

In natives, 920 cases were treated with 150 deaths, a case mortality of 15·2%. The number of cases treated in 1917 was much greater, viz., 1,059 and with a lower case mortality of 11·2.

Of the 920 cases treated in 1918, the Amoebic variety constitute 66·7% and the Bacillary variety 23·1%.

43. *Enteric.*—Four cases of Enteric Fever were recorded as treated in 1918. Of these, one was a European who contracted infection either before leaving England or on board ship and took ill very soon after landing. Of the remaining three cases in natives, two cases occurred early in the year in Lagos and probably formed the last of the infection that prevailed in 1917, as recorded in section 42 of the Annual Report for that year.

On the occurrence now of any cases of a particular infectious disease private medical practitioners will be notified as to the presence of such disease to put them on the alert.

44. *Influenza in the Southern Provinces.*—Influenza first made its advent into Lagos on the 14th September, 1918, when three cases were recognised on a ship which brought the infection from the Gold Coast; besides these other cases about the same period were also brought by ships from the Gold Coast.

Beyond the receipt of a cablegram on the 30th August, 1918, from the Governor of Sierra Leone, giving the information that there was a serious epidemic of Influenza at Freetown, and of vague rumours as to Influenza with a high mortality on the Gold Coast no authentic information was received officially until the 18th September, 1918, from the Gold Coast, when a cablegram was received stating that Influenza was widespread at Accra. This information was too late to put us on our guard for a small vessel crowded with deck passengers, amongst which were many infected, from the Gold Coast, crept into port unnoticed as she needed no pilot; as a result the infection was disseminated in Lagos and by train, overland, and by canoe along creeks and rivers into the interior.

Although Influenza does not come within the list of three diseases:—

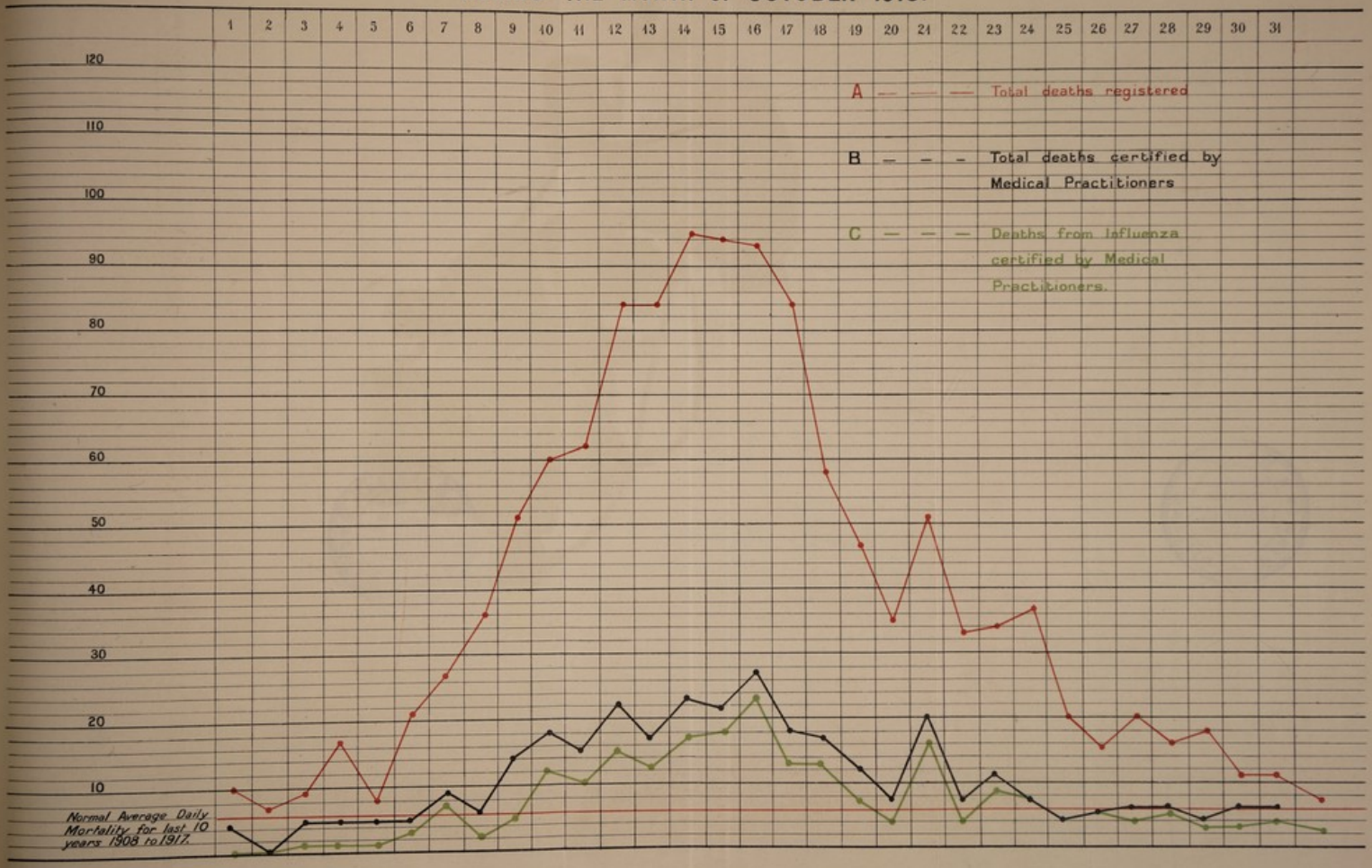
(1) Cholera
(2) Plague
(3) Yellow Fever

which according to the International Convention of Paris demand quarantine and notification, yet so far as the West African Colonies are concerned in case of any such severe outbreaks of infectious disease, as Influenza or Cerebro-Spinal Fever, etc., spreading rapidly or occasioning a high mortality, concerted action is necessary on the part of all the Colonies to the mutual advantage of others so as to notify them of the prevalence of such disease at the very onset of the outbreak, and so to permit of preventive measures being adopted by any Colony that wishes to take action and not supply the necessary information, so to say "a day after the fair."

The last time Influenza is said to have visited Lagos and the Southern Provinces in epidemic form, with a heavy mortality was in 1890.

A very full and interesting report, "The Influenza Epidemic of 1918 in the Southern Provinces of Nigeria," has recently been submitted and a copy has been transmitted to the Secretary of State. The plan of Nigeria accompanying the report shows the ports of entry of the disease with dates and routes of spread of the Epidemic by rail, rivers, creeks and land, with dates thereof throughout the Southern Provinces. The following is an extract from the report:—

Chart Showing the Daily Mortality in Lagos and Ebute Metta during the month of October 1918.



INFLUENZA EPIDEMIC

SOUTHERN PROVINCES OF NIGERIA

Scale:- 5,000,000 or 1·014 Inches to 80 Miles

Miles 75 0 125 250 375 500 Miles

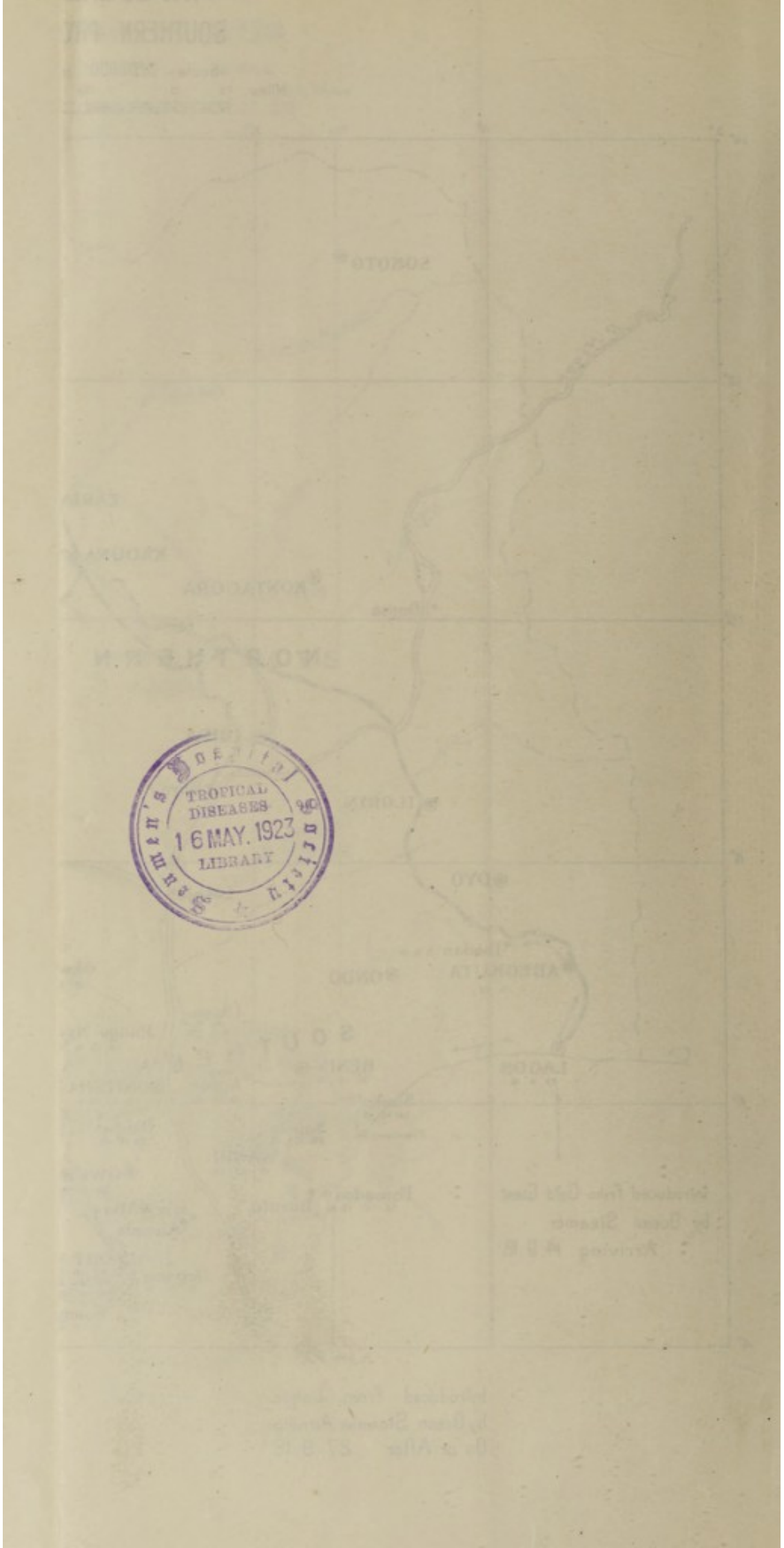
Introduced from Gold Coast by Ocean Steamer Arriving 14.9.18

The Arrows Indicate Direction of Spread

The dates Indicate the First recorded Cases On Shore.

Introduced from Lagos by Ocean Steamer Arriving On or After 27.9.18

Introduced by Ocean Steamer Arriving 28.9.18



"VIII. SUMMARY AND CONCLUSIONS."

"41. (*a*) Nearly 3% of the population of the Southern Provinces of Nigeria, that is at least 250,000 individuals, died from Influenza during the Epidemic.
(Paragraphs 27, 28 and 32).

"(*b*) More than half the population suffered from the disease in a more or less acute form. (Paragraphs 31 and 32).

"(*c*) More than 5% of those attacked in a more or less acute form died. (Paragraphs 31 and 32).

"(*d*) The onset and decline in each place were remarkably rapid: there was a period of about a fortnight during which the disease reached its maximum followed by a fortnight when the disease was at its maximum, then a third fortnight of rapid decline. (Paragraph 30).

"(*e*) Young adults suffered more than children and the old, and men more than women. (Paragraph 33 and 34).

"(*f*) Lagos was the primary focus of infection; minor foci being Calabar and Forcados. (Section II).

"(*g*) The disease spread chiefly along the railway, and by river and road along the trade routes. (Section II).

"(*h*) Lagos was infected on the 14th September; generally the Epidemic spread northward and eastward: the river Niger in the Southern Provinces being reached during the middle of October, the Eastern Railway at the end of the month, the Cross River early in November, and the Cameroons about the middle of November. (Section II).

"(*i*) Spread was facilitated by natives running away or returning to their homes and by their superstition and the machinations of the Juju man. (Paragraphs 26 and 39).

"(*j*) Practically all prophylactic measures were useless. (Paragraphs 35 and 36).

"(*k*) Some antagonism against Europeans was manifested in a few districts as it was believed that the "White Man" had introduced the disease. (Paragraphs 39 (b) and (c)).

"(*l*) The Epidemic was too overwhelming for treatment to have much effect—except in a few places where Medical Officers are stationed. Matters had necessarily to be left to themselves. Excluding the Cameroons, the population of the Southern Provinces of Nigeria is about nine million, the area about 78,600 square miles, and the Medical Officers about 32."

From the foregoing it is seen how great was the magnitude of the task for the medical and sanitary authorities to tackle this epidemic by the institution of preventive measures and the treatment of the sick. Every effort was made to carry these out at each place to the extent that it was practicable, and I wish to record the liberal co-operation that was everywhere given to the medical and sanitary authorities in their efforts to check the spread of this disease by all the officials of other Government Departments as well as by the civilian population.

In Europeans the incidence rate is 21·1%, a rather low estimate as many very mild cases were never recorded since they never sought treatment.

The total number of cases of Influenza in Europeans for 1918 was 418 treated with 15 deaths, giving a case mortality of 3·5%. Number of Government officials invalided due to Influenza was 9, and the deaths of officials amounted to 12.

The case mortality in Europeans for the whole epidemic amounts to 4·8% in the Southern Provinces as compared to 5·1 as recorded in the Northern Provinces.

In natives, 15,317 cases of all classes were treated with 666 deaths, a case mortality of 5% for the whole of the Southern Provinces, Lagos included, up to 31st December, 1918.

For the whole of the epidemic the case mortality was 4·5%.

Influenza in Lagos.—A very detailed "Report on the Influenza Epidemic in Lagos, October, 1918," has already been forwarded and it has been submitted to the Secretary of State. Section II, subsections 31 to 33, deals in full with the "General Preventive Measures Taken" and section IV, subsection 40, gives "Details of some of the measures taken in regard to shipping." Amongst other measures taken House to House Visiting was conducted by the aid of volunteers and the sanitary staff under the Medical Officer of Health; disinfection, segregation of contacts and the removal of sick to the Infectious Diseases Hospital was carried out so far as practicable in the early part of the epidemic until the cases were not too numerous, but later only the more urgent and needy cases requiring care and nursing were removed to Hospital, which without doubt was the means of saving many lives.

When it was seen that the disease was becoming general and that every resource must be tapped to meet the situation in order to render medical aid to the poor and needy, it was considered expedient to requisition the help of medical practitioners who assisted in the House to House Visiting, gave free medical attendance and they were also provided with a supply of milk to be given free as nourishment to the weak and urgent cases until they could be removed to Hospital. Every possible precaution was taken to avoid spread of the disease by rail and creeks or overland into the interior, but all proved of no avail.

Section IX of the Report submitted, "Summary and General Conclusions," embodies much statistical information and gives a concise resumé of the measures adopted. It will be as well to quote section IX, subsection 64, herein :—

IX.—"SUMMARY AND GENERAL CONCLUSIONS."

"64. (*a*) At least 1·5%, *i.e.*, 1,200 of the population of Lagos died from Influenza (paragraph 29).

"(*b*) More than half the population suffered from the disease in a more or less severe form, *i.e.*, excluding Inflamatory cases (paragraph 59).

"(*c*) The case mortality varied from 1·6 amongst the Government clerk and superior workman class to 13·9 in the Infectious Diseases Hospital to which, as a rule, only the worst cases were taken, including moribund cases picked up in street or house. (Paragraph 59). From (*a*) and (*b*) above it follows that the general case mortality was about 3%.

"(*d*) The s.s. "Bida" was the main source of infection, arriving at Lagos on the 14th September and discharging 239 passengers from the Gold Coast. (Paragraph 5).

"(*e*) The Sanitary Authorities were not aware that the Gold Coast was infected until after Lagos was infected. (Paragraph 9).

"(*f*) Apart from (c), the passengers from "s.s. Bida" scattered without passing through the hands of the Sanitary Authorities owing to the peculiar status of the Captain as pilot (paragraph 9).

"(*g*) Even if the "s.s. Bida" had been prevented from infecting Nigeria it is highly improbable that the Colony would have escaped.

"(*h*) Influenza was made a notifiable disease on the 3rd September, 1918; the first non-imported case was notified on the 20th September (paragraph 10) and Lagos was declared infected on the 25th.

"(*i*) The epidemic increased very rapidly and decreased as rapidly. (Paragraph 22).

"(*j*) The post mortem naked eye appearances of some undoubted cases of Influenza struck those present as remarkably like those seen in Yellow Fever. But on this subject I am not in a position to give details: I understand that a report will be submitted in due course by the Director of the Medical Research Institute.

"(*k*) The usual prophylactic measures taken in Infectious Diseases—isolation, segregation, disinfection and so forth—were at first rigorously enforced but without avail in stopping the spread of the Epidemic.

"(*l*) Later, House to House Visiting in search of concealed and unattended cases was undertaken; its initiation, in the hands of native volunteers at their own request, was not a great success. (Section V).

"(*m*) Schools, Churches, Mosques and indoor meetings, etc., were stopped. (Paragraph 33 (g)).

"(*n*) Free treatment, drugs and milk were at the disposal of all necessitous poor patients.

"(*o*) Sanitary measures were first directed to prevent importation of cases and finally, when Lagos was well infected, their export. Intermediately action depended to some extent on the relative degree of infection of shore and ship."

Much credit is due to the Acting Medical Officer of Health, Dr. Beringer, for the thoroughness and tenacity with which he carried out all the preventive measures against spread of the disease, and the Sanitary Authorities are indebted to all the medical men, official and non-official—European and native—as well as to the rest of the gentlemen both official and civilian who gave their time and energies in assisting in prosecution of preventive measures and the care of the sick.

In Lagos the case mortality due to Influenza for the whole Epidemic amounted to 4·2% amongst Europeans, as compared to 4·8% for the whole of the Southern Provinces; and 5·6% in natives in Lagos as compared to 4·5% for the whole of the Southern Provinces.

(3).—Helminthic Diseases.

45. *Entozoa.*—In Europeans 7 cases were treated for the following Entozoa:—

Tænia saginata		1
Ascaris	...	1
Oxyuris	...	1
Strongylus	...	4

In natives the following is the percentage incidence struck from the cases treated:—

Tapeworms of all kinds	5·9%	same as in 1917.
Ascaris	77·8%	higher by nearly 10% than in 1917.
Ankylostome ...	13·6%	lower by 10% than in 1917.
Oxyuris	·69%	slightly lower than in 1917.
Others	·82%	

The total cases treated for worms amount to 3,014 in natives a compared to 3,593 in 1917. Locality incidence of cases treated:—

	Western Province.	Central Province.	Eastern Province.	Total.
Tapeworms ...	178	nil.	nil.	178
Ascaris ...	1,036	1,026	285	2,347
Ankylostome ...	138	148	157	443

From the foregoing it is seen that Tapeworms are mostly met with clinically in the Western Province and it is remarkable that records for the Eastern Province do not shew any cases for it will be noted from the 1916 annual report that the highest figures for cases treated were recorded in the Eastern Province. Possibly an increased consumption of meat in the Western Province accounts for the high incidence.

The clinical distribution of Ascaris is about equal for the Western and Central Provinces, and for Ankylostome the infection seems more or less equally and widely distributed throughout the three Provinces and the Eastern Province records the highest figures, which was also noted as such in the annual report for 1916.

46. *Trematodes.*—Two cases of Fluke infection are recorded as treated.

47. *Bilharzia and Trichiniasis.*—Are deserving of no comment as no cases are recorded of latter and few of former.

48. *Guinea-Worm.*—In Europeans 3 cases were treated, all occurred in the Eastern Province.

In natives the following were treated in:—

Western Province	322	or	57·8%
Central Province	57	or	10·2%
Eastern Province	178	or	32·0%
	557		100%

In 1917 quite 50% of the cases were recorded in the Western Province also, the Central Province comes next and the Eastern Province records least. In this year's records for 1918 the Western Province still leads with 57·8%, the Eastern Province comes next and the Central Province shews least.

III.—General Measures.

49. *Sewage Disposal.*—Disposal into soil or water is carried out to the best advantage according to local conditions at each station.

50. *Latrines.*—During 1918 the same difficulty, due to war conditions, has prevailed for obtaining galvanised iron latrine pails and various unsatisfactory substitutes have been adopted.

Now that the war is over and the past stringency in the manufacture of metal ware is relaxed the existing difficulties will be rapidly overcome. Public latrines are being gradually increased where necessary.

51. *Disposal of Refuse.*—There is nothing of note to add to the methods of disposal by burial and burning in vogue. The construction of small efficient destructors at reasonable cost is one still to be achieved.

52. *Drainage.*—No new drainage schemes have been considered; expenditure on such has been for the present prohibitive. The existing permanent drains have been kept in repair so far as possible and the temporary surface drains require constant attention for the clearing of silt and undergrowth.

53. *Bush Clearing.*—At each station sanitary gangs are maintained to keep down undergrowth. Where such is particularly luxurious special clearings are carried out annually.

54. *Markets and Slaughter Houses.*—The establishment of these on more model sanitary lines is one being kept in view for second class Townships which are rapidly developing.

At Abeokuta in the native town the market has been very much improved by the erection of permanent booths, with cemented floors and improved drainage.

55. *Infectious Diseases Hospitals.*—These are maintained as permanent ones at Lagos, Calabar and Warri and prove of very great utility in enabling outbreaks of infectious diseases to be dealt with satisfactorily in their initial phase.

Temporary ones are maintained at all outstations.

During the recent Epidemic of Influenza the Infectious Diseases Hospital in Lagos proved of extreme value. The accommodation was more than doubled by the erection of temporary buildings and the Ikoyi Prison was also converted for the time being into an Infectious Diseases Hospital to take the overflow of patients from the existing one.

56. *Sanitary Stations.*—Until the end of 1918 three such stations for Quarantine purposes were always maintained at Lagos, Forcados and Bonny. The quarantine station at Forcados was subsequently abolished.

57. *Prisons.*—According to the Annual Report of the Prisons Department, 1918, the following figures shew the daily average number of prisoners in the Southern Provinces:—

In	1907	2,410 prisoners.
„	1914	4,809 „
„	1915	5,210 „
„	1916	5,381 „
„	1917	7,060 „
„	1918	6,953 „

The foregoing figures shew that in the period 1907 to 1914 the daily average number of prisoners was doubled. Subsequently a steady rise has taken place until 1917, when the figures reached 7,060, and in 1918 this number has been nearly maintained at 6,953. As compared to 1907 the daily average is now nearly three times what it was but the prison accommodation has not increased in the same ratio.

In 1917 a certain amount of increased cell accommodation was provided.

In 1918 a further increase of cell accommodation as follows:—

Considerable increase at Port Harcourt and Aba.
Moderate increase at Warri and Ogoja.
Small increase at Abeokuta, Sapele and Ogwashi.

A table shewing Prison Statistics accompanies this report as in other years.

In this table, columns numbered 1, 2, 5, 7, 8, 9 and 10 afford the necessary information as to the main sanitary data and health condition of the prisoners. On comparing column 2 with 1 it will be seen to what excess overcrowding takes place in the various prisons over and above the authorised standard accommodation available. Out of 30 prisons no less than 18 shew excess varying from 2 to 4 times the authorised number.

This excess is only based on average figures so that at times the actual excess is often very much higher and overcrowding excessive. The causes of mortality are mainly

Influenza, Pneumonia, Bronchitis,
Diarrhœa, Dysentery and Ankylostomiasis.

The Death Rate.—This varies within wide limits at different places as seen from column 10. Out of 30 prisons 2 shew no deaths, 9 shew a fall in the death rate, 5 shew a rise in the death rate, in 8 the death rate is doubled, in 2 it is quadrupled, and in 2 still higher.

The Influenza Epidemic is to a great extent responsible for the increase in mortality. This was the case with regard to the Lagos prison, where the death rate in 1918 is 25·9 as compared to 6·3 in 1917, and at the Calabar prison it is 109·2 in 1918 as compared to 54·9 in 1917. These two prisons are the best constructed, equipped, conducted and supervised and yet their death rate has risen greatly, hence it can be understood how much higher was the death rate in 1918 at other outstations that do not reap the same advantages to the extent enjoyed by the prisons at Calabar and Lagos.

With regard to the rise in the death rate the figures for 1918 are not a fair guide as to improvement or otherwise in the health conditions of prisons that prevailed in 1917, which were quite bad enough when Influenza superimposed inflicted its deadly blow.

It will be well now to await the statistics for 1919 to judge as to improvement or otherwise in the health statistics of prisons as compared to that of former years.

Under normal conditions, regardless of epidemics, the main factors that subscribe towards the maintenance of health of prisoners are:—

(*a*) Adequate sanitary accommodation.
(*b*) Clothing and Blankets.
(*c*) Diet.

As regards accommodation much has been written on this subject, something has been done and hopes are now entertained that this question of increasing the accommodation to meet all requirements will receive its due attention with the return of normal times.

The deficiency in the supply of clothing and blankets was attributed to shortage in shipping, but towards the end of the year conditions improved and supplies were more generous.

No difficulties should now be encountered in the future in this respect.

The present scale of prison diet is of excellent standard but for dietetic benefits to be evinced a watching brief needs to be kept on both quality and quantity of food stuff with provision of regularity in supply.

In the Annual Report of the Prisons Department, 1918, paragraph 9, it reads as follows :—

"9. The authorised scales of prison dietary were generally "adhered to. It was impossible, however to obtain regularly the "food stuff prescribed."

With a view to the exercise of much closer supervision by an European official of the prison department it would be well for two travelling Inspectors of Prisons to be appointed who would periodically visit all the prisons at outstations, and frequently visit those shewing bad health records so as to keep a watching brief on their management, diet and general sanitary condition. Such Inspectors would need to be men with some sound local experience and with a knowledge of local conditions.

58. *Town Planning and Building Regulations.*—The drawing up of model Building Regulations as applicable to new European Reservations and new native locations of Townships is receiving attention. Although little advance has been made in this direction it is hoped that the end of 1919 will see the maturation of some of the efforts in this matter.

Such regulations will be primarily ones which are applicable to the suburban expansion of Lagos and Ebute Metta which it is proposed will take place towards Yaba and for the new native location of Apapa.

Subsequently it will be possible to formulate more definite building regulations for 2nd and 3rd class townships as applicable to quarters occupied by natives.

59. *Inspection of the Railway.*—It is much regretted that owing to shortage of staff no systematic inspection has been conducted of the Railway main line in the Southern Porvinces nor of the Eastern section during 1918.

As soon as the staff of sanitary officers is up to normal strength such inspection will be carried out in detail.

Borrow Pits on the Railway.—Early in the year as a result of an inspection of Ibadan by a Sanitary Officer the attention of the Railway Authorities was called to the presence of borrow pits which evoked the following reply :—

"That the railway is not at present in a position to undertake "work of this nature."

What is lost sight of is that sanitation in its own sphere is as much to the interests of the state as is the construction of a railway and it would be well if, now that normal times are being resumed, action were now taken by the Railway to fill in or drain or both all borrow pits dug for any railway purpose whatsoever within a town or a township or within a mile of the boundaries of any town or township ; moreover, in the course of construction of earthworks for new railway extensions the principle of "prevention being better than cure" should be applied for after all it is practicable in most cases and it is the cheapest sanitation in the long run. By this means the interests of the railway will be subserved in :—

(*a*) Helping to preserve the health of railway employees, as well as that of the public.

(*b*) In preventing the after expense incurred in having to remedy insanitary conditions produced during construction.

(*c*) And thus will the time and energy of Sanitary Officers as well as that of officials of other departments be conserved for devotion to other sanitary problems that afford more satisfactory results.

60. *Lagos and Ebute Metta*—With regard to infectious diseases in Lagos much has been written on Tuberculosis and Influenza (see sections 41 and 44). Reference has also been made to Small-Pox (section 30) and Enteric (section 43). Besides these there occurred 39 cases of Chicken Pox, 1 of Measles and 1 of Mumps.

Food.—Bake-houses are registered and inspected regularly. Places where native foods are prepared are also inspected as to their cleanliness and freedom from rats.

All animals for slaughter are inspected primarily and so also the carcase after slaughter. The sale of meat in markets is also supervised.

The consumption of meat is on the increase as seen from the following figures for animals slaughtered.

	1917.	1918.
Cattle per diem	25	28·5
Sheep „ „	4·7	6
Goats „ „	14	2·3
Pigs „ „	4·6	4·4

Animals rejected before slaughter as unfit for slaughter for sale:—

In 1915	78 Cattle.
„ 1916	56 „
„ 1917	27 „
„ 1918	6 „

Number of organs and parts condemned was 1420: of these Liver Fluke (Fasciola gigantica), chiefly in cattle, furnished 860, occurring in 8·2% of those examined and the Bronchial worm (Metastrongylus apri) in the lungs of pigs 130, forming 8%.

Contagious Pleuropneumonia and acute Pleurisy in cattle and a form of Liver Cirrhosis in pigs were the commonest diseased conditions met with.

Tuberculosis was found in 18 cases as compared to 54 cases in 1917. The foregoing information on Food is extracted from the Annual Report for 1918 on Lagos by the Medical Officer of Health of the Town Council.

Drainage and Reclamation.—In the Annual Report of the Medical Officer of Health for Lagos the following appears on page 12 under "V General Sanitation" "(3) Drainage and Reclamation.".

> "70 out of 152 public fountains in Lagos are still without drains "to carry off waste water, causing constant nuisance in streets and "furnishing an extra source of stagnant puddles. One had again "to be closed temporarily during the rains as the street was "practically impassable. Broken supply pipes are promptly "repaired, but the secret of a non-leaking tap seems to await "discovery."

This question of the drainage of waste water from stand-pipes is one that will receive attention so that progress may be reported on in the next Annual Report.

With reference to reclamation the following is stated:—

> "At Apapa reclamation, commenced in 1915, still proceeds; "the area filled up to the end of 1918 being 98·8 acres."

Many other areas in Lagos need reclamation from the sanitary point of view and unless the reclaiming facilities, in the way of dredgers and reclamation plant are increased the progress of reclamation will be very slow in proportion to these needing reclamation. At Apapa extensive bush clearing was again carried out in the vicinity of the Government quarters with a view to improving their general sanitary condition.

Water Supply.—A large number of wells still exist in Lagos as a source of water supply. During the year, quoting from the report by the Medical Officer of Health, 140 were filled in but 20 were dug. Under recent Byelaws enacted under the Public Health Ordinance new wells cannot be dug without permission from the Medical Officer of Health nor can they be dug within a radius of 100 yards from an available standpipe or watermain of the public water supply.

The Iju Water Works form the main source of water supply to Lagos. In the Annual Sanitary Report for 1917 reference was made to improvements suggested for the Iju Water Works by the Sanitary Authorities. As a result the Water Authority proposed to carry out some of the suggestions made. The Sanitary Authorities now wait to be informed as to the improvements effected when an inspection will be made and a report rendered.

With the recent advances being made in the purification of water by means of Chlorination as an adjuvant to filtration it behoves us to be abreast of the times in such advancement and the sooner the better for our sister Colony, the Gold Coast, is going ahead of us, I am informed, in this matter and has already imported a Chlorinating plant for the Seccondee Water Supply. It would be as well to mention that this question of recent advancement in the methods of purification of water, now employed in many other countries as America, England and India, by means of the use of coagulants and Chlorination as adjuvants to filtration have not been overlooked by the Senior Sanitary Officer who investigated the situation in England on his last leave. As a result recommendations in full will be submitted shortly to the Executive not only with regard to the Lagos Water Supply but with regard to other water supplies that already exist or are in view. For the Lagos water supply from Iju, Chlorination specially commends itself after filtration since there is considerable danger of contamination taking place in the course of distribution owing to the existing physical conditions of site, soil, subsoil, proximity of ground water and pollution of such that prevail in Lagos.

61. *Port Harcourt.*—In the Annual Sanitary Report for 1917 section 57 reference was made to the proposed scheme for a pipe borne water supply from the Aba River for which an investigation of the Head waters of the Aba River were carried out and that plans of the proposed filtration system need to be submitted to the Sanitary Authorities for approval. This still remains to be fulfilled. It is important that the Sanitary Authorities view these plans and offer any suggestions necessary; more so in view of the remarks that have been made under section 60 "Lagos and Ebute Metta" in the paragraph dealing with "Water Supply". The recent advances that are being made in the methods of water purification, which are not purely limited to filtration, make it incumbent on us to adopt the most efficient of recent methods in application elsewhere with success and plans for new water purification schemes should be drawn up accordingly with provision for modern accessories such as chlorination and the use of a coagulant where necessary.

62. *Calabar* was inspected in January, 1918, and sanitary recommendations were submitted in great detail. Unfortunately, with the closing year of the war and shortage of staff, money and materials little has been accomplished. Calabar is now a 2nd class Township with an Advisory Board which has ample material in the way of sanitary suggestions for accomplishing improvements as facilities occur or are made for carrying out the suggestions. The development of Port Harcourt as an important shipping and trade centre seems to have taken away considerably from the importance of Calabar nevertheless efforts will be made to maintain the sanitary interests of Calabar.

Lectures.

63. In Lagos the training of Sanitary Inspectors has been conducted by Dr. Dalziel and Dr. Beringer during the periods each was acting as Medical Officer of Health. This work of tuition involves considerable energy on the part of the Medical Officer of Health who delivers lectures, holds demonstrations and defines routine duties for practical work in the Native town, keeping a keen eye on their work and progress. A course in general education is also given to the Sanitary Inspectors in Training by the staff at King's College to whom the thanks of the Sanitary Branch is due.

64. *Teaching of Hygiene, and Sanitation in Schools.*—On this subject the following note has been made by the Director of Education:—

"The principles of Elementary Hygiene and Sanitation have "been taught during the year in the majority of schools under "Government inspection."

"A paper in this subject is set to candidates for Teachers "Certificate Examination"

"Fair progress has been made in schools in large towns and "practical results are gradually making themselves felt."

"In up country schools it is more difficult to make advance "chiefly owing to local conditions and environments."

"Improvement may be expected with an increase in the number "of teachers who have been through a Training College Course".

Short sanitary lectures are given to chiefs and their headmen and to senior pupils in schools by Sanitary Officers when on tours of inspection. In advising the chiefs on sanitary matters relative to their towns the assistance of Political Officers in charge of the district or province is always invoked.

65. *Vital Statistics.*—The Senior Sanitary Officer is also Principal Registrar of Vital Statistics under the Births, Deaths and Burials Ordinance 1917. The duties as Principal Registrar are growing every year and often considerable time has to be devoted to the work. The sphere of influence of his duties has been increased by the application of the Ordinance, so far as non-natives are concerned, to the Northern Provinces also and it will be very considerably increased still further when the Births and Deaths of natives become registrable in townships of both the Southern and Northern Provinces, involving an increase in the work of the staff also.

The fact that the Senior Sanitary Officer holds the post of Principal Registrar is advantageous from the sanitary point of view more especially for Lagos which is a first class township where Births and Deaths in natives have to be registered. Moreover owing to the large number of private practitioners in Lagos the number of certified deaths is not only comparatively large but steadily increasing and the observations on Vital Statistics of very much greater value from the public health and sanitary point of view.

66. In view of the fact that registration of both non-natives and natives for Lagos and Ebute Metta has now long been accurately maintained which permits of their being more comparable from year to year a summary of some of the more important observations in connection with these statistics is recorded hereunder:

Non-native.

The estimated population is not available.

Total births	6
„ deaths	26
Deaths—Infants under one year ...	1
„ —Children under five years ...	3
Deaths—causation of—certified by medical practitioners ...	24
„ —causation of—certified by medical practitioners per cent	92.3

Natives.

Estimated population	81,941
Total births	2,514
Birth rate (per 1,000 population) ...	30.6
Total deaths	3,228
Death rate (per 1,000 population) ...	39·3
Deaths—Infants under one year ...	830
Infantile mortality (per 1,000 births)	330·1
Deaths—Children under 5 years ...	1,314
Percentage of deaths of children under 5 years to total deaths	41·01
Deaths—causation of—certified by medical practitioners	982
Deaths—causation of—certified by medical practitioners per cent...	30·4
Deaths under one year certified by medical practitioners	142
Still births	151

Non-native and native.—The total deaths each year prior to the Influenza epidemic during the period 1910 to 1917 shew slight variations and the average number of deaths per annum for the same period amounts to 2155.

In 1918 the total deaths registered were 3254. Deducting from this figure 1017 deaths due to Influenza it leaves 2237 deaths attributed to the ordinary causes of mortality, which is slightly above the average of 2155 *viz.* an excess of 82 which in the majority of cases may be reasonably attributed indirectly to Influenza or its after effects which doubtless subscribed to the precipitation of death ascribed to other causes.

67. Increase in the number of certified deaths registered:
Of the total deaths, certified and uncertified registered annually the percentage of certified deaths for the years 1910 to 1913 was fairly steady; from 1914 the percentage rose and in 1918 it reached its maximum when 983 deaths, out of 3,254 registered, 30·2% were certified by medical men.

As an outcome of false information supplied by informants who register non-certified births and deaths it is proposed to appoint in 1919 a Sanitary Inspector as an Investigator to verify addresses and causes of death given by informants, to investigate any suspicious circumstances as to cause of death or where the number of deaths registered are rising unduly and epidemic disease is suspected.

The appointment of such an Investigator will doubtless have the salutary effect of making informants give correct information and also of increasing the number of certified deaths for many people would prefer to call in medical attendance so as to avoid investigation of a death with the possible prospect of an inquest.

68. The causes of deaths. As regards the causation of death in normal years Diseases of the Respiratory system come first numerically and Diseases of the Digestive system follow closely, the two together constituting the main classes of cases that subscribe chiefly to the fatality.

In 1918 deaths registered under the heading "General Diseases" which include Infectious Diseases and consequently Influenza form the bulk of the deaths.

Influenza in Lagos is estimated to have accounted for the mortality of 1·5% of the population of Lagos.

69. The following points of interest have been deduced from the Vital Statistics recorded for Lagos relative to the epidemic of Influenza: –

I.—Age and sex incidence of fatality:—

(*a*) *At age period 1 to 10 years*, number of deaths in males 162, in females 201, hence fatality higher in females at this age period.

(*b*) *At age period 11 to 55 years*, number of deaths in males 316, in females 198, hence fatality much higher in males at this age period.

(*c*) *At age period over 55 years*, number of deaths in males 15, in females 24, hence fatality high in females at this age period.

II.—Influence of the Epidemic of Influenza on

(*a*) Births and

(*b*) Still births.

(*a*) Births. The average number of births for Lagos during one month are about 190. During the month of October when the epidemic raged the number of births was 209, slightly above the average, but on the other hand during the following month of November there were 159 births registered which is considerably below the average.

(*b*) Stillbirths. The average number of stillbirths per month for the period 1910 to 1918 is 11.7. During the month of October the epidemic had the effect of raising the number of stillbirths to 27.

III.—Influence of the Epidemic on increasing the number of certified deaths registered in the Township of Lagos:—

	Total Deaths	Number Certified.	Percentage Certified.
1916	2,102	552	26·2
1917	2,167	594	27·4
1918	3,254	983	30·2

70. *Infantile Mortality.* This stands at 330 and is very high if the figures are considered by themselves. No comparison can be made with authentic figures pertaining to infantile mortality in other towns since Lagos is the only township where the deaths of natives are registrable.

The chief registered causes of infant mortality are:

Malaria, Convulsions, Bronchitis,
Broncho-Pneumonia, Diarrhœa,
Prematurity and infantile atrophy which includes debility, marasmus and malnutrition.

IV.—Recommendations.

The following are the recommendations for the future advancement of sanitary interests:—

1. The advancement of vaccination as an effective measure against Small-pox.
2. Further steps to combat the increase of Tuberculosis in Lagos: notification as a measure advisable.
3. The construction of small efficient refuse destructors at reasonable cost.
4. The construction of slaughter houses for 2nd class townships.
5. An increase in prison cell accommodation.
6. Formulation of Building Regulations applicable to new towns or town extensions and to native locations forming part of new townships, all of which have been laid out on model sanitary lines.
7. Further steps for borrow pits on the railway to be dealt with efficiently.
8. In Lagos the drainage of waste water from fountains to receive attention.
9. The Chlorination of Iju water as an adjuvant to the slow sand filtration.
10. The promotion of adoption of the more modern methods of water purification schemes for new water supplies in view and for the improvement of existing ones.
11. Increase in the sanitary staff both of Sanitary Officers and of European Sanitary Inspectors. In the Sanitary Report for 1917 it was stated that this "is one to be kept definitely in view for sanitary work to make the desired advance in the vast field open to it".

This recommendation still holds and the plea for it is stronger than ever in the light of the present knowledge of sanitary requirements.

The Director of Medical and Sanitary Services in his covering letter dated 18th December, 1918, when submitting the Annual Medical and Sanitary Report for 1917 stated:

"I agree with the Senior Sanitary Officer that the increase of "sanitary staff will have to be seriously considered in the near "future".

His Excellency the Governor in submitting this Annual Report to the Secretary of State made the following comment in his despatch dated 14th February, 1919, in para: 3:—

"At present we have a staff of four Sanitary Officers in the "Colony and Southern Provinces but I consider it will shortly be "necessary to increase this to six which would mean four always "on duty".

The Secretary of State in his despatch Nigeria No. 734 dated 20th May, 1919, bearing on the Annual Medical and Sanitary Report remarks in para: 6:—

"The Nigerian Government will no doubt submit in due course "recommendations for increasing the sanitary staff of Nigeria".

It is again requested that this question of increase in staff receive consideration.

The following tables, etc. are attached to this report:—

1. Table I (Table IV of the Model Report).
2. Table of Statistics in reference to Prisons.
3. Table of cases of Infectious Diseases.
4. „ „ Helminthic Diseases.
5. „ shewing returns of Anti-mosquito work.
6. Plan shewing the advent and spread of the Influenza Epidemic in the Southern provinces of Nigeria.
7. Chart shewing the daily mortality in Lagos and Ebute Metta from Influenza during the month of October, 1918.
8. Leaflets on Tuberculosis.
9. Report on the alleged increase of Tuberculosis in Lagos Town.

H. ANDREW FOY,
Senior Sanitary Officer.

Lagos, 11th October, 1919.

IV.—METEOROLOGICAL.

The smallest rainfall ever recorded at Lagos occurred in 1918 following on a phenomenally large rainfall of the previous year. This was by no means characteristic of the whole of the Southern Provinces as Forcados and the coast ports to the East show records considerably larger than the average.

The maximum temperature throughout the Southern Provinces was 103° at Ubiaja in January and the minimum temperature 48° at Ikom in February.

V.—HOSPITALS AND DISPENSARIES.

New Hospitals, European eight beds and Native thirty beds are in course of erection at Port Harcourt.

At the Hospitals at Lagos and Calabar the bulk of the Operative Surgical Work is done. Lagos Hospital is fitted with a thoroughly up-to-date X Ray installation which is run off the main. There are also smaller installations at Warri and Calabar but there being no public electric supply at these places it is necessary to rely on small petrol engines and accumulators for a source of current and they have never proved entirely satisfactory.

V.—HOSPITALS AND DISPENSARIES.

Station.	Nature of building.	Extent of Mosquito-proofing.	No. of Beds.		In-patients.	Out-patients.	Subsequent Attendances at Dispensary.	Operations performed.
			Male.	Female.				
Lagos—European	Brick and Wood	Completely	12	1	219	474	...	224
„ Native	Wood and Iron	Partially	53	14	1,061	3,470	14,881	
„ Massey Street Dispensary	Brick	None	...	...	...	10,987	59,136	259
„ Ereko Dispensary	„	„	...	...	...	5,155	28,919	144
„ Ebute Metta Dispensary:—								
European	„	„	...	...	...	219	329	...
Native	„	„	...	...	...	5,098	17,765	...
„ Prison Hospital and Dispensary:—								
European	„	„	...	...	4	5	...	...
Native	„	„	...	...	118	1,365	8,097	...
I.D.H.—European	„	Completely	6	4	...	...	...	...
„ Native	„	„	25	13	750	9	171	3
Yaba Lunatic Asylum	„	None	24	24	53	...	...	...
„ Leper Asylum	Mud and thatch	„	21	12	21	...	...	...
Ibadan—European	Wood on Iron pillars ...	Completely	5	...	53	110	23,950	7
„ Native...	Bricks	„	16	4	529	3,006		
Abeokuta—European	None	...	...	...	...	116	...	59
„ Native	Mud with iron roof ...	None	8	8	439	3,182	30,365	
Badagry—European	None	...	...	...	...	...	...	...
„ Native	Brick	Completely	6	...	...	...	...	...
Warri—European	Concrete	„	6	...	25	259	516	11
„ Native	Brick	Partially	20	4	496	3,292	11,892	
„ I. D. Hospital	Brick and Mud	„	20	...	...	...	...	...
Sapele—European	Brick	Completely	2	2	29	247	349	30
„ Native	„	Partially	16	2	116	2,293	9,859	
„ I. D. Hospital	„	„	8	...	...	...	...	...
Onitsha—European	Brick and Wood	Completely	3	1	28	64	...	69
„ Native	Cement and Wood	Partially	19	5	664	6,503	26,547	
Forcados—European	Concrete	Completely	4	...	14	155	...	...
„ Native	Brick	Partially	8	4	595	4,954	16,408	...
Agbor—European	None	...	...	...	...	2	...	...
„ Native	Brick	...	6	...	674	1,728	12,756	...

V.—HOSPITALS AND DISPENSARIES—*continued.*

Station.	Nature of building.	Extent of Mosquito-proofing.	No. of Beds.		In-patients.	Out-patients.	Subsequent Attendances at Dispensary.	Operations performed.
			Male.	Female.				
Benin City—European	None	...	...	...	...	19	...	57
„ Native	Brick	Partially	8	...	224	1,433	8,436	
Enugu—European	None	...	...	...	...	71	...	...
„ Native	Bush house	None	...	...	940	1,885	63,387	15
Okwoga—European	None	...	...	...	...	9	...	...
„ Native	Bush house	None	...	...	263	1,376	10,782	107
Calabar—European	Wood	Completely	6	2	76	256	1,487	
„ Native	Brick	„	46	11	818	8,609	42,735	161
„ I.D. Hospital	Concrete	None	50	16	399	...	...	...
Bonny—European	None	...	...	...	3	58	...	...
„ Native	Brick	Partially	10	3	220	1,613	12,133	14
„ I.D. Hospital	„	None	8	4	...	...	...	...
Brass—European	None	...	...	...	...	...	...	...
„ Native	Brick	None	8	...	...	...	...	...
Degema—European	None	...	...	...	...	61	...	...
„ Native	Brick	None	27	5	225	1,318	13,526	55
Ikot-Ekpene—European	None	...	...	...	...	12	30	...
„ Native	Brick	None	16	3	900	1,652	6,781	32
Opobo—European	„	Completely	4	...	20	268	...	...
„ Native	Corrugated Iron	None	6	2	433	7,505	22,321	446
Owerri—European	None	...	...	...	...	...	...	...
„ Native	Bush house	None	...	...	269	1,236	7,913	4
Port Harcourt—European	Wood and Iron	Completely	2	...	...	397	579	61
„ Native	„ „	Partially	32	...	1,833	6,097	19,284	
Afikpo—European	None	...	...	...	...	8	...	...
„ Native	Bush house	None	...	...	336	526	4,271	23
Ikom—European	None	...	...	...	...	16	...	...
„ Native	Bush house	None	...	...	177	898	4,110	44
Obubra—European	None	...	...	...	...	...	...	...
„ Native	Brick	None	4	2	...	...	...	...
Ogwashi Oku—Native	Mud and thatch	None	...	...	...	...	...	...

V.—HOSPITALS AND DISPENSARIES—*continued.*

Station.	Nature of building.	Extent of Mosquito-proofing.	No. of beds.		In-patients.	Out-patients.	Subsequent Attendances at Dispensary.	Operations performed.
			Male.	Female.				
Obudu—European	None	None	...	...	...	1	...	...
„ Native	Brick	...	...	...	16	294	3,343	...
Okigwi—European	None	...	...	...	...	5	...	...
„ Native	Bush house	None	...	...	430	1,317	8,496	...
Ogoja—European	None	...	...	...	...	3	...	...
„ Native	Bush house	None	.	...	81	807	5,868	...
Abakaliki—European	None	...	...	...	...	23	...	...
„ Native	Bush house	None	...	...	155	1,317	6,791	18
Victoria—European	Brick	„	6	...	...	...	...	...
„ Native (16)	Brick and galvanised iron	One completely ...	401	...	7,097	12,036	143,871	9
„ I.D. Hospital	Galvanised iron	None	99	...	...	...	...	...
Buea—European	None	...	...	...	...	30	...	...
„ Native	Galvanised Iron	None	10	...	486	3,046	8,743	8
Ossidinge - European	None	...	...	...	...	...	...	...
„ Native	Galvanised Iron	None	4	...	...	...	...	...
Bamenda—European	None	...	...	...	...	8	...	...
„ Native	Brick	None	20	4	415	864	864	4
Dohang—European	...	...	...	...	...	6	...	...
„ Native	...	...	...	...	149	1,283	6,847	8
Total	...	...	...	...	21,853	109,056	664,548	1,842

VI.—SCIENTIFIC.

Research work of a serious character has been impossible for most Medical Officers under existing conditions.

The Annual Report by the Director Medical Research Institute, Yaba, is included in the Appendix.

Reports on cases of interest by Drs. Parkinson, Jackson Moore, and Maples.

H. B. S. MONTGOMERY,
Acting Principal Medical Officer.

TABLE IV.

(1).—TOWN AREA AND OPEN SPACES.

Name of Town.	1917.		1918.	
	Approximate Area in Acres.	Number of Proclaimed Open Spaces.	Approximate Area in Acres.	Number of Proclaimed Open Spaces.
Lagos	1,152	3	1,152	3
Calabar	9·2 sq. miles	3	9·2 sq. miles	3

(2).—POPULATION.

Name of Town.	1917.			1918.		
	Number of Europeans.	Number of Natives.	Total.	Number of Europeans.	Number of Natives.	Total.
Lagos	600	80,000	80,600	600	81,941	82,541
Calabar	130	10,698	10,828	120	15,000	15,120

(3).—HOUSING.

Town.	1917.				1918.			
	Houses.		Huts.		Houses.		Huts.	
	Number occupied by Europeans.	Number occupied by Natives.	Number occupied by Europeans.	Number occupied by Natives.	Number occupied by Europeans.	Number occupied by Natives.	Number occupied by Europeans.	Number occupied by Natives.
Lagos	272	5,070	...	12,173	274	Unknown	...	12,639
Calabar ...	65	54	...	2,287	65	54	...	2,289

(4).—MOSQUITO-PROTECTION OF HOUSES.

Town.	1917.				1918.			
	Number wholly mosquito-protected.	Number with mosquito-proof room.	Number wholly mosquito protected during the year.	Number partially mosquito-protected during the year.	Number wholly mosquito-protected.	Number with mosquito-proof room.	Number wholly mosquito-protected during the year.	Number partially mosquito-protected during the year.
Lagos	25	141	...	...	25	141	...	...
Calabar ...	...	7	...	...	...	7	...	...

TABLE IV—*continued.*

(5).—ERECTION OF NEW BUILDINGS DURING THE YEAR.

Town.	1917.					1918.				
	No. of public buildings erected with full sanction as to site, &c.	No. of houses erected with full sanction as to site, &c.	No. of huts erected with full sanction as to site, &c.	No. of houses built without sanction.	No. of huts built without sanction.	No. of public buildings erected with full sanction as to site, &c.	No. of houses erected with full sanction as to site, &c.	No. of huts erected with full sanction as to site, &c.	No. of houses built without sanction.	No. of huts built without sanction.
Lagos	2	70	173	...	...	2	66	78	...	...
Calabar ...	...	...	4	...	...	...	...	7	...	2

ACTION TAKEN.

Town.	1917.				1918.			
	No. of prosecutions.		No. demolished.		No. of prosecutions.		No. demolished.	
	Houses.	Huts.	Houses.	Huts.	Houses.	Huts.	Houses.	Huts.
Lagos	1	...	...	...	2	...	1	...
Calabar ...	...	...	...	11	...	...	...	7

(6).—MARKETS.

Town.	1917.			1918.		
	Total Number.	Number paved and drained.	Number unpaved.	Total Number.	Number paved and drained.	Number unpaved.
Lagos	10	5	5	10	5	5
Calabar	5	...	5	5	...	5

(7).—SLAUGHTER HOUSES.

Town.	1917.			1918.		
	Total Number.	Number paved and drained.	Number unpaved.	Total Number.	Number paved and drained.	Number unpaved.
Lagos	2	2	...	2	2	...
Calabar	1	1	...	1	1	...

(8).—LATRINES—PUBLIC.

1917.

Town.	No of Latrines.				No. erected during the year.				No. repaired during the year.				No. demolished during the year.			
	Male.		Female.		Male.		Female.		Male.		Female.		Male.		Female.	
	Number.	Number of seats.	Number.	Number of seats.	Number.	Number of seats.	Number.	Number of seats.	Number.	Number of seats.	Number.	Number of seats.	Number.	Number of seats.	Number.	Number of seats.
Lagos	37	236	37	226	...	...	...	...	11	54	11	45	...	...	...	...
Calabar ...	18	137	17	124	...	...	...	...	6	38	6	37	...	...	...	...

1918.

Town.	No. of Latrines.				No. erected during the year.				No. repaired during the year.				No. demolished during the year.			
	Male.		Female.		Male.		Female.		Male.		Female.		Male.		Female.	
	Number.	Number of seats.	Number.	Number of seats.	Number.	Number of seats.	Number.	Number of seats.	Number.	Number of seats.	Number.	Number of seats.	Number.	Number of seats.	Number.	Number of seats.
Lagos	37	236	37	226	...	...	...	...	10	67	10	66	...	...	...	...
Calabar ...	16	113	16	112	...	...	...	...	...	...	...	...	2	24	1	12

LATRINES—*continued.* (Private).

1917.

Town.	No. of private latrines.	Average No. of pails of nightsoil removed daily.	Average No. of clean pails substituted for soiled pails.	No. of nightsoil men employed.	No. of cesspools.	No. of cesspools cleaned.	No. of new cesspools constructed during the year.	No. of old cesspools abolished.	No. of cesspools regularly oiled by the Department.
Lagos	5,581	879	879	159	...	...	...	...	...
Calabar... ...	538	380·6	792·3	79	135	Unknown	19	55	...

1918.

Town.	No. of private latrines.	Average No. of pails of nightsoil removed daily.	Average No. of clean pails substituted for soiled pails.	No. of nightsoil men employed.	No. of cesspools.	No. of cesspools cleaned.	No. of new cesspools constructed during the year.	No. of old cesspools abolished.	No. of cesspools regularly oiled by the Department.
Lagos	5,600	894	894	159	...	...	...	...	...
Calabar... ...	540	418	616	74	168	Unknown	36	3	...

(9).—REMOVAL OF REFUSE.

Town.	1917. Number of dust-bins.	1917. Number of carts removing street refuse daily.	1917. Amount of refuse removed daily.	1917. Number of carts removing refuse from yards and premises daily.	1917. Amount of refuse removed from yards and premises daily.	1917. Number of men employed for removing refuse.	1918. Number of dust-bins.	1918. Number of carts removing street refuse daily.	1918. Amount of refuse removed daily.	1918. Number of carts removing refuse from yards and premises daily.	1918. Amount of refuse removed from yards and premises daily.	1918. Number of men employed for removing refuse.
Lagos	52	49	20 tons.	...	...	263	52	42	56 tons.	...	...	296
Calabar	81	5	43·77 Cartloads.	...	209·2 drums (10 gallons).	82	83	5	1238·86 drums.	...	687·26 (10 gallons).	70

(10).—MODE OF DISPOSAL OF EXCRETA, REFUSE AND OFFAL.

Town.	1917. Buried or Trenched. Daily average number of pails of excreta.	Daily average number of cart-loads of refuse.	Daily average number of cart-loads of offal.	1917. Burnt. Daily average number of pails of excreta.	Daily average number of cart-loads of refuse.	Daily average number of cart-loads of offal.	1917. Thrown into Sea. Daily average number of pails of excreta.	Daily average number of cart-loads of refuse.	Daily average number of cart-loads of offal.	1917. Otherwise dealt with. Daily average number of pails of excreta.	Daily average number of cart-loads of refuse.	Daily average number of cart-loads of offal.	1918. Buried or Trenched. Daily average number of pails of excreta.	Daily average number of cart-loads of refuse.	Daily average number of cart-loads of offal.	1918. Burnt. Daily average number of pails of excreta.	Daily average number of cart-loads of refuse.	Daily average number of cart-loads of offal.	1918. Thrown into Sea. Daily average number of pails of excreta.	Daily average number of cart-loads of refuse.	Daily average number of cart-loads of offal.	1918. Otherwise dealt with. Daily average number of pails of excreta.	Daily average number of cart-loads of refuse.	Daily average number of cart-loads of offal.
Lagos ...	...	...	very small quant.	...	120 tons	...	879	...	small quant.	...	...	...	...	...	...	...	55	...	894	...	...	...	...	...
Calabar ...	168·9	4·37	...	...	4·26	...	211·7	35·14	·862 drums 10 (gallons).	...	...	...	57·45	4·05	...	589·83	34·37	...	198·46	27·15	1·14	...	...	...

11. Average daily number of cartloads of tin cans, bottles, broken crockery, and other incombustible materials removed from houses, huts, and compounds.

Town.	1917.	1918.
Lagos	...	...
Calabar	·22 Cartloads from public spaces and streets.	·45 Cartloads from public spaces and streets.

(12).—WATER SUPPLY.

Pipe-borne Water.

Town.	1917.				1918.			
	Source (river, lake or spring).	No. of linear yards.	No. of public standpipes.	No. of private standpipes.	Source (river, lake or spring).	No. of linear yards.	No. of public standpipes.	No. of private standpipes.
Lagos	River	(28" main 17 miles). 53,424 yards	172	298	River	(28" main -17 Miles). 53,624 yards	172	384
Calabar ...	...	19,560	6	102	...	19,560	6	102

Wells.

Town.	1917.				1918.			
	Public.		Private.		Public.		Private.	
	Number.	Number with pumps protected against surface water and mosquitoes.	Number.	Number with pumps protected against surface water and mosquitoes.	Number.	Number with pumps protected against surface water and mosquitoes.	Number.	Number with pumps protected against surface water and mosquitoes.
Lagos ...	7	...	2,885	8	4	...	2,914	11
Calabar ...	...	...	2	...	...	...	4	...

Tanks (Public).

Town.	1917.						1918.					
	Number underground.	Number mosquito protected and served by pumps.	Number above ground.	Number mosquito protected.	Number of 400 galls. capacity or less.	Number above 400 galls.	Number underground.	Number mosquito protected and served by pumps.	Number above ground.	Number mosquito protected.	Number of 400 galls. capacity or less.	Number above 400 galls.
Lagos ...	...	...	2	2	2	...	...	...	2	2	2	...
Calabar ...	3	...	2	1	...	5	3	...	2	1	...	5

Tanks (Private).

Town.	1917.						1918.					
	Number under ground.	Number mosquito protected and served by pumps.	Number above grounds.	Number mosquito protected.	No. of 400 galls. capacity or less.	Number above 400 galls.	Number under ground.	Number mosquito protected and served by pumps.	Number above grounds.	Number mosquito protected.	No. of 400 galls. capacity or less.	Number above 400 galls.
Lagos	...	...	492	431	351	141	...	...	476	454	329	141
Calabar ...	...	...	50	47	21	29	...	...	56	48	27	29

Nature of Tanks.

Town.	1917.			1918.		
	Wood.	Iron.	Concrete.	Wood.	Iron.	Concrete.
Lagos	...	371	121	...	359	117
Calabar	...	50	...	...	56	...

Barrels.

Town.	1917.		1918.	
	Number.	Number mosquito protected.	Number.	Number mosquito protected.
Lagos	489	170	444	132
Calabar...	295	1	321	1

(13).—DRAINAGE.

(Masonry Drains) Public Drains.

Town.	1917.				1918.	
	Linear yards.	Linear yards reconstructed during the year.	Linear yards repaired during the year.	Linear yards.	Linear yards reconstructed during the year.	Linear yards repaired during the year.
Lagos	32,756½	98½	100	33,229	73	1,000
Calabar	13,715	...	1½	13,715	...	...

PRIVATE DRAINS (MASONRY DRAINS).

Town.	1917.			1918.		
	Linear yards.	Linear yards reconstructed during the year.	Linear yards repaired during the year.	Linear yards.	Linear yards reconstructed during the year.	Linear yards repaired during the year.
Lagos	...	...	...	...	...	...
Calabar	16,669	...	39	16,669	...	...

PUBLIC DRAINS—*continued.* EARTH DRAINS OR DITCHES.

Town.	1917.			1918.		
	Linear yards of ditches cleaned.	Linear yards of ditches dug and graded.	Average frequency of clearing ditches of grass.	Linear yards of ditches cleaned.	Linear yards of ditches dug and graded.	Average frequency of clearing ditches of grass.
Lagos	7,470	952	Bi-monthly	800	...	Bi-monthly
Calabar	15,724	...	monthly	15,724	...	Monthly

PRIVATE DRAINS—*continued.* EARTH DRAINS OR DITCHES.

Town.	1917.			1918.		
	Linear yards of ditches cleaned.	Linear yards of ditches dug and graded.	Average frequency of clearing ditches of grass.	Linear yards of ditches cleaned.	Linear yards of ditches dug and graded.	Average frequency of clearing ditches of grass.
Lagos	...	...	...	...	...	...
Calabar	3,724	...	monthly	3,724	...	Monthly

(14).—CLEARANCE OF UNDERGROWTH, LONG GRASS AND JUNGLE.

Town.	1917.		1918.	
	No. of Square yards of weeds, grass and vegetation cut and removed.	Average frequency of clearance of rank vegetation on the same area.	No. of Square yards of weeds, grass and vegetation cut and removed.	Average frequency of clearance of rank vegetation on the same area.
Lagos	95,040	Bi-monthly	95,040	Bi-monthly
Calabar	6,809,028	Monthly	7,039,572	Monthly

(15).—EXCAVATIONS AND LOW-LYING LAND.

Town.	1917.							1918.						
	No. of pools and excavations.	Number of excavations filled up.	Amount of low-lying and marsh land raised and drained.	Number of pools, marshes, streams, &c., fish stocked.	No. of cubic yards of material used for filling up pools and excavations.	Number of persons fined for making new excavations.	Average No. of men daily employed in filling up pools, &c.	No. of pools and excavations.	Number of excavations filled up.	Amount of low-lying and marsh land raised and drained.	Number of pools, marshes, streams, &c., fish stocked.	No. of cubic yards of material used for filling up pools and excavations.	Number of persons fined for making new excavations.	Average No. of men daily employed in filling up pools, &c.
Lagos	...	20	10,000 sq. yds.	...	2,304,490	...	265	...	...	178,029 sq. yds.	...	600,000	2	...
Calabar ...	210	190	...	...	Unknown	...	...	75	55	...	...	Unknown	...	...

(16).—OILING.

TOWN.	1917.				1918.			
	Number of drains oiled.	No. of pools and excavations oiled.	No. of tanks and barrels oiled.	Average No. of men daily employed for oiling.	No. of drains oiled.	No. of pools and excavations oiled.	No. of tanks and barrels oiled.	Average No. of men daily employed for oiling.
Lagos	138	7,324	167	3	96	1,101	98	3
Calabar ...	145	132	45	5	150	75	...	4

INSPECTIONS AND PROSECUTIONS.

Town.	1917.								1918.							
	No. of Inspectors employed.	No. of houses inspected.	No. of houses where larvæ were found.	No. of notices served to remove conditions causing breeding of Larvæ.	No of persons fined for having mosquito Larvæ on premises.	No of notices served to remove insanitary conditions of premises.	No. of persons fined for not removing insanitary conditions after notice.	No. of Soda and Aerated factories inspected.	No. of Inspectors employed.	No. of houses inspected.	No. of houses where larvæ were found.	No. of notices served to remove insanitary conditions causing breeding of Larvæ.	No. of persons fined for having mosquito Larvæ on premises.	No. of notices served to remove insanitary conditions on premises.	No. of persons fined for not removing insanitary conditions after notice.	No. of Soda and Aerated factories inspected.
Lagos	32	632,287	13,186	208	1,158	1,760	1	2	33	617,787	10,126	810	1,067	2,219	106	2
Calabar	6	106,035	204	210	206	3,772	10	1	6	103,291	216	75	24	2,996	11	1

ANNUAL SANITARY REPORT ON PRISONS FOR 1918.

PRISONS.	1 Authorised accommodation available according to sanitary standard scale.	2 Average No. of prisoners per night.	3 Site area in square yards per prisoner.	4 Percentage of area prison compounds covered by buildings.	5 Average cell space in cubic feet per prisoner.	6 Average ventilation area in square feet per prisoner.	7 Total number of prisoners medically treated.	8 Total number of prisoners unfit for duty.	9 Average number of days off duty of prisoners unfit.	10 Death rate per 1,000.
Abeokuta	122.	472·49	18·5	11·5	150·3	1·7	590	143	10·6	80·4
Agbor	44·	89·89	54·7	18·0	293·1	·6	113	60	9·6	88·9
Aflkpo	72·	149·68	24·7	17·0	244·4	12·7	426	281	7·0	93·5
Aba...	157·1	169·15	25·2	24·0	536·0	2·1	199	171	111·4	5·9
Abakaliki	39·3	74·21	36·8	26·0	309·7	2·3	220	75	7·3	107·7
Benin-City ...	60·1	131·68	30·9	45·5	264·9	3·2	520	200	7·7	113·9
Brass	41·4	46·3	53·4	12·7	539·8	5·1	35	87	9·6	...
Bonny	154·	40·2	53·7	34·1	2298·5	18·8	100	35	9·1	24·8
Calabar	295·6	539·85	22·2	20·1	244·0	4·5	1,327	486	9·2	109·2
Degema	139·4	126·9	63·0	21·2	650·1	10·6	612	170	18·2	86·6
Enugu	308·36	794·01	25·6	15·8	220·6	5·6	1,812	1,131	7·7	202·9
Forcados	55·65	85·7	103·5	7·3	368·7	2·4	344	99	12·6	35·
Ibadan	49·7	126·82	26·1	24·3	237·1	2·9	215	71	7·3	39·4
Ifon...	23·5	36·23	55·2	17·6	357·3	1·8	...	...	...	...
Ikot-Ekpene ...	146·3	356·27	67·1	15·0	236·3	5·8	1,634	902	15·5	106·6
Kwale	75·5	150·3	31·0	21·6	293·4	3·6	392	56	11·8	19·9
Lagos	310·	539·98	25·9	25·8	318·3	3·2	2,342	352	5·6	25·9
Obubra	162·9	110·3	127·2	...	853·6	5·5	396	174	6·0	63·4
Ogoja	63·9	95·65	81·0	21·6	3821·1	8·0	198	71	10·2	20·8
Okwoga	57·	67·91	41·6	17·0	493·2	6·0	472	68	10·8	73·6
Okigwi	105·	228·6	30·4	...	248·5	5·8	637	213	6·3	39·3
Ogwashi-Uku ...	40·2	87·26	12·7	31·9	269·6	...	237	186	3·7	137·5
Opobo	141·1	157·5	21·0	27·2	481·8	8·3	640	222	7·1	6·3
Onitsha	128·7	142·25	82·1	27·6	464·4	8·5	686	417	12·1	56·2
Owerri	155·	141·8	79·7	21·4	630·8	10·8	708	308	19·6	42·3
Port Harcourt ...	458·	801·95	61·8	8·0	312·1	...	3,396	1,481	14·4	140·9
Sapele	141·	92·20	107·7	11·5	817·7	11·7	307	78	6·4	97·6
Ubiaja	45·36	113·54	23·8	19·3	221·8	7·2	312	48	21·2	44·0
Udi	319·6	40·9	36·9	...	4689·4	·56	208	71	12·2	203·3
Warri	174·7	283·9	60·8	5·6	390·1	6·9	689	331	12·4	52·8

Year.	Beri-beri.	Cerebro-spinal fever.	Chicken-pox.	Diphtheria.	Dysentery.	Enteric fever.	Erysipelas.	Gonorrhœa.	Influenza.	Leprosy.	Malaria.	Blackwater fever.	Measles.	Rubella.	Pappataci fever.	Pneumonia.	Rabies.	Relapsing fever.	Rheumatic fever.	Septicæmia.	Trypanosomiasis.	Small-pox.	Syphilis Primary.	Syphilis Secondary.	Syphilis Inherited.	Tetanus.	Tuberculosis.	Whooping Cough.	Yaws.	Yellow fever.	Others.
1918 ...	13	5	2,231	2	960	4	3	1,685	16,735	106	9,506	30	43	...	1	1,001	...	1	20	10	2	439	233	43	2	25	140	17	370	2	126
1917 ...	4	...	2,695	1	1,093	12	3	2,449	408	114	11,801	27	56	...	2	484	...	...	8	27	6	231	263	105	3	19	184	61	631	4	36
1916 ...	10	...	1,488	...	1,106	...	1	2,482	15	80	8,741	27	75	...	3	768	...	...	21	24	3	85	208	105	27	34	186	144	263	1	22
1915 ...	43	1	1,110	3	1,236	1	1	1,569	5	81	5,540	16	33	...	...	225	1	...	18	25	73	30	132	115	19	33	171	37	200	15	13
1914 ...	227	...	510	1	1,326	4	...	1,616	7	248	5,169	22	42	1	...	339	...	2	151	9	177	22	37	145	38	26	116	55	194	8	11
1913 ...	15	...	1,055	...	1,063	1	2	1,913	41	137	6,995	28	73	...	...	321	...	...	156	34	378	17	46	142	28	46	163	28	297	11	...
1912 ...	35	...	1,228	...	1,037	2	4	1,945	29	124	8,194	23	7	...	...	263	...	...	93	44	154	52	92	151	59	44	155	27	163	...	...
1911 ...	56	...	1,155	...	840	...	...	1,645	1	41	6,943	23	11	...	...	239	...	...	...	...	5	59	70	157	22	32	167	99	104	...	...

YEAR.	ANIMALS.			CESTODA.			NEMATODES.										
	Protozoa.	Trematoda (Flukes.)	Others.	Taenia solium.	Taenia saginata.	Others.	Ascaris.	Trichuris Trichiuris.	Dracunculus.	Filariasis.	Strongylus.	Ankylostomiasis.	Oxyuris.	Schistosoma	Others.	Mylasis.	Others.
1918	5	2	...	100	75	4	2,348	...	560	89	7	443	22	...	13	...	29
1917	5	6	...	159	64	19	2,466	...	719	77	...	841	46	...	...	...	...
1916	...	2	...	189	23	2	2,667	3	568	86	...	688	8	...	2	16	14
1915	...	20	12	215	25	1	1,639	6	718	91	...	570	3	...	4	41	20
1914	1	3	11	69	58	...	1,910	15	635	32	...	335	2	3	1	25	31
1913	...	1	...	1	6	...	1,973	3	640	63	2	212	1	...	...	17	57
1912	...	3	...	1	17	...	2,673	6	625	95	2	405	36	...	...	10	17
1911	...	...	...	1	3	...	3,349	...	484	18	...	404	1	20	...	...	63

Station.	Houses Inspected 1918.	Number of houses with larvae 1918.	Rainfall 1918.	Rainfall 1917.	Mosquito Index 1918.	Mosquito Index 1917.
Lagos and Ebute Metta	617,787	10,226	...	115·4	1·6	2·08
Abeokuta	35,401	1,658	40·7	89·5	84·6	13·9
Ibadan	24,139	380	45·9	67·5	1·5	3·03
Badagry	3,665	32	...	63·1	·8	1·8
Epe	11,363	263	20·6	85·8	2·3	2·2
Warri	63,836	53	141·1	130·1	·08	·2
Forcados	30,731	209	172·8	146·8	·6	·6
Sapele	13,458	17	93·9	106·3	·1	·09
Koko	1,338	21	...	...	1·7	1·4
Benin City	7,878	121	77·1	94·0	1·5	2·05
Onitsha	20,453	35	69·0	66·9	·1	·1
Siluko	7,114	36	...	...	·5	·65
Okwoga	3,120	6	54·0	59·2	·1	·24
Asaba	3,216	58	59·3	70·1	1·8	1·25
Enugu	12,797	18	72·5	68·0	·1	·11
Agbor	2,716	32	99·1	73·4	1·1	1·7
Calabar	181,226	278	113·6	111·7	·2	·1
Bonny	8,264	182	137·6	175·4	2·2	6·1
Brass	15,193	47	95·2	178·9	·3	·3
Opobo	11,639	46	138·3	146·7	·3	·5
Owerri	18,943	200	105·2	122·5	1·05	·76
Degema	30,753	482	112·9	89·0	1·5	1·4
Ikot-Ekpene	3,714	25	75·5	100·1	·67	1·7
Ogoja	5,694	70	...	...	1·22	·8
Abakaliki	1,148	13	65·4	82·9	1·1	1·4
Obudu	3,796	...	85·2	78·8	...	·6
Afikpo	787	35	85·4	46·1	4·4	3·4
Port Harcourt	18,754	228	75·1	104·5	1·22	...

TABLE V.

METEOROLOGICAL RETURNS FOR THE YEAR 1918.

Station—Lagos.

Lat. 6° 27' N. Long. 3° 24' E.

	Absolute shade maximum.	Absolute shade minimum.	Average maximum.	Average minimum.	Relative humidity.	Rainfall in inches
January	90°·2	67°·2	87°·7	72°·3	81·0 %	Nil.
February	91°	68°·5	88°·6	74°·9	81·3 %	3·66
March	90°·4	68°	87°·3	75°·3	78·5 %	7·86
April	90°·3	70°·2	88°·2	75°·3	78·6 %	4·15
May	91°·4	70°	88°·6	74°·9	79·2 %	7·85
June	88°	70°·1	83°·5	73°·5	86·4 %	18·13
July	87°·5	72°	82°·4	73°·8	83·7 %	1·03
August	85°·2	69°	82°·5	72°·2	84·2 %	1·32
September	87°·3	70°	84°·7	74°·0	83·9 %	3·71
October	90°	69°·4	86°·1	74°·1	81·5 %	4·11
November	98°·3	70°	89°·2	76°·0	80·5 %	2·05
December	90°·3	70°	88°·0	74°·3	80·7 %	0·02
Means	98°·3	67°·2	86°·4	74°·2	81·6 %	53·89

Station—Onitsha.

Lat. 6° 10' N. Long. 6° 47' E.

January	99°	64°	93°·1	69°·6	71 %	Nil.
February	99°	61°	94°·1	72°·4	75 %	1·38
March	97°	70°	91°·4	74°·0	94 %	6·58
April	98°	68°	90°·0	73°·3	84 %	6·12
May	94°	70°	90°·4	73°·7	89 %	10·42
June	90°	70°	85°·6	73°·0	89 %	8·40
July	90°	69°	84°·2	72°·1	94 %	8·11
August	88°	69°	83°·9	71°·2	94 %	4·30
September	92°	71°	87°·6	73°·4	94 %	16·51
October	94°	70°	86°·9	73°·2	89 %	6·09
November	95°	71°	91°·7	74°·9	90 %	0·06
December	96°	62°	91°·1	71°·2	89 %	1·11
Means	99°	61°	89°·2	72°·7	87°·7 %	69·08

Station—Forcados.

Lat. 5° 23' N. Long. 5° 26' E.

January	87°	62°	87°·0	70°·4	84 %	1·28
February	88°	67°	86°·0	73°·3	85 %	1·46
March	89°	70°	85°·5	73°·6	85 %	7·94
April	88°	69°	85°·9	72°·7	80 %	6·08
May	88°	69°	85°·1	72°·5	85 %	13·45
June	85°	69°	80°·9	71°·5	84 %	32·23
July	83°	69°	78°·5	71°·3	89 %	44·46
August	81°	67°	78°·7	71°·0	84 %	23·13
September	84°	70°	80°·7	72°·5	89 %	20·84
October	86°	69°	82°·8	72°·3	85 %	17·91
November	88°	70°	85°·9	73°·5	72 %	4·10
December	87°	66°	85°·3	71°·6	85 %	Nil.
Means	89°	62°	83°·5	72°·2	839 %	172·88

TABLE V.—*continued.*

Station—Ibadan.

	Lat. 7° 24′ N. Long. 3° 53′ E.					
	Absolute shade maximum.	Absolute shade minimum.	Average maximum.	Average minimum.	Relative humidity.	Rainfall in inches.
January	100°	59°	88°·7	69°·4	74 %	Nil.
February	101°	63°	90°·1	70°·3	71 %	0·15
March	100°	62°	90°·2	70°·1	84 %	6·08
April	99°	65°	91°·7	70°·2	89 %	8·05
May	95°	65°	89°·2	70°·7	89 %	5·29
June	91°	62°	83°·7	69°·7	94 %	9·09
July	89°	70°	82°·3	72°·2	94 %	5·88
August	87°	69°	81°·5	72°·0	94 %	0·60
September	91°	73°	85°·7	75°·1	94 %	4·84
October	93°	72°	88°·7	75°·3	85 %	5·76
November	97°	72°	93°·4	76°·5	85 %	·25
December	97°	63°	94°·5	71°·3	94 %	Nil.
Means	101°	59°	88°·3	71°·9	87·3 %	45·99

Station—Calabar.

	Lat. 4° 58′ N. Long. 8° 19′ E.					
January	90°	65°	85°·7	69°·5	89 %	2·05
February	91°	64°	88°·2	71°·6	80 %	1·21
March	93°	69°	87°·1	72°·8	80 %	16·41
April	91°	70°	87°·0	72°·7	85 %	7·05
May	92°	69°	87°·5	73°·8	80 %	3·80
June	90°	70°	83°·2	73°·3	84 %	9·18
July	86°	70°	81°·2	72°·7	89 %	22·21
August	85°	69°	79°·9	71°·7	89 %	16·69
September	88°	70°	82°·5	73°·0	84 %	17·07
October	88°	71°	83°·7	73°·0	84 %	12·19
November	89°	69°	85°·4	72°·0	85 %	5·49
December	89°	68°	85°·9	72°·3	84 %	0·27
Means	93°	64°	84°·8	72°·4	84·4 %	13·62

Station—Enugu Ngwo.

	Lat. 6° 22′ N. Long. 7° 25′ E.					
January	96°	65°	90°·4	70°·4	72 %	Nil.
February	96°	61°	92°·1	67°·2	64 %	1·31
March	98°	58°	92°·7	68°·6	76 %	4·98
April	92°	64°	90°·7	69°·3	76 %	4·78
May	92°	59°	90°·8	66°·2	76 %	10·85
June	91°	64°	89°·6	67°·7	80 %	17·06
July	99°	64°	83°·5	68°·0	72 %	5·75
August	90°	59°	88°·3	66°·1	80 %	4·45
September	91°	58°	88°·3	66°·1	75 %	14·85
October	91°	63°	88°·5	67°·3	76 %	3·93
November	94°	58°	87°·1	67°·1	75 %	4·60
December	93°	64°	89°·7	68°·3	76 %	Nil.
Means	99°	58°	89·3	67°·7	74·8%	72·56

TABLE VI.

RETURN OF DISEASES AND DEATHS (EUROPEAN) FOR THE YEAR 1918.

DISEASES.	IN-PATIENTS.					OUT-PATIENTS.	
	Remaining in Hospital at end of 1917.	Total.		Total cases treated.	Remaining in Hospital at end of 1918.	Total.	
		Admissions.	Deaths.			Cases treated.	Deaths.
Infective Diseases:—							
Beri-Beri	...	...	...	...	...	...	...
Cerebro-Spinal Fever	..	...	...	...	...	...	...
Chicken Pox	...	...	...	...	...	...	...
Cholera	...	...	...	...	...	...	...
Dengue	...	...	...	...	...	...	...
Diphtheria	...	...	...	...	...	...	...
Dysentery:—							
(*a*) Amœbic	...	11	...	11	2	23	...
(*b*) Bacillary	...	...	...	...	...	...	...
(*c*) Type not determined	...	2	...	2	...	4	...
Endocarditis-infective	...	...	...	...	...	...	...
Enteric	...	...	...	...	...	1	...
Erysipelas	...	..	...	...	...	1	...
Gonorrhœa	...	1	...	1	...	78	...
Influenza	...	83	8	83	...	335	7
Kala-Azar	...	...	...	...	...	...	...
Leprosy:—							
(*a*) Nodular	...	...	...	...	...	...	...
(*b*) Anaesthetic	...	...	...	...	...	...	...
Malaria:—							
(*a*) Tertian	...	...	...	...	...	1	...
(*b*) Quartan	...	...	...	...	...	...	...
(*c*) Aestivo-autumnal	7	127	1	134	1	452	...
(*d*) Chronic	...	...	...	...	...	14	...
(*e*) Type not determined	...	...	...	...	...	...	...
Blackwater Fever	2	17	3	19	...	10	1
Measles	...	...	...	...	...	...	...
Papataci Fever	...	...	...	...	...	...	...
Plague	...	...	...	...	...	...	...
Pneumonia	...	2	1	2	...	1	...
Pyrexia of uncertain origin	...	...	...	...	...	...	...
Rabies	...	...	...	...	...	...	...
Relapsing Fever	...	...	...	...	...	...	...
Rheumatic Fever	...	1	...	1	...	1	...
Septicaemia	...	1	...	1	...	...	...
Small-Pox	...	...	...	...	...	...	...
Syphilis (*a*) Primary	...	11	...	11	...	18	..
(*b*) Secondary	...	...	...	...	...	...	...
(*c*) Inherited	...	...	...	...	...	...	...
Tetanus	...	...	...	...	...	...	...
Trypanosomiasis (Sleeping Sickness)	...	1	...	1	...	1	...
Tuberculosis	...	3	...	3	...	2	...
Undulant Fever	...	...	...	...	...	...	...
Whooping Cough	...	...	...	...	...	...	...
Yaws	...	...	...	...	...	...	...
Yellow Fever	...	1	1	1	...	...	...
Other Diseases	...	3	...	3	...	6	...
Intoxications:—							
Alcoholism	...	...	...	...	...	7	1
Morphinism	...	...	...	...	...	...	...
Other Intoxications	...	...	...	...	...	1	...
General Diseases:—							
Anæmia	...	5	...	6	...	123	...
Anæmia-Pernicious	...	...	...	...	...	...	...
Diabetes	...	...	...	...	...	...	...
Exophthalmic goitre	...	...	...	...	...	...	...

TABLE VI.—RETURN OF DISEASES AND DEATHS (EUROPEAN) FOR THE YEAR 1918—*continued.*

DISEASES.	IN-PATIENTS.					OUT-PATIENTS	
	Remaining in Hospital at end of 1917.	TOTAL.		Total cases treated.	Remaining in Hospital at end of 1918.	TOTAL.	
		Admissions.	Deaths.			Cases treated.	Deaths.
GENERAL DISEASES—*continued.*							
Gout	...	...	...	...	...	9	...
Leucocythæmia	...	...	...	...	...	...	...
Lymphadenoma	...	...	...	...	...	...	...
Myxœdema	...	...	...	...	...	...	...
Purpura	...	...	...	...	...	...	...
Rickets	...	...	...	...	...	...	...
Scurvy	...	...	...	...	...	...	...
Other Diseases	...	...	...	...	...	9	...
LOCAL DISEASES.							
DISEASES OF THE NERVOUS SYSTEM.							
Sub-section 1.—Diseases of the Nerves:—							
Neuritis	...	4	...	4	...	16	...
Meningitis	...	2	...	2	..	...	...
Myelitis	...	...	...	...	...	...	...
Hydrocephalus	...	...	...	...	...	...	...
Encephalitis	...	...	...	...	...	...	...
Abscess of brain	...	...	...	...	...	...	...
Congestion of brain	...	...	...	...	...	...	...
Other Diseases	1	5	...	6	...	8	...
Sub-section 2.—Nervous Disorders and Diseases of Undetermined Nature:—							
Apoplexy	...	...	...	...	...	...	...
Paralysis	...	...	...	...	...	2	...
Chorea	...	...	...	...	...	..	...
Epilepsy	...	2	...	2	...	9	...
Neuralgia	...	3	...	3	...	63	...
Hysteria	...	...	...	...	...	...	...
Other Diseases	...	7	...	7	1	19	..
Sub-section 3.—Mental Diseases:—							
Idiocy	...	...	...	...	...	...	...
Mania	...	...	...	...	...	...	...
Melancholia	...	1	...	1	...	...	...
Dementia	...	...	...	...	...	...	...
Delusional Insanity	...	1	...	1	...	2	...
Other Diseases	...	...	...	...	...	2	...
DISEASES OF THE EYE:—							
Conjunctivitis	...	2	...	2	...	20	...
Keratitis	...	...	...	...	...	...	...
Ulceration of cornea	...	...	...	...	...	4	...
Iritis	...	1	...	1	...	...	...
Optic neuritis	...	...	...	...	...	...	...
Cataract	...	...	...	...	...	...	...
Other Diseases	...	1	...	1	...	2	...
DISEASES OF THE EAR:—							
Inflammation	...	3	...	3	...	46	...
Other Diseases	...	3	...	3	...	22	...
DISEASES OF THE NOSE:—							
Inflammation	...	...	...	...	...	4	...
Other Diseases	...	...	...	...	...	15	...
DISEASES OF THE CIRCULATORY SYSTEM:—							
Pericarditis	...	...	...	...	...	2	...
Endocarditis	...	...	...	...	...	...	...

TABLE VI.—RETURN OF DISEASES AND DEATHS (EUROPEAN) FOR THE YEAR 1918—*continued.*

DISEASES.	IN-PATIENTS.				OUT-PATIENTS.	
	Remaining in Hospital at end of 1917.	TOTAL.		Total cases treated.	Remaining in Hospital at end of 1918.	TOTAL.	
		Admissions.	Deaths.			Cases treated.	Deaths.
LOCAL DISEASES—*continued.*							
DISEASES OF THE CIRCULATORY SYSTEM—*continued.*							
Valvular Disease:—							
(1) Mitral	...	2	...	2	...	2	...
(2) Aortic	...	...	...	...	...	...	...
(3) Tricuspid	...	...	..	...	...	...	...
(4) Pulmonary	...	...	...	...	...	...	...
Arterial sclerosis	...	...	...	...	...	1	...
Aneurism	...	...	...	...	...	1	...
Other Diseases	...	6	...	6	...	8	...
DISEASES OF THE RESPIRATORY SYSTEM:—							
Laryngitis	...	1	...	1	...	21	...
Bronchitis	...	4	...	4	...	156	...
Broncho-pneumonia	...	7	...	7	2	2	...
Abscess of Lung	...	...	...	...	...	...	...
Gangrene of Lung	...	...	...	...	...	...	...
Emphysema	...	...	...	...	...	1	...
Pleurisy	...	4	...	4	...	11	...
Empyema	...	...	...	...	...	1	...
Other Diseases	...	...	...	...	...	38	...
DISEASES OF THE DIGESTIVE SYSTEM:—							
Stomatitis	...	..	...	...	...	10	...
Caries of teeth	...	...	...	...	...	32	...
Pyorrhœa alveolaris	...	1	...	1	...	2	...
Glossitis	...	1	...	1	...	9	...
Sore throat	...	2	...	2	...	27	...
Inflammation of tonsils	...	5	...	5	...	31	...
Gastritis	...	12	...	12	1	110	...
Ulceration of stomach	...	...	...	...	...	2	...
Hæmatemesis	...	...	...	...	...	1	...
Dilatation of stomach	...	...	...	...	...	1	...
Stricture of stomach	...	...	...	...	...	...	...
Dyspepsia	...	7	...	7	...	134	...
Enteritis	1	2	...	3	...	5	...
Appendicitis	...	2	...	2	...	3	...
Colitis	...	3	...	3	...	16	...
Ulceration of intestines	...	...	...	...	...	1	...
Sprue	...	...	...	...	...	...	...
Hernia	...	2	...	2	...	...	...
Diarrhœa	...	5	...	5	...	90	...
Constipation	...	2	...	2	1	77	...
Colic	...	1	...	1	...	28	...
Hæmorrhoids	...	2	...	2	...	10	...
Pancreatitis	...	...	...	...	...	1	...
Hepatitis—Acute	...	3	...	3	...	15	...
Abscess	...	1	...	1	...	1	1
Cirrhosis	...	1	...	1	...	...	...
Jaundice	1	1	...	2	...	1	...
Peritonitis	...	...	...	...	...	...	...
Ascites	...	...	...	...	...	...	...
Other Diseases	...	1	...	1	...	43	...
DISEASES OF THE LYMPHATIC SYSTEM:—							
Splenitis	...	1	...	1	...	6	...
Inflammation of lymphatic gland	...	15	...	15	1	26	...
Suppuration of lymphatic gland	...	1	...	1	...	7	...
Lymphangitis	...	1	...	1	...	2	...
Elephantiasis	...	...	...	...	...	...	...
Other Diseases	...	...	...	...	...	7	...

TABLE VI.—RETURN OF DISEASES AND DEATHS (EUROPEAN) FOR THE YEAR 1918—*continued.*

DISEASES.	IN-PATIENTS.					OUT-PATIENTS.	
	Remaining in Hospital at end of 1917.	TOTAL.		Total cases treated.	Remaining in Hospital at end of 1918.	TOTAL.	
		Admissions.	Deaths.			Cases treated.	Deaths.
LOCAL DISEASES—*continued.*							
DISEASES OF THE URINARY SYSTEM:—							
Acute nephritis	...	1	...	1	...	1	...
Bright's Disease	...	2	...	2	...	2	...
Pyelitis	...	...	...	...	...	...	...
Calculus	...	1	...	1	...	...	...
Renal colic	...	...	...	...	...	...	...
Cystitis	...	1	...	1	...	6	...
Vesical calculus	...	...	...	...	...	...	...
Suppression	...	...	...	...	...	...	...
Hæmaturia	...	...	...	...	...	...	...
Chyluria	...	..	..	...	...	...	...
Other Diseases	...	1	...	1	...	3	...
DISEASES OF THE GENERATIVE SYSTEM:—							
Male Organs:—							
Urethritis	...	...	...	...	...	28	...
Gleet	...	...	...	...	...	3	...
Stricture	...	...	...	...	...	2	...
Prostatitis	...	...	...	...	...	1	...
Soft chancre	...	2	...	2	...	19	...
Condyloma	...	...	...	...	...	...	...
Inflammation of scrotum	...	...	...	...	...	...	...
Hydrocele	...	...	...	...	...	...	...
Orchitis	...	...	...	...	...	4	...
Epididymitis	...	1	...	1	...	4	...
Abscess of testicle	...	...	...	...	...	...	...
Other Diseases	...	3	...	3	...	4	...
Female Organs:—							
Ovaritis	...	...	...	...	...	...	...
Ovarian cyst	...	...	...	...	...	...	...
Endometritis	...	...	...	...	...	...	...
Displacement of uterus	...	...	...	...	...	...	...
Vaginitis	...	...	...	...	...	...	...
Amenorrhœa	...	...	...	...	...	...	...
Dysmenorrhœa	...	...	...	...	...	...	...
Menorrhagia	...	...	...	...	...	...	...
Leucorrhœa	...	...	...	...	...	..	...
Other Diseases	...	...	...	...	...	...	...
AFFECTIONS CONNECTED WITH PREGNANCY:—							
Abortion	...	...	...	...	...	...	...
Other Affections	...	...	...	...	...	...	...
AFFECTIONS CONNECTED WITH PARTURITION:—							
Delayed Labour	...	...	...	...	...	...	...
Retained placenta	...	...	...	...	...	...	...
Premature Birth	...	...	...	...	...	...	...
Other Affections	...	...	...	...	...	...	...
AFFECTIONS CONSEQUENT ON PARTURITION:—							
Post-partum hæmorrhage	...	...	...	...	...	...	...
Puerperal septicæmia	...	...	...	...	...	...	...
Mastitis	...	...	...	...	...	...	...
Abscess of breast	...	...	...	...	...	...	...
Other Affections	...	...	...	...	...	...	...
DISEASES OF ORGANS OF LOCOMOTION:—							
Osteitis	...	...	...	...	...	2	...

TABLE VI.—RETURN OF DISEASES AND DEATHS (EUROPEAN) FOR THE YEAR 1918—*continued.*

DISEASES.	IN-PATIENTS.					OUT-PATIENTS	
	Remaining in Hospital at end of 1917.	TOTAL.		Total cases treated.	Remaining in Hospital at end of 1918.	TOTAL.	
		Admissions.	Deaths.			Cases treated.	Deaths.
LOCAL DISEASES—*continued.*							
DISEASES OF ORGANS OF LOCOMOTION—*continued.*							
Arthritis	...	11	...	11	1	61	...
Spondylitis	...	...	...	...	...	...	...
Bursitis	...	...	...	...	...	...	...
Myalgia	...	2	...	2	...	48	...
Other Diseases	...	1	...	1	...	26	...
DISEASES OF CONNECTIVE TISSUE:—							
Cellulitis	1	4	...	5	1	12	...
Abscess	1	6	...	7	...	30	...
Other Diseases	...	...	...	...	...	7	...
DISEASES OF THE SKIN:—							
Ulcer	1	5	...	6	...	51	...
Urticaria	...	...	...	...	...	15	...
Eczema	...	1	...	1	...	44	...
Boil	...	5	...	5	...	64	...
Carbuncle	...	...	...	...	...	3	...
Herpes	...	1	...	1	...	7	...
Psoriasis	...	1	...	1	...	4	...
Oriental sore	...	...	...	...	...	...	...
Tinea	...	...	...	...	...	75	...
Scabies	...	...	...	...	...	11	...
Acne	...	...	...	...	...	1	...
Prickly heat	...	...	...	...	...	24	...
Other Diseases	...	1	...	1	...	24	...
INJURIES:—							
General	...	3	...	3	...	19	
Local	...	15	1	16	2	133	...
TUMOURS:—							
Benign	...	2	...	2	...	3	...
Malignant	...	...	...	...	...	..	...
Malformations	...	...	...	...	...	...	...
POISONS:—							
Vegetable	...	...	...	...	...	...	...
Animal	...	...	...	...	...	1	...
Other Poisons	...	...	...	...	...	4	...
PARASITES.							
ANIMAL PARASITES:—							
Protozoa	...	...	...	...	...	...	...
Trematoda (Flukes)	...	...	...	...	...	...	...
Cestoda:—							
Tænia solium	...	...	...	...	...	...	...
Tænia saginata	...	...	...	...	...	1	...
Other Cestodes	...	...	...	...	...	...	...
Nematoda:—							
Ascaris	...	...	...	...	...	1	...
Trichuris Trichiuris	...	...	...	...	...	...	...
Trichina	...	...	...	...	...	...	...
Dracunculus	...	...	...	...	...	3	...
Filaria	...	...	...	...	...	4	...
Strongylus	...	...	...	...	...	...	...
Ankylostomum	...	...	...	...	...	...	...
Oxyuris	...	...	...	...	...	1	...
Other Nematodes	...	...	...	...	...	...	...
Insecta:—							
Insects producing myiasis	...	...	...	...	...	...	...
Dematophilus penetrans	...	...	...	...	...	3	...
Other Insects	...	...	...	...	...	8	...
Total	17	470	15	487	13	3,040	10

TABLE VII.

RETURN OF DISEASES AND DEATHS (NATIVE) FOR THE YEAR 1918.

DISEASES.	IN-PATIENTS.					OUT-PATIENTS.
	Remaining in Hospital at end of 1917.	TOTAL.		Total cases treated.	Remaining in Hospital at end of 1918.	Total cases treated.
		Admissions.	Deaths.			
INFECTIVE DISEASES:—						
Beri-Beri	...	13	1	13	...	...
Cerebro-Spinal Fever	...	4	3	4	...	1
Chicken Pox	198	1,863	10	2,061	28	170
Cholera	...	...	...	...	...	...
Dengue	...	...	...	...	...	...
Diphtheria	...	...	...	...	...	2
DYSENTERY:—						
(*a*) Amœbic	18	367	116	379	10	233
(*b*) Bacillary	...	120	18	120	3	93
(*c*) Type not determined ...	1	54	16	55	...	40
Endocarditis-infective ...	...	...	...	...	...	...
Enteric	...	3	...	3	...	...
Erysipelas	...	...	...	...	...	2
Gonorrhœa	18	212	2	230	8	1,376
Influenza	5	5,882	666	5,887	27	10,430
Kala-Azar	...	...	...	...	...	...
LEPROSY:—						
(*a*) Nodular	28	9	3	37	39	7
(*b*) Anaesthetic	50	4	4	54	11	8
MALARIA:—						
(*a*) Tertian	...	1	...	1	...	30
(*b*) Quartan	...	6	...	6	1	77
(*c*) Aestivo-autumnal ...	31	1,236	28	1,267	12	7,390
(*d*) Chronic	...	1	1	1	...	109
(*e*) Type not determined ...	...	23	...	23	...	1
Blackwater Fever	...	1	...	1	...	...
Measles	...	10	...	10	...	33
Papataci Fever	...	1	...	1	...	...
Plague	...	...	...	..	...	...
Pneumonia	50	638	161	688	26	310
Pyrexia of uncertain origin ...	...	3	...	3	...	34
Rabies	...	...	...	...	...	...
Relapsing Fever	...	...	...	...	...	1
Rheumatic Fever	...	6	...	6	...	12
Septicaemia	...	8	7	8	...	1
Small-pox	14	358	74	372	5	67
Syphilis (*a*) Primary	3	37	1	40	...	164
(*b*) Secondary ...	2	7	...	9	...	34
(*c*) Inherited	...	1	...	1	...	1
Tetanus	...	20	11	20	...	5
Trypanosomiasis (Sleeping Sickness)	...	...	...	...	...	...
Tuberculosis	3	68	34	71	4	64
Undulant Fever	...	...	...	...	...	...
Whooping Cough	...	...	...	...	...	17
Yaws	12	97	...	109	10	261
Yellow Fever	...	1	1	1	...	...
Other Diseases	...	6	...	6	...	95
INTOXICATIONS:—						
Alcoholism	1	1	...	2	...	...
Morphinism	...	...	...	...	...	...
Other Intoxications	...	2	...	2	2	...
GENERAL DISEASES:—						
Anæmia	1	64	9	65	4	979
Anæmia-Pernicious	...	2	2	2	...	...
Diabetes	...	1	...	1	...	...
Exophthalmic goitre	...	1	1	1	...	5

TABLE VII.—RETURN OF DISEASES AND DEATHS (NATIVE) FOR THE YEAR 1918—*continued.*

DISEASES.	IN-PATIENTS.					OUT-PATIENTS.
	Remaining in Hospital at end of 1917.	TOTAL.		Total cases treated.	Remaining in Hospital at end of 1918.	Total cases treated.
		Admissions.	Deaths.			
GENERAL DISEASES—*continued.*						
Gout	...	20	...	20	...	37
Leucocythæmia	...	...	...	...	...	...
Lymphadenoma	...	...	...	...	...	...
Myxœdema	...	1	...	1	...	...
Purpura	...	...	...	...	...	...
Rickets	...	...	...	...	...	8
Scurvy	...	1	...	1	1	...
Other Diseases	...	1	1	1	...	96
LOCAL DISEASES.						
DISEASES OF THE NERVOUS SYSTEM.						
Sub-section 1.—Diseases of the Nerves:—						
Neuritis	1	14	...	15	...	52
Meningitis	...	6	6	6	...	...
Myelitis	...	...	...	...	...	2
Hydrocephalus	...	...	...	...	...	3
Encephalitis	...	2	...	2	...	...
Abscess of brain	...	1	1	1	...	...
Congestion of brain	...	1	1	1	...	4
Other Diseases	1	13	3	14	1	27
Sub-section 2.—Nervous Disorders and Diseases of Undetermined Nature:—						
Apoplexy	...	8	5	8	...	3
Paralysis	...	13	1	13	3	39
Chorea	...	...	...	...	...	1
Epilepsy	...	34	6	34	2	35
Neuralgia	1	155	...	156	1	1,389
Hysteria	...	3	...	3	1	105
Other Diseases	2	...	2	2	...	111
Sub-section 3.—Mental Diseases:—						
Idiocy	5	...	...	5	...	...
Mania	56	2	4	58	18	7
Melancholia	8	51	1	59	50	1
Dementia	...	2	...	2	...	5
Delusional Insanity	2	1	...	3	3	1
Other Diseases	...	1	...	1	...	4
DISEASES OF THE EYE:—						
Conjunctivitis	4	99	...	103	1	1,533
Keratitis	1	8	...	9	...	33
Ulceration of cornea	...	5	...	5	1	21
Iritis	...	10	...	10	...	27
Optic neuritis	...	1	...	1	1	5
Cataract	...	...	...	...	...	27
Other Diseases	2	...	...	2	...	127
DISEASES OF THE EAR:—						
Inflammation	...	17	...	17	...	1,190
Other Diseases	...	12	...	12	...	412
DISEASES OF THE NOSE:—						
Inflammation	...	1	...	1	...	45
Other Diseases	...	3	...	3	...	57
DISEASES OF THE CIRCULATORY SYSTEM:—						
Pericarditis	1	10	7	11	1	12
Endocarditis	...	2	...	2	...	23

TABLE VII.—RETURN OF DISEASES AND DEATHS (NATIVE) FOR THE YEAR 1918—*continued.*

DISEASES.	IN-PATIENTS.				OUT-PATIENTS.
	Remaining in Hospital at end of 1917.	TOTAL.		Total cases treated.	Remaining in Hospital at end of 1918.	Total cases treated.
		Admissions.	Deaths.			
LOCAL DISEASES—*continued.*						
DISEASES OF THE CIRCULATORY SYSTEM—*continued.*						
Valvular Disease:—						
(1) Mitral	3	38	16	41	...	129
(2) Aortic	1	8	4	9	...	15
(3) Tricuspid	...	...	...	...	...	...
(4) Pulmonary	...	...	...	...	...	1
Arterial sclerosis	...	4	1	4	...	2
Aneurism	...	1	1	1	...	4
Other Diseases	...	21	5	21	...	22
DISEASES OF THE RESPIRATORY SYSTEM:—						
Laryngitis	...	5	...	5	...	114
Bronchitis	51	731	29	782	23	10,304
Broncho-pneumonia	...	46	11	46	3	49
Abscess of Lung	...	1	...	1	...	...
Gangrene of Lung	...	...	...	...	...	10
Emphysema	...	1	1	1	...	5
Pleurisy	4	77	10	81	5	137
Empyema	...	2	1	2	1	...
Other Diseases...	1	20	1	21	...	110
DISEASES OF THE DIGESTIVE SYSTEM:—						
Stomatitis	...	36	1	36	...	450
Caries of teeth	...	28	...	28	...	917
Pyorrhœa alveolaris	...	5	...	5	1	59
Glossitis	...	5	...	5	...	80
Sore throat	...	8	...	8	1	199
Inflammation of tonsils ...	...	7	...	7	...	253
Gastritis	4	52	1	56	...	348
Ulceration of stomach ...	...	...	...	...	...	13
Hæmatemesis	...	1	1	1	...	1
Dilatation of stomach... ...	...	...	...	...	...	1
Stricture of stomach	...	...	...	...	...	1
Dyspepsia	1	10	...	11	...	1,334
Enteritis...	...	38	15	38	...	125
Appendicitis	1	7	...	8	...	4
Colitis	...	26	18	26	...	110
Ulceration of intestines ...	...	1	. .	1	...	1
Sprue	...	...	...	...	...	1
Hernia	23	188	17	211	7	195
Diarrhœa	31	1,073	85	1,104	18	2,426
Constipation	16	210	2	226	6	8,152
Colic	3	208	2	211	2	1,982
Hæmorrhoids	...	28	...	28	1	229
Pancreatitis	...	...	...	...	...	...
Hepatitis—Acute	1	11	2	12	...	32
Abscess	...	8	2	8	...	7
Cirrhosis...	...	12	8	12	...	5
Jaundice...	...	3	1	3	...	18
Peritonitis	...	6	4	6	...	11
Ascites	3	24	5	27	2	61
Other Diseases...	...	18	4	18	1	163
DISEASES OF THE LYMPHATIC SYSTEM:—						
Splenitis	1	10	...	11	2	400
Inflammation of lymphatic gland	8	129	...	137	3	878
Suppuration of lymphatic gland	2	32	...	34	...	70
Lymphangitis	...	10	...	10	...	104
Elephantiasis	8	16	...	24	...	19
Other Diseases...	3	8	1	11	1	11

Table VII.—Return of Diseases and Deaths (Native) for the Year 1918—*continued.*

Diseases.	In-Patients.				Out-Patients.
	Remaining in Hospital at end of 1917.	Total. Admissions.	Total. Deaths.	Total cases treated.	Remaining in Hospital at end of 1918.	Total cases treated.
Local Diseases—*continued.*						
Diseases of the Urinary System:—						
Acute nephritis	2	25	9	27	...	64
Bright's Disease	1	21	12	22	...	10
Pyelitis	...	1	...	1	...	3
Calculus	...	...	...	...	...	...
Renal colic	...	1	...	1	...	...
Cystitis	1	23	...	24	...	112
Vesical calculus	...	1	...	1	...	...
Suppression	...	2	...	2	...	2
Hæmaturia	...	2	...	2	...	6
Chyluria	...	...	...	...	...	...
Other Diseases	2	9	1	11	2	19
Diseases of the Generative System:—						
Male Organs:—						
Urethritis	2	3	...	5	...	61
Gleet	...	2	...	2	...	18
Stricture	6	37	2	43	2	31
Prostatitis	...	3	...	3	...	2
Soft chancre	1	21	...	22	1	163
Condyloma	1	...	...	1	...	2
Inflammation of scrotum	...	2	...	2	...	6
Hydrocele	9	45	1	54	...	51
Orchitis	2	31	...	33	2	160
Epididymitis	2	8	...	10	...	49
Abscess of testicle	...	2	...	2	...	4
Other Diseases	3	27	1	30	...	81
Female Organs:—						
Ovaritis	...	1	...	1	...	7
Ovarian cyst	1	...	...	1	...	3
Endometritis	...	10	...	10	...	42
Displacement of uterus	...	2	...	2	...	10
Vaginitis	...	3	...	3	...	18
Amenorrhœa	...	3	...	3	...	42
Dysmenorrhœa	...	3	...	3	...	77
Menorrhagia	...	2	...	2	...	53
Leucorrhœa	...	...	...	...	...	20
Other Diseases	2	20	2	22	...	105
Affections connected with Pregnancy:—						
Abortion	...	13	1	13	...	21
Other Affections	...	6	...	6	...	16
Affections connected with Parturition:—						
Delayed Labour	...	9	...	9	...	3
Retained placenta	...	4	...	4	...	4
Premature Birth	...	1	...	1	...	5
Other Affections	...	8	1	8	...	7
Affections consequent on Parturition:—						
Post-partum hæmorrhage	...	...	2	...	...	4
Puerperal septicæmia	...	6	...	6	...	1
Mastitis	1	4	...	5	...	52
Abscess of breast	...	...	...	...	...	20
Other Affections	...	...	...	...	...	6

TABLE VII.—RETURN OF DISEASES AND DEATHS (NATIVE) FOR THE YEAR 1918—*continued.*

DISEASES.	IN-PATIENTS.					OUT-PATIENTS.
	Remaining in Hospital at end of 1917.	TOTAL.		Total cases treated.	Remaining in Hospital at end of 1918.	Total cases treated.
		Admissions.	Deaths.			
DISEASES OF ORGANS OF LOCOMOTION:—						
Osteitis	2	20	...	22	1	117
Arthritis...	35	506	3	541	16	2,963
Spondylitis	...	2	...	2	...	1
Bursitis	1	16	...	17	...	108
Myalgia	2	72	...	74	2	3,473
Other Diseases	12	71	3	83	4	1,312
DISEASES OF CONNECTIVE TISSUE:—						
Cellulitis	14	173	2	187	9	1,235
Abscess	33	569	6	602	12	1,426
Other Diseases...	...	11	...	11	...	108
DISEASES OF THE SKIN:—						
Ulcer	52	1,139	1	1,191	31	10,417
Urticaria...	...	4	...	4	...	88
Eczema	8	229	...	237	6	2,338
Boil	2	121	...	123	...	1,101
Carbuncle	...	2	...	2	...	15
Herpes	...	12	...	12	...	40
Psoriasis...	...	...	...	...	...	31
Oriental sore	...	...	...	...	...	...
Tinea	...	40	...	40	...	1,623
Scabies	...	20	...	20	...	1,186
Acne	...	1	...	1	...	12
Prickly heat	...	1	...	1	...	16
Other Diseases...	1	39	1	40	...	587
INJURIES:—						
General	...	38	8	38	1	88
Local	87	1,568	44	1,655	45	15,910
TUMOURS:—						
Benign	2	50	2	52	...	139
Malignant	1	6	1	7	1	8
Malformations	...	6	1	6	1	7
POISONS:—						
Vegetable	...	...	...	...	...	..
Animal	...	2	...	2	...	8
Other Poisons	...	13	4	13	...	17
PARASITES.						
ANIMAL PARASITES:—						
Protozoa...	...	...	...	...	...	5
Trematoda (Flukes)	...	2	...	2	...	...
Cestoda:—						
Tænia solium	1	16	...	17	...	83
Tænia saginata	...	2	...	2	...	72
Other Cestodes	...	...	...	...	...	4
Nematoda:—						
Ascaris	3	61	2	64	...	2,283
Trichuris trichiuris ...	...	...	...	...	...	...
Trichina	...	...	...	...	...	...
Dracunculus	3	109	...	112	1	445
Filaria	...	6	...	6	1	79
Strongylus	...	2	...	2	...	5
Ankylostomum	19	271	69	290	5	153
Oxyuris	...	11	...	11	...	10
Other Nematodes ...	...	...	...	...	...	13
Insecta:—						
Insects producing myiasis	...	...	...	...	...	...
Dermatophilus penetrans	...	...	...	...	...	53
Other Insects	...	...	...	...	...	21
Total	998	20,368	1,635	21,366	494	106,016

TABLE VIII.

SURGICAL OPERATIONS PERFORMED.

Total Number.	Cured.	Relieved.	Unrelieved.	Died.
1,842	1,594	206	11	31

Table Showing the Sick, Invaliding, and Death rates of European Officials in Nigeria during 1916, 1917 and 1918.

	Nigeria.		
	1916.	1917.	1918.
Total number of European officials resident	1,708	1,633	1,598
Average number resident	1,055·3	1,120·13	1,080·88
Total number on sick list	1,020	1,731	2,221
Total number of days on sick list	11,241	12,110	18,890
Average daily number on the sick list	30·7	33·17	51·75
Percentage of sick to average number resident ...	2·9	2·96	4·78
Average number of days on the sick list to each patient	11	7	8·5
Average sick time to each resident	10·6	10·8	17·47
Total number invalided	89	87	139
Percentage of invalidings to total number resident ...	5·2	5·3	8·69
Percentage of invalidings to average number resident	8·4	7·7	12·8
Total number of deaths	14	22	32
Percentage of deaths to total number resident ..	·81	1·34	2
Percentage of deaths to average number resident ...	1·3	1·96	2·96

APPENDIX.

ANNUAL REPORT, MEDICAL RESEARCH INSTITUTE, 1918.

The tenth Annual Report of the Medical Research Institute is presented herewith.

The subjects which occupied special attention during 1918 were Chronic Dysentery and Leprosy.

The Director was on duty from 1st January until 31st December. For a period of four weeks in the earlier part of the year he travelled in the Northern Provinces, collecting information on skin diseases. For a fortnight in the later part of the year he acted as Medical Officer at Ibadan Residency.

The services of Dr. H. Sinclair Coghill, Assistant Bacteriologist, were again lent to the Northern Provinces for the year.

The post of Laboratory Attendant remained vacant.

The native assistant retired at the beginning of the year, on account of illness.

Thus the entire work of the Laboratory devolved on the Director, except in the Entomological Department. This was conducted entirely by Mrs. Summers Connal.

The medical supervision of the Yaba Lunatic and Leper Asylums was again undertaken by the Director, throughout the year.

During the earlier part of the epidemic of Influenza in Lagos, the Director was given medical charge of the Gaol and of the W.A.F.F. Barracks. Later, he assisted the Medical Officer at Railway Headquarters, Ebute Metta.

CHRONIC DYSENTERY.

A considerable amount of work has been done during 1917 and 1918 on the subject of Chronic Dysentry. A full report is not given for the reasons that many of the patients are still under observation, and the chronicity of the disease is such that long periods of observation are necessary before conclusions can be justifiably formed.

Some notes are appended which show the complexity of the problem of cure, and the need for prolonged treatment with the drugs in use.

Although it would seem that it is possible to get rid of the cyst infection in some cases, it is a difficult matter to say when a cure is definitely effected. It must not be forgotten that in Lagos, as also in other endemic areas, re-infection is not only possible, but it is probable during the intervals when medicinal treatment is suspended.

It is also difficult to apportion the credit of cure to the drug, to the prophylactic measures and the lapse of time. Practically all of the cases now to be detailed were in the private practice of Dr. G. M. Gray, in Lagos, in conjunction with whom these notes are compiled.

Thirty cases have been selected out of thrice that number which have been observed. Three of these cases were suffering from acute Amœbic Dysentry when first seen.

Experience has shown that when Emetin is administered early in an acute attack and in adequate dosage, the prognosis is highly favourable. But unfortunately, all cases do not show an acute onset, and in many instances the infection is well established before specific remedial measures can be adopted. It occasionally happens too, that the patient is several days' journey removed from medical assistance, or that he is content to treat himself with chlorodyne or other sedative drugs in his travelling medicine-chest.

At any rate, whether there be an insidious onset or an improperly treated acute attack, there are usually abundant cysts of Entamœba histolytica in the motions, when the patient comes for treatment. The cysts not the amœbae are the difficult forms to eradicate.

The causes which led the patient to seek medical advice were somewhat indefinite. They included vague abdominal pain or discomfort; occasional loose stools which contained mucus in small shreds or little masses; sometimes constipation with little flakes of jelly-like mucus adhering to the scybala; a certain amount of lassitude; an inability for prolonged exertion; a disordered appetite; and sometimes headaches.

The diagnosis of the cysts in the laboratory was based on the number and on the character of the nuclei, on the shape of the chromatin bodies, on the presence or absence of vacuoles and on the size and shape of the cyst both in the fresh and in the fixed and stained state.

In identifying the free Entamœba histolytica, the presence of ingested red cells was always demonstrated before accepting the diagnosis.

Three groups of cases are represented in the following tabulated statements:—I those definitely cured; II those improved but not definitely cured; III, those remaining apparently unaffected.

The patient was regarded as definitely cured when there was an absence of cysts in the fæces at several consecutive examinations and when he himself expressed his belief that he was cured. This personal opinion of the patient came to be regarded as reliable. It happened on occasions, that all the clinical signs of infection had cleared up, but the patient did not give a confident expression of a feeling of well-being. In such cases there was usually a reappearance of cysts in the stools at a later period.

In tabulating the results of the examination of the fæces it was found impossible to give the duration of the illness in so many days or weeks. Such a statement was precluded because of the indefinite history usually obtained regarding the onset. Consequently, each period at which the stools were examined is given as so many days after the first examination. There was a definite date in only three cases, (1) T.R. (2) I.R., and (12) E.A., in all of which the stools were examined on the second day of illness, which was the first day on which blood and mucus appeared in the stools.

The signs used are:—

E = Entamœba histolytica, free form.

C = „ „ encysted.

H = Mucus containing neither free nor encysted forms.

P = Protoplasmic strands or masses, on staining.

O = Negative.

Group I.—Cases in which cure was effected.

(1) T.R.—Onset acute, mucus in stools with pus and red blood cells. E. histolytica numerous. Treated with Alcresta, grains V, thrice daily for ten days. This course was repeated after a week's interval. Improvement rapid. Under observation 328 days. Fæces examined on 8 occasions. Hospital patient.

1st. Exam. 13 days 24, 36, 76, 217, 301, 308.

E. O. O. O. O. O. O. O.

(2) I.R.—Onset as in (1). Treated with Alcresta, grains V, thrice daily for one week. Other two such courses at a 7 days' interval. Improvement rapid. Under observation 289 days. Fæces examined on 6 occasions. Hospital patient.

1st. Exam. 5 days 8. 115, 170, 289.
E. O. M. O. O. O.

(3) H.E.—Onset uncertain. Gave a history of some looseness of the bowels, vague abdominal pains, a feeling of lassitude and incapacity for work. There was tenderness in the sigmoid and cæcal regions. The stools contained pus in which were found active and encysted forms of E. histolytica, and degenerated epithelial cells. Treatment for the first fortnight consisted in the administration, once daily of Pil. Ipecac. Co., (Pulv. Ipecac. gr. I, Pulv. Ipecac, Co. grs. II, Pil. Opii Co. grs. III). This failed to relieve the condition.

Alcresta was then given, grs. V. thrice daily for ten days. This got rid of the free amœbae and lessened the number of cysts. After a three weeks' interval the course of Alcresta was repeated. At its completion, cysts could not be found in the stools. A fortnight later there was a return of the free amœbae and cysts.

Bismuth Emetin Iodide was tried, grs. III in salol-coated pills, enclosed in gelatin capsules, given at bed-time, after a preliminary injection of morphia. Despite these precautions and the patient's own intentions, nausea and vomiting occurred. A second and a third attempt on successive nights met with the same result. Emetin was then given hypodermically, gr. I daily for a week. Three such courses were administered at intervals of one week. The cysts persisted and Alcresta was substituted, grs. V thrice daily for ten days. This course was repeated after a week's interval. During the next seven weeks, cysts were sometimes found and sometimes not.

Another course of Alcresta similar to the former ones was given and during the first seven days of it, Emetin gr. I daily was administered hypodermically. Thereafter the fæces remained free from cysts. Under observation 212 days. Fæces examined on 22 occasions. Out-patient.

1st. Exam. 14 days 20, 48, 62, 74, 83, 95, 112, 119, 126, 134,
E.C. E.C. C. O. E.C. O. C. C. O. C. C. O.
140, 147, 153, 163, 169, 180, 192, 198, 204, 212.
C. O. O. C. O. C. O. O. O. O.

(4) N.A.—Onset uncertain. Looseness of bowels occasional mucus, of about one month's duration. Entamœba histolytica both free and encysted in stools. Emetin was given daily, in one-grain doses hypodermically for seven days. After a week's interval Alcresta was tried, grs. V thrice daily for ten days. After five days' interval the course of Alcresta was repeated. Under observation 131 days. Fæces examined on 18 occasions. Hospital patient.

1st Exam. 3 days. 4, 11, 16, 17, 21, 23, 27, 29, 36, 41, 44, 47,
E.C. C. O. O. E.C. E.C. O. O. O. E.C. O. O. M. M.
50. 63. 126. 131.
O. O. O. O.

(5) W.A.—Onset uncertain. Stool contained E. histolytica free and encysted. Received two courses of Alcresta, grs. V thrice daily for ten days with a week's interval. Under observation 84 days. Fæces examined on 12 occasions. Out-patient.

1st Exam. 9 days. 10, 14, 17, 20, 22, 27, 31, 49, 66, 84.
E.C. E.C. E.C. O. O. O. E.C. O. O. O. O. O.

(6) H.D.—Onset uncertain. Stool contained cysts of E. histolytica. Bismuth Emetin Iodide grs. V in salol-coated pills contained in gelatin-capsules, given daily for seven days. Declined further such treatment

Alcresta administered, grs. V thrice daily for ten days. Other two such courses given with a week's interval between each. Under observation 290 days. Fæces examined on 15 occasions. Out-patient.

1st Exam.	7 days.	14,	26,	38,	52,	89,	116,	127,	138,	142,
C.	O.	O.	C.	O.	C.	O.	O.	O.	O.	C.

148,	277,	285,	290.
O.	O.	O.	O.

(7) S.H.—Onset uncertain. Cysts of E. histolytica in stools. Two courses of Emetin given hypodermically, gr. I daily for twelve days, with a week's interval. Thereafter Bismuth Emetin Iodide grs. III in salol-coated pills enclosed in gelatin capsules, given thrice daily for seven days. This was the only patient who took Bismuth Emetin Iodide without demur. He complained of "indigestion" and had some nausea but there was no vomiting. On the other hand he complained of considerable discomfort from the Emetin hypodermically. Under observation 213 days. Fæces examined on 9 occasions. Hospital patient.

1st Exam.	22 days.	27,	37,	56,	65,	90,	131,	213.
C.	C.	C.	C.	O.	O.	O.	O.	O.

(8) C.A.—Onset uncertain. Felt "out of sorts," lack of appetite, "run down." Tenderness and thickening over sigmoid. History of "diarrhoea" in 1910. Stools contained E. histolytica, free and encysted. One dose of Bismuth Emetin Iodide grs. III prepared as above, caused much vomiting and nausea and further doses were refused. Alcresta then given in V grain doses thrice daily for ten days. This course was repeated after one week's interval. Period of observation 49 days. Fæces examined on 8 occasions. Out-patient.

1st Exam.	7 days.	13,	20,	23,	28,	35,	42,	49.
E.C.	O.	O.	E.C.	O.	O.	O.	O.	O.

(9) M.R.—Onset uncertain. Cysts of E. histolytica in stools. Three courses of Alcresta given, grs. V thrice daily for ten days with a week's interval between each course. Under observation 263 days. Faeces examined on 9 occasions. Out-patient.

1st Exam.	3 days.	10,	16,	23,	31,	95,	223,	263.
C.	C.	O.	O.	O.	O.	O.	O.	O.

(10) F.A.—Onset uncertain. First examination of fæces negative. Cysts of E. histolytica found five days afterwards. Patient's complaint of occasional intestinal disturbance, and lassitude, led to a clinical diagnosis of chronic Dysentery, and treatment was begun before the laboratory findings confirmed the diagnosis. Bismuth Emetin Iodide was refused after the first dose. Alcresta was then given, grs. V thrice daily for a week. This course was repeated on two occasions, with a week's interval between each. Under observation 57 days. Fæces examined on 7 occasions. Out-patient.

1st Exam.	5 days.	8,	16,	42,	47,	57.
O.	C.	C.	C.	O.	O.	O.

(11) C.U.—Onset uncertain. Cysts of E. histolytica in stools. Bismuth Emetin Iodide, prepared as above caused much vomiting and was refused after two doses. Pil. Ipecac. Co. as above was tried for a few days, with apparently no effect, and then Alcresta was resorted to in the usual dosage, for the usual period.

After a week's interval the course of Alcresta was repeated. Under observation 73 days. Fæces examined on 6 occasions. Out-patient.

1st Exam.	12 days.	33,	49,	56,	73.
C.	O.	O.	O.	O.	O.

(12) E.A.—Onset as in (1) and (2). Emetin was given intramuscularly, one grain daily for seven days, concurrently with Alcresta internally, grs. V thrice daily. At the end of the week the stools were normal and the patient was well. Under observation 40 days. Fæces examined on 8 occasions. Hospital patient.

1st Exam.	3 days.	6,	8,	9,	13,	33,	40.
E.C.	E.C.	M.	O.	O.	O.	O.	O.

(13) B.U.—History of dysentery about six months previously. Bismuth Emetin Iodide with salol and gelatin as above, refused after several trials. Pil. Ipecac. Co. as above, ineffective. Alcresta in V grain doses given thrice daily for ten days. This course was repeated on three subsequent occasions with a week's interval between each. Under observation 202 days.

Fæces examined on 9 occasions. Out-patient.

1st Exam.	7 days.	18,	36,	60,	103,	111,	198,	202.
C.	C.	C.	O.	O.	O.	O.	O.	O.

(14) B.L.—Two previous attacks of Dysentery. Felt "run down" and "out of sorts." Stools contained cysts of E. histolytica. Alcresta, given in V grain doses thrice daily for ten days. For the first seven days, Emetin was given concurrently, one grain daily, hypodermically. The course of Alcresta was repeated on two subsequent occasions, with a week's interval between each. Under observation 66 days. Fæces examined on 7 occasions. Hospital patient.

1st Exam.	21 days.	24,	27,	31,	32,	66.
C.	E.C.	O.	P.	O.	O.	O.

(15) F.I.—An attack of acute Diarrhoea. No blood or mucus in stools. Numerous cysts of E. histolytica found. Given Alcresta grs. V thrice daily for ten days, concurrently with Emetin hypodermically one grain daily for seven days. Alcresta course repeated after a week's interval. A month after the completion of this last course, patient had another attack of acute Diarrhoea with blood and mucus in the stools, but no amœbæ or cysts.

The course of Emetin hypodermically and Alcresta internally were given as before, but the Alcresta was continued for two weeks. Subsequently, patient had two further courses of Alcresta at intervals of a week. Under observation 101 days. Fæces examined on 8 occasions. Hospital patient.

1st Exam.	4 days.	8,	40,	47,	60,	87,	101.
C.	O.	O.	O.	O.	O.	O	O.

Group II.—Cases in which there was improvement, but not a definite cure.

(*a*) W.I.—Complained of feeling out of sorts. Cysts of E. histolytica found in stools. Pil. Ipecac. Co. as above, had no effect on the cysts after three week's treatment. About two months later, there was an attack of acute Dysentery with pus, blood, amœbæ (E. histolytica) in the stools. One dose of Bismuth Emetin Iodide prepared as above produced violent vomiting and patient objected to another dose. He was then tried with Emetin and Alcresta concurrently, the former in one-grain dose daily, hypodermically for seven days and the latter in doses of five grains thrice daily for ten days. The course of Alcresta was repeated subsequently on two occasions with a week's interval between each. Under observation 352 days. Fæces examined on 19 occasions. Hospital patient.

1st Exam.	10 days.	59,	75,	81,	89,	92,	97,	133,	143,	150,	157,
C.	C.	C.	E.C.	C.	O.	C.	O.	O.	O.	O.	O.

170,	186,	199,	215,	239	270,	352.
O.	O.	O.	O.	C.	O.	O.

(*b*) S.M.—Onset uncertain. Cysts and free forms of E. histolytica in stools. Bismuth Emetin Iodide prepared as above, was refused after one dose. Emetin was then given hypodermically, one grain daily for seven days. This was followed by Alcresta in V grain doses thrice daily for a week. Two more such courses of Alcresta were given at intervals of a week. Under observation 166 days. Fæces examined on 12 occasions. Out-patient.

1st Exam.	8 days.	13,	19,	26,	33,	40,	49,	63,	121,	160,	166.
E.C.		O.	E.C.	E.C.	C.	O.	O.	O.	O.	C.	O.	O.

(*c*) S.C.—Onset uncertain. Cysts of E. histolytica in stools. Bismuth Emetin Iodide prepared as above, was refused after the first dose on account of nausea and vomiting. Alcresta was given instead, in V grain doses thrice daily for ten days, and this course was twice repeated thereafter, with one week's interval between each. Under observation 176 days. Fæces examined on 12 occasions. Out-patient.

1st Exam.	8 days.	18,	25,	31,	38,	47,	89,	99,	114,	128,	176.
C.		C.	O.	C.	O.	C.	C.	C.	O.	C.	O.	O.

(*d*) M.O.—Onset uncertain. Entamœba histolytica free and encysted in stools. Emetin, one grain, was given hypodermically, daily for one week.

This course was repeated on three occasions thereafter, with ten days' interval between each. He was next tried with Pil. Ipecac. Co. as above, thrice daily for several weeks. As no improvement followed, Bismuth Emetin Iodide, prepared as above, was tried. Nausea and vomiting were such that the treatment was refused after two doses. Alcresta was then administered in V grain doses thrice daily for ten days.

The course was repeated on ten occasions thereafter at intervals of from one to two weeks. Under observation 334 days. Fæces examined on 22 occasions. Out-patient.

1st Exam.	14 days.	33,	66,	87,	115,	125,	134,	139,	142,	153,	167,
E.C.		C.	E.C.	C.	C.	E.C.	E.C.	O.	O.	E.C.	E.C.	O.

172,	232,	241,	278,	304,	317,	319,	321,	324,	334.
O.	C.	O.	O.	O.	E.C.	C.	C.	C.	O.

(*e*) M.U.—Onset uncertain. Cysts of E. histolytica in stools. Alcresta given in V grain doses thrice daily for one week. This course was repeated about four months later. Patient died from Influenza. Under observation 177 days. Fæces examined on 5 occasions. Out-patient.

1st Exam.	4 days.	100,	149,	177.
C.		C.	O.	C.	O.

(*f*) P.O.—Onset uncertain. Cysts of E. histolytica in stools. Emetin one grain hypodermically daily for seven days followed by Alcresta, V grains thrice daily for ten days. This course of Alcresta was twice repeated at intervals of three days. Under observation 88 days. Fæces examined on 7 occasions. Hospital patient.

1st Exam.	3 days.	6,	15,	71,	76,	88.
C.		O.	C.	O.	E.C.	E.C.	O.

Group III.—Cases in which there was no improvement.

(*a*) H.U.—Onset uncertain. Had been feeling out of sorts for some months. Passed a quantity of fæces containing strings of mucus, which he thought were worms. There were numerous cysts and free forms of E. histolytica in the stool. First treated with Emetin hypodermically, one grain daily for seven days. He was then put on to Bismuth Emetin Iodide grs. V prepared as above, thrice daily for ten days. He complained of nausea, so Alcresta was given, grs. V thrice daily for ten days. The Alcresta course was repeated at intervals of a week, over a period of two months. Under observation 179 days. Fæces examined on 18 occasions. Out-patient.

1st Exam.	6 days.	11,	18,	29,	36,	43,	57,	64,	71,	88,	109,	118,	126,	139,	161,	168,	179.
E.C.	P.	O.	O.	O.	C.	O.	O.	O.	C.	O.	C.	O.	C.	C.	O.	C.	C.

(*b*) A.L.—Onset uncertain. Cysts of E. histolytica in stool. Bismuth Emetin Iodide, prepared as above, caused violent sickness and vomiting on the first two occasions, and further doses were refused. Emetin one grain daily, was then given hypodermically, for seven days. This was followed by Alcresta, grains V thrice daily for ten days. The course of Alcresta, was repeated on two subsequent occasions at intervals of a week. Under observation 194 days. Fæces examined on 10 occasions. Out-patient.

1st Exam.	9 days.	27,	36,	49,	70,	86,	104,	156,	194.
C.	E.C.	O.	C.	C.	C.	C.	C.	C.	C.

(*c*) M.L.—Onset uncertain. Cysts of E. histolytica in stools. First treated with Pil. Ipecac. Co. as above for two weeks. Alcresta was at that time, not available. Bismuth Emetin Iodide as above prepared, was not tolerated, and patient remained untreated for nearly two months. Then Alcresta was obtained and administered in doses of grs. V thrice daily for ten days. On three subsequent occasions this course of Alcresta was repeated at intervals of seven days. Under observation 214 days. Fæces examined on 12 occasions. Out-patient.

1st Exam.	8 days.	12,	30,	52,	95,	106,	120,	128,	181,	197,	214.
C.	O.	C.	C.	C.	E.C.	E.C.	O.	O.	O.	C.	C.

(*d*) W.L.—Onset uncertain. Cysts of E. histolytica in stools. Alcresta was given, grs. V thrice daily for ten days and repeated after an interval of one week. Under observation 111 days. Fæces examined on 8 occasions. Out-patient.

1st Exam.	14 days.	22,	35,	69,	93,	100,	111.
C.	O.	C.	O.	O.	C.	O.	C.

(*e*) M.N.—Onset uncertain. Cysts of E. histolytica in fæces. Bismuth Emetin Iodide treatment declined after one attempt to retain the dose. Put on Alcresta grs. V thrice daily for ten days. Other two such courses were given, at intervals of one week. Under observation 72 days. Fæces examined on 8 occasions. Out-patient.

1st Exam.	5 days.	9,	19,	27,	35,	47,	72.
C.	O.	O.	C.	O.	C.	C.	O.

(*f*) L.Y.—Acute Dysentery apparently cured by the administration of Emetin hypodermically, one grain daily for seven days. About a year later, cysts of E. histolytica found in stools. Pil. Ipecac. Co. as above, tried for two weeks. Then Alcresta,

grs. V thrice daily, was given for seven days. This course of Alcresta was repeated on two further occasions with a week's interval between each. Under observation 387 days. Fæces examined on 11 occasions. Out-patient.

1st Exam.	15 days.	19,	332,	338,	348,	354,	366,	374,	380,	387.
E.C.	O.	O.	C.	C.	C.	C.	C.	C.	O.	C.

(*g*) B.E.—Onset uncertain. Cysts of E. histolytica in stools. He was given three courses of Alcresta, grs. V thrice daily, for ten days, at intervals of one month. Under observation 219 days. Fæces examined on 6 occasions. Out-patient.

1st Exam.	11 days.	32,	44,	120,	219.
C.	C.	C.	C.	C.	C.

(*h*) R.O.—Had an attack of Acute Dysentery, apparently cured by Emetin hypodermically, one grain daily for seven days. About four months later, cysts of E. histolytica were found in the stools. He was again given Emetin hypodermically, one grain daily for seven days, then Alcresta grs. V thrice daily for ten days. The course of Alcresta was repeated a week later. Under observation 444 days. Fæces examined on 6 occasions. Out-patient.

1st Exam.	10 days.	18,	138,	366,	444.
E.C.	O.	O.	C.	C.	P.

(*i*) M.A.—An attack of Acute Dysentery apparently cured with Emetin hypodermically, one grain daily for seven days. Four months later, cysts of E. histolytica were found in the stools. Two courses of Alcresta were administered, grs. V thrice daily for ten days with an interval of one week between. Under observation 162 days. Fæces examined on 5 occasions. Out-patient.

1st Exam.	9 days.	124,	136,	162.
E.C.	O.	C.	O.	C.

Considerations.—As many of the cases are still under treatment, and practically all are still under observation, it is at present unwise to form definite conclusions.

Generally speaking, it may be said that a method of treatment which combined the hypodermic administration of Emetin with the oral administration of Alcresta, gave the best results, particularly if the patient could be persuaded to remain in Hospital for a fortnight or longer, where rest in bed, suitable diet and regular habits could be enforced.

Emetin, given hypodermically, is apparently efficacious against the entamœbæ in the tissues, but it would seem that it has little or no effect on the cysts. The cysts, in all probability lie in pockets, crypts or depressions, which have resulted from the process of dysenteric ulceration; that is, they are on, not in the tissues, and they are thus in a situation where they cannot be got at effectively by the drug in the circulation. The main difficulty lies in obtaining a form of Emetin which can be administered so as to come into direct contact with the cysts and which can be given in sufficient dosage to be fatal to the parasite without causing vomiting or other undesirable results in the host. The form, amongst the few which have been tried in this investigation, which approximates most closely to the ideal, is Alcresta.

In seeking to explain certain apparent failures, one hesitates to suggest the development of an emetin-resistant type of entamœba. Such a PIS ALLER is asenticing in this as in other protozoal diseases, but it would seem that the persistence of cysts is due to their not being reached by the drug, and not to any qualities which they may have

developed. An untreated or an inefficiently treated attack of Dysentery, allows of considerable ulceration with consequent uneven pockets and irregular scars and depressions in the mucous membrane. A diet which is easily digested and which contains the minimum of waste material, is necessary so that these depressions are not covered over by the fœcal matter, thus preventing the drug from obtaining direct contact with the cysts.

There are indications that chronic dysentery can be cured by efficient dosage with Emetin in one form or another when it is accompanied by proper dieting and suitable purgation. The problem resolves itself into bringing Emetin into actual contact with the free and the encysted stages of the entamœba. A method combining both hypodermic and oral administration is necessary.

It may be stated that Alcresta, an American preparation, is announcced by the makers, to be an aluminium emetin silicate, an adsorption compound of kaolin and emetin.

In marked contrast with Bismuth Emetine Iodide, Alcresta was well tolerated by the patients to whom it was given, in Lagos. No single case of nausea or vomiting occurred during its use. In some cases there appeared to be a slight purgative action. One patient complained of dyspepsia during his course of the drug.

Nor did the Emetin hypodermically have any unpleasant results beyond a slight soreness around the seat of puncture, sometimes persisting for several days.

There was almost complete unanimity amongst the patients as to the objectionable after-effects of Bismuth Emetin Iodide. Various methods of preparing this drug for oral administration were tried. These included coating with salol or keratin; enclosing in a gelatin capsule; injecting morphia hypodermically beforehand or giving Bromide by the mouth; rest in bed and a light meal. Despite these precautions and the patient's determination to retain the dose, vomiting practically always ensued.

The only other form of treatment given a trial, was by Pil. Ipecac. Co. which contained Pulv. Ipecac. gr. I, Pulv. Ipecac. Co. grs. II and Pil. Opii. Co. grs. III. This preparation appeared to be simply useless.

As regards the question of an idiosyncrasy to Emetin, only one case of such has occurred, and it requires further investigation.

An interesting practical point has emerged, that alcohol is best used sparingly or not at all, during Emetin treatment.

LAMBLIASIS.

It remains to be added that Alcresta was tried in two cases, suffering from an infection by Lamblia. The drug was administered in the same way as for the cases of Dysentery, five grains thrice daily by the mouth, for ten days, and a similar course after a week's interval.

In the first case the parasites disappeared in a month, but returned a month later.

1st Exam.	26 days.	31,	38,	40,	58.
Lamblia.	Lamblia.	O.	O.	O.	Lamblia.

In the second case there was no return of the parasites, but the period of observation was only two and a half months.

1st Exam.	26 days.	40,	49,	66,	76.
Lamblia.	Lamblia.	O.	O.	O.	O.

No definite conclusions can be gathered from the above two cases, the behaviour of Lamblia infections being what it is, erratic.

All the above cases were Europeans, 23 males and 7 females.

LEPROSY.

The Annual Report of 1916, contained an account of the results obtained by Dr. H. Sinclair Coghill, using Heiser's form of treatment. In 1917 a summary was given, based on the notes in the Asylum Case-Books, showing the results which followed treatment by Chaulmoogra Oil, by Nastin, by Heiser's compound and by Gynocardate of Soda.

These accounts are now supplemented, as regards fourteen of the patients in the Yaba Leper Asylum, who were treated during 1918 by Gynocardate of Soda either alone, or followed by a course of Atoxyl.

The use of this latter drug was suggested by Dr. T. Hood, C.M.G., Director of Medical and Sanitary Services, who was impressed by the improvement which resulted in two cases under the care of Dr. E. E. Maples at Calabar. An epitome of each case is given.

The first six were treated with Gynocardate of Soda only, given intravenously in a uniform dose of 3 grains once a week, from 1st January until 30th September, 1918, the last three months of the year being kept as a period of observation, without treatment. One of these patients, however, D.A. latterly complained that the injections made him feel unwell, and he also blamed the drug, for an attack of double iritis, so that treatment in his case was stopped on 25th June.

Case D.A.—At the end of 1917, patient, a male aged 44 years, disease of 12 years' duration, presented the following appearance. The leonine facies had disappeared, the skin of the face and arms being soft, shiny and wrinkled or hanging in folds. Nodules were hardly perceptible. Sensation was unaffected except in both legs. There were no maculæ and no ulcers. There was slight œdema of the left foot. There was no thickening of the ulnar or peroneal nerves.

The injections were stopped on 25th June. Iritis was present in both eyes, and the left foot and ankle were swollen.

On 30th September, the condition was as follows:—Facies as at end of 1917. No nodules palpable. No ulcers. No maculæ. Impaired sensation in fingers of both hands and in lower two-thirds of both legs. Right foot, all toes "nibbled," nails gone. Left foot, all digits disappeared, except that the stump of the great toe remained.

At the end of the year, the iritis had subsided, leaving some adhesions. Sensation was still impaired in the fingers, but only in the lower third of the legs. There was no further absorption of the toes, but the right little finger was angled, due to absorption at the proximal phalangeal joint.

Case L.A.—At the end of 1917, patient, a male aged 28 years, disease of 7 years' duration presented the following appearance. The leonine expression had greatly lessened, but there was still some thickening of the skin of the face. No nodules were observable. There were no ulcers and no maculæ. There was no impairment of sensation. Some œdema was present in both hands and feet.

Weekly injections were given regularly until 30th September. At this time the œdema had disappeared and the only sign of the disease being still active was an impairment of sensation in the lower two-thirds of both legs. Three months later, with no further treatment, sensation was complete, but a few small tubercles had reappeared on chin, lips, nose and brow. There was also swelling of the right index finger and there was only a stump of the left little toe.

Case B.K —At the end of 1917, patient, a male aged 60 years, disease of 35 years' duration, presented the following appearance. Both hands were anæsthetic. A large chronic ulcer on the right sole was nearly healed. Considerable deformity of hands and feet existed.

There were no maculae and no nerve thickenings. Treatment was stopped on 30th September, at which time there was practically no change in the patient's condition. The large ulcer on the right sole had healed, but a fresh one had appeared at the anterior aspect of the old one.

At the end of the year, that is after three months' respite from treatment sensation was complete and there were no ulcers. Further deformities were a shortening of the 2nd last left toe, and of the index and ring fingers of the left hand.

Case S.H.—At the end of 1917, patient, a male aged 53 years, disease of 26 years' duration, presented the following appearance. Sensation was impaired only in the hands and in the right leg from the knee downwards. There were no nerve thickenings, no ulcers, and no maculæ. Both hands and feet were considerably maimed.

After nine months' treatment, sensation was impaired only in the lower third of the right leg. Both legs and feet, however, were swollen. There was no return of nerve thickenings, ulcers or maculæ.

At the end of the year, sensation was complete, but there was a general puffiness of the skin, not amounting actually to œdema. Further deformities were shortening of the little toe on both feet.

Case O.G.—At the end of 1917, patient, a male aged 39 years, disease of 21 years' duration, presented the following appearance. All ulcers were healed except a minute one on the right heel. Sensation had returned to both arms and legs, but was still impaired in the feet. The maculæ on face and neck were smaller and fainter. There was considerable deformity of hands and feet.

After nine months' treatment, that is on the 30th September, the only change was the presence of a dirty superficial ulcer on the inner side of the right heel. Three months later, at the end of 1918, there was a small ulcer at the base of the right 2nd toe, the ulcer on the heel having cicatrised over.

Sensation was impaired in the left foot and in the lower third of the right leg.

Case A.E.—At the end of 1917, patient, a male aged 39 years, disease of 12 years' duration, presented the following appearance. There was considerable mutilation of the toes. A small ulcer was present on the right foot. There were no maculæ or nodules and no impairment of sensation was noted.

By 30th September, the ulcer had spread superficially over a considerable area on the outer side of the right sole.

Three months later, at the end of 1918, the ulcer had healed, and there was no further mutilation of digits.

The next six cases were treated with Gynocardate of Soda 3 grs. intravenously, once a week, for four months, 1st January to 30th April.

The treatment was then changed, Atoxyl being given instead, hypodermically, beginning with a dose of ½ grain and rising by ½ grain at each weekly dose until a maximum of 6 grains was reached in July and maintained until 30th September. Both drugs were well borne during

their respective periods of administration except in one case, O.M. who declined further treatment with both Gynocardate and Atoxyl on the plea that she felt worse. She was therefore untreated from 9th April until 10th May and from 10th July onwards.

Case P.A.—At the end of 1917, patient, a male aged 44 years, disease of 25 years' duration, presented the following appearance. Corneal opacity in both eyes permitted an appreciation of light and darkness only. The ulnar nerves were no longer thickened. The maculæ had faded and all ulcers healed. Sensation had returned to the arms and legs except that the feet were still anæsthetic. There was mutilation of both hands and both feet.

After the two courses of treatment, by the end of September, the one change was, that impairment of sensation was limited to the left leg from the knee downwards.

At the end of the year there was further absorption of the digits in both hands. There was impaired sensation in both hands and feet.

Case A.K.—At the end of 1917, patient, a male aged 54 years, disease "since boyhood," presented the following appearance. Nerve thickenings had disappeared. There were no maculæ. There was anæsthesia from both elbows and both knees downwards. There was only one ulcer, at the back of the right elbow. There were no toes on the left foot.

At the end of nine months, sensation was complete, "Claw hands" still present, ulcer healed, and no further mutilation of digits.

At the end of the year the condition was the same except that there was a shallow linear ulcer on the outer side of the left sole, and a small punched-out ulcer at the site of the left great toe.

Case C.A.—At the end of 1917, patient, a male aged 37 years, disease of eighteen months' duration, presented the following appearance. The maculæ were increased in size and number, the nodules were more numerous and bigger, and the leonine appearance was more marked. There was tingling in both arms.

By 30th September, the disease was still farther advanced, except that the maculae were fainter. The tingling had increased to actual pains in both arms and legs.

At the end of 1918, the maculæ had disappeared. The tubercular process had increased, the left 2nd toe was 'nibbled,' the hands and feet were swollen and the pains were still present in the limbs.

Case O.M.—At the end of 1917, patient, a female aged 60 years, disease of 24 years' duration, presented the following appearance. Sensation was complete, the healed ulcer on the left sole had broken down and the other ulcer on the left sole remained. There was extensive mutilation of the digits.

After three months' treatment with Gynocardate, one month's rest, two months' treatment with Atoxyl and three months' rest, the only change was an impairment of sensation in both hands and in the left foot.

Three months later, at the end of 1918, the ulcer on the anterior part of the left sole was healed, but the other remained. Sensation had returned to the hands, but anæsthesia had involved the left leg from the knee downwards.

Case O.S.—At the end of 1917, patient, a male aged 51 years, duration of disease 16 years, presented the following appearance. There was still anæsthesia of hands and feet. There was a small ulcer on the right hand and another on the left foot. There were maculæ on the chest. There was considerable mutilation of digits.

After the two courses of treatment, by the end of September, sensation was complete, there was no further mutilation of digits, there was no appearance of claw-hand, and the maculæ had disappeared. The two ulcers were still present and a third had appeared on the right heel. At the end of the year all the ulcers were healed and there was no further mutilation.

Case L.M.—A male aged 42 years, duration of disease 8 years. The condition was quiescent in this patient, by the end of 1917, and there were no signs of active disease during 1918.

The remaining two cases received only the first form of treatment, *i.e.*, by Gynocardate of Soda in the dosage already described. The injections were given from 1st January until the end of April.

Case B.O.—At the end of 1917, patient, a female aged 42 years, duration of disease over six years, presented the following appearance. There was considerable mutilation of digits, sensation was unimpaired, there were no ulcers and no maculæ. Treatment was suspended at the end of April, 1918. On 30th September, there was no change in the condition and at the end of the year the *status quo* was maintained.

Case I.S.—At the end of 1917, patient, a male aged 48 years, duration of disease 19 years, presented the following appearance. There was mutilation of the digits of the left foot, the right eye was blind, but ulcers and maculæ had disappeared and there was no impairment of sensation. At the end of September, 1918, there was no change, and at the end of the year there was still no evidence of active disease.

Conclusions.

During 1918, six lepers, all old-standing, advanced cases, were treated with Gynocardate of Soda in 3 grain doses, given intravenously, by the method recommended by Sir Leonard Rogers. The injections were made weekly. All the patients had received treatment previously by Chaulmoogra oil, Heiser's mixture and by Gynocardate of Soda, at one time or another. In all the cases, Gynocardate of Soda had been given for the previous six months of 1917, so that the drug had been administered for fifteen months without a break. The initial dose in June, 1917, was one-tenth grain, increased at each weekly injection by one-tenth grain until the maximum of 3 grains was reached in November, 1917. Therefore, for over ten months, these six patients received a weekly injection of 3 grains, Gynocardate of Soda. At the end of this period, improvement was noted in all the cases, but the results were not definitely more striking than those obtained by other forms of treatment, or even by merely improved hygienic surroundings. There was no definite arrest of the disease in any case and although certain conditions were ameliorated, other processes of the disease continued.

Other six lepers, five of them old-standing, and one a recent case were treated with the Gynocardate as above, continued from the last six months of the previous year, but only for the first four months in 1918, Atoxyl being then given instead. The Atoxyl was administered subcutaneously, once a week, beginning with a dose of $\frac{1}{2}$ grain and increasing by $\frac{1}{2}$ grain weekly until the dose was 6 grains. This maximum was attained in mid-July, 1918 ,and continued until the end of September. The improvements in these cases were in no way more striking than in the first six cases, except perhaps in Case L.M. in which the disease was apparently quiescent at the end of 1917, and no alteration was observed during 1918. Case C.A. in whom the disease was recent and active, obtained no benefit, in fact the lesions developed with rapidity during the whole time. Two cases received the continued

Gynocardate treatment for only the first four months in 1918, having received it during the previous six months of 1917. In both cases, the disease had been apparently arrested by the end of 1917, and no fresh lesions were observed during 1918.

BLACKWATER FEVER.

Reports on sixteen cases have been kindly forwarded by the Medical Officers in charge.

The patients were all of the male sex.

The ages are given for 12, namely, 22 years, 24 years, 26 years, 31 years, 34 years, 34 years, 36 years, 37 years, 45 years, 45 years, and 50 years.

The nationality was British in all cases.

The headquarters of the individuals were, Baro, Ibadan, Ilorin, Lokoja, Ibi, Jarawa, Bauchi, South Bukuru, Lagos, Bassa, Zaria (2) Munshi, Zungeru and Karre, and one patient was a railway guard travelling between Lagos and Zaria.

The months in which the cases occurred were February, April two, June, July two, August four, September two, October three and December.

The total periods of residence in West Africa were 17 years, 10¼ years, 10 years, "many years," "some years," 6 years, 3 years, 2 years, 2 years, one year, 10½ months, 6½ months, 6 months and there is no such information concerning three patients. The length of the tour in which the disease was contracted was 4 months in two cases, 5 months, 6 months in two cases, 9 months in two cases, 10 months, 10½ months, 14 months, 16 months, 18 months and 20 months, and there was no information regarding the remaining three.

There was a previous history of Malaria in 12, no history of Malaria in one, and no information in three.

There was a history of previous Blackwater fever in four cases one fourteen years previously, one three years, and one two years, whilst one patient had had two previous attacks, one in 1917 and one early in 1918, the first one whilst in the Gold Coast and the second in England. There was a history of "Hæmaturia" six years previously in one case. In only one case was there no information whilst in the remaining ten there had been no previous attacks.

The occupation in every case was such as to lead to considerable exposure to the sun and the vagaries of the weather, to considerable physical strain, and to intimate contact with natives. Seven of the patients were attached to the W.A.F.F. or to the W.A.S.B., an O.C. Troops, a Lieutenant, a Sergeant and four Colour-Sergeants, Four of the patients were in the Political Department, a Resident and three District Officers. Three of the patients were attached to the Mines, a Manager, Prospector, and a Miner. The remaining two were Railway Officers, a Guard and a Foreman Platelayer.

As regards the prophylactic use of quinine, six patients took the drug only when they thought they required it, that is, when they felt ill. Two patients stated that they took Quinine regularly, but no dose is mentioned. Two took 5 grains daily and one five grains regularly. One patient was "fairly regular." One patient took 10 grains of the Bihydrochloride twice weekly, another took 5 grains in solution daily, but had vomited it regularly for eleven days prior to his attack. Another had neglected Quinine prophylaxis during an attack of Influenza. No information is given regarding the habits of the remaining two cases.

No two cases were similar in their onset. Premonitory signs were present in some, but absent in others. The most common were rigors and vomiting and pain was a very common symptom. Some details are given.

Case (1)—Under treatment for Malaria, five days previous to onset of hæmoglobinuria. Had been taking 5 grains Quinine Hydrochloride twice daily during that time, *i.e.*, 50 grains in five days. In the early morning of the 6th day, had a rigor, and four hours later, *i.e.*, 6 a.m., passed black water. The interval between the last dose of Quinine and the rigor was about 12 hours.

Case (2)—There is no information as to Quinine administration, apparently there was a sudden onset of acute pain in the back of the neck, "running downwards in three lines" followed shortly by vomiting and three hours later, the hæmoglobinuria was evident.

Case (3)—Here also, no mention is made of Quinine. There was acute pain in the stomach and an urgent desire to defæcate at 4.20 a.m., and two hours later, the patient feeling very weak and perspiring freely, passed water which he observed was black.

Case (4)—The patient felt out of sorts for a few days. Then thinking he had Malaria, took ten grains of Quinine in the morning. At noon, hæmoglobinuria appeared. At 4.30 in the evening of the 19th day of convalescence he felt a little unwell and passed one specimen of red urine. He had been taking 5 grains Quinine Hydrochloride thrice daily for 4 days previously.

Case (5)—Headache and fever commenced on 15-7-18. Patient had been in the habit of taking 5 grains Quinine daily, but for some months had been using sugar coated tabloids. He took 5 grains of Quinine and sought medical advice in the evening. He was given 10 grains Quinine Sulphate in solution at 5 p.m. and again at 7.30 p.m. Next day he was given a similar dose in the morning, five grains in the afternoon and 5 grains in the evening, all in solution. The fever and headache persisted and at 10 p.m. on the same day, *i.e.*, 16-7-18, hæmoglobinuria appeared, that is, within a few hours of the last dose of Quinine.

Case (6)—For four months previously, there had been constantly recurring attacks of Malaria at weekly intervals, in spite of the taking of 5 grains Quinine daily. Four days before the onset of Blackwater there were subtertian parasites in the blood, and for three days, during which he felt "off colour" and had broken sleep at nights he took 4 grains Quinine Hydrochloride in solution thrice daily. On the morning of the fourth day, he went out to work, feeling better and neglecting a dose of Quinine. At 8 a.m. he passed water and noticed it was black.

There was a twelve hours' interval between the last dose of Quinine and the appearance of Hæmoglobinuria. The urine was almost clear again at 7 p.m., but at 8 p.m. there was a severe rigor with headache and vomiting and the urine became black again at 11 p.m.

Four days later the urine was clear and remained so for two days when he passed one specimen of dark red urine without any discomfort.

Case (7)—About ten days before his attack, patient complained of "having some fever about him" and was given a bottle of Quinine in solution. It is not stated how much he took, but at 3 a.m. of the 11th day the doctor was sent for on account of an attack of severe abdominal pain and vomiting. He had passed black water half an hour previously, but made no mention of it. He had a rigor at the same time.

Case (8)— Patient was one of those who take Quinine only when feeling out of sorts. On the day of his attack he went to work in his usual health in the morning. On returning for lunch, felt "a little green" and took a five grains tabloid of Quinine Bisulphate, as well as a good meal. Returned from work rather earlier than usual in the evening and had another similar tabloid (10 grains in all). Was unable for dinner. At 7.30 p.m., he vomited and a few minutes later he passed urine of the colour of porter.

Case (9)—Patient stated he was in the habit of taking five grains Quinine Hydrochloride daily. Went to work on 21-8-18, as usual, feeling in good health. At midday he had a sudden severe pain in the head, with pains in the joints and round the waist. Struggled back to his bungalow, and took 20 grains Quinine. Had a severe rigor in the evening, and slept badly during the night. Felt only a little weak next morning, 22-8-18, and went to work. Had another rigor at 6 p.m. He passed a sleepless night and felt very ill next morning 23-8-18. Seen then by Medical Officer. Skin hot and dry. Conjunctivæ injected. Temperature 101·8° F. Both liver and spleen enlarged and tenderness over latter. Severe headache and joint pains. Had 10 grains Quinine Hydrochloride in solution, which was promptly vomited. Severe rigor in evening with intermittent acute pains in abdomen and thighs. Complained that tongue felt swollen and interfered with swallowing. At 7 p.m., a severe rigor, temperature 105° F. Then sweated, temperature fell to 100·4° F., and he had a quiet night. At 6.30 next morning 24-8-18, looked very ill and complained of evil dreams. Marked jaundice. Severe epigastric pain and cramp in limbs. Passed a small quantity (seven drachms) of black urine at 10 a.m.

Case (10)—Patient slept without a mosquito curtain and took Quinine (in the form of the Bisulphate) only when he felt unwell. Felt unwell, 28-8-18, and took 15 grains Quinine Bisulphate at 6 p.m., Began vomiting at midnight and passed black water at 9.30 a.m., 29-8-18.

Case 11)—Patient was in the habit of taking 5 grains Quinine Bihydrochloride regularly. As this failed to ward off Malarial attacks, he had been taking 10 grains on Sundays and Wednesdays for the two months previous to his attack of Hæmoglobinuria. On a Wednesday morning he took his usual ten grains Quinine Bihydrochloride with breakfast. At 11 a.m., he felt tired and feverish. At 1 p.m., he returned to his bungalow with cold shiverings and nausea. A few minutes later he passed black water.

Case (12)—Admitted to Hospital from Military Camp on 20-9-18, suffering from 'Malarial Gastritis.' Had 6 or 7 attacks of fever in previous six months, and for the last 11 days had vomited his daily dose of 5 grains Quinine. He was very anæmic. On admission to Hospital, temperature normal, liver and spleen enlarged and tender.

No parasities found in blood. At midnight had severe pain in epigastrium, with vomiting. Temperature 100·2°. At 8 a.m., 21-9-18, passed dark-red urine.

Case (13)—Patient stated he took Quinine regularly. Felt unwell one evening. Took temperature and found it 99° F. Took 10 grains Quinine. Passed black urine at 4 o'clock next morning.

Case (14)—Rigors commenced on 28-10-18. Patient then took 20 grains of Quinine during the day. He then noticed his urine was black. He stopped the Quinine and the urine cleared on 29-10-18.

On 30-10-18, he again took Quinine and the hæmoglobinuria returned, and again cleared on stopping the drug. He was vomiting, feverish and restless during this time.

Case (15)—From October 12th, until October 28th, patient was on the sick list with Influenza. During that time he neglected Quinine. On 29th October, he felt unwell and took 10 grains Quinine. Shortly afterwards he had a rigor and passed reddish water about midday.

Case (16)—Patient took Quinine only when he thought he required it. Felt feverish in the evening of 10-12-18, and by midday of 11-12-18, had taken 30 grains Quinine Hydrobromide in divided doses. He was then flushed, icterus was noticed, his temperature was 104° F., and he complained of headache. He was given Aspirin, went to bed, had a good sweat and at 6 p.m. the temperature was down to 102·4° F., and he felt better. At 8.30 p.m. he passed black water.

Mildness of onset is not necessarily an indication of a mild illness for cases (8), (10), (13) and (16) were all fatal. The course of the disease also varied considerably in the sixteen cases. The only constant features were the hæmoglobinuria which varied in intensity and duration, and the pyrexia which varied in degree. A continued fever or a marked recrudescence were grave signs.

Jaundice when it occurred appeared within two days. Vomiting was a frequent sign and when it persisted was of bad omen. Headache was commonly complained of. Diarrhœa occurred in one case. Both the liver and the spleen were noted as enlarged and tender in two cases, the spleen only was enlarged and tender in one case, and there was pain in the region of the spleen in a fourth case.

Hiccough appeared only in the fatal cases.

There were seven deaths in the sixteen cases, five from suppression of urine and two from syncope.

There had been a previous attack of Blackwater Fever in two of the fatal cases; in fact there had been two previous attacks in one of them.

The duration of hæmoglobinuria was 32 hours in case (1), and is not stated for case (2); it was 48 hours in case (3) and 12 hours in cases (4) and (5); in case (6) it was 96 hours. The hæmoglobinuria in case (7) lasted 116 hours, the urine gradually clearing, but becoming less in amount. The last specimen was clear, before suppression set in. The duration was 120 hours in case (8) and the urine was clear before death occurred from sudden heart failure. In case (9) only one small amount of thick dark urine was passed; thereafter there was complete suppression. The period of hæmoglobinuria was 24 hours in case (11) and 48 hours in case (12), the urine being clear in the latter before death from syncope. In case (13) small amounts of thick dark urine were passed at infrequent intervals during the first 53 hours at the end of

which time, suppression occurred. In case (14) the duration of each of the two periods of hæmoglobinuria was rather less than 12 hours. It was 24 hours in case (15) and in case (16) it was 22 hours, the urine having been clear for some days before suppression set in.

There was one relapse on the 19th day in case (4), one specimen of red water being passed. In case (6) there was a remission on the 1st day and a relapse (one specimen only) on the 7th day, two days after the urine had cleared. In case (14) there was a relapse on the 2nd day, the urine having cleared during the first day.

Microscopic examination of the blood was made in 12 cases. In case (5) specimens were examined 36 hours before, 12 hours before, 12 hours after and 36 hours after the onset of hæmoglobinuria. No parasites were seen in any of the smears and no pigmented leucocytes. The differential leucocyte counts were:

	Poly-morph.	Small lymph.	Large lymph.	Monos.	Eosin.	Transit.	Mast.	Myelo-cytes.	Normo-blasts.
36 hours before onset	61	10·5	·5	10	14	3	1	...	...*
12 „ „ „	64·8	11·4	1·4	8·2	8·8	3·2	·8	1·4	...*
12 „ after „	45	19	2·4	15	11·8	5·2	·8	·2	·6*
36 „ „ „	42	20·2	3·4	10	14·2	3·6	·2	2	4·4*

Twelve hours after onset, erythrophages, *i.e.*, large mononuclear cells containing ingested red corpuscles, were 0·6% and vacuolated cells of this large mononuclear type were 1·2%; the vacoulated cells were 0·6%, 36 hours after onset. These vacuolated cells appear to represent a later stage of the large mononuclear erythrophages.

In case (12) no parasites were found on the day before the onset of hæmoglobinuria.

A series of blood films was sent from a mild case of which no report was received. The smears were first taken three-quarters of an hour after the onset of hæmoglobinuria, and subsequently on each of the three succeeding days. Subtertain rings were numerous in the first smears, few in the second and absent from the third and fourth days' specimens. The differential leucocyte counts were:

	Poly-morph.	Small lymph.	Large. lymph.	Mon.	Eosinos.	Transit.	Mast.	Normo-blasts.
1st day ...	82·8	6·4	1·6	6·8	·8	1·6	...	...*
2nd day ...	49·6	19·2	2·8	18·4	2	8	...	...*
3rd day ...	54	19·2	2	15·6	4·4	2·8	·4	1·6*
4th day ...	48·4	22·4	2·4	20·8	2	2·8	...	1·2*

A heavy infection of subtertain rings was found in case (7) on the first day of hæmoglobinuria.

In another case, not reported, no parasites were found on the first day of hæmoglobinuria and the differential leucocyte count was:

Poly-morph.	Small lymph.	Large lymph.	Monos.	Transit.
82	5·6	3·2	8·	1·2*

An asterisk * means that the differential leucocyte count was done at the Medical Research Institute.

In case (9) blood smears were examined on the first and second days of hæmoglobinuria. No parasites or pigmented leucocytes were found, and the differential leucocyte counts were:

	Poly-morph.	Small lymph.	Large lymph.	Monos.	Myelo-cytes.	Normo-blasts.	Tran-sits.
1st day ...	79·2	8·8	1·2	7·2	3·2	0·4	...*
2nd day ...	80	7·4	0·8	7·4	3·4	...	1·*

Vacuolated mononuclears were 0·4% on the first day.

No parasites were found on the second day of hæmoglobinuria in case (11).

Blood smears from case (10) on the second day of hæmoglobinuria showed no parasites nor pigmented leucocytes. The differential leucocyte count was: –

Poly-morph.	Small lymph.	Large lymph.	Monos.	Tran-sits.	Mast.	Myelo-cytes.
83·2	5·6	1·2	7·4	2	0·4	0·2*

Erythrophages were 0·4% and vacuolated mononuclears 0.8 per cent.

The blood was examined in case (1) on the third day of hæmoglobinuria. There were no parasites and no pigmented leucocytes. The differential leucocyte count was:—

Poly-morph.	Small lymph.	Large lymph.	Monos.	Eosino-phil.	Transit.	Myelo-cytes.	Mast.
65	6·4	1·4	21	0·2	4	1·2	0·8*

Two erythrophages were noted in 500 leucocytes.

In case (14) the blood was examined three days after the urine had cleared. No parasites were found.

In case (4) subtertian parasites were numerous in the blood, on the fourteenth day after the urine had cleared.

In case (6) a specimen of blood taken twenty-two days after the urine had cleared, showed a few subtertian rings and the differential leucocyte count was:—

Poly-morph.	Small lymph.	Large lymph.	Monos.	Eosino-phil.	Transit.
42·2	21·8	3·2	27·6	1·2	4·*

Sections of organs were received from two fatal cases. The histological examination of these revealed nothing that has not already been described.

The following notes are of considerable interest:—

Dr. W. B. Johnson, commenting on one of his cases writes, "The concentrated, intensely acid urine before the onset [of hæmoglobinuria] should have warned me, as in other cases of fever with this sign, where I believe I have averted an attack of Blackwater Fever, by giving heavy doses of alkalis."

An asterisk * means that the differential leucocyte count was done at the Medical Research Institute.

Dr. N. A. Dyce Sharp reports, "he [the patient] did not use a mosquito-net, as he said he had no mosquitos upstairs in his quarters. That this was very far from being the case, I had reason to discover during his [the patient's] illness, when I was tormented with bites in his bedroom at night".

One meets these people in West Africa who are not bitten by mosquitos and who have none in their Quarters.

Dr. H. R. Ellis writes "Points noticeable in this case [case (8)] were.

The absence of any pain or discomfort throughout.

The absence of rigors and sweating.

The low temperature after the initial rise.

The period of complete suppression of urine, 68 hours (urine was passed in fair quantity again for two days before death).

The two previous attacks of Blackwater (one in England). The freedom from Malaria in the 4 months preceding the attack".

Dr. W. D. Inness, states, regarding case (9), "The following points appear to be of interest:—

1. The very rapid onset of suppression, after the appearance of the hæmoglobinuria. The patient was an intelligent man, and he assured me that he passed water several times, in the open, whilst he was very ill, and before seeking medical advice, and that the urine was quite normal.

2. The three rigors, at daily intervals.

3. The absence of a history of Malaria. He [the patient] was the only one of the B.N.C.Os. who had not been on the sick-list.

4. The apparent inability of the mucous membranes to absorb water. Quantities of fluid remained in the stomach and in the rectum for hours on end, without any absorption taking place. In fact, although it was not possible to verify this by actual measurement, the amount voided by both mouth and rectum appeared to exceed the measured quantity introduced.

5. The difficulty in diagnosis. When I saw the patient I was certain that I had to deal with a case of Yellow Fever. Had it not been for the fortunate passage of seven drachms of haemoglobinuric urine, I should have maintained that diagnosis and there was nothing in the post-mortem to have made me change my views. The true nature of the disease might possibly have been revealed later in the laboratory.

YELLOW FEVER.

Specimens were received in the Laboratory from two fatal cases of Yellow Fever.

The first case occurred in a European at Forcados. Death had taken place at an early stage of the disease. The stomach showed several areas of submucous haemorrhage. The spleen was densely infiltrated by leucocytes and contained no malarial pigment. No gross fatty change was observed in the liver but there were all the signs of acute hepatitis, the outline of the lobules being lost; extensive round-celled invasion and an absence of pigment in the connective tissue cells were noted. The kidney was in a state of acute congestion with general cloudy swelling.

The second case was in a male adult native at Benin City. Blood smears taken on the 2nd and 3rd days of illness were examined. In the smears of the 2nd day no parasites nor pigmented leucocytes were found. One subtertian ring was observed in the smears taken on the 3rd day. The differential leucocyte counts were:—

	Poly-morph.	Small lymph.	Large lymph.	Monos.	Transit.	Mast cells.
2nd day	57·6	11·8	2·2	24·2	4	0·2
3rd day	62	12	3	20·4	2·6	—

The absence of eosinophils in a count of 500 leucocytes is noteworthy, particularly when the subject is a native.

A specimen of urine was obtained which contained red blood corpuscles.

After death the stomach showed remains of coffee-grounds material adhering to the walls. There were several areas of submucous haemorrhage. The urinary bladder also showed some submucous haemorrhages particularly round the urethral opening. The liver was in a state of old-standing cirrhosis; super-imposed on this, there was an intense hepatitis, with round-celled infiltration and numerous haemorrhages. Vacuoles which had contained fat were observed in many of the hepatic cells. The kidney showed the signs of acute inflammation with many haemorrhages; there was exudation into Bowman's capsules, and blocking of many of the tubules by debris. The spleen was deeply engorged and densely infiltrated.

Cerebro-Spinal Fever.

Material from two cases of Epidemic Cerebro-spinal Meningitis was received. Both were natives. The first case came from Calabar. Pus from the brain and the spinal cord, post-mortem, showed the Diplococcus intracellularis meningitidis of Weichselbaum, abundantly. The second case occurred in Lagos. Lumbar puncture, in life, yielded an opalescent fluid under high presure. On standing, this fluid cleared gradually, a fine cobweb-like clot developed and the sediment which was faintly yellow, consisted of pus cells mainly, containing the specific diplococcus as in the first case.

Typhoid Fever.

Samples of blood-serum from 13 individuals were received for the Widal test. Most of these were from the Northern Provinces where the disease appears to be less uncommon than in the Southern Provinces. Three sera definitely agglutinated Bacillus typhosus in a dilution of 1—100 within an hour. The other sera were noted as negative to Bacillus typhosus, Bacillus paratyphosus A, and Bacillus paratyphosus B. Nevertheless, in some of these there was a partial agglutination of one or other of the typhoid group of bacilli. One explanation of this may be that there is a variety of the typhoid or paratyphoid bacillus in West Africa with affinities to the group. A specimen of small intestine was received from Zungeru, which showed the typical ulceration in Peyer's Patches.

INFLUENZA.

During the epidemic of Influenza which reached Lagos towards the end of the year, no real bacteriological work was done, as the services of the bacteriologist were requisitioned for the more urgent medical work of attending to the numerous victims of the disease.

Sputum from seven of the early cases all showed, predominating amongst other organisms, Bacillus influenzæ and Micrococous catarrhalis. Post-mortem specimens were received from seven cases, all natives.

In case (1) the right lung was in the stage of grey hepatisation, and at the base of the lower lobe there was gangrene. There was also acute purulent pericarditis. In case (2) the left lung showed grey hepatisation with commencing gangrene in the lowermost portions. There were several small areas of broncho-pneumonia in the right lung.

In case (3) the illness had pursued a particularly rapid and acute course suggestive of Septicæmia. Post-mortem there was an early stage of red hepatisation in the middle area of both lungs. Cultures taken from the blood within the heart, and from the consolidated patches in the lungs, grown on fresh blood-smeared agar slopes showed pure cultures of what appeared to be Bacillus influenzæ, judged by morphological and staining characters. Case (4) resembled case (2), and case (5) resembled case (3). In cases (6) and (7) specimens of the liver only, were received.

Histological examination of the various tissues showed nothing new in the morbid anatomy of the disease. The changes in the liver, kidney and spleen resembled those resulting from acute febrile diseases in general, congestion of the vessels and cloudy swelling of the tissue cells being the rule. The consolidated areas in the lungs showed the usual pathological changes, under the microscope.

Tuberculosis.

Twenty-five specimens were received in answer to an appeal by the Principal Medical Officer, that the sputum be sent for examination, in all cases suspicious of Phthisis pulmonalis. Tubercle bacilli were demonstrated in six samples, five of these being from natives.

Three specimens of tissues, showing tubercular lesions were received from Calabar, all three being from natives. Two of the specimens were small intestine, both showing tubercular ulceration. The third specimen was a mass of glands, removed from the neck, by operation. These glands contained tubercle bacilli.

In a fatal case of Trypanosomiasis, in a native at Minna, the small intestine showed several calcareous collections embedded in the mucous membrane. These probably represented healed tubercular ulcers.

EXAMINATION OF FÆCES.

The total number of specimen of fæces examined was 689, those from Europeans numbering 508, from natives 173, and 8 from Asiatics. Amongst the Europeans 255 showed no evidence of protozoal or helminthic infection, these specimens coming from 119 individuals. Cysts of Entamœba histolytica were found in 159 instances, the cysts alone in 148, with Trichuris ova in addition in 5, with Ascaris ova in 4, with Ankylostomum ova in 2, and with Ascaris and Tænia ova in one. The specimen with cysts alone came from 59 individuals, those with Trichuris ova from 5, those with Ascaris ova from 3, and those with Ankylostomum ova from two individuals.

Entamœba histolytica in the free active state was demonstrated in 45 instances, being associated with active Lamblia intestinalis in one. These specimens came from 36 individuals and for the most part the fæces also contained mucus with pus cells and red blood corpuscles as well. In a few cases however, there were no pus cells or red blood corpuscles. Mucus alone, showing, when stained, only shreds and irregular masses of protoplasm, was found in 22 instances. These specimens came from 19 individuals.

Lamblia intestinalis occurred in four specimens from two individuals.

Entamœba coli and E. nana were the only other protozoa, apart from spirochætes, observed in the specimens from Europeans.

Ova of Trichuris were noted in 19 instances from 17 individuals.

Ascaris ova were found in eight specimens from 6 individuals.

Ankylostomum ova occurred in eight specimens from 5 individuals.

Tænia ova were seen in one case.

The findings in the samples of fæces from 173 natives were much more varied than in those from the Europeans.

The protozoa noted were Entamœba histolytica, encysted in 88 and free in 18, Cercomonas in 5, and Lamblia in three.

Blastocystis occurred in two cases.

The helminthic ova were Ascaris in 92, Trichuris in 72, Ankylostomum in 66, Strongyloides in 20, Tænia in 4 and Schistosomum in one. In only 26 individuals examined were there no ova, and 9 of these were suffering from acute Amœbic Dysentery, at which time ova are seldom found in the fæces. In 63 cases no protozoa were observed.

The findings in the specimens from 8 Asiatics were Tænia ova in 4, in one of which there were also free E. histolytica, in another Trichuris ova, and encysted E. histolytica and in a third Strongyloides ova. Cysts of E. histolytica, alone, occurred in one. Ova of Ascaris, Trichuris, and Ankylostomum were found in one. Ova of Ascaris and Trichuris, with cysts of E. histolytica were noted in the seventh case and the findings were negative in the eighth.

Examination of Blood Smears.

One hundred and forty-eight thin blood smears were examined, 115 from Europeans and 33 from natives. Amongst the Europeans, subtertian malarial parasites were found in 17 individuals, three of these being cases of Blackwater Fever. Pigmented mononuclear leucocytes but no parasites were found in 4 cases. The remaining 94 smears were negative.

A differential leucocyte count was done in 80 instances. In the natives, subtertian malarial parasites were observed in two, Trypanosomes in two and quartan malarial parasites in one. Pigmented mononuclear leucocytes were found in one case in which no parasites were seen.

The remaining 27 were negative.

A differential leucocyte count was made in 29 cases.

Thick blobs of blood, dehæmoglobinised, fixed and stained were examined from five Europeans and 14 natives.

Embryos of Loa loa were found in one European, and embryos of Loa loa and Acanthocheilonema perstans in another, both in the day blood and not in the night blood. The remainder were negative. In the natives, embryos of Filaria bancrofti were found in the night blood and not in the day blood of one. The remainder were negative.

Examination of Urine.

Twenty-eight specimens of urine were sent for examination. Nine of these showed no abnormality. Pus cells were found in the centrifulgalised deposit of five. There was albumen in six, in four of which tube-casts were found on centrifugalisation. Granular tube-casts only, were noted in two specimens. The proportion of sugar was estimated in three specimens from a case of Diabetes mellitus.

Red blood corpuscles were observed in two samples and bile was present in one.

Examination of Sputum.

Twenty-six specimens of sputum were examined. As already noted, tubercle bacilli were found in six. Pfeiffer's bacillus of Influenza was noted in five samples. Hepatic cells were observed in a specimen of sputum from a case of liver abscess which had ruptured into the lung.

Miscellaneous Specimens.

These included five samples of cerebro-spinal fluid, in two of which there was a mononuclear increase and in one the meningococcus was present; three smears from gland-juice which were negative; three smears from the brain in two of which the meningococcus occurred, and in one there were numerous subtertian rings; two smears from the nose, in one of which B. lepræ were present; two smears from superficial ulcers in one of which there were B. lepræ; two smears from pus in the pleural cavity; two smears from the spleen, one from a European showing numerous subtertian rings, and the other from a native infant which showed enormous numbers of many stages of the subtertian malarial parasite, including crescents; two smears containing gonococci one from the vagina and the other from the urethra; two smears from skin abscesses; two specimens from effusion into the knee-joint and one sample of fluid from a case of ascites.

Several vaccines were prepared and some wassermann tests were performed, in necessitous cases.

In addition to a regular bacteriological examination of the Lagos Water Supply, two samples of water were analysed, one from a well in Lagos, and the other from the Imo river near Port Harcourt.

The bactericidal properties of the effluent from one of the British Cotton Growing Association's establishments was tested against the Bacillus typhosus. The bactericidal action was practically nil.

Blood smears from an Oribi, shot near Kaduna, were found to contain Trypanosomum theileri.

Trypanosomum vivax was noted in the blood smear from a cow slaughtered at Zaria.

Spirochætosis occurred in two widely separated pens of fowls in Lagos. Blood smears from the infected birds showed enormous numbers of spirochætes.

A number of domestic animals, horses, dogs, cats, ducks, and others were examined at various times.

Histological Examinations.

Many specimens of tissues were received for examination. These were hardened, embedded and stained by the usual processes. Twenty specimens of liver were examined. There was cloudy swelling in seven, acute hepatitis in five, fatty degeneration in three and gumma in two. One specimen showed advanced cirrhosis.

There were seventeen specimens of kidney. The signs of acute nephritis were present in eight and in seven there were cloudy swelling and congestion.

Specimens of spleen numbered sixteen. There was acute congestion in eight, round-celled infiltration in five, and a dense cirrhotic condition in one. The organ was enormously enlarged in one case.

Fifteen specimens of lung tissue were received. There was grey hepatisation in four with areas of gangrene in three of them. There was red hepatisation in three and hypostatic congestion in three. One specimen showed several gummata and there was general emphysema in another.

There were six specimens of each of the following organs brain, heart, stomach and intestine. Three of the specimens of stomach showed submucous hæmorrhages; the conditions in the intestine were tubercular ulceration in two, ankylostomum infection in two, typhoid ulceration in one, and dysenteric ulceration in one; one specimen of heart showed acute purulent pericarditis; and one specimen of brain showed the leucocytic infiltration round the capillaries, typical of trypanosomiasis. Other specimens included neck-glands two, spinal cord one, urinary bladder one, and thickened pleura, one.

Tumours.

Specimens of malignant and other tumours were, epithelioma of lip, and epithelioma, leg; carcinoma of cervix, carcinoma of vagina; sarcoma of testicle; papilloma of anus; epithelial odontoma, venous nævus; myoma of uterus; gumma of breast, and gumma in mediastinum.

Slaughter House Material.

Specimens from cattle included eleven samples of lung, two of mammary gland, two of lymph glands, one of testicle and one of leg muscle. Tubercle bacilli were not found in any.

There were seven specimens from sheep, four of liver, two of testicle and one of lung, in none of which were tubercle bacilli found.

Specimens from pigs numbered five, three of liver and two of lung. Tubercle bacilli were not found.

MEDICAL ENTOMOLOGY.

The work of identification in this section was done by Mrs. Summers Connal.

The following biting flies were added to the list from the various stations; Culex decens and Mansonioides africanus from Bonny, Glossina palpalis and Chrysops silacea from Ogoja, Stegomyia fasciata, Mansonioides africanus, Culex grahami, Anopheles costalis, A. pharœnsis and A. rufipes from Hadeija. Conorhinus sp., the bite of which resulted in acute lymphangitis, was received from Port Harcourt.

The specimens of Chrysops silacea received from Ogoja were three in number. They were preserved in spirit. On dissection one fly, a female was found to be heavily infected with Filaria. The larvæ teased out from the thorax numbered 195, from the head 140 and from the abdomen 36, a total of 371 in one insect. The larvæ were similar to those found in Chrysops from Sapele in the previous year. No further work has been done on this subject.

As in other years, the Municipal Sanitary Officer sent mosquito-larvae to the Institute for identification. These larvae were obtained by the Sanitary Inspectors on their daily rounds. The number collected and forwarded is much less than in former years, but this failing-off is explained by several causes other than a reduction in the number of mosquitos. It will be seen from Table (1) that stegomyia fasciata is still the preponderating mosquito (114 collections of larvae) although Culiciomyia nebulosa is also numerous (66); Anopheles costalis was obtained in 18, and the others were Ochlerotatus irritans 6; Culex decens 3, Uranotaenia annulata 3, and Anopheles mauritianus one.

Stegomyia larvae were mostly found in the Coolers, *i.e.* large earthenware pots in which the household water supply is stored, and also in barrels, bottles, Buckets, cocoa-nut shells, drums (*i.e.* paint drums and oil drums) Dustbin-covers, Gutters, Holes in the trees, the iron base of a crane, jugs, pots, tanks, tins and wells. Culiciomyia predominated in Pots of Agbo (concoctions of leaves used by the natives as medicine) and was also found in barrels, coolers, drains, pots and wells. Anopheles was found in drains, pools, puddles and wells. Pool is used here to denote a permanent small collection of water such as is found in swampy places, and puddle denotes a small shallow collection of water left after rain and soon drying up. Ochlerotatus was in Crab-holes and pools, Culex decens in Crab-holes, drains and wells, and Uranotaenia in Crab-holes.

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Receptacle.	Larvae	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Total.
Agbo Pot	Culiciomyia nebulosa ...	13	3	3	5	7	9	1	2	1	...	2	...	46
Barrel	„ „ ...	...	...	...	1	...	...	1	...	...	...	...	...	2
„	Stegomyia fasciata	...	...	...	...	1	1	...	...	1	...	...	...	3
Bottle	„ „	2	...	...	...	...	...	...	...	...	...	...	...	2
Bucket	„ „	...	...	...	...	...	...	..	1	...	...	...	...	1
Catchpit	„ „	2	...	1	..	...	1	...	...	1	...	...	...	5
Cocoa-nut shell ...	„ „	...	...	...	...	...	...	1	...	...	...	...	...	1
Cooler	„ „	4	8	4	5	2	28	2	9	4	...	2	1	69
Crab-hole	„ „	...	...	...	...	1	...	3	...	...	...	...	...	4
„	Culex decens	1	...	...	...	...	...	...	...	...	...	...	...	1
„	Ochlerotatus irritans ...	...	...	...	...	...	...	...	3	1	...	...	...	4
„	Uranotaenia annulata. ...	...	...	...	...	...	...	...	2	...	...	...	...	2
„	O. irritans, U. annulata ...	...	...	...	...	1	...	...	...	...	...	...	...	1
Drain	Anopheles costalis ...	1	...	...	1	1	...	...	...	...	...	...	...	3
„	Culiciomyia nebulosa ...	...	...	...	...		...	...	...	...	...	...	...	1
„	Culex decens	1	...	...	...	...	...	...	...	...	...	...	...	1
„	Anopheles mauritianus ...	...	...	...	..	1	...	...	...	...	...	...	...	1
Drum	Stegomyia fasciata	...	...	...	...	...	1	3	...	..	...	...	...	4
Dustbin-cover ...	„ „	...	...	...	...	...	...	..	...	1	...	...	...	1
Gutters	„ „	...	...	...	1	...	...	3	...	3	...	...	...	7
Hole in tree ...	„ „	...	...	...	...	1	...	1	...	...	...	...	...	2
Iron base Crane ...	„ „	...	...	...	...	...	...	1	...	..	...	...	...	1
Jug	„ „	...	...	...	...	..	...	1	...	...	...	...	...	1
Pool	Anopheles costalis	2	...	2	...	1	1	...	1	1	...	...	...	8
„	A. costalis O. irritans ...	...	...	..	...	1	...	...	...	...	...	..	...	1
Pot	Culiciomyia nebulosa ...	...	2	...	2	1	..	1	6	3	..	...	...	15
Puddle	Anopheles costalis	...	1	3	...	...	...	...	...	...	...	...	...	4
Tank	Stegomyia fasciata... ...	...	...	...	...	...	...	2	...	...	...	...	...	2
Tin	„ „	...	...	...	1	1	2	...	...	...	...	...	...	4
Well	„ „	1	1	...	...	4	...	1	...	...	...	...	..	7
„	Anopheles costalis	...	...	...	...	...	1	...	..	1	..	...	...	2
„	Culex decens	...	...	...	...	...	1	...	...	...	...	...	...	1
„	Culiciomyia nebulosa ...	...	...	...	1	...	...	...	...	1	...	...	...	2
	Total for Month	27	15	13	17	24	45	21	24	18	...	4	1	209

Table (1) showing monthly distribution of Mosquito larvæ in Lagos, during 1918.

ANNUAL REPORT FOR THE YEAR, 1918.

By W. Ralston, B.Sc. (Lond.), F.I.C., Government Chemist, Nigeria.

The work done in the Chemical Laboratory during 1918 extended throughout the full year, and besides the usual routine correspondence and other general work involved the examination of 259 samples, some of the analyses being complicated and requiring several ingredients to be determined. Some of the problems which had to be considered arose primarily as direct effects caused by the war, others were more indirectly connected with it, the latter being rather due to the stimulus which it has given in the direction of developing the natural resources of this country.

2. The samples submitted have been classified as below :—

Nature.	Dept. Submitting.	No. of Samples.	Totals.
Spirits and Wines	Customs	7	
Essential Oils, and Perfumes	Customs	74	
Drugs and Toilet Requisites	Customs	49	
Matches	Customs	2	
			132
Water	Sanitary	3	
Water	Political	1	
			4
Chemico-legal	Medical	22	
Chemico-legal	Police	4	
Chemico-legal	Political	1	
			27
Mineral.			
Coal	Railway	3	
Tar-Oil	,,	1	
Limestone, etc.	P.W.D.	11	
Clays	Customs	20	
			35
Miscellaneous		57	
Special Consultations	Railway	—	
Special Consultations	Posts & Telegraphs	4	
			61
			259

3. *Customs Work.*—As in former years this department has submitted the bulk of the samples requiring testing. The Spirits included.

Perfumery and Essential Oils.—Of these 74 samples, 18 came from Burutu, 1 each from Warri, Degema and Port Harcourt, and 37 were imported at Lagos while other 16 were for Kano. Most of these contained no alcohol, only one perfume giving 32% while 2 flavouring essences gave 84 and 46% alcohol respectively. All the others were either essential oils, or perfumed oil or water.

Medicinal and Toilet Preparations.—Out of 49 samples, 34 were imported at Lagos, 10 at Burutu, 2 at Port Harcourt and 1 each at Forcados, and Sapele, with 1 for Kano. Only 24 of these showed the presence of alcohol, the highest being 2 lotions for the hair with about 60% alcohol; other 4 samples gave from 52 to 41% while the remainder gave under 15%.

Matches.—Two new brands "Consaco" and ("Three-legged Pot") of matches were tested and found to be free from white phosphorus.

4. *Water.*—Three samples of water were analysed for the Sanitary Department, two being from a bungalow in Calabar where water run from the pipes gave a sediment of Iron rust on standing, and one was from Imo (or Aba?) River which the Senior Sanitary Officer

suggested was probably that proposed as a source of supply for Port Harcourt. This water was found to be very soft and quite similar to the Loch Katrine Water which supplies Glasgow, which would be difficult to surpass as to purity.

A fourth sample was drawn from Lake Wawarafi near Kazaure and sent by the Resident at Kano for analysis as instructed by His Excellency the Governor-General. It was a fresh water highly polluted with organic matter probably of vegetable origin.

5. *Chemico-Legal.*—22 samples were analysed for the Medical Department, 14 being samples of bread as baked and sold in Lagos and Ebute Metta. Adulteration by mixing the Wheat flour with another starchy foodstuff was suspected but it was proved to be genuine Wheat bread, although in a few cases the weight of the loaf was found to be under the legal minimum. Two prosecutions were brought by the Police Department on this charge and a conviction obtained in one case. Seven specimens of Viscera from post-mortem cases were examined for traces of any poisons present but no commonly known mineral or alkaloidal poison was found. One case was connected with the "Ordeal" test with Sassy-bark (Erythrophloem guineaensis). Stains on a cloth were also examined for evidence in a case of rape.

Four specimens were examined for the Police Department, one being a native sword with rusty stains on it which were considered after testing not to have been caused by blood. The other specimens were identified as the small receptacles—made of tin and sometimes covered with hide—used to contain powdered Galena with short iron pins for applying this powder to the face by native women. This mineral (Galena or Sulphide of Lead) is erroneously named "Antimony" in the local native markets. Several of these small tins were found in England in a consignment of Palm Kernels from West Africa and their discovery caused some alarm as it was thought some danger or injury might have been intended, but it is very probable they got shipped to England by accident.

A specimen of the common charcoal and sand mixture was identified for the District Officer at Ifon, and it might be of use to record the fact that this mixture is actually used as "medicine" in the English sense of the word, as well as a "charm" or "Juju" powder by fetish men and other natives who wish to influence other persons. When native dispensers and herbalists use this powder as a genuine medicine, it is probably not realised that charcoal may be prepared from any animal or vegetable substance by heating it to a suitable heat till no more smoke or gases are evolved, but they may think that the final product derives its efficiency from the original ingredients used to make it, as for example, from "electric fish."

6. *Mineral Analysis.*—Two samples of coal from Munshi District were received through the Railway Department, which were found to be of very poor quality, only about one-third of it being organic matter and 61% being mineral matter (ash)! Its Calorific value was 1,210, a number so low that it was not very surprising to find later that when a test of its steam-raising power was attempted by the Marine Department at Apapa it would not even ignite! It merely became red hot like a bit of rock when heated in a coke-fire used for brazing.

A sample of Udi Coal was tested for the Railway Department to see if it was very liable to Spontaneous Combustion, and the result was negative. Some Udi Coal was distilled in England and a sample of very crude tarry oil obtained from it was submitted by the Railway Department for examination to determine if it could be used in any way as a lubricant. Most of the oily fractions obtained by laboratory distillation consisted of unsaturated oils, phenoloidal bodies and so on, but very little oil of the paraffin series of hydrocabons, and hence it was concluded this tarry oil was not likely to be of much use to the Railway Department as a source for lubricants.

Eleven samples of limestone Rock were tested for the Public Works Department in regard to its use as building material, and twenty samples of White Clay Rock were analysed for the Customs Department in case some specimen might happen to be Bauxite, the mineral from which metallic aluminium is reduced. Some of these clays were nearly pure Kaolin or China-clay, while others contained so much fine sand as to make them good fireclays.

7. *Miscellaneous Work.*—The samples considered here may be classified according to the Department of origin.

a. Agricultural Department.—42 samples were received for examination, some of the tests and observations being of the nature of research work. Thus, three Cocoa-nuts were purchased and seven experiments were made with the object of testing a recipe for making Cocoa-nut Butter as a substitute for ordinary milk butter. The recipe originally appeared in the Bulletin of the Department of Agriculture of Trinidad and Tobago of 13th August, 1917.

The Cocoa-nut butter so prepared was found to be quite palatable and wholesome as food when spread on bread and in its frozen state its appearance suggested the pleasant snow-white icing used on cakes. Each nut of about 350 grams weight (pulp grated) yielded nearly ¼ lb. (104 grams) of the butter, and analyses of two samples of the butter gave the results below for comparison with milk butter.

PERCENTAGES.

	Cocoa-nut No. 1.	Butter No. 2.	Milk Butter (limits).
Water	18·56	21·78	11–13%
Fat	79·76	76·21	85–87
Pulp Fibre, or Cord	·6	·85	1·5–3·5
Salt	1·08	1·16	1–2
	100	100	

Even in the liquid state—after freezing and allowing to re-melt—the oil so prepared was quite colourless, sweet tasted and free of all rancidity and should be skimmed off the water layer at the bottom with a spoon and used like honey. Salting was beneficial in giving a savour to the watery layer and in preserving it for a day or two, as it was found this layer soon began to putrify and caused rancidity in the oil. But if the oil was separated at once, it could be kept much longer before rancidity to any extent was noticeable, and in fact, if thoroughly dried by heating till all trace of water was evaporated, it could be kept good for months, and was quite suitable for cooking and baking. A sample of native-prepared oil was bought locally and found to have a smoked or acrid taste, which was however most probably due to having been carelessly overheated over a smoky wood fire.

Without the salted water, the oil alone did not taste quite so savoury as the "Butter," as it was almost tasteless with only a faint flavour of the nut.

Six samples of beans were examined for cyanogenesis, and a very small percentage of prussic acid was obtained from each; the two samples mentioned in the report of 1917 were also re-examined but these were found to produce no hydrocyanic acid, thus confirming the former results.

In Twenty-two samples of Palm Oil the moisture and acidity (due to free fatty acid) were determined with the object of testing their keeping qualities. The samples had been prepared at the Agricultural Department, Ibadan, at intervals ranging from January, 1917 to July,

1918, and it was found that the acidity did not depend so much on the length of time the *oil* had been kept as on some other factor, probably connected with the condition of the palm fruits and the manner of preparing the oil. The samples were in bottles fitted air-tight with rubber washers and screwed metal caps, so that the acidity probably, did not increase to any great extent after the bottling of the oil. Three samples of Sugar Cane were examined, and observations made of the average length, and weight of the canes, and also the yield of juice and its analysis. These canes were grown on an experimental plot at Ibadan, and the report should prove of use in comparing the samples which were selected from different parts of the plot.

2 samples of Elu-aja (Indigo) ball were tested for the percentage of dye-stuff yielded, which proved very small, though apparently quite normal.

4 samples of Ash from Cotton Seed and Cotton Cake, and 2 lots of ammoniecal liquor were analysed with the object of determining their value for manure. These samples were waste products from the Producer Gas Plant at a ginnery of the British Cotton Growing Association.

b. Customs Department.—A sample of good Ground nuts and the powder found in the bags used to export these were submitted to have the oil determined in each and the *foreign* matter in the powder; the foreign matter being reported as 60% of the powder.

c. Medical Department.—11 samples were submitted, which included a bark supposed to have medicinal properties and a yam-like root from the Medical Officer at Port Harcourt, 6 samples of Cotton Seed from growing centres at Ibadan and Zaria for comparison of the oil contents; and 2 tins of preserved green-corn and beans, being selected from a stock which was suspected of having caused severe illness in certain cases at Calabar.

A sample sent from Northern Nigeria as used in preparing Skins and hides was identified as "lubi," containing about 65% Sodium Carbonate.

d. Public Works Department.—A sample of Sasse-wood timber was submitted to be tested to see if it could safely be used for making axe shafts, and the Director submitted a bag-full of flowers from the Shea-Butter tree to be tested in regard to their value as a raw material for manufacturing alcohol. Three experiments were made and it was found these flowers could be treated so as to yield about five gallons of alcohol (absolute) per ton of flowers.

8. *Special Consultations.*—The Traffic Manager of the Railway Department requested information as to some substitute for Sealing Wax being prepared from materials produced locally, in case the stock on hand could not be replenished from England and several small experiments were made to demonstrate the possibilities in the use of Balata Rubber. The Engineer-in-Chief of the Posts and Telegraphs referred the correspondence about faulty River Cables to me for criticism, submitting 4 samples for examination and comparison with a view to arriving at some reasonable explanation of the breakdown in the insulation of these cables. It was considered the damage was due to deterioration of the rubber caused by climatic conditions (chiefly over-heating) and as a possible improvement an additional insulation layer of water-proofed paper was suggested.

(Sgd.) W. RALSTON,
Government Chemist.

Chemical Laboratory,
Yaba.
8/2/19.

Report upon a case of Rat-bite Fever by Dr. W. R. Parkinson.

H.A.W., O.S. of H.M.S. "Astrea" was admitted to the hospital with the following notes:—

January 17th, 1918.

On the 27th December this patient, whilst asleep, was bitten on the back of the left hand by a rat. The hand began to swell and he was entered on the sick list December 30th, when the injured part presented a hard swelling, no sign of fluctation in the centre, and lymphangitis spreading up the arm. The temperature was 103·8, headache severe and attacks of fainting. Patient also had some vomiting. A small incision was made into the swelling and a small amount of chocolate coloured matter came out; but there was no sign of any pus. The part was treated with pure carbolic acid and saline foments applied.

January 1st.—By this date, an ulcer had formed, about as big as a penny, the centre of which consisted of a dirty greyish black necrotic mass. There was marked induration of the base of the ulcer extending for some distance beyond the margin of the ulcer. A small portion of this necrotic tissue was cut away. The headache was better and the T. had come down to 100. Local treatment consisted of hydrogen peroxide, boric baths and fomentations.

January 2nd.—Ulcer, punched out, edges regular, centre portion gangrenous induration of base marked, surrounding ulcer were white vesicles, containing clear serum. Examination microscopically of contents of vesicles shewed no specific organisms. General appearance of part suggested malignant pustule.

January 3rd.—Similar condition to previous day. Ulcer swabbed out with pure carbolic acid. Boric baths and fomentations continued. Morning temperature normal; evening temperature 101.

January 4th.—Induration base of ulcer less. Centre quite gangrenous, exposed cutanous nerve passing across bottom of ulcer. Some necrotic tissue cut away. Applications of hydrogen peroxide and Eusol dressings, M.T. 99·6

January 5th.—Local condition improving.

January 6th.—Central necrotic tissue beginning to separate. Induration of base disappeared. On this date, 9 days after having been bitten, a scattered papular eruption appeared, chiefly on front of the chest abdomen, and arms—a few on the back. This was accompanied by a temperature of 102·8

January 7th.—Central slough, shewing definite line of separation, was dissected out. Rash about the same as previous day. Urine—no alb. Complains of pain in the feet at night.

January 9th.—Local condition improved. Ulcer punched out, edges clean and regular. Base covered with a much whiter looking slough, all greyish black gangrenous tissue gone, also no induration. Rash much more marked, discrete. Papular, raw ham coloured eruption present over whole body. A few spots slightly sensitive. Tongue presented a black appearance upon dorsum. Eyes suffused and injected. Slight cramp-like pains in the legs. No headache. A mixture of Pot. Iod. gr. x to 1 oz. started.

January 10th.—Eruption still more marked, a little paler in colour, spots raised, with some infiltration—older spots fading and disappearing, new ones becoming evident. Ulcer cleaning up, smaller in size. Eusol continued.

January 11th.—Spots vary in size, a few slightly sensitive.

January 12th.—Rash fading, no new spots appearing, ulcer smaller, looking much cleaner, healthy looking granulations forming. T. normal.

January 14th.—Rash still fading and disappearing, but the spots shew a change in character. The size is increased, irregular in shape, centre of each spot is papular, and this is surrounded by an area of erythema. Wound smaller and healing, granulations healthy. Temp. beginning to rise again.

January 15th.—Rash chiefly confined to the front of the chest, abdomen and thighs. A further change has occurred in the character of the eruption—The centre of each spot is raised and papular, outside this is a ring of paler appearance, somewhat whitish and outside this an area of erythema.

January 16th.—During the night patient spat out a small quantity of blood, apparently from back of throat, also signs of blood in nose. "Says he has some pain over upper part of chest in front, No "P.S. Rough examination of blood shews increase in polymorphonuclear "leucocytes. Patient has lost 14 lbs. since December 30th, and this "morning the temperature is up again to 102·4. Ulcer much smaller, "clean with healthy looking granulations. Rash about the same. No "palpable enlargement of the spleen."

(Sgd.) J. B.
Staff-Surgeon, R.N.

On admission to Lagos Hospital on the 17th January there was a clean healing ulcer on the back of the left hand, a circinate erythema over the whole of the body, the temperature was 100 and the boy looked ill. The ulcer rapidly healed with hot fomentations but the rash remained in rather a faded state and the temperature remained fairly closely about 99 until the 23rd, and then it jumped to 103·4. It was up and down to 102 during the next week and on January 30th, he was given ·6 grm. of Arsenobillon. It was followed by a rigor and vomiting with temperature of 103·8 the same afternoon but in the morning the temperature was 97 and was not again above normal during 11 days further stay in hospital. There was no alb. in the urine. No extensive bacteriological examination was made as the D.M.R.I. was away and the examinations made were negat. This appears to be a typical case of rat-bite fever, the first paroxysm of fever and the rash appeared on the 8th to 9th days and it was cured at the fourth paroxysm by Arsenobillon. It is of particular interest as so few cases have been reported from Africa. The Spirochæta morsus muri was discovered in 1916. The first case to be reported from Africa was in Morocco in February, 1917, and there have not been more than one or two recorded since. It seems probable that the infected rat in this case was from South Africa and there is no reason to suspect that Nigerian rats are infected.

FROM PERSONAL RECORDS OF CASES AT PORT HARCOURT, by Dr. J. Jackson Moore.

Patient No. 6.

A much more interesting case. He was aged about 45. During the month of July, I was called to see a man with an attack which closely resembled ordinary malaria, and on the third day his temperature in the morning was 98·6. He felt so well that it was arranged that a resumption of duty should be made on Monday, as the week-end would complete his convalescence.

But the next morning (Sunday) an urgent visit was asked for, and to my surprise the right knee was acutely inflamed and swollen—the history was that on Saturday evening a sharp pain of a shooting character suddenly developed in this knee, which kept him awake all night, followed in the same lightning manner, heat, swelling and tenseness of the skin.

On examination it was easy to see that he had developed a very acute Synovitis, the knee was about twice the size of the left, flexed, with foot everted, and so painful to touch and manipulation that it was impossible to state what Arthritis also existed. The temperature had risen to 103·6 and pulse to 95, but the only severe symptom that irritated the patient was the agonizing pain in the knee.

Fomentations were applied very frequently, with opium therein, with considerable success; the knee placed in the position of greatest ease, salicylates were freely given, and opium at night to secure rest.

At this period the patient denied venereal infection, and the only history that he supplied—to show a weak spot in that knee, was retiring from football and clog dancing owing to Local Injury. For two weeks the condition remained almost stationary, except that the pain was less acute, and temperature reduced to 100·2 in the evening and 99·2 in the morning, and pulse steady at 85. I had then the advantage of another Medico, who endorsed my line of treatment of rest. It was then possible to flex the kneejoint a little.

For the next two weeks he had a light tonic course of treatment with some benefit to general health, but on applying a little massage to the knee, when one could feel the semi-liquid fluid underneath, in two days the pain and tenderness reappeared almost as severe as in the initial stages. Immediately afterwards mental symptoms were observed. Incidentally it may added that the M.O. Bonny saw the patient during fourth week of disease, as his condition caused me considerable anxiety.

When the mental symptoms were observed, I wired to Lagos to hold a Board, and the M.O. Bonny revisited, and under the influence of an anaesthetic an incision was made down through the synovial membrane on one side of the patella. As was expected nothing but serum-coloured fluid escaped, and a passage was present under the knee-cap, where fluid had been circulating, the synovial membrane was greatly thickened. As my colleague advised against operation, two large doses of streptococcal serum were injected without benefit; the serum had just arrived from Calabar.

A short chained streptococcus was observed in the serum from the synovial membrane. Two days later the opposite side of the patella was widely incised, in the hope of draining away some of the infection, which had an influence on the pulse and temperature, the former falling from 130 to 100.

Three days later, he was placed aboard a coal boat called 'Diana' and sailed for Lagos, in the hope that vaccines might be made to aid his recovery.

Anyone who has travelled aboard the 'Diana' will understand the hospital ship accommodation on this collier. Ill luck was on their course as after leaving Bonny, very bad weather was encountered, so that the unfortunate patient and his attendant were sea-sick, the ship deviated from her course, and delay in voyage, collapse of patient and death aboard just as they were off Lagos, twenty-four hours later than ordinary passage. A necropsy was done at Lagos which showed extensive disease of the synovial membrane and the articular cartilages of kneejoint. This case is of interest, as to the cause and mode of infection and difficulty of carrying out treatment in the patient's own quarters.

I am inclined to the opinion that the original source of infection was in the urethra. I also regretted not amputating the leg in the hope of cutting short the infection, even against the wishes of my colleagues.

A CASE OF SOME INTEREST.

A boy named Dick, aged about 20 years—occupation, a cook to a European Official, visited the Native Hospital at Port Harcourt during the month of July 1917. He complained of a boring and scratching pain in the abdomen, located slightly below the Umbilicus and one inch to the right of middle line.

He stated that this sickness had been troubling him for the past four months and was becoming worse, and gave him little rest of mind or body.

There was no history of former illness or any injury.

Examination.—Showed no abnormality palpable in the Abdomen; in fact only slight tenderness on deep pressure over the area. The temperature and pulse were normal, and the patient was a little nervous and self-centred. He was told the result of examination and given a sedative mixture.

In less than one month, he returned with the same complaint and looked more worried and had lost flesh.

He had still no temperature and a pulse slightly accelerated, probably functional. An examination was made under chloroform, very carefully and thoroughly, as the patient was thin, without revealing anything abnormal.

Over the painful area, the skin had been deeply incised by a native practitioner, leaving raised linear scars.

I assured him that no sickness in his abdomen was found while he was asleep, and another sedative medicine prescribed.

But in two weeks' time he returned and begged that he might have his abdomen 'cut' properly, and as he seemed so miserable and self-centred, he was taken into Hospital and in due course operated on. Before doing so, at my request, one of the Native Nurses in conversation elicited the statement that he believes that an enemy of his had put this sickness into his abdomen; on a former query he denied this delusion. His description of the pain was that of a fowl's foot tearing his inside.

A laparotomy was done, and with the exception of a thin band (like official tape) stretching from the abdominal wall to the Mesentery, of Inflammatory origin, and easily excised a wide search revealed no enlarged glands or anything abnormal in the abdomen; Appendix quite healthy.

On the day after the operation he was shown a bottle containing specimens, which included the excised band of about 4 inches long, one of which had a hard and horny appearance. On seeing the latter he exclaimed "I sabey them be fowl foot, and I sure them 'person' done put him into my belly, thank you, thank you. I am glad you pull him proper."

As the suggestion was necessary to his regaining his mental equilibrium, I took the credit of removing the cruel fowl's foot.

The skin sutures were removed on the 5th day, and on the 9th morning after the operation, he left the Hospital at his own request, in order to tell the good news to his friends at Port Harcourt. He had then regained a cheerful appearance.

Since then I have seen him happy and healthy-looking on many occasions, and even as late as November, 1918 at Enugu Ngwo, when his master had Epidemic Influenza.

This case I consider of interest as it shows the great influence of mind over matter in even primitive African types.

J. JACKSON-MOORE,
Medical Officer, W.A.M.S.

Onitsha,
10 January, 1919.

Reports of cases by Dr. E. E. Maples.

In view of the very voluminous scientific report of 1917—extending to 34 pages of typed foolscap—and my absence from the station for 8 months of the year, I have but little to report in this section in 1918.

The value of *organic Arsenic*,—in the particular form of Atoxyl—was tested in the treatment of several conditions of disease—This drug appeared to have a favourable action in all stages of Syphilis and in the Anæmias, whether primary or secondary, *e.g.* in Banti's Disease, Ankylostomiasis Anæmia, Malarial Anæmia, etc., etc.

In two cases of *Leprosy* it was also given a trial and appeared to have a notable beneficial effect on the general health of the patient, although subsequent microscopical examination proved that lepra bacilli were still present in myriads, in the skin. A short report has already been furnished on these two cases.

The drug was administered by subcutaneous injection on alternate days, starting with ½ grain or 1 grain, and increasing the dose each week by a half a grain or a grain, up to seven grains. When this dose was reached the injections were maintained at this strength but only given twice weekly.

Tetany.—One case of marked and persistent *Tetany* occurred in a child, affecting the right hand and right foot only. Examination of the stools revealed a heavy infection with ankylostomes and a less severe one with ascarids. Appropriate helminthic treatment was given, and although the spasm became less prominent under this and electrical treatment, complete recovery did not ensue.

Food Poisoning.—Two European Ladies and several native children in a local boarding school were, in the early part of the year, seized with a sudden acute gastro-enteritis, accompanied by bloody diarrhœa, and acute collapse.

Fortunately all the cases recovered, although the condition of one of the Europeans became so extremely serious that she nearly died. The cause of the illness was ascribed to eating a certain brand of tinned Indian Corn, samples of which were sent to Lagos for examination with a short report of the cases.

Surgical Cases.

Estlander's Operation.—A child was admitted with hectic-fever and with an old-standing sinus, situated between the 8th and 9th ribs in the left posterior axillary line, which extended into the pleural cavity, and from which pus was escaping in considerable quantities—At the first exploration a piece of the 9th rib below the sinus was removed, and the extent of the empyema ascertained when it was found to occupy practically the whole of the right pleural cavity—The empyema was drained by means of rubber tubing, and although the condition of the child improved greatly, and the abscess closed down to a considerable extent, after several weeks a track was still left which reached opposite from the 8th rib to almost the apex of the lung—At the subsequent operation, eight weeks later, a portion of the 8th rib above the sinus was removed, but the track still refused to close.

Six months after admission, an Estlander's operation was performed, a semicircular flap of the tissues, down to the rib surfaces, with its convexity above the sinus, being reflected, and pieces of four ribs, in front and behind alternately, being removed—By this means, the outer thoracic wall was enabled to relax down upon the thickened visceral pleura, and the sinus then closed within three weeks of the performance of the operation.

Hepatic Abscess.—An interesting case occurred in an European. The patient, who had been ill for eight days previously on a steamer, was admitted to Hospital in an advanced state of collapse, from which he was only resuscitated with difficulty—A large swelling was found to

occupy the lower right abdomen, and at the first laparotomy, undertaken as soon as his condition permitted, a huge abscess was found occupying the right iliac fossa, to the outer side of the Caecum and Ascending Colon, and also a large portion of the Pelvis. This abscess was opened and drained anteriorly through the abdominal wall, also posteriorly through the right lumbar region. The patient did not make satisfactory progress after this first laparotomy, for the wound continued to discharge large quantities of pus, accompanied by persistent septic fever. A further laparotomy was undertaken six weeks after admission, when the whole of the pus-forming track was explored.

It was then found that the infection had arisen in a liver abscess which had tracked down to the Pelvis along the outer side of the Ascending Colon. Further drainage was established, and the patient recovered sufficiently to get safely to England, after being in Hospital 17 weeks.

Filigree Hernia Operations.—In my 1917 Annual Report, I communicated a paper on the method of cure of large gliding Hernias by filigree implantation. An extended experience reveals one most important factor which must not be lost sight of in performing these operations. This is a factor of sepsis. I do not here refer to ordinary sepsis arising, say, up to three to four days after the operations, but to a special infection which I call "delayed" sepsis. In several of these cases, the patient healed by first intention and with no rise of temperature within the first week after the operation, but from the eighth to the tenth day an infection occurred which consisted of a deep bacillus coli abscess formed around the posterior filigree. In most of these patients, the stitches had already been removed before the first rise of temperature occurred. It was noted that these coli abscesses usually arose in the old and weakly in contrast to the young and vigorous. I assume that these abscesses arise owing to the irritation of the deep filigree, (lying upon the Fascia Transversalis) upon the surrounding structures, and are occasioned by the migration of the Bacillus coli communis from the Bowel or Bladder to the irritated parts, and not to any failure of asepsis in the performance of the operation. Only by such an explanation can I account for the delay in the appearance of the signs of inflammation, and for the constant and peculiar nature of the infection being that of a coli abscess.

Identification of Blood-sucking Flies Collected in the Vicinity of Lagos, Nigeria, by Dr. J. M. Dalziel.

(Submitted by Dr. J. H. Ashworth, F.R.S.)

CULICIDAE :

13. *Anopheles obscurus*, Grunb.—1 ♀, 30-9-17.

10. *Stegomyia apicoargentea*, Theo.—2 ♂, Olokemeji, 30-9-17.

10. *Stegomyia metallica*, Edw.—1 ♂, 2 ♀, Olokemeji, 30-9-17.

5, 6. *Ochlerotatus domesticus*, Theo.—2 ♀, 16-5-17.

12. *Mansonioides africanus*, Theo.—2 ♀, 24-11-17.

1, 2, 3, 7, 8, 9. *Culex thalassius*, Theo.—1 ♂, 5 ♀, 2-7-17.

4. *Culex invidiosus*, Theo.—1 ♀, 16-5-17.

11. *Eretmopodites quinquevittatus*, Theo.—1 ♂, 1 ♀, Olokemeji, 29-9-17.

SIMULIIDAE :

— *Simulium* sp. (unnamed in B.M.)—2 ♀, Olokemeji, 30-9-17.

TABANIDAE :

14. *Tabanus ditaeniatus*, Macq.—1 ♀, 6-4-17.

COLONIAL HOSPITAL,
LAGOS, May 23rd, 1918.

Sir,

I have pleasure in submitting to you my report of the dental work done in the Colony during 1918.

2. Number of officials, wives and children, etc., attended:—

European Officials	213
Native Officials	131
Others	7
Total	351

3. The following conditions were treated:—

Caries simplex	210
Pulpitis	87
Dento-Alveolar Abscess	10
Neuralgia	5
Periostitis	25
Pyorrhœa Alveolaris	14
Erosion	12
Dysphagia	1
Dilaceration	3
Pulpal Polypus	4
Mucosal Polypus	2
Gingivitis Acuta	6
Gangrene of Pulp	1
Total	380

4. Treatments:—

Extractions	91
Conservative:—	
Synthetic porcelain	35
Amalgam (Silver)	70
Amalgam (Copper)	10
Permanent G. P.	15
Temporary G. P.	21
Root fillings and dressings	109
Scaling, polishing, etc.	22
Total	373
Prosthetic Work:—	
Dentures, crowns and repairs thereto ...	14

5. The towns visited included Lagos (twice) Kaduna and Zaria. Time did not permit me to visit Warri or Calabar.

6. As in previous years the whole of my limited time has been given to practical work in the mouth and the eight months allotted to Nigeria is all too short to permit me to treat in anything like an adequate manner the large numbers that urgently require treatment. A number of soldiers in the W.A.F.F. were also treated but very inadequately as the condition of their mouths was such that their treatment alone would have occupied me many months.

7. Pyorrhœa is common amongst the natives. I have seen some very bad cases but even in these the patients' general health was not, as far as I could judge, affected to any marked extent by the constant absorption of pus. The resistance of natives to pyogenic infection appears to be very great. Only a very little prosthetic work was attempted most of the extraordinary operations being additions or repairs to existing dentures.

I have, etc.,
H. F. HARDIE.

THE DIRECTOR OF THE MEDICAL AND SANITARY SERVICE,
LAGOS, NIGERIA.

ALLEGED INCREASE OF PHTHISIS IN LAGOS TOWN.

In accordance with the instructions of the Director of Medical and Sanitary Services a meeting was held at the Sanitary Office at 11 a.m. on the 24th January, 1918, to discuss the alleged increase of Tuberculosis in Lagos Town.

* * * *

12. The following means of controlling the spread of Tuberculosis were discussed and recommendations made as set out; these being additional to taking action under the Public Health Ordinance section 7 subs 2 and 11 and Regulation No. 49 as recommended by the Director of Medical and Sanitary Services.

I. *Isolation.*—Quite impracticable at present. Dr. Sapara mentioned cases of Government officials who had been much improved or cured by being sent to Offa and other more northerly stations.

II. *Notification.*—It was recommended that all forms of tuberculosis should be notified. The Medical Officer of Health would keep a "spot map" of all cases.

III. *Microscopic Examination..*—It was recommended that sputum and other suspected discharges should be examined free of charge for all private practitioners.

IV. *Education.*—It was recommended that leaflets in English and Yoruba should be available for use by doctors, inspectors and others giving in simple language directions for preventing the spread of the disease, its nature and cause.

V. *Health Visitors.*—It was recommended that the experiment be made of appointing a woman Sanitary Inspector whose sole duty it shall be to visit houses in which there are cases of tuberculosis and to give advice but not to prosecute. It was pointed out that such a woman must be carefully chosen: perhaps one who had been a Nurse: she must have reached the age of discretion but not be so old as to be easily fatigued: she must be a woman of some education intelligent, of good character, sympathetic and tactful. It was pointed out that such women had been employed on the Gold Coast and in Dr. Beringer's experience with much promise of good.

VI. *The Housing Problem.*—It is unquestionable that there is not enough suitable accommodation for the native population of Lagos and that so long as the Housing problem is not properly dealt with so long will the conditions which favour the spread of tuberculosis persist. Recommendations made were:—

(*a*) That Lagos is no longer a suitable place for the man who wants to build his own house himself in more or less his own way. Such a man should either go or pay rent for properly built lodgings.

(*b*) That the question of building tenement houses be considered.

(*c*) That the lay out of new townships in the neighbourhood be considered.

LEAFLET ON TUBERCULOSIS.

Phthisis or Tuberculosis of the lungs is a disease which causes many deaths, and which readily spreads from the diseased to the healthy.

It is commonly known as *Consumption* and it may prove rapidly fatal, or it may last a long time.

The disease can be cured if medical treatment is sought when the patient first becomes ill.

It is a preventable disease and prevention is much better than cure.

The symptoms are weakness and wasting of the body, fever and much sweating at night, along with cough and spitting of material from the lungs which in many cases is coloured with blood.

The native idea of this disease is that it is caused by some evil-disposed person or enemy who has got possession of the saliva or sputum of the sufferer; the result is that people fraternise with him and may sit with him in a confined room so as to ward off any suspicion of their having any part in the evil deed. This idea can safely be attributed to ignorance.

The chief source of danger to a healthy person is the material which is coughed up by the patient, which may pass directly from the one to the other.

For this reason it is dangerous to sleep or live in the same room as a person suffering from *consumption*.

The coughed material may also fall on the floor or the ground, where it dries up and may be blown about in the air and so be breathed into the lungs of healthy persons. On this account the patient ought to spit into a cup or small jar or bottle containing a little carbolic or other disinfectant.

The spit collected in the cup or bottle should be burnt or buried in a hole a foot deep in the ground so as to kill the poison of the disease.

For the same reason the dust and dirt in the patient's house are dangerous, and the room should be cleaned, not by sweeping with a broom or duster, but by the use of a damp cloth.

The best and simplest preventive of Consumption is to live as much as possible in fresh air. Therefore all houses should have plenty of doors and windows to allow free ventilation and plenty of sunlight.

Rooms should never be overcrowded, or dark, or damp.

Many consumptive patients recover if the disease is treated early and if they live much in the open air.

It is important that the whole house in which you live should be kept both thoroughly clean and also dry.

A consumptive patient should never share a bed or room with any healthy person.

He should also be provided with separate utensils from which to eat and drink alone, as is done with persons suffering from swollen glands in the neck. This disease is known in the Yoruba language as *ese* and it has the same origin and is of the same nature as *Consumption*.

A mother suffering from Consumption should not be allowed to suckle her child.

Rooms which have been long occupied by a consumptive patient should, before being occupied by some one else, be disinfected and then white-washed.

Animals also suffer from Tuberculosis, and the eating of diseased meat may cause the disease in man.

Therefore diseased meat, and more especially the lungs which are diseased, should not be eaten but destroyed by burning.

All meat should be thoroughly cooked.

NIGERIA:

NORTHERN PROVINCES.

ANNUAL

MEDICAL AND SANITARY REPORT

FOR THE

YEAR ENDING 31ST DECEMBER, 1918.

NORTHERN PROVINCES.

RETURNS.

GRAPHS.

CONTENTS.

COLONY AND SOUTHERN PROVINCES.

Annual Medical and Sanitary Report, for the year ending 31st December, 1918.

NORTHERN PROVINCES, NIGERIA.

I. ADMINISTRATIVE.

The Medical Staff consisted of :—

1 Principal Medical Officer,
1 Deputy Principal Medical Officer,
2 Provincial Medical Officers,
4 Senior Medical Officers,
35 Medical Officers.

Promotions—Nil.

Transfer—Nil.

Re-Transfer—

Dr. R. F. Williams was re-transferred to Northern Provinces on 24th October, 1918.

Appointment—

Dr. J. R. C. Stephens was appointed on 2nd January, 1918.

Retirements—Nil.

Resignation—

Capt. J. M. Benson resigned on 4th December, 1918.

Deaths—Nil

The following Medical Officers served with the army in Europe and East Africa :—

Dr. E. A. Chartres,	Dr. B. J. Courtney,
„ W. A. Trumper,	„ W. G. Cobb,
„ J. Lindsay,	„ P. W. Black,
„ A. J. M. Crichton,	„ C. J. H. Pearson,
„ L. W. Davies,	„ H. North.

Nursing Staff consisted of :—

2 Senior Nursing Sisters,
12 Nursing Sisters,
1 Male Nurse.

Appointments—

Miss I. Harley was appointed on 27th March, 1918.

„ L. Mernagh was appointed on 2nd October, 1918.

„ E. Parker was appointed on 11th November, 1918.

Transfers—Nil.

Retirements— Nil.

Terminations—

Nursing Sister M. I. Rhind's appointment was terminated on 1st October, 1918.

Resignations—Nil.

Deaths —Nil.

Non-Commissioned Officers—

2 Staff Sergeants,

4 Sergeants.

Appointment—

Sergt. W. J. Edwards, R.A.M.C., was appointed on 10.11.18.

Promotions—Nil.

Re-Absorptions—Nil.

The Clerical Staff consisted of :—

4 First-class Clerks,

3 Second-class Clerks.

Appointments—

Mr. C. W. V. H. Wallace, Second-class Clerk, on transfer from Political Department on 1st March, 1918.

„ T. B. F. Mends, Second-class Clerk, on transfer from Political Department on 1st June, 1918.

Transfers—

Mr. J. F. Ogodazi, Second-class Clerk, to Political Department on 6th March, 1918.

„ C. W. V. H. Wallace, Second-class Clerk, to Political Department on 1st June, 1918.

Dispensing Staff—

3 First-class Dispensers,

9 Second class Dispensers.

Appointment—

Mr. H. M. Davies was appointed Second-class Dispenser on 13th May, 1918.

Hospitals and Dispensaries Staff—

4 Ward-Masters,
15 Head Dressers,
10 Dressers,
3 Cooks,
4 Head Ward-Servants,
10 Ward-Servants,
11 Personal Servants to European Nursing Sisters,
3 Laundrymen,
4 Messengers.

The Sanitary Staff consisted of :—

(*a*) EUROPEAN.

1 Senior Sanitary Officer,
1 Sanitary Officer.

(*b*) NATIVE.

1 Second-class Clerk,
4 Inspectors of Nuisances,
1 Laboratory Attendant,
2 Mallamai Pupil Inspectors of Nuisances.

Appointment—

Mr. S. W. Opoku, Third-class Clerk, on transfer from Secretariat on 1st September, 1918.

Transfer—

Mr. J. B. Woode, Second-class Clerk, to Secretariat on 31st August, 1918.

FINANCIAL.

	£	s.	d.
The total Revenue was	1,382	19	0

EXPENDITURE.

Personal Emoluments	23,152	14	2
Other Charges	9,046	0	6
Total	32,198	14	8

II.—PUBLIC HEALTH.

(*a*).—GENERAL REMARKS.

The most important feature of the year was the epidemic of Influenza. The disease reached Lagos in September, and from that point spread rapidly all over the country ; the native population was universally affected and a very large number of deaths occurred.

Further experience of Kaduna has confirmed the opinion previously formed regarding the advantages it possesses, from a health point of view, over Zungeru, the former Headquarters of the Northern Provinces; the clearing and general improvements already carried out have exercised a very beneficial effect, which gives excellent promise for the result of the further work which still requires to be done.

Judging from the number who have sought medical assistance, the general health of the Europeans has not been as satisfactory as in preceding years; although the average European population has increased 26·9% the number of cases treated has risen 65·8%. Part of this increase is no doubt to be attributed to Influenza, but there would also appear to be some decrease of the individual power of resistance to disease which, I think, may possibly have resulted from the unavoidable, and almost universal, prolongation of the term of local service.

The number of deaths recorded is considerably greater than in 1917, and the Death Rate has risen from 23·1 to 36·4, although this again is due to Influenza, as, if the deaths resulting from that affection be excluded, the Death Rate is only 17·1.

Among the native population the mortality has been very high, but an estimate of its amount, even approaching accuracy, is practically impossible.

EUROPEAN.

	1912.	1913.	1914.	1915.	1916.	1917.	1918.
Average European Population	703	804	969	897	762	779	989
Number of Deaths	22	13	27	14	14	18	36
Death Rate per 1,000	31·29	16·16	27·86	15·6	18·3	23·1	36·4
Number Invalided	50	70	82	34	34	54	53 *
Invaliding Rate per 1,000	71·12	87·06	84·62	37·9	44·6	69·3	53.5

* The total number invalided is 139.
The numbers given for preceding years represent those invalided before completing their tours and the 53 shown above is comparable with them.

During the year thirty-six Europeans died in the Northern Provinces, the cause in each case being as under:—

	Officials.	Non-Officials.
Blackwater Fever ...	4	3
Drowning	1	...
Gastritis	1	...
Influenza	9	10
Local Injury	...	1
Malaria	...	2
Pneumonia	...	2
Septicæmia	...	1
Sun Trauma	1	1
	16	20
Total	...	36

The number of natives who died in hospital was 487, an increase of 221.

INVALIDINGS.

The great increase in the number of invalidings is due to the fact that for a large part of the year no one, whatever their period of tour, was allowed to proceed to England except for health reasons, or on account of the exigencies of the service.

The following is a list of the causes which rendered invaliding necessary.

	Officials.	Non-Officials.
Abscess	1	...
Abscess Liver ...	...	1
Alcoholism	1	...
Anæmia	20	1
Arthritis	1	...
Blackwater Fever ...	5	..
Bronchitis	2	...
Cardiac Disease	8	...
Cerebral Syphilis	1	...
Cerebral Thrombosis ...	2	...
Congestion of Kidney ...	1	...
Congestion of Liver ...	1	...
Colitis	4	...
Debility	3	...
Diabetes	1	...
Diarrhœa	1	...
Dysentery	1	...
Dyspepsia	6	...
Enteritis	1	...
Epithelioma	1	...
Faucitis	1	...
Filariasis	1	...
Gas Poisoning	1	...
Gastritis	11	...
Headache	1	...
Hemiplegia	1	...
Hydrocele	1	...
Influenza	14	1
Intestinal Catarrh ...	1	...
Insomnia	5	...
Locomotor Ataxia ...	1	...
Malaria	12	...
Malaria Boil	1	...
Nervous Dyspepsia ...	...	1
Neurasthenia	3	2
Pneumonia	...	1
Prostatitis	2	...
Pyorrhoea	3	...
Rabies	1	...
Rheumatic Fever	1	...
Sun Trauma	2	...
Synovitis Knee	...	1
Trypanosomiasis	1	..
Tuberculosis	2	...
Typhoid Fever	3	...
Ulceration of Cornea ...	1	...
	131	8
Total	...	139

	1913.	1914.	1915.	1916.	1917.	1918.
Average European Population ...	801	969	897	762	779	989
Total number of Europeans treated	1,547	1,506	1,137	990	1,504	2,500
Average frequency of treatment of each	1·92	1·55	1·26	1·29	1·90	2·52

Insect-borne Diseases.

Malaria.—The number of cases of this disease which have been reported has risen, but, if the increase be viewed in comparison with the total number of patients treated, the proportion is less than in the previous year. While the cases of malaria have increased 33·1% the total number of patients has gone up 52·6%.

Among the Europeans only, however, the number of cases has risen 50·9% although the average population has only increased 26·9%.

Blackwater Fever.—This disease has, unfortunately, been more prevalent among Europeans than for some years, the number of cases having risen 42%; the proportion, however, to every hundred of Malaria remains practically the same, viz.:—5.

BLACKWATER FEVER.

	1913.	1914.	1915.	1916.	1917.	1918.
Average European Population ...	804	969	897	762	779	989
Number of cases	17	22	22	22	19	27
Incidence per 1,000 among Average European Population	21·14	22·70	24·52	28·87	24·39	27·3
Number of Deaths	6	6	4	8	4	7
Death Rate per 1,000 of Average European Population	7·4	6·1	4·4	10·4	5·1	7·07
Case Mortality	35·29	27·27	18·18	36·36	21·05	25·92

Yellow Fever.—The outbreak of Yellow Fever which occurred in 1917 in the district round the Benue river did not recur in the wet season of 1918, and no case has been recorded during the year.

Trypanosomiasis.—Twenty-four patients suffering from Sleeping Sickness have come under observation and treatment, the majority having been reported from the Nassarawa Province.

One European became infected and was invalided to England.

Infectious and Epidemic Diseases.

Influenza.—A special report on the epidemic has been submitted by the Senior Sanitary Officer in which complete details are given.

The mortality from this disease among the native population must have been very high, although it appeared to vary somewhat in different districts. When it was possible to give even a limited amount of medical attention and advice the results were very advantageous. In one instance, where an enlightened Native Ruler issued directions that the people should sleep in the open, the epidemic was not so widespread nor were the cases attended by such fatal consequences.

Among the Europeans 370 cases were treated and 19 deaths recorded.

Variola.—Small-pox continued to be very prevalent in many parts of the country and a large number of deaths occurred.

Although as much as possible was done it was quite beyond the powers of the present staff to render the amount of assistance needed.

Enteric Fever.—Seven cases have been reported, five in Europeans and two in natives; in one of the latter death resulted.

Dysentery.—This affection still causes a considerable amount of illness among Europeans, thirty cases coming under observation, all of which recovered.

Leprosy.—There are Settlements for sufferers from this affection in several places, the largest being the one at Maiduguri in the Bornu Province where there are about 500 collected together, but segregation is not compulsory.

During 1918 it was impossible to continue the work in connection with this disease as satisfactorily as formerly.

Venereal Diseases.—The percentage of patients reported as suffering from these diseases show a slight decrease, it being about the same as in 1916. In many instances these affections are thought so lightly of that large numbers do not come to the notice of Medical Officers.

Helminthic Diseases.

The number of European patients who have come under observation suffering from Cestodal infections has increased considerably, 18 instances having been reported, and the total number of cases observed shows an increase of 26·8%.

Guinea-worm still causes a considerable amount of disability for active employment. Anchylostome and Filarial infections show a gratifying decrease.

(*b*).—EUROPEAN OFFICIALS.

While the average number of Officials resident has risen 44·3% the number of those placed on the sick list has increased 66·8%, and the total number of days on the sick list has gone up 79·4%.

The number of invalidings of Officials who have served under 12 months is only 45, which is less than in 1917, the remainder, 86, had served prolonged tours.

The figures in the following Table relating to invaliding are calculated on the number invalided after less than 12 months in order that they may be comparable with those of previous years.

Table Showing the Sick, Invaliding, and Death Rates of European Officials.

	1917.	1918.
Total number of European Officials resident	x	x
Average number resident	343	495
Total number on the sick list	760	1,283
Total number of days on the sick list	6,251	11,217
Average daily number on the sick list	17·1	30·7
Percentage of sick to average number resident	4·9	6·2
Average number of days to each sick patient	8·2	8·7
Average sick time to each resident	18·2	22·6
Total number invalided	47	45*
Percentage of invalidings to total number resident	x	x
Percentage of invalidings to average number resident	13·7	9·0
Total number of deaths	7	16
Percentage of deaths to total number resident	x	x
Percentage of deaths to average number resident	2·04	3·2

x Figures not available.

* This is the number invalided under 12 months, the total number of invalidings was 131.

(*c*).—NATIVE OFFICIALS.

The epidemic of Influenza affected the statistics of the Native Officials very adversely, although otherwise their general health has continued good.

TABLE SHOWING THE SICK, INVALIDING, AND DEATH RATES OF NATIVE OFFICIALS.

	1917.	1918.
Number of Native Officials resident	x	x
Average number resident	584	531
Total number on the sick list	572	675
Total number of days on the sick list	3,465	4,493
Average daily number on the sick list	9·4	12·3
Percentage of sick to average number resident	1·6	2·3
Average number of days to each sick patient	5·9	6·6
Average sick time to each resident...	5·9	8·4
Total number invalided	3	1
Percentage of invalidings to total number resident	x	x
Percentage of invalidings to average number resident	·51	·18
Total number of deaths	1	12
Percentage of deaths to total number resident	x	x
Percentage of deaths to average number resident	·17	2·2

x Figures not available.

(*d*).—SOLDIERS.

TABLE SHOWING THE SICK AND DEATH RATES OF SOLDIERS.

	1917.	1918.
Average strength of Soldiers	1,454	1,607
Sick rate per 1,000 of average strength	1,702·26	1,472·58
Death rate per 1,000 of average strength	13·067	21·16

(*e*).—POLICE.

TABLE SHOWING THE SICK AND DEATH RATES OF THE NATIVE MEMBERS OF THE GOVERNMENT POLICE FORCE.

	1917.	1918.
Average strength of Police	900	921
Sick rate per 1,000 of average strength	...	...
Death rate per 1,000 of average strength	7·77	19·53

(*f*).—PRISONERS.

It is noticeable that the death rate in the Prisons is still rising, although the increase has not been so great as in the previous year.

TABLE SHOWING THE SICK AND DEATH RATES OF PRISONERS IN THE GOVERNMENT PRISONS IN NORTHERN PROVINCES.

	1917.	1918.
Total number of prisoners passed through the Registers ...	2,486	2,610
Daily average number of prisoners	823	903
Sick rate per 1,000	x	x
Death rate per 1,000	27·7	32·5

x No record available.

(*g*).—EUROPEAN NON-OFFICIALS.

TABLE SHOWING THE SICK, INVALIDING AND DEATH RATES OF EUROPEAN NON-OFFICIALS.

	1917.	1918.
Average number of European non-officials resident	436	494
Total number on the sick list	265	282
Total number of days on the sick list	2,922	2,300
Average daily number on the sick list	8	6·3
Percentage of sick to average number resident	1·8	1·2
Average number of days to each patient	11	8·15
Average sick time to each resident	6·7	4·6
Total number invalided	7	8
Percentage of invalidings to average number resident ...	1·6	1·6
Total number of deaths	12	20
Percentage of deaths to average number resident	2·7	4·04

(*h*).—GENERAL NATIVE POPULATION.

The epidemic of Influenza and the general prevalence of Small-pox have exercised a very deleterious effect on the general health of the native population.

The number of native patients who have presented themselves for treatment at the Government Dispensaries has gone up 52%, although half of this increase was caused by cases of Influenza.

The inclination of the native to seek European Medical assistance is greater than formerly and likely to become more marked in future. As an indication of this tendency the case of an enlightened Emir in the north who sought surgical assistance for a Hernia, with most satisfactory results, may be quoted.

VITAL STATISTICS.

In 1911, the time of the last Census, the Native population was estimated at 9½ millions. The latest estimates, however, are as follows:—

Males	2,539,813
Females	3,082,333
Children	2,915,223
Total	8,537,369

Records of Births and Deaths among the Europeans and non-European Aliens only are kept, no attempt having yet been made in any place in the Northern Provinces to inaugurate a system of registration of either deaths or births among the natives of the country.

III.—SANITATION.

(*a*).—GENERAL REVIEW OF WORK DONE, LAWS PASSED AND PROGRESS MADE.

(I).—ADMINISTRATION.

The year 1918 was not characterised by sanitary activities likely to contribute dignity or to add weight to the medical annals of the Northern Provinces of Nigeria. With the exception of a brief space of

time in the Autumn, during which his services were lent to the Southern Provinces, Port of Lagos, in consequence of the advent of pandemic Influenza, the Sanitary Officer was obliged to direct his energies to purely medical work exclusively; while the normal activity of the Senior Sanitary Officer assumed an advisory—or, more correctly, an academic—form and was applied irregularly between spells of medical duty. This feature of the year's work, however, may be dealt with more appropriately at the end of the report: and, there, it shall be referred to again at some length.

The most notable feature of the year was the invasion of the country by pandemic Influenza. As observed here, the pandemic, in its protean manifestations, betrayed no fresh feature hitherto unobserved elsewhere; it defied all administrative measures to control its progress throughout the land; such limited measures as seemed to afford any prospect of being attended by success were applied; but, in the end, it was found that all that could be done effectively was to extend to the helpless such care, aid and maintenance as the Administrations, both direct and native, could encompass with the means at their disposal. At various centres, the Native Administrations behaved admirably in giving effect, by all the means within their power, to European advice, not scoring any startling success thereby, but auguring well for systematic sanitary activity in the future.

New camps were laid out, at Zaria, at Zungeru and at Baro, for the first, the second and the third battalions, respectively, of the West African Service Brigade. The soldiery concerned, who had been destined to service overseas, were subjected to intensive training at the standing camps named: and this state of affairs was of service in confirming the views already entertained touching the relative salubrity of the three Stations; for Baro undoubtedly suffered by comparison with Zaria and Zungeru. Zaria maintained its good reputation; at Zungeru, nothing occurred to diminish its claim to rank as an eligible military headquarter Station; but Baro confirmed its claim to being an unsuitable spot for a large population.

As a result of the military exigencies of the time, a large number of inexperienced Europeans were resident within the Northern Provinces during the year. This brought out, in a striking manner, how largely, in a tropical region such as this, so called acclimatisation is merely a matter of personal experience, and of management prompted thereby: a fact not demonstrated by tragically serious ailments; but by malaise, regarded by the "old hand" as evil dreams of the past.

Early in the year, several cases of trypanosomiasis (one of them in a European) were observed in the Kaduna region. In two of the cases, including the European one, the evidence pointed strongly to the infection having been contracted in the neighbourhood of the Capital. An extensive clearing scheme was recommended and sanctioned and was in progress at the end of the year. Such clearing is not such a simple affair as it seems to be on paper: really good trees are not plentiful in the immediate vicinity of the Capital; clearing has to be effected with judgment, if the preservation of valuable trees be assured, and, for this reason, the constant presence of a forestry expert—the personnel of the Forestry, like that of other Departments, is sadly attenuated—is necessary; valuable trees have been sacrificed in the past with ruthless ignorance; and general nervousness in the presence of insect-borne disease is the opportunity of the clearing iconoclast. When the scheme of clearing now being effected shall have been completed, all cause for apprehension will be removed. The belated clearing in question is nothing more than the programme originally envisaged, what time the site of the new Capital was selected; the advent of the war postponed it, in common with other programmes; and, had it not been for this state of affairs, it is very unlikely that Trypanosomiasis would ever have been mentioned in connection with Kaduna at all.

At Wamba, in the tsetse-fly-haunted province of Nassarawa, cases of Sleeping Sickness were reported among the soldiery; the principle of transferring the military post to a fly-free area was sanctioned; and a new site, at Akwanga, had been selected by the end of the year. It was decided that new barracks should be erected and the new site occupied by the end of the dry season.

The transfer of the civil and military official population—alluded to in the report for 1917—from Katagum to Hadeija was effected early in the year: and the road connecting Kano with Hadeija was maintained in a condition making it practicable for motor-cars. This means that the journey from Hadeija to Kano can, on emergency, be effected in a day; and, from Hadeija to Kaduna Hospital, in two days.

Arrangements were made for the transfer of the headquarters of the emirate of Gombe from Nafada to a more desirable site at Doma.

Early in the year, the Governor-General reached Sokoto by motor-car; his second visit to Sokoto so effected: whilst, later on, the Lieutenant-Governor, accompanied by the Principal Medical Officer, reached Lake Tchad by the same means of transport. Whilst he was at Sokoto, in the course of a meeting with the members of the local European mercantile community, the Governor-General arrived at an arrangement for the location of the hide-curing activities conducted there: an arrangement mutually acceptable to the Administration and to them. Such journeys by motor-car are most important; for a practicable motor-road is never given up; and they assure, as few other means can, the maintenance of the great trunk roads which materially subserve the public health.

At high water, the Governor-General, attended *inter alios* by the Senior Sanitary Officer, made the tour of the river Benue. The requirements of certain riparian stations were considered on the spot; the results of the phenomenal rise of the river in 1916 were noted; and, in some cases, amendments were made in the finally approved plans of the stations concerned. The most important administrative result of the Benue Tour, from the sanitary point of view, was the decision that Yola should be evacuated as the Headquarters of the emirate. For some years evidence had been accumulating, showing that the health of the indigenous Native population had been deteriorating through continuous residence at Yola and that the energy of the Europeans stationed there did not compare favourably with that of their colleagues posted to other stations in the Province. The Resident and the Medical Officer, fortunately, had succeeded in securing the confidence of the Emir and his people; with the result that the medical history of Yola had become known as it never had been before. The people gave a definite history of progressive deterioration of physique and loss of stamina during the last three generations; it was found that they nourished no such sentimental regard for the spot as would make it indispensable as their capital; and it became evident that the Emir, his big men and his people had been increasingly desirous of a change of venue for some considerable time. The European Officers maintained unanimously that they always felt better when their duties took them to some part of the Province away from Yola: and it was found, further, that Yola had enjoyed an exaggerated reputation, so far as its importance as a trading centre was concerned. As stated, it was decided that Yola should cease to be the capital of the Province. It was impossible, however, to decide at the time in what direction a site for a new capital should be looked for: it was desirable that the new capital should not only be on a good site, but that it should be central also; a part of what had been German Adamawa had come under British administration tentatively; it was not known whether or not the tentatively possessed new territory would become a permanent possession; if it did become permanent, the centre of the Province would lie to the south of the Benue; but, if it did not, the provincial centre would lie to the north of that river. An eligible site

was available at Song, northward and inland from the river; whilst another, equally eligible, was obtainable in the Maie Faran region, inland from the river to the south. Pending the final, international, territorial allocation, His Excellency arranged matters in this way:—(*a*) that the Emir with some of his people should spend a large portion of the next year at Song; (*b*) that a detachment of soldiery should be quartered at Song during the following year; and (*c*) that the Medical Officer should, during the succeeding year, make frequent visits to Song, on the one hand, and to the Maie Faran region, on the other. It was hoped that, by these means, both places should have been well observed by the time that the *post bellum status quo* should have become known. At the end of the year the fate of Yola was either transfer southward to the Maie Faran region, if any of the former German territory in that direction fell to the British Empire, or transfer northward to Song, if the territorial *status quo ante bellum* were resumed. Both regions are a great improvement on Yola, from the hygienic point of view; both are flourishing cattle countries, which points to freedom from tsetse flies; and each is unsurpassed for salubrity by any other region within the Province.

Limestone of an useful kind had been discovered in two places: between Jebba and Ilorin, on the Nigerian Railway; and below Lokoja, on the Niger. At Elebu on the Railway and at Lokoja on the Niger, the burning of the local limestone, for economic purposes, was undertaken systematically by the Department of Public Works during the year. This enabled work to be proceeded with in connection with over-due and urgently needed buildings—notably, the Hospitals, European and Native, at Kaduna—which, probably, could not have been undertaken at all, had cement imported from England been, as formerly, the sole mortar cement available. It is true that, in the past, local limestone had been burnt in limited amount, at Sokoto and at Kano, and applied to local buildings there; but, both places being so far landward and so poor in local fuel, the lime produced was restricted to those places solely; whilst the forced economy in the use of fuel did not permit complete burning. This systematic burning and use of local limestone means a great move forward; for there can be no doubt that, in the past, the practically total lack of local lime and the necessity for reliance on imported cement alone have constituted the chief difficulties in connection with the extension of healthy permanent dwellings and other buildings. When the Eastern Railway from Port Harcourt, which taps the Udi coalfield, shall have entered the Northern Provinces, local coal as well as local lime will be available on the actual arteries of traffic; and, in consequence of this, loftier and more spacious buildings may be contemplated; whilst, in the Townships, schemes of paving and draining, hitherto out of the question, may be entertained with confidence.

Throughout, and despite, the war, commercial activity had been steadily extending at various centres; notably, at Kano, where it became necessary to increase materially the area allocated for the setting-out of European, residential, trading premises. At Kano likewise, the Township market received considerable attention; the trading booths were improved; and comparatively ambitious structural reforms were adumbrated.

In the Bauchi Province, new permanent residential quarters were completed in the headquarter Station at Bauchi itself; whilst, on the Plateau, it was arranged that the temporary quarters at Naraguta should be gradually evacuated, as permanent buildings became available at Jos, four miles away, on the light Railway.

Considerable attention was devoted to Lokoja and to Baro by the Governor-General in person, on the actual spots themselves, and pains were taken to arrange the future possibilities of both places to the best advantage.

Territorial readjustments between the Northern and the Southern Provinces, respectively, took effect during the year: the Southern Provinces taking in a part of the Kabba–Ilorin Province; the Northern Provinces, a portion of the Iddah country marching with their old Province of Bassa. In consequence of the second of those territorial readjustments just mentioned, it became possible to set up the new Munshi Province. This was done by adding to the old Bassa Province the Munshi district of the Province of Muri together with the portion of the Iddah country ceded by the Southern Provinces. The Munshi Province now contains within its boundaries the Munshi, the Igara–Okpoto, the Bassa and the Bassa–Komo tribes: people among whom much sanitary work calls for attention so soon as it can be got at.

Legislation.

Rules were made and published as follows:—

(1) Under "The Townships Ordinance, 1917": published in the Nigeria Gazette, No. 5 of 24th January, 1918.

(2) Under "The Townships Ordinance, 1917": published in the Nigeria Gazette, No. 20 of 18th April, 1918.

(3) Under "The Markets Ordinance, 1917": published in the Nigeria Gazette, No. 46 of 22nd August, 1918.

(4) Under "The Townships Ordinance, 1917": published in the Nigeria Gazette, No. 57 of 3rd October, 1918.

(5) Under "The Public Health Ordinance, 1917": published in the Nigeria Gazette, No. 74 of 21st November, 1918.

A Regulation was made under "The Births, Deaths and Burials Ordinance, 1917," and was published in the Nigeria Gazette, No. 15 of 28th March, 1918.

It is unnecessary to set out at length the text of the Rules and Regulation alluded to above: they were made for the purpose of giving more effective application and greater precision to the Ordinances concerned.

A Bill entitled (short title) "The Lunacy (Amendment) Ordinance, 1919," was published in the Nigeria Gazette, No. 80 of 19th December, 1918. The "Objects and Reasons" of and for this Bill, as set forth in the Gazette, are: "To provide for the establishment of Lunatic Asylums by Native Authorities and to amend the Lunacy Ordinance, 1916, by removing certain ambiguities."

Progress made.

Arrangements were completed for getting on with the alterations necessary for the conversion of the old Gaol at Zungeru, together with the Annex thereof, into a Lunatic Asylum; so soon as it should have been evacuated by the troops in temporary occupation of it.

Slow but steady progress was made with the metalled road for motor transport from Zaria to Sokoto; the great trunk roads were maintained and, in some parts of the country, were added to; the extension of the laying-down of Dhub grass was steadily maintained at various places; and, notably at Kaduna, the number of permanent incinerators was increased; whilst many of the existing ones were practically renewed.

The temporary piped water installation at Kaduna was strengthened and increased: as a consequence of this, failures in supply became less frequently recurrent; although they did not cease entirely.

The Rest Camps along the main routes were well maintained; many of the rest houses therein were rebuilt; and the rule of having new rest camps situated sufficiently far distant from the towns concerned was faithfully observed.

Wells and other sources of Native water supplies continued to receive steady attention: particularly in the direction of having the mouths of wells raised and defended by parapets, in having the immediate vicinity of water-supply kept cleared, and in selecting new sources of supply with more care to avoid contamination than had been exercised formerly.

The native population at different localities mutually distant exhibited a spontaneous desire for vaccination: this was especially encouraging, as the communities concerned were chiefly composed of raw Pagans.

There can be no doubt that successful vaccination and skilful surgery constitute by far the most powerful means of convincing the native of the soundness of European medicine and hygiene. He is sceptical and conservative and needs a lot of persuading; but, once he has been persuaded, he is apt to cherish his new convictions as stubbornly as he did his ancient prejudices. For this reason initiatory pick and shovel work should be so continuous as it is sound. The new desire for vaccination in the case of the Pagans, alluded to above, has largely sprung from their having observed that their comrades, who have returned vaccinated from the haunts of the European, are no longer liable to infection by small-pox. It is only within the last few years that it has been possible to get at the furtive Pagans in this way; for it is only within that time that railway construction and mining and road-making activity have enticed some of their number away from their villages in pursuit of unusually remunerative labour, and so brought them within reach of the vaccinator.

In the Spring of the year, by arrangement, a Medical Officer—he is a brilliant surgeon—went to the residence of a Northern Emir and there performed on him a major operation. The result of this was that the Medical Officer concerned was literally mobbed by candidates for his surgical assistance, which he extended so far as he could in the time at his disposal; and he left many disappointed patients behind him, with whom he had been unable to deal. This surgical episode is cited here because it has a direct sanitary bearing. The bearing is this:—The town of the Emir in question is just over one hundred miles distant from the nearest station to which a Medical Officer is posted.

Formerly, a Medical Officer had been regularly posted to the station beside the Emir's headquarter town. In those days, the Emir was a firm supporter of the vaccinating and sanitary activities of the local Medical Officer; and he supported the Medical Officer by example as well as by precept; for he made his own household submit to vaccination in addition to recommending it to his people; he applied sanitary principles to his own personal establishment in addition to lending his influence to the adoption of them by his people; and he, aided by his District Headmen, made the rest camps throughout his Emirate a pattern to the whole country—which, as a matter of fact, they still are. But, in the days alluded to, the Medical Officer did not find general medical so satisfactory as he did vaccinating and sanitary activity. The reason for this was not far to seek: the Emir had not enjoyed an opportunity of recommending the former by example. But, once he had submitted his own person to the knife of the surgeon, his people followed like a flock of sheep. This shows the paramount importance of enlisting the living support of the big men: and, likewise, how important it is that the sanitary officers be constantly travelling in their districts.

As, fortunately, is usually the case in the Northern Provinces, the prevention of diseases due to, or aggravated by, want did not call for consideration: although they constituted a self-supporting country which raised all and consumed most and, ground-nut excepted, exported none of its food-stuffs, and although there was no unusual scarcity, there was hardly a single article of local produce which did not rise in price; and the fact, that despite this the people were not only well fed, well clothed and well housed, but found themselves in a position to revive some of their dead or dying native industries as well, showed that internal prosperity was well maintained and widely diffused.

(II).—Preventive Measures.

Mosquito and Insect-Borne Diseases.

Malaria, yellow fever and filariasis.

The preventive measures practised are those described in former reports. Of the mosquito-borne diseases, Malaria retains its ancient lead; Yellow Fever has been absent, or has eluded notice, since the invasion of 1917; and Filariasis generally spares the European, although it is by no means rare among the native community.

Most of the European Officials are now provided with portable, so called, mosquito-proof rooms; practically all Europeans use either such rooms or mosquito-nets; and the use of the mosquito-net continues to extend steadily among the Non-European community, both native and alien.

All the means available are employed to avoid the establishment of breeding grounds for mosquitoes; and to disestablish or to render innocuous existing ones by filling in, draining, oiling, etc. In addition to this, all Europeans are advised to take a daily ration of Quinine: and supplies of ration Quinine are issued freely to all official Europeans, who apply therefor. Practically all the servants of Europeans, and most Non-Europeans living in Townships, receive free and thorough treatment when they are attacked by Malaria: and the long odds are that the average European is surrounded by much less active Malaria than he was, say, ten years ago.

The heresy that the regular consumption of a Quinine ration has been greatly overrated hitherto as a preventive measure against Malaria, has fortunately not spread materially here; although it has in the Medical press. It is, however, put forward occasionally by members of the non-medical community: and it is probable that the number of those will increase as the public gleans copy from the medical press. Such a probability cannot be regarded as anything else than a misfortune; for, if regular Quinine consumption go down, the incidence of Malaria will go up. If the records, published in the medical press during the year, touching the efficacy of Quinine in the treatment and prevention of Malaria, be correct and founded on accurate observation, they must have reference to a type of Malaria either unknown or exceedingly rare in the Northern Provinces of Nigeria; for they are entirely at variance with Northern Nigerian experience. It is impossible to take the records alluded to otherwise than seriously: at the same time, in the opinion of the present reporter, it would be flagitious for any medical or sanitary worker in this part of Africa to accept and act upon them without reserve. The records in question deal with cases of Malaria recruited from all the malarious fronts and bases of the war; the pyretology of the world is not yet complete; the pyretology of some of the fronts is still in its infancy; and one or all of them may be well able to furnish more than one *tertium quid* capable—though itself unknown to science—of running synchronously with Malaria Fever.

There is hardly a Medical Officer of any length of experience in the Northern Provinces who has not been told repeatedly by non-medical friends and patients that they never knew the privilege of relative freedom from Malaria until, on his advice, they had become regular consumers of a Quinine ration. The term, ration, is employed here instead of the term, dose, advisedly; because it is wise to persuade the European—particularly, the European new-comer—to regard his daily Quinine as a ration, and not as a dose of physic.

Trypanosomiasis.—Trypanosomiasis is endemic in various regions and previously unknown centres are reported from time to time. The measures employed in the prevention of this invasion have been described in former reports and little remains to be added to the subject in this one.

The project, entertained for a brief space some years ago, of transferring all cases of Trypanosomiasis to one central, fly-free region and segregating them there, has long been discarded as impracticable. Even segregation in central, provincial, fly-free areas is probably equally impracticable. The problem of dealing with Trypanosomiasis is quite as much a political-economic, as it is a sanitary one: if, indeed, it be not more so. When Trypanosomiasis is reported from any spot, the first thing to be ascertained is whether or not there be tsetse flies there; the second, whether or not the disease reported really be Trypanosomiasis. If the presence of the invasion be demonstrated, the next question is whether the Tsetse Fly can or cannot be disestablished by the means available: and, if it can be, well and good; but, more often than not, it cannot be. Evacuation of the infected area will almost always be found to be the only safe and reasonable solution. When such a solution is accepted, the question becomes one of finding a neighbouring fly-free locality to which the population concerned can be transferred with a minimum amount of loss and inconvenience to themselves and of interruption and disruption of their normal pursuits. Of course, if a thoroughfare have to be kept open through the evacuated locality, it must be widened out throughout its entire course through the fly-belt.

Every centre of Trypanosomiasis thus demands the careful co-operation of a political and a sanitary or medical officer in collaboration with a Native Authority, and the devotion of considerable time to the question by all concerned. Since the outbreak of war, it has seldom been possible to treat a Trypanosomiasis centre in this way: and the attenuated political and medico-sanitary—especially the latter—personnel affords little hope of following this procedure in the near future.

It may be taken as the general rule that Trypanosomiasis does not invade people who live in the open among extensive and regular cultivation; but that, on the contrary, its victims are found among backward people who seclude themselves in villages, encircled by marshy forest or situated on the banks of bush-bordered streams, and cultivate small isolated patches of ground in the neighbourhood. It is true that tsetse flies are found in the dry orchard bush in some regions; but extensive and continuous cultivation is inimical to them; and a fly-belt is seldom or never found traversing a large area over which relatively high farming is practised. It follows from this that, what time it may become necessary to move an entire community in consequence of the invasion thereof by Trypanosomiasis, the population involved will not be a large one.

Infectious and Epidemic Diseases.

CEREBRO-SPINAL FEVER, PNEUMONIA AND INFLUENZA.

In former reports, Pnuemonia and Influenza have been taken together; because it is really impossible to say where the one ends and the other begins. It is now wise to make a group of three by

including Cerebro-Spinal Meningitis with them. All three are endemic and periodically assume the epidemic form; they are all associated with closely allied or, it may be, identical parasites; they are all connected with over-crowding and seem to be most prevalent in the same regions; and Pneumonia is frequently a complication of either of the other two. In addition to all this, during the invasion of the country by pandemic Influenza, some of the cases were, in their clinical manifestations, inseparable from Cerebro-Spinal Meningitis; there were few fatal cases from which Pneumonia could be excluded; and, in the absence of an acknowledged epidemic of Influenza, the cases showing cerebro-spinal symptoms would undoubtedly have been returned as Cerebro-Spinal Meningitis. Cerebro-Spinal Meningitis, however, is pronouncedly a dry weather disease: it is seldom or never heard of in the rainy season proper. When the pandemic Influenza reached the Northern Provinces in the second half of September, the rains were still on; but, then, it was found along the railway and the navigable waterways; and before it had made its way far along the overland trade routes towards, what may be called, the cerebro-spinal country, the dry season had already commenced. It would have been most interesting, had it been possible, to have had an analysis of the cases in the dry North, showing particularly the proportion assuming the cerebro-spinal form; but this was impossible; as the scanty medical personnel available was overwhelmed with work; whilst only a very small proportion of the cases was seen by medical men at all.

When local epidemics of the three diseases in this group occur, more often than not, the diagnosis is made by circumstantial evidence obtained after the event: for what generally happens is that some political officer gets to know that the "people have been dying" in a certain town or district; when he arrives on the spot, the outbreak is reported as ended; and, finally, on indirect evidence, the diagnosis—or, rather, the probable diagnosis—is made by the method of exclusion. In some of those local epidemics, the mortality is high; the disease concerned is highly contagious within the district concerned; but the epidemic seldom becomes general. Such a limited epidemic of Influenza broke out in Kano City—it was especially virulent within the Native Gaol there—seven years ago. There was a general epidemic of Cerebro-Spinal Meningitis—observed first at Sokoto—in 1905. In the dry season, 1906-1907, an epidemic of Cerebro-Spinal Meningitis of the limited variety took place at Zungeru; but, so far as is known to the present reporter, who was the medical officer concerned, it did not spread beyond that station.

Pandemic Influenza made its way through the country precisely as those with topographical knowledge expected. It made its way from Lagos along the railway to Kano, and down to Baro; from Baro, down the Niger, to Lokoja; and, from Lokoja, up the Benue, to Yola. From centres on the railway and on the rivers, it spread steadily along the overland trade routes; and, along those, its progress was a little slower than the normal rate of travel; in consequence of the carriers breaking down on the way. It was essentially a visitation to the active: children and people over forty taking but little skaith. The mortality was not high among those who were induced or compelled to live entirely out of doors; but it took heavy toll of those who sought refuge—as the native generally does under such circumstances—in dark, closed huts. A most striking feature was the relative immunity which seemed to be enjoyed by the sufferers from chronic nasal or naso-pharyngeal catarrh. At the end of the year, the invasion was still active in the more remote regions and it appeared to be recurring in the south. Its manifestations were quite as protean here as were any reported from other parts of the world: in addition to its simulation of Cerebro-Spinal Meningitis, already alluded to, some cases were almost replicae of Yellow Fever; others simulated acute Rheumatism; and it was only their failure to yield to treatment by Quinine which made it possible to distinguish others from Malarial Fever.

Dysentery.—Dysentery was widely prevalent: the Amoebic form, judging by those cases which came under accurate observation, being, as usual, much more common than the Bacillary form of the disease.

Enteric Fever.—There were a few cases of Enteric Fever: just enough to demonstrate its continued presence.

Tuberculosis.—There are always, unfortunately, a few cases of Tuberculosis present now: although few in number, they show a growing tendency to occur in pairs, husband and wife suffering together.

Leprosy.—This disease, which occupies much the same place here as Tuberculosis does in Europe, is widely prevalent. No new practice was applied to it during the year; for the simple reason that it was impossible. No class of the native community can be regarded as exempt from it, and, when the time shall have come to tackle it systematically, much exercise of sound judgment and application of local knowledge will be called for. Meanwhile, all the legislation necessary for dealing with this problem is already available for application at any time.

Measles.—Measles showed itself sporadically and in small local epidemics, and it is most probable that many cases, which were not seen by Medical Officers, were put down to Influenza.

Mumps.—There were several local epidemics of this affection, notably at Zungeru. The observant traveller who makes extensive tours across country frequently notices sporadic cases in the villages and markets; and the present reporter has come to the conclusion that the vast majority of the indigenous population enjoys immunity in consequence of having contracted the disease in childhood. It is certainly well known among the people at many places, where it seems to contribute to the domestic practice of the ubiquitous "old wife."

Rheumatism.—Rheumatism in all its forms is common in most regions: so also is chronic osteo-arthritis.

Rabies and Tetanus.—There is nothing new to record about these two infections. One case of Tetanus, a fatal one, came under treatment, and others were heard of; but, although news of rabid dogs came in from time to time, rumour failed to hint at any case of human Rabies.

Small-Pox.—Small-pox assumed the form of considerable local epidemics in various regions, and there were numerous sporadic cases as well.

To get at this disease by vaccination has become progressively more difficult since the outbreak of War. All soldiers, police, their women, their children and the rest of their following in barracks, who are not already protected by former attacks of Small-pox, are vaccinated compulsorily; so also are all Government Employees and their following together with the prisoners in the Gaols; and every effort is made to protect the general inhabitants of the Townships after the same fashion. This activity has been, on the whole, so successful that Vaccinators have to proceed progressively further afield for the practice of their activity.

In the Northern Provinces, a country of great distance and widely scattered people has to be dealt with; Native Vaccinators for obvious reasons, require to be closely supervised; and such necessary supervision has steadily become less available in recent years. The problem, now, is not how to induce the people to submit to vaccination: it is how to meet the earnest desire of the people to be vaccinated. A scheme was adopted during the year, the object of which was to attach Apprentice Vaccinators to the Medical Officers who should give each a training in the technique of vaccination and of surgical cleanliness. The result of this will be eventually a staff of Vaccinators throughout the country: but the machinery necessary for the adequate inspection and supervision of their work is not yet in view.

Vaccination.

	1917.	1918.
Total number vaccinated	9,147	11,035
Total number successful	4,365	6,125

It is a pleasing obligation to have to record that of the vaccinations set down above, 962, of which 906 were successful, were performed by a District Officer of the Political Service who had already in former years done much good among the people of his Districts by his zealous vaccinating activity: purely voluntary work, so far as he was concerned.

Chicken-Pox.—As usual, outbreaks of Chicken-pox occurred in various regions: few of the cases seen were severe.

Venereal Diseases.—Venereal Diseases maintained their prominence among the diseases of the country. In all of them, particularly in the case of Gonorrhoea and in that of Soft Chancre, many of the cases are complicated by having associated with them mixed infections from other sources: and it is not surprising that phagedaenic ulceration is exceedingly common.

During the year, it was decided to try the experiment of ceasing to penalise—by stoppage of pay, etc.—soldiers who might contract venereal disease. The reason for making the experiment was that, inducement to conceal infection having been removed, infected soldiers would seek treatment voluntarily and without delay.

Although it is still too early for any definite expression of opinion to be warranted, there is a fairly general feeling that the experiment is likely to be justified by success. By success is not meant the successful eradication of disease; but a material diminution in loss of effective service traceable to the contracting of disease.

Helminthic Diseases.

Some of these invasions were, if anything, commoner than usual during the year under review.

Bilharzia may, in many parts of the country, be regarded as an affection of childhood, so frequently, as mentioned in the last report, is it observed in children and immature youths.

Taenia Saginata was unusually prevalent. This probably does not mean that there was an actual increase of the parasite itself, but that the increasing internal prosperity of the country had added materially to the number of habitual meat-eaters.

Ankylostomiasis was not often observed. This did not mean any actual decrease, but simply that less travelling was possible among the people who furnish most of the hosts.

Ascarides and Threadworms can always be found in most places, if they be carefully looked for.

Guinea Worm was exceedingly common, and the present reporter cannot recall a single place visited by him in the course of the year where he did not see victims of the parasite. In this connection, an unusually large number of cases was observed in which the victims were harbouring several parasites at the same time. Along some of the trade routes, it is impossible to halt at any village at which some one or more persons is not suffering from the effects of invasion by this worm.

Meat Inspection is effected so far as this is possible and every effort is made to induce the people to abstain from the consumption of under-cooked meat, which, unfortunately, is on sale at every market.

(III).—General Measures.

Clearance of Bush, Undergrowth, etc.

This activity, as described in former reports, is a continued one: it is only limited by the means—financial and other—available for the purpose. In Townships and Stations at which there are Gaols, this constitutes the greater part of the out-door labour of the prisoners. In addition to this, a considerable portion of the Township funds is devoted to clearing operations; and grants of money are allocated to places at which the local means available are not sufficient for the effecting of adequate clearing. At many stations, the successful laying down of Dhub grass has contracted the area demanding annually recurring, necessary, clearing operations. The extension of allotments and the cultivation of short crops thereon likewise contracts the area calling for unproductive clearing: and the time is approaching, it is hoped when, by giving, against the Townships and Stations concerned, land to Native agriculturists on specially advantageous terms on condition that they restrict their cultivation to prescribed crops, much costly clearing may be avoided and the open area may be materially extended.

Disposal of Refuse: Drainage.

Disposal of refuse is effected after the fashion already described in former reports. One welcome result of the new, local, lime-burning activity will probably assume the form of a material increase of the number of effective incinerators. Drainage is effected by the old methods.

Regulation of Buildings; Sanitary Inspections (including Food Inspection) and Prosecutions; Town Planning.

To add here to what was written on these subjects in the report for the previous year would be superfluous reiteration, little of which would be new. The establishment of Sanitary Inspectors has been increased and the legislation set forth in the last report has been useful; but the attenuated medico-sanitary personnel has made it a physical impossibility to take full advantage of the latter.

Sewage Disposal.

The system in use has been described fully in former reports. Before the war, a piped sewerage system had been adumbrated for Kaduna; for obvious reasons, this did not materialise, and it still remains an adjourned problem of the future.

Water Supply.

This is a subject which is never put aside. Sources of supply at Townships and recognised Stations are objects of constant scrutiny; where condensers are in use they receive constant attention; and native water supplies receive so much attention as it is possible to devote to them.

There are several water supplies which are in urgent need of reform or of radical alteration. Now that the war is over, it is a matter of urgency that the installation of the permanent piped supply at Kaduna, together with its pumping arrangements and high reservoir, be proceeded with, and the present rather precarious temporary piped supply be disestablished, so soon as possible.

The water supply, conveyed by pipes from the Shalawa to Kano, which has already been planned, is also a matter of urgency.

At Offa likewise, the water supply calls for careful attention, although, compared with the Kano and Kaduna supplies, it constitutes a small affair.

(*b*).—MEASURES TAKEN TO SPREAD KNOWLEDGE OF HYGIENE AND SANITATION.

Elementary Hygiene retains its place in the curriculum of the Government Provincial Schools.

Early in the year, two well-born Native young men, who, after having passed through the Government Schools, had received a course of training from the Sanitary Officers, were sent back to their respective Emirates to act as Sanitary Inspectors under the Native Administrations concerned. Towards the end of the year, the Resident of the Province concerned reported one of these to be a "most useful Native Official"; whilst the other appears to be doing well also, judging by his correspondence with the Sanitary Officer.

In place of the two young men mentioned above, other two, with similar qualifications, were taken on and still remain under training with the same object. Those pupils are nominated by the Residents of the Provinces whence they come, on the recommendation of the Director of Education.

No touring was done by the Sanitary Officers, in association with Political Officers and District Headmen. The entire elimination of this procedure is a calamity from the sanitary point of view; for the practice is not only the most effective of all possible educative measures, but is that to which quite seventy-five per cent. of the energies of the Sanitary Officers should be directed.

This question of educative measures shall be alluded to again in the next section.

(*c*).—RECOMMENDATIONS FOR FUTURE WORK.

In recent reports, the recommendations made under this heading have certainly not been inspiring: they could not be so in the nature of things; the sanitary officers knowing quite well that they had no means of foretelling, so long as the war lasted, what portion of their time they were likely to be able to devote to their purely sanitary activities alone.

What is about to follow shall take, therefore, not so much the form of recommendations for future work as of a brief essay on Sanitary Apologetics.

Since the outbreak of the great War, the Sanitary Branch of the Medical Department has been, steadily and with increasing rapidity, taking a back seat. This has been the fault of nobody—the ex-Kaiser alone excepted—for, when it is a case of "all hands to the pumps," in the presence of the exigencies of a great war, the civilian who asserts his claim to being allowed to stick to his own job is merely understudying "Nero fiddling whilst Rome was burning." During the war, "business as usual" has not been the rule in the Northern Provinces: the attenuated personnel of the Medical Department has been subjected to chronically progressive shrinkage; and, naturally, the Sanitary Officers have been morally bound to fill gaps of pressing importance left by their medical colleagues called off for military service.

In the Northern Provinces, all sanitary work worthy of the name must assume the form of the *argumentum ad hominem*, and the argument must be advanced and pushed home on the spot; for the functions of the sanitary officers, being purely educative, persuasive and advisory, cannot be performed executively from a chair in an headquarter's office. When the Sanitary Branch had been created, this state of affairs was fully realised and acknowledged; the Principal Medical Officer generously extended to the Senior Sanitary Officer the hospitality of his store, the services of his storekeeping staff and supervision for the office of the latter; the Sanitary Officers were thus released to unrestricted travelling, and by far the greater portion of their energies was devoted to touring the country in association with Political Officers and District Headmen locally concerned. This arrangement worked effectively and smoothly; sanitary activity went ahead with fruitful progress and, in consequence of this, the Governor-General had already, early in 1914, promised his support to the Senior Sanitary Officer in the proposed application of the latter for an additional colleague. Then came the war, with the consequent turning down of all such expansion. This was not all: unavoidable changes in the personnel of the Principal Medical Officer's headquarter staff rendered it impossible for him to extend to the Senior Sanitary Officer any longer the store hospitality and the store and office assistance to which the latter had been accustomed; the Senior Sanitary Officer was unable to make good the consequent deficiency, and the result was that sanitary store keeping suffered eclipse, whilst the sanitary office became a most inefficient instrument. Meanwhile, the personnel of the Political Staff had also become attenuated; their frequent calls to purely medical duty made it impossible for the sanitary officers to undertake regular, pre-arranged tours, as had been their custom; when they could go on tour, Political Officers, more often than not, were not available to accompany them at the time; and the consequence was that cross-country touring—by far their most important function—gradually became attenuated to extinction. All this means that the hands of the sanitary clock have been put back and back, until now zero has been reached: *i.e.*, that the Sanitary Branch now stands pretty well where it did, what time it had been created in the Spring of 1910. In other words, it behoves the Sanitary Branch to begin again from the beginning: *i.e.*, the Sanitary Branch, practically, will have to be reorganised, if not actually recreated.

As this report is being written, the Sanitary Officer is seconded to purely medical duty, whilst the Senior Sanitary Officer himself has only been released from medical duty for a few weeks and has no assurance of not being obliged to return thereto; and the time, when both sanitary officers, or even one of them, can feel justified in looking forward to purely sanitary duty, is not yet in sight. Nevertheless, the war is over, and the time has come for, at least, making some attempt at setting the house in order; for, until this shall have been done, or until some idea of what the possibilities of the Sanitary Branch are likely to be shall be forthcoming, it is sheer fatuity to make recommendations for future work.

The method of procedure followed by the Sanitary Officers in overtaking their work has been like this:—

(1) Inspection of the various Townships and Stations, *i.e.* the areas of Direct Administration: at stations to which Medical Officers have been posted, leaving the routine to them, in their *ex-officio* capacities as local Health Officers; seconding their activity with advice and support; but taking on, entirely, extensions, remodellings and other radical alterations.

(2) Total responsibility accepted for Stations to which Medical Officers have not been posted.

(3) Selection of sites for and planning the lay-out of new Townships and Stations, and the arrangement of extensions and alterations of existing ones.

(4) Recurrent scrutiny of the routine sanitary measures carried out at the Townships and Stations with careful regard to local conditions and, where and when necessary, effecting change of practice.

(5) The taking of necessary preventive measures in the presence of epidemics and when invasions have been threatened by epidemic disease from without the boundaries. This activity, of course, includes, particularly, all possible points of entry on the railway, on the rivers, the railway rolling stock and passengers, and vessels plying on the water-ways together with their holds, passengers and cargoes: and it likewise includes the arrangement of isolation camps.

(6) The inspection of Gaols and the inhabitants thereof.

(7) The supervision of arrangements for effecting vaccination and the maintenance and appropriate distribution of an adequate lymph supply.

(8) General inspection of station areas along the railway and of the passenger rolling stock.

(9) Cross-country inspections of towns, villages, etc., throughout the spheres of influence of the Indirect Administrations. In effecting those inspections, the Sanitary Officers have been accompanied by the local Political Officers and District Headmen concerned. After inspection of specimen towns in a given District, the District Headman together with the Headman of each town concerned being present at each inspection, the District Headman together with the Heads of each town inspected in his district have been assembled at the headquarter town of the District; and there, with the Political Officer sitting with him, the Sanitary Officer has gone fully into all the matters calling for reform which he has indicated to them on the spot, has explained the procedure necessary and the reasons therefor, and schemes of reform have been arranged on the understanding that the Political Officer will expect to see steady progress being made on the occasions of his subsequent visits. At those sittings, also, simple lessons have been taught them on the principles dominating water supplies and the disposal of refuse and sewage, the commoner diseases likely to visit them and the public preventive measures called for; venereal diseases, their gravity, their immediate and remote effects and their prevention; small-pox, vaccination and the rationale thereof, and kindred subjects. The presence of a Political Officer is necessary, because the political is the only authorised avenue of approach to the Native Administrations; the presence of the Political Officer implies that what is being advocated has the approval and support of the Resident of the Province, and consequently of the Governor himself; and his intimate local knowledge enables him to put the Sanitary Officer right touching the intelligence of the people and how much teaching they are capable of assimilating.

Rightly or wrongly—rightly, he is absolutely convinced—the Senior Sanitary Officer has ever regarded this work among the Native Administrations as by far the most important of his duties, and the most experienced Europeans residing in the country have agreed with him.

To do this highly important duty effectively, the Sanitary Officers should be constantly on tour; for, particularly among natives whose own vernacular is the medium of communication, if the European be not conversing with new natives almost daily, he is apt to become tongue-tied, because he loses ready command of idiomatic turns of speech and varied complexion of native outlook: and, *qua* the native, the proverb: "*Gutta cavat lapidem, non vi; sed soepe cadendo,*" is the beginning and ending of wisdom.

(10) General inspection of trade routes, rest camps, water supplies, markets and caravansarais, and the setting-out of new native towns.

(11) The drawing up of concise reports conveying necessary representations and recommendations, acting at headquarters as general adviser on sanitary affairs, and being ready to furnish at all times local information and advice on matters pertaining to the Public Health.

Such, briefly put, are the main activities of the Sanitary Officers and the procedure followed in effecting them: and such is the house which has to be put in order.

Now, in considering ways and means, the first thing to be remembered is that the presence of a Sanitary Officer at headquarters for much more than two months in the aggregate out of the twelve is an indication of failure; for, remembering the local conditions and limitations prevailing in the Northern Provinces, sound sanitary work cannot be effected ex cathedra from an headquarter office: the work must be planned and repeatedly supervised on the spot by the Sanitary Officer concerned, for to act otherwise would be comparable with practising Medicine by correspondence. Nevertheless, adequate continuity must be maintained in the office, and methodical management at the central store.

At present, were the two Sanitary Officers free to pursue their own proper avocations exclusively, this would be the available force of the Sanitary Branch:—

(*a*) Two Sanitary Officers.

(*b*) One Clerk, with occasional assistance from the Clerical Staff of the Principal Medical Officer.

(*c*) No Sanitary Store.

(*d*) No Sanitary Storekeeper.

It is unnecessary to go into the question of Sanitary Inspectors here, for this is a matter which can always be arranged when the Estimates are submitted.

In the past, it has not been possible to second a Medical Officer for duty as acting Sanitary Officer, during the absence on leave of one of the Sanitary Officers; so that, for considerable periods, one or other of the Sanitary Officers has had to carry on single-handed.

The time seems ripe now for the submission of what the establishment of the Sanitary Branch should be: and what follows constitutes, in the opinion of the present reporter, a modest proposition:—

I. Three Sanitary Officers. This is necessary for assuring the necessary minimum of residence at headquarters of a Sanitary Officer, for effecting relief, and for enabling adequate absence on tour to be effected.

II. Two European Sanitary Inspectors. This is necessary for assuring the presence of one of them always at headquarters, in charge of the Office and Central Store.

III. Two competent Native Clerks. It will be found that the increase of clerical assistance will become progressively necessary as the numerous new Townships and settlements expand in area and increase in population and importance.

If this foundation be sanctioned and established, such other desiderata as the increase of the personnel of native subordinate staff—Sanitary Inspectors, Vaccinators and the like—office and store accommodation, etc., will be achieved automatically.

There are two other desiderata which must stand by themselves; because the one is as much a Medical as a Sanitary matter, whilst the other concerns the Southern as well as the Northern Provinces. These are:—

I (*a*). There should be established a central school for the training of Sanitary Inspectors and Vaccinators, as well as Dispensers, Dressers, etc. This would be appropriately a Native Administration Institution; for the personnel trained would be for service in the Native Administration areas. Adequate provision already exists for the training of English-speaking functionaries of the sort for service in the Townships and Stations. A precedent for the kind of school advocated here has already been established in the shape of the Native Survey School at Kano. It has been a flourishing institution about six years now; it secures and trains the right kind of Native personnel; and the same personnel is obtainable for a Medico-Sanitary School. Medico-Sanitary work is quite as important as is Survey work.

II (*b*). The entire Railway system should be erected into one Sanitary District or more: and it should constitute the exclusive sphere of activity of one Sanitary Officer or more. At present—this, of course, only professes to be the Northern Provinces' state of affairs—with our great distances, it is liable to happen, as has happened before, that an urgent sanitary question, affecting the Railway alone, arises when both Sanitary Officers are some two hundred miles, in different directions, distant from the Railway. Such a state of affairs is apt to be attended by delay and grave inconvenience. The presence of a travelling Sanitary Officer, whose activities were restricted to the Railway alone, would avoid this.

In viewing the sanitary requirements of the Northern Provinces, together with the conditions governing those requirements, it is necessary to enter one paramount caveat, to wit: the value, the magnitude and the genuineness of the sanitary reforms and other activities effected in the Native Administration areas—by far the most extensive and the most important part of the country: if the indigenous natives, whose own native land the country is, be given the first place, which, after all, is only their right—cannot be estimated in terms of expenditure shown in Estimates. Sanitation in those areas is essentially rural sanitation and is consequently chiefly domestic: and being so, it is not shown in any published Estimates. Such elementary requirements—the paramount requirements, in truth—as the disestablishment of mosquito-breeding places, the simple but necessary disposal of refuse by burial or burning, the keeping clear and clean of thoroughfares and market places, the thinning out of over-crowded compounds, the care of wells and the topographical relationships of those to sources of contamination, the converting of intra, into extra-mural markets and caravansarais the relationship between long and short crops and the peripheries of towns, the extension of existing towns and the setting-out of new ones on correct sanitary lines, the moving of a body of people

from a pestilential to a healthy spot, the evacuation of a focus of sleeping sickness, and many other obvious requirements simple in themselves but, nevertheless, including all the vital requirements of Hygiene, are really matters of domestic economy and are met as such.

It must not be forgotten that the traditions of the indigenous natives are entirely patriarchal and that their conception of right of user in land is radically different from that of the typical Occidental European: and that it follows from this that, in directly administered Townships and Stations, claims for compensation for disturbance, due to the meeting of sanitary requirements, are entertained which, in his own haunts, the indigenous native would never dream of making, or of expecting to be entertained if made.

At the same time, it is impossible to press too strongly the argument that the greater part of the energies of the Sanitary Officers should be directed to the indirectly administered areas. The small aggregate area made up of the directly administered Townships and Stations already possesses its routine procedure, which—all such places having Europeans resident thereat—tends to go on automatically: but it is otherwise in the case of the indirectly administered area, and for the Sanitary Officers to direct the major part of their energies to the directly rather than to the indirectly administered area would seem to the present reporter to be comparable with treating a rash without regard to the systemic disease of which it was but a symptom.

As indicated above, sanitary evolution moved forward steadily and without interruption from the creation of the Sanitary Branch in 1910 to the latter part of 1914: and, up until then, the Senior Sanitary Officer would have felt himself justified in surrendering his office to a successor, harbouring, at the same time, a modicum of honest pride of achievement. Since then circumstances have changed, until now, he could not hand over without a sense of shame: a sense of shame not rendered less acute, because the regrettable state of affairs was traceable to circumstances over which he had no control.

The chief feature of the Sanitary Branch at present is its morbidity and the symptoms of this morbidity are accumulated arrears, together with the absence of plans for work which ought, not only to have been planned but, to have been effected long ago.

There are numerous centres of alleged sleeping sickness and of other diseases which ought to have been inspected and systematically dealt with long ere now, but which have not, so far, even been visited. Enough has been written here to show that, once a practical *modus vivendi et agendi* shall have been re-established, numerous recommendations shall be forthcoming.

The necessity for reconstruction seems to be the paramount one over most parts of the Empire; but, if it be permissible to compare small things with great, nowhere is reconstruction more urgently called for than it is in the Sanitary Branch of the Medical Department of the Northern Provinces of Nigeria.

M. CAMERON BLAIR,
Senior Sanitary Officer,
Northern Provinces.

IV.—METEOROLOGY.

Climatic conditions vary considerably in the different parts of the Northern Provinces.

I attach tables, indicating the meteorological conditions at some of the most important Stations in the Northern Provinces.

V.—HOSPITALS AND DISPENSARIES.

At Kaduna a Hospital for Native patients, which will provide conveniences and advantages not previously obtained, has been erected and should be ready shortly for occupation.

An European Hospital has also been commenced, which will be a great advance on the building now in use, the latter having on a number of occasions been overfull.

The European Hospital at Kano was closed during the latter part of the year and has since been used simply as a Rest House for the sick.

On account of the number of troops at Zaria it has been necessary to increase the amount of Hospital accommodation for natives by the erection of temporary huts, which it is hoped will be replaced by permanent buildings later.

The following table shows the number of patients treated at the various Hospitals and Dispensaries.

	1913.	1914.	1915.	1916.	1917.	1918.
Average European Population ...	804	969	897	762	779	989
Europeans	1,547	1,506	1,137	990	1,504	2,500
Natives	26,297	29,533	20,251	24,846	31,707	48,199

VI.—SCIENTIFIC.

The past year has been one during which, in order to meet the necessities of the war, the Medical staff has been at the lowest mark possible with the result that more work than formerly has fallen to the lot of each of its members. It has not been possible, therefore, to devote as much time to Research as would otherwise have been the case.

I attach two interesting papers recording observations made by Dr. W. B. Johnson, (*a*) Tsetse; (*b*) Influenza at Ibi; (*c*) Blood-sucking Diptera caught in Ibi District; and also notes on a case which came to the notice of Dr. Moiser.

In addition to the various returns I submit Graphs relating to Deaths and Invalidings, Blackwater Fever, Malaria, and Meteorological conditions.

ARTHUR PICKELS,
Principal Medical Officer,
Northern Provinces,
Nigeria.

3rd May, 1919.

TABLE I.

MEDICAL STAFF ON 31st DECEMBER, 1918.

Principal Medical Officer	Dr. J. A. Pickels
Deputy Principal Medical Officer ...	„ E. A. Chartres (lent to War Office)
Provincial Medical Officer	„ W. H. A. Gordon-Hall
„ „ „	„ C. E. S. Watson
Senior Medical Officer	„ G. R. Twomey
„ „ „	„ H. G. McKinney
„ „ „	„ J. Currie (seconded to Uganda)
„ „ „	„ H. R. Ellis
Medical Officer	„ R. F. Williams
„ „	„ B. Moiser
„ „	„ C. W. McLeay
„ „	„ J. M. Pollard
„ „	„ W. A. Trumper (seconded to East Africa)
„ „	„ E. J. Porteous
„ „	„ J. Lindsay (lent to War Office)
„ „	„ W. A. Nicholson
„ „	„ H. C. Jeffreys
„ „	„ G. Rollason
„ „	„ A. J. M. Crichton (lent to War Office)
„ „	„ L. W. Davies (lent to War Office)
„ „	„ B. J. Courtney (seconded to R.A.M.C.)
„ „	„ B. A. Percival (lent to Gibraltar)
„ „	„ J. W. Thomson
„ „	„ R. Willan
„ „	„ W. G. Cobb (lent to War Office)
„ „	„ W. B. Johnson
„ „	„ R. H. Nolan
„ „	„ P. W. Black (lent to War Office)
„ „	„ N. A. Dyce Sharp
„ „	„ J. C. C. Hogan
„ „	„ C. J. H. Pearson (seconded to East Africa)
„ „	„ B. W. F. Wood
„ „	„ H. North (lent to War Office)
„ „	„ W. E. S. Digby
„ „	„ J. T. Watt (seconded to Somaliland)
„ „	„ J. R. C. Stephens

NON-COMMISSIONED OFFICERS, R.A.M.C., ON 31st DECEMBER, 1918.

Staff Sergeant	F. H. Plaum
Sergeant	H. Blair
„	N. W. J. Turnbull
„	J. E. Kelliher
„	A. Pretious
„	T. W. G. Rogers
„	T. H. Smitherman
„	W. J. Edwards

Nursing Staff on 31st December, 1918.

Senior Nurse	Sister E. F. Dunne
" "	" G. Coupe
Nurse	" B. M. Renwick
"	" M. Munro
"	" M. E. Tate
"	" E. B. Mellis
"	" D. C. A. Rolfs
"	" I. Harley
"	" L. Mernagh
"	" E. Parker
Male Nurse	Mr. J. W. Vincent

Principal Members of Subordinate Staff.

First Class Clerk	J. F. Eshon
" " "	T. R. Mullen
" " "	E. A. Williams
" " "	E. P. Benin
Second Class Clerk	T. B. F. Mends
" " "	N. O. Dixon
" " "	J. H. Agusiobo

Dispensing Staff.

First Class Dispenser	J. J. Nicol
" " "	S. J. Coker
" " "	T. J. Watson
Second Class Dispenser	I. N. Anthony
" " "	D. A. Olubi
" " "	F. A. John
" " "	M. Marchie
" " "	J. N. Allen
" " "	I. D. Emanuel
" " "	W. B. G. Lawson
" " "	H. M. Davies

SANITARY STAFF ON 31st DECEMBER, 1918.

Senior Sanitary Officer ...	Dr. M. Cameron Blair
Sanitary Officer	" W. J. D. Inness

Principal Members of Subordinate Staff.

Third Class Clerk	S. W. Opoku
Inspector of Nuisance ...	G. B. Joseph
" " "	Marku
" " "	O. B. Langley

TABLE V.

METEOROLOGICAL RETURNS FOR THE YEAR 1918.

Station—Ilorin.

Lat. 8° 30' 26·77" N. Long. 4° 34' 43·9" E.

	Absolute shade maximun.	Absolute shade minimum.	Average maximum.	Average minimum.	Relative humidity.	Rainfall in inches.
					%	
January	96	51	91·6	58·2	50	...
February	99	55	95·5	66·6	64	...
March	100	67	93·6	72·1	77	2·67
April	97	67	92·1	71·0	80	3·41
May	92	66	88·8	70·1	83	6·14
June	91	65	85·5	69·6	82·7	6·21
July	86	66	82·6	70·0	85·5	6·64
August	88	66	81·7	68·0	80·6	0·88
September	88	66	85·1	69·5	87·1	7·98
October	93	67	88·4	70·4	85·6	5·76
November	98	68	92·8	72·0	80·5	1·49
December	94	55	91·3	64·7	63·9	0·12
Means	100	51	89·0	68·5	76.6%	41·30

Station—Kaduna Capital.

Lat. 10° 32' 05" N. Long. 7° 25' E.

					%	
January	94	51	84·4	55·9	37	...
February	97	53	89·5	62·6	39	...
March	99	64	93·1	69·4	56	0·08
April	98	61	91·6	69·8	63	5·07
May	95	62	88·5	68·9	72·5	4·11
June	89	61	83·0	66·7	79·9	7·08
July	86	52	81·6	66·2	84·3	9·92
August	85	64	78·5	70·1	88·3	9·96
September	89	66	83·8	74·6	79·5	5·45
October	91	60	88·2	67·5	76·4	2·57
November	94	56	91·1	60·7	57·0	...
December	92	52	87·0	56·6	62·0	...
Means	99	51	86·6	65·7	66·2%	44·24

Station—Maiduguri.

Lat. 11° 47' N. Long. 13° 11' E.

					%	
January	103	47	87·2	53·7	51	...
February	108	51	94·9	59·9	71	...
March	114	61	105·4	72·1	29	0·03
April	115	67	108·2	74·9	32·9	1·00
May	113	73	107·3	76·7	42	1·24
June	108	70	98·9	75·0	57·8	4·41
July	101	66	92·9	72·7	73·6	9·45
August	95	66	88·3	70·7	76·4	13·85
September	100	68	95·2	72·8	71·3	4·06
October	104	64	98·6	70·5	57·9	0·61
November	102	59	97·6	63·8	38·0	...
December	97	53	88·9	57·8	42·0	...
Means	115	47	96·9	68·3	53·5%	34·65

METEOROLOGICAL RETURNS FOR THE YEAR 1918—*continued.*

Station—Naraguta.

Lat. 9° 56' N. Long. 8° 32' 50" E.

	Absolute shade maximum.	Absolute shade minimum.	Average maximum.	Average minimum.	Relative humidity.	Rainfall in inches.
					%	
January	86	50	79·2	55·2	35	...
February	89	52	82·6	60·7	33	0·23
March	96	63	83·8	66·6	46	2·56
April	93	60	86·4	66·3	57	4·01
May	92	60	84·8	64·0	58·5	6·70
June	86	60	80·7	62·3	66·7	15·36
July	86	60	79·0	62·5	72·0	12·51
August	81	60	76·2	61·1	76·0	14·85
September	86	60	80·8	61·8	66·8	8·56
October	87	59	84·8	61·7	50·0	1·72
November	90	57	84·4	60·3	41·3	...
December	86	52	79·5	56·1	29·2	...
Means	96	50	81·8	61·5	52·6%	66·50

Station—Kano.

Lat. 12° 00' 12" N. Long. 8° 32' 42·29" E.

					%	
January	93	41	80	49·2	34	...
February	99	44	88·8	55·5	29	...
March	102	57	97·3	67·9	35	0·01
April	105	65	100·0	72·7	46·3	1·63
May	103	68	99·2	74·9	51·4	0·33
June	99	64	90·6	71·1	70·1	8·74
July	99	64	87·8	69·9	76·0	6·22
August	89	61	84·5	68·2	81·3	17·79
September	96	65	88·5	69·6	73·4	5·98
October	96	58	94·0	65·4	50·0	0·04
November	97	52	93·0	57·5	33·7	...
December	91	42	83·3	49·9	43·9	...
Means	105	41	90·5	64·3	52%	40·74

Station—Lokoja.

Lat. 7° 48' N. Long. 6° 45' E.

					%	
January	95	57	90·9	63·2	60	...
February	100	58	94·3	69·2	64	2·60
March	98	69	90·9	74·2	73	2·95
April	96	68	90·5	73·4	71	4·16
May	95	69	90·2	73·6	69·1	3·87
June	91	67	86·3	70·8	77·5	7·11
July	92	69	82·6	72·1	79·1	9·31
August	88	68	84·7	71·3	79·5	6·15
September	91	68	86·3	71·8	80·6	12·72
October	93	70	87·7	72·0	77·0	6·15
November	95	69	92·1	72·4	71·2	0·12
December	94	60	90·2	66·6	69·3	...
Means	100	57	88·8	70·8	72·6%	55·14

METEOROLOGICAL RETURNS FOR THE YEAR 1918—*continued.*

Station—Sokoto.

Lat. 13° 02' 10" N. Long. 5° 14' 46·9" E.

	Absolute shade maximum.	Absolute shade minimum.	Average maximum.	Average minimum.	Relative humidity.	Rainfall in inches.
					%	
January	102	51	88·9	57·1	30	...
February	106	51	94·9	61·5	26	...
March	107	65	100·8	71·4	25	...
April	108	56	101·5	71·8	41·9	0·06
May	106	60	100·2	74·8	43·3	2·62
June	100	62	93·2	71·0	56·6	5·74
July	97	63	88·9	72·1	...	6·42
August	94	62	85·7	69·6	76·2	10·75
September	94	63	89·3	71·7	70·8	5·58
October	100	64	95·1	70·8	54·4	0·62
November	98	61	96·5	66·0	31·5	...
December	95	52	87·0	61·4	32·6	...
Means	108	51	93·5	68·2	44·3%	31·79

Station—Yola.

Lat. 9° 12' 28·9" N. Long. 12° 29' 30" E.

					%	
January	102	61	91	64·8	30	...
February	105	54	96·5	69·8	33	...
March	108	70	100·4	77·5	47	0·94
April	104	73	100·0	77·5	49·8	1·64
May	104	68	95·8	75·9	63	4.40
June	96	69	92·1	73·2	71·5	4·89
July	97	66	87·1	71·7	76·5	7·46
August	89	69	83·8	71·7	79·7	12·92
September	94	68	88·0	72·1	73·3	4·68
October	96	68	91·7	73·0	71·0	4·99
November	99	65	95·8	71·2	56·6	0·12
December	98	60	92·1	64·7	34·1	...
Means	108	54	92·8	71·9	57·1%	42·04

Station—Zaria.

Lat. 11° 06' N. Long. 7° 30' E.

					%	
January	91	44	81·8	50	97	...
February	99	47	82·7	57·5	82	...
March	98	62	93	67·3	51	0·01
April	98	60	92·8	69·0	71	1·05
May	97	64	91·7	68·3	55·7	3·15
June	88	63	81·9	65·8	75·1	4·07
July	86	63	80·8	65·9	68·4	6·13
August	82	63	79·2	65·5	73·6	11·78
September	85	60	79·0	64·9	64·3	7·15
October	92	55	86·9	64·2	55·9	1·13
November	94	50	89·5	57·5	31·7	...
December	90	50	81·0	53·8	28·4	...
Means	99	44	85·0	62·4	62·8%	34·47

METEOROLOGICAL RETURNS FOR THE YEAR 1918—*continued.*

STATION—ZUNGERU.

	Lat. 6° 48' 32·4" N. Long. 6° 9' 42·26" E.					
	Absolute shade maximum.	Absolute shade minimum.	Average maximum.	Average minimum.	Relative humidity.	Rainfall in inches.
					%	
January	101	55	94·1	65·6	28	...
February	104	64	98·1	70·7	38	...
March	105	67	97·3	75·2	59	1·36
April	102	68	95·2	74·7	63·3	2·26
May	98	69	93·5	73·9	67·2	4·16
June	95	67	87·5	71·1	78·7	7·35
July	90	67	86·1	73·6	81·6	12·87
August	90	67	83·5	70·9	84·4	10·38
September	92	66	87·7	70·7	75·7	8·34
October	96	68	91·8	71·4	71·5	1·66
November	100	61	95·6	67·7	60·1	...
December	99	58	94·4	64·5	32·5	...
Means	105	55	92·0	70·8	61·6%	48·68

TABLE SHOWING RAINFALL IN INCHES.

Stations.	1904.	1905.	1906.	1907.	1908.	1909.	1910.	1911.	1912.	1913.	1914.	1915.	1916.	1917.	Average to 1917.	1918.
Abinsi	...	...	...	...	...	...	...	...	...	...	...	...	53·49	...	53·49	...
Ankpa	...	...	...	...	58·77	66·85	56·44	...	47·81	49·78	19·57	...	10·84	66·98	47·13	42·23
Baro	...	...	...	...	46·46	55·77	47·98	46·14	43·51	39·50	32·33	47·51	...	...	44·90	...
Bauchi	...	...	42·24	...	47·88	43·23	38·86	48·79	35·83	33·89	45·16	...	50·23	...	42·90	41·00
Birnin-Kebbi	...	...	...	...	...	27·70	25·10	30·69	20·32	33·37	21·77	14·46	...	...	24·77	...
Geidam	...	...	...	...	22·39	21·28	16·87	10·46	12·59	5·76	19·30	...	...	...	15·52	...
Hadeija	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	17·88
Ibi	...	...	23·49	...	...	53·30	49·63	36·38	46·10	43·42	23·75	39·47	47·47	43·18	40·61	41·70
Ilorin	...	47·02	49·00	54·74	55·46	65·18	51·14	52·58	38·85	43·83	42·83	43·37	52·47	64·88	50·89	41·30
Jebba	...	...	...	...	...	...	...	...	...	29·56	30·93	53·22	...	...	37·90	...
Kaduna Capital	...	...	...	...	...	...	...	...	...	...	...	...	...	52·04	52·04	44·24
Kaduna Junction	...	...	...	...	...	...	...	...	...	...	41·67	61·90	51·39	...	51·65	45·11
Kano	...	36·69	38·12	27·55	34·86	49·03	26·18	40·00	29·20	19·05	19·06	32·33	38·92	33·94	32·68	40·74
Katagum	...	...	...	...	23·70	23·03	18·21	19·96	20·50	13·81	9·54	...	21·15	18·18	18·67	0·99
Kontagora	...	46·28	58·40	37·28	51·15	60·67	53·01	54·09	32·83	36·27	6·54	...	...	...	43·65	...
Lokoja	41·72	49·64	51·83	36·68	44·12	65·14	45·59	41·57	46·74	34·76	42·81	48·15	61·13	47·61	46·96	55·14
Maiduguri	...	...	...	...	23·30	31·89	19·53	30·00	18·38	13·98	11·49	25·32	33·04	21·87	22·88	34·65
Minna	...	...	...	...	...	...	...	...	...	...	...	53·62	66·55	61·18	60·45	53·30
Nafada	...	...	...	...	...	37·27	33·24	30·32	22·01	16·58	22·28	...	37·17	25·27	28·01	0·20
Naraguta	...	...	...	...	...	...	...	57·84	47·33	51·37	59·17	61·91	72·16	75·71	60·78	66·50
Offa	...	...	...	...	...	...	...	...	...	40·82	30·58	56·46	49·23	52·93	46·00	45·98
Sokoto	32·14	33·32	...	19·86	20·44	29·72	23·11	28·70	19·16	16·38	24·94	28·37	24.46	18·78	24·56	31·79
Wamba	...	...	...	19·11	...	49·02	44·40	40·45	53·95	58·94	49·40	...	...	80·84	49·51	65·81
Yola	33·77	42·76	34·60	27·55	53·77	44·26	38·67	42·22	38·93	29·93	27·83	26·70	39·93	30·79	36·55	42·04
Zaria	...	51·27	61·05	29·80	45·48	55·88	53·80	43·35	43·13	33·01	35·64	46·95	49·80	40·66	45·37	34·47
Zungeru	51·10	41·31	60·39	37·16	48·78	58·89	53·44	42·90	29·93	35·17	33·46	54·61	39·06	43·22	44·24	48·68

TABLE VI.

RETURN OF DISEASES AND DEATHS (EUROPEAN) FOR THE YEAR 1918.

DISEASES.	IN-PATIENTS.					OUT-PATIENTS.	
	Remaining in Hospital at end of 1917.	TOTAL.		Total cases treated.	Remaining in Hospital at end of 1918.	TOTAL.	
		Admissions.	Deaths.			Cases treated.	Deaths.
INFECTIVE DISEASES.							
Beri-Beri	...	...	...	...	...	...	...
Cerebro-Spinal Fever	...	...	...	...	...	...	...
Chicken Pox	...	...	...	...	...	...	...
Cholera	...	...	...	...	...	...	...
Dengue	...	...	...	...	...	...	...
Diphtheria	...	...	...	...	...	2	...
DYSENTERY:—							
(*a*) Amœbic	...	8	...	8	...	30	...
(*b*) Bacillary	...	...	...	...	...	...	...
(*c*) Type not determined	...	...	...	...	...	...	...
Endocarditis-infective	...	...	...	...	...	...	...
Enteric	...	3	...	3	...	2	...
Erysipelas	...	...	...	...	...	...	...
Gonorrhœa	...	2	...	2	...	30	...
Influenza	1	34	4	35	4	335	15
Kala-Azar	...	...	...	...	...	...	...
LEPROSY:—							
(*a*) Nodular	...	...	...	...	...	...	...
(*b*) Anaesthetic	...	...	...	...	...	...	...
MALARIA:—							
(*a*) Tertian	...	51	1	51	...	12	...
(*b*) Quartan	...	...	...	...	...	39	1
(*c*) Aestivo-Autumnal	5	36	...	41	3	400	...
(*d*) Chronic	...	...	...	...	...	2	...
(*e*) Type not determined	...	...	...	...	...	...	...
Blackwater Fever	...	10	1	10	...	17	6
Measles	...	...	...	...	...	...	...
Papataci Fever	...	...	...	...	...	...	...
Plague	...	...	...	...	...	...	...
Pneumonia	...	2	1	2	...	5	1
Pyrexia of uncertain origin	...	3	...	3	...	1	...
Rabies	...	...	...	...	...	...	...
Relapsing Fever	...	...	...	...	...	...	...
Rheumatic Fever	...	...	...	...	...	6	...
Septicaemia	...	...	...	...	...	1	1
Small-Pox	...	...	...	...	...	...	...
Syphilis (*a*) Primary	...	7	...	7	...	17	...
(*b*) Secondary	...	...	...	...	...	4	...
(*c*) Inherited	...	...	...	...	...	...	...
Tetanus	...	...	...	...	...	...	...
Trypanosomiasis (Sleeping Sickness)	...	1	...	1	...	...	...
Tuberculosis	...	...	...	...	...	2	...
Undulant Fever	...	...	...	...	...	...	...
Whooping Cough	...	...	...	...	...	...	...
Yaws	...	...	...	...	...	...	...
Yellow Fever	...	...	...	...	...	...	...
Other Diseases	...	...	...	...	...	...	...
INTOXICATIONS:—							
Alcoholism	...	1	...	1	...	1	...
Morphinism	...	...	...	...	...	...	...
Other Intoxications	...	...	...	...	...	...	...
GENERAL DISEASES:—							
Anæmia	...	16	...	16	...	58	...
Anæmia-Pernicious	...	...	...	...	...	...	...
Diabetes	...	...	...	...	...	1	...
Exophthalmic goitre	...	...	...	...	...	...	...

TABLE VI.—RETURN OF DISEASES AND DEATHS (EUROPEAN) FOR THE YEAR 1918—*continued.*

DISEASES.	IN-PATIENTS.				OUT-PATIENTS.	
	Remaining in Hospital at end of 1917.	TOTAL.		Total cases treated.	Remaining in Hospital at end of 1918.	TOTAL.	
		Admissions.	Deaths.			Cases treated.	Deaths.
GENERAL DISEASES—*continued.*							
Gout	...	...	...	...	...	...	...
Leucocythæmia	...	...	...	...	...	...	...
Lymphadenoma	...	...	...	...	...	...	...
Myxœdema	...	...	...	...	...	...	...
Purpura	...	...	...	...	...	...	...
Rickets	...	...	..	...	...	...	...
Scurvy	...	...	...	...	...	...	...
Other Diseases	...	7	...	7	1	14	...
LOCAL DISEASES.							
DISEASES OF THE NERVOUS SYSTEM:—							
Sub-section 1.—Diseases of the Nerves:—							
Neuritis	...	2	...	2	...	5	...
Meningitis	...	2	...	2	...	1	...
Myelitis	...	...	...	...	...	...	...
Hydrocephalus	...	...	...	...	...	...	...
Encephalitis	...	...	...	...	...	...	...
Abscess of brain	...	..	...	...	...	...	...
Congestion of brain	...	...	...	...	...	...	...
Other Diseases	...	2	...	2	...	9	...
Sub-section 2.—Nervous Disorders and Diseases of Undetermined Nature:—							
Apoplexy	...	...	..	...	...	...	...
Paralysis	...	1	...	1	...	2	...
Chorea	...	...	...	...	...	...	...
Epilepsy	...	...	...	...	...	3	...
Neuralgia	...	...	...	...	...	35	...
Hysteria	...	...	...	...	...	...	...
Other Diseases	...	10	...	10	...	26	...
Sub-section 3.—Mental Diseases:—							
Idiocy	...	...	...	...	...	...	...
Mania	...	...	..	..	...	...	...
Melancholia	...	...	..	...	...	1	...
Dementia	...	1	...	1	...	...	...
Delusional Insanity	...	1	...	1	...	1	...
Other Diseases	...	...	...	...	...	1	..
DISEASES OF THE EYE:—							
Conjunctivitis	...	...	...	...	...	20	...
Keratitis	...	...	...	...	...	2	...
Ulceration of cornea	...	...	...	...	...	...	...
Iritis	...	1	..	1	...	5	...
Optic neuritis	...	...	...	...	...	...	...
Cataract	...	...	..	...	...	...	...
Other Diseases	...	...	...	...	...	10	...
DISEASES OF THE EAR:—							
Inflammation	...	...	...	...	...	15	...
Other Diseases	...	...	...	...	...	20	...
DISEASES OF THE NOSE:—							
Inflammation	...	...	...	...	...	1	...
Other Diseases	...	...	...	...	...	5	...
DISEASES OF THE CIRCULATORY SYSTEM:—							
Pericarditis	...	...	...	...	...	1	...
Endocarditis	...	...	...	...	...	...	...

Table VI.—Return of Diseases and Deaths (European) for the Year 1918—*continued.*

Diseases.	In-patients.				Out-patients.	
	Remaining in Hospital at end of 1917.	Total.		Total cases treated.	Remaining in Hospital at end of 1918.	Total.	
		Admissions.	Deaths.			Cases treated.	Deaths.
Local Diseases—*continued.*							
Valvular Disease:—							
(1) Mitral	...	1	...	1	...	5	...
(2) Aortic	...	...	...	...	...	...	...
(3) Tricuspid	...	...	...	...	...	...	...
(4) Pulmonary	...	...	...	...	...	...	...
Arterial sclerosis	...	...	...	...	...	1	...
Aneurism	...	...	...	...	...	...	...
Other Diseases	...	4	...	4	...	10	...
Diseases of the Respiratory System:—							
Laryngitis	...	...	...	...	...	7	...
Bronchitis	...	4	...	4	...	53	...
Broncho-pneumonia	...	1	...	1	...	1	...
Abscess of Lung	...	...	...	...	...	...	...
Gangrene of Lung	...	...	...	...	...	...	...
Emphysema	...	...	...	...	...	...	...
Pleurisy	...	1	...	1	1	5	...
Empyema	...	...	...	...	...	...	...
Other Diseases	...	1	...	1	...	12	...
Diseases of the Digestive System:—							
Stomatitis	...	...	...	...	...	6	...
Caries of teeth	1	...	...	1	...	43	...
Pyorrhœa alveolaris	...	...	...	...	...	7	...
Glossitis	...	...	...	...	...	4	...
Sore throat	...	...	...	...	...	17	...
Inflammation of tonsils	...	3	...	3	...	16	...
Gastritis	...	15	1	15	...	95	...
Ulceration of stomach	...	...	...	...	...	1	...
Hæmatemesis	...	...	...	...	...	...	...
Dilatation of stomach	...	...	...	...	...	...	...
Stricture of stomach	...	...	...	...	...	...	...
Dyspepsia	...	...	...	...	...	87	...
Enteritis	...	5	...	5	...	21	...
Appendicitis	...	1	...	1	...	5	...
Colitis	...	10	...	10	...	21	...
Ulceration of intestines	...	...	...	...	...	...	...
Sprue	...		...	...	...	...	...
Hernia	...	...	...	...	...	...	...
Diarrhœa	...	2	...	2	...	53	...
Constipation	...	...	...	...	...	7	...
Colic	...	2	...	2	...	10	...
Hæmorrhoids	...	1	...	1	...	16	...
Pancreatitis	...	...	...	...	...	...	...
Hepatitis—Acute	...	3	...	3	1	9	...
Abscess	2	...	...	2	...	2	...
Cirrhosis	...	2	...	2	...	1	...
Jaundice	...	...	...	...	...	3	...
Peritonitis	...	1	...	1	...	...	...
Ascites	...	...	...	...	...	1	...
Other Diseases	...	3	...	3	...	3	...
Diseases of the Lymphatic System:—							
Splenitis	...	...	...	...	...	...	...
Inflammation of lymphatic gland	...	3	...	3	...	24	...
Suppuration of lymphatic gland	...	...	...	...	...	13	...
Lymphangitis	1	...	...	1	...	...	...
Elephantiasis	...	...	...	...	...	...	...
Other Diseases	...	...	...	...	...	...	...

TABLE VI.—RETURN OF DISEASES AND DEATHS (EUROPEAN) FOR THE YEAR 1918—*continued.*

DISEASES.	IN-PATIENTS.					OUT-PATIENTS.	
	Remaining in Hospital at end of 1917.	TOTAL.		Total cases treated.	Remaining in Hospital at end of 1918.	TOTAL.	
		Admissions.	Deaths.			Cases treated.	Deaths.
LOCAL DISEASES—*continued.*							
DISEASES OF THE URINARY SYSTEM:—							
Acute nephritis	...	...	...	...	...	1	...
Bright's Disease	...	...	...	...	...	...	...
Pyelitis	...	...	...	...	...	2	...
Calculus	...	...	...	...	...	1	...
Renal colic	...	1	..	1	...	4	...
Cystitis	...	...	...	...	...	11	...
Vesical calculus	...	...	...	...	...	...	...
Suppression	...	...	...	...	...	...	...
Hæmaturia	...	...	...	...	...	3	...
Chyluria	...	...	...	...	...	...	...
Other Diseases	...	...	...	...	...	5	...
DISEASES OF THE GENERATIVE SYSTEM:—							
Male Organs:—							
Urethritis	...	...	...	...	...	19	...
Gleet	...	1	...	1	...	5	...
Stricture	...	...	...	...	...	2	...
Prostatitis	...	1	...	1	...	4	...
Soft chancre	...	...	...	...	...	13	...
Condyloma	...	...	...	...	...	...	...
Inflammation of scrotum	...	...	...	...	...	...	...
Hydrocele	...	...	...	...	...	3	...
Orchitis	...	...	...	...	...	8	...
Epididymitis	...	...	...	...	...	...	...
Abscess of testicle	...	...	...	...	...	...	...
Other Diseases	...	1	...	1	...	2	...
Female Organs:—							
Ovaritis	...	...	...	...	...	...	...
Ovarian cyst	...	...	...	...	...	...	...
Endometritis	...	...	...	...	...	...	...
Displacement of uterus	...	...	...	...	...	...	...
Vaginitis	...	...	...	...	...	...	...
Amenorrhœa	...	...	...	...	...	...	...
Dysmenorrhœa	...	...	...	...	...	...	...
Menorrhagia	...	...	...	...	...	...	...
Leucorrhœa	...	...	...	...	...	...	...
Other Diseases	...	...	...	...	...	...	...
AFFECTIONS CONNECTED WITH PREGNANCY:—							
Abortion	...	...	...	...	...	1	...
Other Affections	...	...	...	...	...	...	...
AFFECTIONS CONNECTED WITH PARTURITION:—							
Delayed Labour	...	...	...	...	...	...	...
Retained placenta	...	...	...	...	...	...	...
Premature Birth	...	...	...	...	...	...	...
Other Affections	...	...	...	...	...	...	...
AFFECTIONS CONSEQUENT ON PARTURITION:—							
Post-partum hæmorrhage	...	...	...	...	...	...	...
Puerperal septicæmia	...	...	...	...	...	...	...
Mastitis	...	...	...	...	...	...	...
Abscess of breast	...	...	...	...	...	...	...
Other Affections	...	...	...	...	...	...	...
DISEASES OF ORGANS OF LOCOMOTION:—							
Osteitis	...	...	...	...	...	...	...
Arthritis	...	...	...	...	...	8	...

TABLE VI.—RETURN OF DISEASES AND DEATHS (EUROPEAN) FOR THE YEAR 1918—*continued.*

DISEASES.	IN-PATIENTS.					OUT-PATIENTS.	
	Remaining in Hospital at end of 1917.	TOTAL.		Total cases treated.	Remaining in Hospital at end of 1918.	TOTAL.	
		Admissions.	Deaths.			Cases treated.	Deaths.
LOCAL DISEASES—*continued.*							
Diseases of Organs of Locomotion—*continued.*							
Spondylitis	...	...	...	...	...	...	...
Bursitis	...	...	...	...	...	1	...
Myalgia	...	3	...	3	...	46	...
Other Diseases	...	1	...	1	...	26	..
DISEASES OF CONNECTIVE TISSUE:—							
Cellulitis	...	2	...	2	...	8	...
Abscess	...	8	...	8	...	18	...
Other Diseases	...	1	...	1	1	3	...
DISEASES OF THE SKIN:—							
Ulcer	...	2	...	2	...	25	...
Urticaria	...	...	...	...	...	8	...
Eczema	1	1	...	2	...	10	...
Boil	1	2	...	3	...	29	...
Carbuncle	...	...	...	...	...	3	...
Herpes	...	...	...	...	...	9	...
Psoriasis	...	...	...	...	...	1	...
Oriental sore	...	...	...	...	...	1	..
Tinea	...	...	...	...	...	15	...
Scabies	...	...	...	...	...	2	...
Acne	...	...	...	...	...	6	...
Prickly heat	...	...	...	...	...	5	...
Other Diseases	...	...	...	...	...	24	...
INJURIES:—							
General	...	2	...	2	...	23	3
Local	...	7	...	7	...	100	1
TUMOURS:—							
Benign	...	...	...	...	...	2	...
Malignant	...	...	...	...	...	...	...
Malformations	...	...	...	...	...	1	...
POISONS:—							
Vegetable	...	...	..	...	...	...	...
Animal	...	...	...	...	...	7	...
Other Poisons	...	...	...	...	...	5	...
PARASITES.							
ANIMAL PARASITES:—							
Protozoa	...	...	...	...	...	2	...
Trematoda (Flukes)	...	...	...	...	...	...	...
Cestoda:—							
Tænia solium	...	...	...	...	...	...	...
Tænia sagninata	...	1	...	1	...	17	...
Other Cestodes	...	...	...	...	...	...	...
Nematoda:—							
Ascaris	...	...	...	...	...	1	...
Tricocephalus dispar	...	..	...	...	...	...	...
Trichina	...	...	...	...	...	...	...
Dracunculus	...	...	...	...	...	...	...
Filaria	...	...	...	...	...	1	...
Strongylus	...	...	...	...	...	...	...
Ankylostomum	...	...	...	...	...	...	...
Oxyuris	...	...	...	...	...	...	...
Other Nematodes	...	...	...	...	...	...	...
Insecta:—							
Insects producing myiasis	...	...	...	...	...	...	...
Dematophilus penetrans	...	...	...	...	...	...	...
Other Insects	...	...	...	...	...	...	...
Total	12	296	8	308	11	2,192	28

TABLE VII.

RETURN OF DISEASES AND DEATHS (NATIVE) FOR THE YEAR 1918.

DISEASES.	IN-PATIENTS.					OUT-PATIENTS.	
	Remaining in Hospital at end of 1917.	Total.		Total cases treated.	Remaining in Hospital at end of 1918.	Total.	
		Admissions.	Deaths.			Cases treated.	Deaths.
INFECTIVE DISEASES:—							
Beri-Beri	...	2	2	2	...	...	...
Cerebro-Spinal Fever ...	...	1	1	1	...	1	1
Chicken Pox	...	102	...	102	10	16	...
Cholera	...	...	...	...	...	...	...
Dengue	...	2	...	2	...	...	...
Diphtheria	...	...	...	...	...	...	..
Dysentery :—							
(*a*) Amœbic	8	250	14	258	2	155	5
(*b*) Bacillary	...	34	1	34	3	...	...
(*c*) Type not determined...	...	...	...	...	...	5	...
Endocarditis-Infective ...	...	...	...	...	...	...	...
Enteric	...	2	1	2	...	...	...
Erysipelas	...	2	...	2	...	...	...
Gonorrhœa	35	1,171	1	1,206	16	1,001	...
Influenza	...	1,666	158	1,666	3	6,061	45
Kala-Azar	...	...	...	...	...	...	...
Leprosy :—							
(*a*) Nodular...	534	39	92	573	460	10	...
(*b*) Anæsthetic	...	8	...	8	1	20	...
Malaria :—							
(*a*) Tertian	7	139	6	146	...	133	...
(*b*) Quartan	...	6	2	6	...	139	1
(*c*) Aestivo-autumnal ...	7	592	3	599	5	1,914	...
(*d*) Chronic	...	3	1	3	...	2	...
(*e*) Type not determined...	...	...	...	...	...	...	...
Blackwater Fever	...	...	...	...	...	...	...
Measles	...	22	...	22	...	8	...
Papataci Fever	...	...	...	...	...	...	...
Plague	...	...	...	...	...	...	...
Pneumonia	10	271	40	281	...	36	...
Pyrexia of uncertain origin	...	...	...	...	...	...	...
Rabies	...	...	...	...	...	...	..
Relapsing Fever	...	...	...	...	...	...	...
Rhuematic Fever	1	9	...	10	...	...	...
Septicæmia	2	5	3	7	...	5	...
Small-Pox	15	132	24	147	...	40	8
Syphilis (*a*) Primary... ...	14	109	...	123	...	105	...
(*b*) Secondary	27	192	2	219	29	105	...
(*c*) Inherited	...	1	...	1	...	44	...
Tetanus	...	1	1	1	...	...	...
Trypanosomiasis (Sleeping Sickness)	2	22	3	24	17	...	...
Tuberculosis	1	24	9	25	2	10	...
Undulant Fever	...	...	...	...	...	...	...
Whooping Cough	...	...	...	...	...	12	1
Yaws	1	18	...	19	...	26	...
Yellow Fever	..	...	...	...	...	...	...
Other Diseases	...	195	...	195	...	23	...
INTOXICATIONS:—							
Alcoholism	...	...	...	...	...	...	...
Morphinism	...	...	...	...	...	...	...
Other Intoxications	...	...	...	...	...	...	...
GENERAL DISEASES:—							
Anæmia	2	36	6	38	...	158	...
Anæmia-Pernicious	...	...	...	...	...	...	...
Diabetes	...	2	1	2	...	...	...
Exophthalmic Goitre ...	...	...	...	...	...	...	...

TABLE VII.—RETURN OF DISEASES AND DEATHS (NATIVE) FOR THE YEAR 1918—*continued.*

DISEASES.	IN-PATIENTS.				OUT-PATIENTS.	
	Remaining in Hospital at end of 1917.	TOTAL.		Total cases treated.	Remaining in Hospital at end of 1918.	TOTAL.	
		Admissions.	Deaths.			Cases treated.	Deaths.
GENERAL DISEASES—*continued.*							
Gout	...	1	...	1	...	...	...
Leucocythæmia	...	...	...	...	...	...	...
Lymphadenoma	...	...	...	...	...	1	...
Myxœdema	...	...	...	...	...	...	...
Purpura	...	...	...	...	...	...	...
Rickets	...	...	...	...	...	1	...
Scurvy	...	...	...	...	...	...	...
Other Diseases	1	81	4	82	2	562	...
LOCAL DISEASES.							
DISEASES OF THE NERVOUS SYSTEM:—							
Sub-section 1.—Diseases of the Nerves:—							
Neuritis	...	11	1	11	...	10	...
Meningitis	...	4	4	4	...	...	...
Myelitis	...	1	...	1	...	...	...
Hydrocephalus	...	...	...	...	...	1	...
Encephalitis	...	...	...	...	...	...	...
Abscess of brain	...	...	...	...	...	...	...
Congestion of brain	...	...	...	...	...	...	...
Other Diseases	...	...	...	...	...	9	...
Sub-section 2.—Nervous Disorders and Diseases of Undetermined Nature:—							
Apoplexy	...	1	1	1	...	...	...
Paralysis	1	6	...	7	...	5	...
Chorea	...	...	...	...	...	...	...
Epilepsy	...	6	1	6	...	39	...
Neuralgia	...	13	...	13	...	439	...
Hysteria	...	...	...	...	...	...	...
Other Diseases	...	1	...	1	1	23	...
Sub-section 3.—Mental Diseases:—							
Idiocy	...	1	...	1	1	...	...
Mania	...	...	...	...	...	...	...
Melancholia	...	2	1	2	...	1	...
Dementia	...	1	...	1	...	...	...
Delusional Insanity	...	2	...	2	...	1	...
Other Diseases	...	...	...	...	...	...	...
DISEASES OF THE EYE:—							
Conjunctivitis	2	61	...	63	2	955	...
Keratitis	...	5	...	5	..	22	...
Ulceration of cornea	...	10	...	10	...	16	...
Iritis	...	2	...	2	...	15	...
Optic neuritis	...	1	...	1	...	...	...
Cataract	...	1	...	1	...	7	...
Other Diseases	3	8	...	11	...	80	..
DISEASES OF THE EAR:—							
Inflammation	...	13	...	13	1	266	...
Other Diseases	...	8	...	8	...	99	...
DISEASES OF THE NOSE:—							
Inflammation	...	...	...	...	...	1	...
Other Diseases	...	3	...	3	...	18	...
DISEASES OF THE CIRCULATORY SYSTEM:—							
Pericarditis	...	4	1	4	...	1	...
Endocarditis	...	3	1	3	...	...	...

TABLE VII.—RETURN OF DISEASES AND DEATHS (NATIVE) FOR THE YEAR 1918—*continued.*

DISEASES.	IN-PATIENTS.					OUT-PATIENTS.	
	Remaining in Hospital at end of 1917.	TOTAL.		Total cases treated.	Remaining in Hospital at end of 1918.	TOTAL.	
		Admissions.	Deaths.			Cases treated.	Deaths.
LOCAL DISEASES—*continued.*							
Valvular Disease :—							
(1) Mitral	3	28	15	31	...	34	1
(2) Aortic	...	11	4	11	...	14	...
(3) Tricuspid	...	...	...	...	...	...	...
(3) Pulmonary	...	...	...	...	...	...	...
Arterial sclerosis	...	...	...	...	...	3	...
Aneurism	...	2	1	2	...	1	...
Other Diseases	...	7	2	7	...	11	1
DISEASES OF THE RESPIRATORY SYSTEM :—							
Laryngitis	...	...	...	...	...	39	...
Bronchitis	18	272	8	290	3	2,637	...
Broncho-pneumonia	4	25	9	29	1	17	...
Abscess of Lung	...	...	...	...	...	...	...
Gangrene of Lung	...	...	...	...	...	4	...
Emphysema	...	...	...	...	...	...	...
Pleurisy	4	47	2	51	1	50	...
Empyema	...	...	...	...	...	...	...
Other Diseases	...	9	1	9	...	101	...
DISEASES OF THE DIGESTIVE SYSTEM :—							
Stomatitis	...	5	...	5	...	66	...
Caries of teeth	...	6	...	6	...	298	...
Pyorrhœa alveolaris... ...	...	...	...	...	...	6	...
Glossitis	...	...	...	...	...	14	...
Sore throat	...	8	...	8	...	120	...
Inflammation of Tonsils ...	...	10	...	10	...	55	...
Gastritis	...	33	..	33	...	241	...
Ulceration of Stomach ...	...	...	...	...	...	...	...
Hæmatemesis	...	1	...	1	...	1	...
Dilatation of stomach ...	...	1	...	1	...	2	...
Stricture of stomach ...	...	...	...	...	...	...	...
Dyspepsia	...	7	...	7	...	244	...
Enteritis	...	12	2	12	1	42	...
Appendicitis	...	5	...	5	...	3	...
Colitis	...	10	1	10	...	17	...
Ulceration of intestines ...	...	1	...	1	...	...	...
Sprue	...	...	...	...	...	...	...
Hernia	2	35	...	37	...	39	...
Diarrhœa	1	137	2	138	...	1,263	2
Constipation	...	7	...	7	...	2,965	...
Colic	...	26	...	26	...	478	1
Hæmorrhoids	...	16	...	16	...	42	...
Pancreatitis	...	...	...	...	...	...	...
Hepatitis—Acute	...	9	...	9	...	12	...
Abscess	...	1	1	1	...	1	...
Cirrhosis	1	8	6	9	...	2	...
Jaundice	...	11	...	11	...	18	...
Peritonitis	...	1	1	1	...	3	...
Ascites	...	7	4	7	...	9	...
Other Diseases	2	16	4	18	...	33	...
DISEASES OF THE LYMPHATIC SYSTEM :—							
Splenitis	1	3	...	4	...	16	...
Inflammation of lymphatic gland	5	116	...	121	4	249	...
Suppuration of lymphatic gland	2	27	...	29	2	54	...
Lymphangitis	...	2	...	2	...	15	...
Elephantiasis	...	2	...	2	...	3	...
Other Diseases	...	...	...	...	...	...	...

TABLE VII.—RETURN OF DISEASES AND DEATHS (NATIVE) FOR THE YEAR 1918—*continued.*

DISEASES.	IN-PATIENTS.				OUT-PATIENTS.	
	Remaining in Hospital at end of 1917.	TOTAL.		Total cases treated.	Remaining in Hospital at end of 1918.	TOTAL.	
		Admissions.	Deaths.			Cases treated.	Deaths.
DISEASES OF THE URINARY SYSTEM :—							
Acute nephritis	...	9	4	9	...	2	...
Bright's Disease	...	5	4	5	...	3	...
Pyelitis	...	...	...	...	...	...	...
Calculus	...	...	..	...	...	...	...
Renal colic	...	...	...	...	...	..	...
Cystitis	...	9	...	9	...	19	...
Vesical calculus	...	...	...	...	...	1	...
Suppression	...	...	...	...	...	1	...
Hæmaturia	...	...	...	...	...	...	...
Chyluria	...	...	...	...	...	...	...
Other Diseases	...	2	1	2	...	1	...
DISEASES OF THE GENERATIVE SYSTEM :—							
Male Organs :—							
Urethritis	...	2	...	2	...	15	...
Gleet	...	5	...	5	...	108	...
Stricture	...	8	...	8	...	17	...
Prostatitis	...	3	...	3	...	8	...
Soft chancre	4	83	...	87	3	47	...
Condyloma	...	2	...	2	...	3	...
Inflammation of scrotum	1	4	...	5	...	8	...
Hydrocele	...	23	...	23	1	31	...
Orchitis	2	54	...	56	...	98	...
Epididymitis	2	12	...	14	...	24	...
Abscess of testicle	...	2	...	2	...	...	...
Other Diseases	...	7	...	7	...	11	...
Female Organs :—							
Ovaritis	1	1	...	2	...	1	...
Ovarian cyst	...	...	...	...	...	...	...
Endometritis	...	5	...	5	...	7	...
Displacement of uterus	...	2	...	2	...	2	...
Vaginitis	...	...	...	...	...	3	...
Amenorrhœa	...	...	...	...	...	1	...
Dysmenorrhœa	...	...	...	...	...	7	...
Menorrhagia	...	...	...	...	...	4	...
Leucorrhœa	...	1	1	1	...	1	...
Other Diseases	1	1	...	2	...	1	...
AFFECTIONS CONNECTED WITH PREGNANCY :—							
Abortion	...	4	...	4	...	7	...
Other Affections	...	...	...	...	...	1	...
AFFECTIONS CONNECTED WITH PARTURITION :—							
Delayed Labour	...	1	...	1	...	1	...
Retained placenta	...	1	...	1	...	1	1
Premature Birth	...	...	...	...	...	...	...
Other Affections	...	...	...	...	...	...	...
AFFECTIONS CONSEQUENT ON PARTURITION :—							
Post-partum hæmorrhage	...	...	...	...	...	...	...
Puerperal septicæmia	...	...	...	...	...	...	...
Mastitis	...	...	...	...	...	6	...
Abscess of breast	...	1	...	1	...	2	..
Other Affections	...	9	2	9	...	1	...
DISEASES OF ORGANS OF LOCOMOTION :—							
Osteitis	...	...	...	...	...	13	...
Arthritis	...	27	3	27	1	70	...

TABLE VII.—RETURN OF DISEASES AND DEATHS (NATIVE) FOR THE YEAR 1918—*continued.*

DISEASES.	IN-PATIENTS.				OUT-PATIENTS.	
	Remaining in Hospital at end of 1917.	TOTAL.		Total cases treated.	Remaining in Hospital at end of 1918.	TOTAL.	
		Admissions.	Deaths.			Cases treated.	Deaths.
LOCAL DISEASES—*continued.*							
Diseases of Organs of Locomotion—*continued.*							
Spondylitis	...	1	...	1	...	1	...
Bursitis	...	7	...	7	1	77	...
Myalgia	6	110	...	116	4	2,239	...
Other Diseases	3	88	2	91	...	226	...
DISEASES OF CONNECTIVE TISSUE:—							
Cellulitis	2	86	...	88	...	294	...
Abscess	11	240	2	251	4	738	...
Other Diseases	...	1	1	1	...	1	...
DISEASES OF THE SKIN:—							
Ulcer	14	290	...	304	15	2,539	...
Urticaria	...	2	...	2	...	20	...
Eczema	...	7	...	7	...	72	...
Boil	1	33	...	34	...	416	...
Carbuncle	...	1	...	1	...	4	...
Herpes	...	3	...	3	...	30	...
Psoriasis	...	1	...	1	...	10	...
Oriental sore	...	...	...	...	...	...	...
Tinea	...	9	...	9	...	195	...
Scabies	...	2	...	2	...	68	...
Acne	...	...	...	...	...	5	...
Prickly heat	...	...	...	...	...	...	...
Other Diseases	8	116	...	124	1	758	...
INJURIES:—							
General	3	45	4	48	4	203	...
Local	13	488	11	501	25	6,297	...
TUMOURS:—							
Benign	...	13	1	13	...	153	...
Malignant	...	2	...	2	...	5	...
MALFORMATIONS	...	2	...	2	...	3	...
POISONS:—							
Vegetable	...	2	...	2	...	54	...
Animal	...	7	...	7	...	38	...
Other Poisons	...	...	...	...	...	18	...
PARASITES.							
ANIMAL PARASITES:—							
Protozoa	...	...	...	...	...	...	...
Trematoda (Flukes)	1	11	...	12	...	15	...
Cestoda:—							...
Tænia solium	...	...	...	...	...	12	...
Tænia sagninata	...	230	...	230	...	1,310	...
Other Cestodes	...	..	...	...	...	1	...
Nematoda:—							
Ascaris	...	9	...	9	...	128	...
Tricocephalus dispar	...	...	...	...	...	...	...
Trichina	...	...	...	...	...	...	...
Dracunculus	8	272	1	280	3	398	..
Filaria	...	1	...	1	...	4	...
Strongylus	..	1	...	1	...	...	...
Ankylostomum	...	46	2	46	...	15	1
Oxyuris	..	...	...	...	...	15	...
Other Nematodes	...	...	..	...	...	1	...
Insecta:—							
Insects producing myasis	...	...	...	...	...	...	...
Dematophilus penetrans	...	...	...	...	...	30	...
Other Insects	...	1	...	1	1	18	...
Total	797	8,612	487	9,439	630	38,760	68

TABLE VIII.

SURGICAL OPERATIONS PERFORMED.

Total number.	Cured.	Relieved.	Unrelieved.	Died.
388	313	54	6	15

APPENDIX.

In view of the fact that cases of sleeping sickness have occurred at Kaduna Capital, I have the honour to submit herewith plans of the distribution of tsetse fly in that district which I have made during observations from May, 1917, to May, 1918.

2. These plans must necessarily be incomplete. They are only a record of the tsetse I have caught during game and bird shooting during the year. They do, however, show the value of prolonged observation, as it will be noticed that in the late Dr. J. E. L. Johnston's report upon an entomological survey of Kaduna district made in 1914 tsetse were only caught twice—once on the Tubo river (two *G. palpalis*) and once on the Kaduna river near Kaduna junction (one *G. tachinoides*). Dr. Johnston made the survey at the time when the bush had been unusually dry owing to delayed rains.

3. Plan No. 1 shows the distribution of tsetse in the immediate surroundings of Kaduna. Plan No. 2 is on a smaller scale, and shows the distribution over a larger area. Plan No. 3 shows roughly the varieties and distribution of wild game in the district.

4. A glance at these plans will show the almost universal distribution of *G. tachinoides*. Kaduna Capital is situated on high ground and is not intersected with thick kurimis, and I have not caught any *G. tachinoides* within the station, but the case of Kaduna Junction is very different. Here densely wooded gullies traverse the station to fall into Kaduna river, upon the south bank of which Kaduna Junction is situated, and *G. tachinoides* are common. In the house I am occupying at Kaduna Junction I have frequently caught *G. tachinoides* on my verandah, most frequently during July and August.

5. *G. palpalis* appears to be much more rare, and I have only obtained this fly from a kurimi immediately to the S.W. of the Capital on the road from old Doka to Afaka. This position is important as it is less than a mile from Kaduna railway station, and considerable native traffic passes along the road which crosses the kurimi. Specimens sent me by Mr. A. C. Francis, D.O., from Ligari proved to be *G. palpalis*. Dr. J. E. L. Johnston stated in his report that he caught two specimens on the banks of a river near Kadi (which I presume to have been the R. Tubo). Dr. H. A. Foy reported both *G. palpalis* and *G. tachinoides* on a tributary stream (R. Kworo) to the Kaduna near Rigachikum in September, 1913—I have not personally visited this stream.

6. It would appear that *G. palpalis* is uncommon, but it must be remembered that I have not made careful examinations of the dense kurimis along stream beds, only crossing them when out shooting, and a more careful search may reveal many more localities. Moreover, amongst my collection of *G. tachinoides* are many atypical specimens which may prove to be the small variety of *G. palpalis* described by Dr. J. J. Simpson as *G. palpalis var. pallida*, and reported and described from Ilorin Province by Dr. Scott Macfie.

7. Seasonal variation of *G. tachinoides*.—There is an almost universal distribution of *G. tachinoides* along the banks of the main Kaduna river during the dry season, and along practically all the tributary streams (and tributaries of R. Tubo) during the rains. This extension along tributaries is not marked until one or two months after the onset of the rains, and the fly may still be caught in the dry season until shortly before the bush fires commence. This fly rarely follows its prey for more than one or two hundred yards from the thick bush of a stream bed. During the rains it appears to be confined to the streams, but during the dry season it is widely spread, though in small numbers,

along the sandy banks of the main Kaduna river, especially collected where pools are left at the foot of steep banks shaded by thorn bushes.

I have been most severely attacked by this tsetse when lying in wait to shoot crocodiles in the quiet shaded backwaters of the river or when fishing in deep rocky pools near the emergence of a shaded tributary stream into the main river.

8. Clearing of all tributary gullies and of the bank of the Kaduna river adjoining Kaduna Junction was attempted on a small scale in August, 1917, and appeared to have considerable effect upon the number of tsetse found within the station. All the bush was cleared from gullies except the larger trees. The smaller bush, however, grows up rapidly and requires clearing each year. I believe that *G. tachinoides* could be exterminated from Kaduna Junction if *both* banks of the Kaduna river and the islands within it were cleared for 30 yards from high water level from a point quarter mile below the railway bridge to one mile above the bridge. The lower reaches tributary gullies would have to be cleared also for 400-500 yards.

9. It is not within the scope of these notes to discuss the importance of *G. tachinoides* as a possible carrier of human trypanosomiasis, especially as *G. palpalis* was also found. Nor need the (relative) importance of *G. submorsitans* (very rare except west of river Tubo), *G. tachinoides* and *G. palpalis* in carrying animal trypanosomiasis. It may, however, be pointed out that infection of horses owned by Europeans at Kaduna is apparently rare. I have only seen one horse infected (with T. vivax), and that may have been infected during a long trek taken a month before symptoms appeared.

There is a wide seasonal movement of large herds of cattle about Kaduna, both of smaller local herds and of large herds which work down towards the Kogin Sarikin Pawa during the dry season, returning towards Zaria in the early rains. Dr. J. E. L. Johnston found 19 (12·6%) out of 150 cattle examined in the district infected with T. vivax.

10. As the question of direct transmission of trypanosomes by biting flies other than Glossina is important, I append a list of biting flies caught by Dr. J. E. L. Johnston in 1914 (July) and myself from May, 1917, to May, 1918, in the Kaduna district.

11. At Ibi I continued the work of examining the blood of wild animals for trypanosomes. The following are results obtained—

Mammals examined—23.

Types examined—Warthog, 7; kob, 5; waterbuck, 4; ribi, 1; bushbuck, 1; hartebeest, 1; bandicoot, 1; hyena, 1; elephant, 1; hippopotamus, 1.

Number with trypanosomes—2.

Type of trypanosomes—T. dimorphon group (in bushbuck) T. vivax group (in waterbuck).

Percentage with trypanosomes—8·7%.

N.B.—In the blood of the hyena examined were microfilaria (? Microfilaria immitis). Films were sent to Yaba, but no certain diagnosis made.

I also enclose a Tsetse map of Ibi district, which is more complete than the one forwarded to the Principal Medical Officer with the Annual Medical Report for 1918.

(Sgd.) W. B. JOHNSON,
Medical Officer.

BLOOD-SUCKING FLIES CAUGHT IN KADUNA DISTRICT.

Dr. J. E. L. Johnston (July, 1914).	Both Collectors.	Dr. W. B. Johnson (May, 1917-May, 1918).
CULICIDAE.		
	A. costalis.	
		A. funestus.
		A. pretoriensis.
		A. rufipes.
		A. domicolus.
		A. flavicosta.
Steg. africana.		A. nili.
Steg. simpsoni.	Mansonioides uniformis.	
O. cumminsi.	Steg. fasciata.	
	Steg. sugens.	
		O. wellmani.
		H. unilineata.
	C. duttoni.	
	C. fatigans.	
	C. tigripes.	
C. annulioris.		C. decens.
		C. invidiosus.
		C. ager.
	Culiciomyia.	
TABANIDAE.		
	H. lacessens.	
	H. tenuicrus.	
H. gracilis.		H. pallidipennis.
H. pertinens.		H. bullatifrons.
H. puniens.		
H. vittata.		
	T. taeniola.	
T. albipalpus.		T. subangustus.
T. fasciatus.		
T. billingtoni.		Chrysops distinctipennis.
T. secedens.		,, longicornis.
T. socialis.		Hippocentrum versicolor.
MUSCIDAE.		
	G. palpalis.	
	G. tachinoides.	
		G. submorsitans.
	Stomoxys calcitrans.	
	,, nigra.	
Stomoxys omega.		
Philaematomyia sp.		
HIPPOBOSCIDAE.		
	Hippobosca maculata.	

REPORT UPON INFLUENZA EPIDEMIC IN MURI PROVINCE.

The Influenza epidemic reached Muri Province by two routes, (1) up the river Benue from Lokoja and (2) by trade routes from Bauchi Province into the north of Muri Province. The spread of infection up river was steady, place after place along the banks being infected in succession. From each new focus the disease rapidly spread inland along trade routes.

The first cases diagnosed at Ibi arrived on the Niger Co. boat "Tugwell" on 17th October. Five cases were isolated from this boat, and all precautions taken. Contacts were isolated and soon afterwards developed the disease, but by this time it had begun to spread in the native town.

The early cases were comparatively mild, and the epidemic appeared to be diminishing when the Medical Officer had to leave Ibi for Abinsi on October 31st. A recrudescence of the epidemic started on November 5th whilst the Medical Officer was still absent. This time it spread with extraordinary rapidity through police barracks, gaol, and native town, quite 70–75% of the native population becoming infected.

In early December no cases were occurring at Ibi, but the disease had spread widely from the Benue river banks to the north and south of the Province, and up river to Lau and Yola Province.

It is interesting to note that natives in this Province still remember a similar epidemic "about 30 years ago." This was no doubt the epidemic of 1889 which is known to have spread to Africa.

VI. In Europeans the disease was comparatively mild:—

Place.	No. Resident.	No. Infected.		Deaths.
		Off duty.	Mild cases.	
Ibi	13	1	3	...
Donga	3	2	...	1
Sallatu and Zaiki Biem	10	6	...	...
Wukari	7	2	...	...
Abinsi	3	2 (1 complicating Blackwater)	1	...
Total	36	13	4	1

Native Officials and Clerks in Trading Firms:—

Place.	No. Resident.	No. Infected.	Deaths.
Ibi	17	8	2
Abinsi	3	3	...
Total	20	11	2

Natives—A. Natives under observation of Europeans (*i.e.*) at Ibi and Mission Stations.

Place.	No. Infected.	Deaths.
Ibi isolation camp	69	8
Ibi native town	Over 2,000. *i.e.*, 75% of population	66
Wukari Mission	56	...
Wukari town	...	80
Sallatu villages	80% of population	94
Zaiki Biem Mission and villages ...	80% of population	25
Donga and district	80% of population	108
Yergum Mission	5	...
Langtang district	75% of population	60

B. Figures obtained by Mr. C. E. Boyed, D.O., through native administration for Kassan Chikki, Ankwe, Wase, Ibi, Wukari, Takum, and Donga Districts.

(Figures will not be complete until end of January, when they will be forwarded).

Attached are some clinical notes on the types of the disease as seen at Ibi and Abinsi.

(Sgd.) W. B. JOHNSON,
Medical Officer.

NOTES UPON INFLUENZA EPIDEMIC AT IBI, 1918.

A. *Pyrexia.*—Three main types were observed.

(1) Simple six-day fever (type C in specimen charts attached).

(2) Saddle-back type—the secondary rise occurring about the fifth day and usually associated with purulent bronchitis (type A in specimen charts attached).

(3) Pneumonic type with fall by crisis or lysis on the seventh or eighth days (type B in specimen charts).

B. *Respiratory System.*—Onset usually with coryza and dry cough.

Pharyngitis common. Many cases developed pain in ears and deafness owing to blocking of eustachian tubes, but no cases of acute otitis were seen.

Broncho-pneumonia was almost invariably present, usually at both lung bases. It showed a patchy distribution, and the consolidated areas tended to wander and become confluent.

Purulent bronchitis was a common and fatal complication, the patient becoming water-logged with purulent secretion.

Lobar pneumonia did occur. It was a less fatal complication than purulent bronchitis.

Pleural effusion occurred in a few cases, but was invariably absorbed. No cases of empyema were seen.

Diaphragmatic pleurisy was a troublesome complication in one case.

C. Gastro-Intestinal.—Tonsillitis was a common symptom at onset of attack.

The tongue was usually flabby and thickly coated.

Vomiting occurred in about 40% of the cases, usually in the first two days, but also with development of purulent bronchitis.

Diarrhœa was common on subsidence of the fever, lasting two to three days. In a few cases it was present from the onset of illness.

D. Nervous System.—Headache was constant.

Pain in back and limbs was frequently complained of, and in some cases there was intolerable aching pain in the legs.

Some delirium was frequently seen, and a few cases developed a typical "typhoid state."

E. Circulatory System.—The pulse rate followed the temperature without dissociation.

The heart was affected early in severe cases, especially in those with purulent bronchitis. There was invariably right-sided cardiac dilatation in severe cases.

F. Urine.—Albuminuria was present in 80% of the cases. It usually appeared as a light cloud on the second day, well marked deposit on the third day, and rapid diminution in amount from the fourth day onwards, unless severe pneumonic signs were present.

G. Various.—Epistaxis occurred in about 8% of the cases.

Jaundice was never seen, although a slight icteric tinge of the sclerae was common.

H. Blood Examination (on second or third day of illness).

No parasites were found in 20 cases examined, except very scanty subtertian parasites in one case.

The total leucocyte count varied from 9,375 to 14,585 per c.mm. with an average of 10,050, *i.e.*, a slight leucopenia was present.

Differential leucocyte count:—There was a large mononuclear increase, averaging 20%.

There was almost invariably a nearly complete disappearance of eosinophile cells (except in one case with microfilaria perstans in blood). This was very striking; in the last 162 blood counts I have done on natives the average eosinophile count has been 6·8%.

I. Fatal Cases.—No post mortem examinations were made, owing to pressure of work. Death in most cases was due to toxaemia from purulent bronchitis, with probably myocarditis, and cardiac dilatation.

This occurred in some cases by the fifth or sixth day of disease, and in others as late as two weeks after the onset, often with a terminal basal pneumonia added.

Other cases died from cardiac failure with true pneumonic consolidation of lungs.

J. Treatment.—Creosote by mouth was given to a few cases, especially those with purulent bronchitis or pneumonia. The results were no better than those from treatment with expectorants and cardiac tonics. Quinine was given daily to all cases. Brandy was found to be the most useful cardiac stimulant. Careful feeding with strong soups, bovril, and milk and brandy was of considerably greater value than any drug treatment.

BLOOD-SUCKING DIPTERA CAUGHT IN IBI DISTRICT, JULY TO DECEMBER, 1918.

TABANIDAE—

Tabanus taeniola (Pal-de Beauv).
Tabanus variatus (Walk).
Tabanus latipes (Macq.).
Tabanus fasciatus (Fabr.).
Tabanus subangustus (Ricardo).
Tabanus biguttatus (wied.).
Tabanus brumpti (Surcouf).
Tabanus par (Walk.).
Haematopota pallidipennis (Austen).
Haematopota lacessens (Austen).
Haematopota bullatifrons (Austen).
Hippocentrum versicolor (Austen).

MUSCIDAE—

Stomoxys calcitrans (Linn.).
Stomoxys nigra (Macq.).
Lyperosia sp.
Glossina palpalis (Rob. Desv.).
Glossina tachinoides (Westw.).
Glossina submorsitans (Newst.).

CHIRONOMIDAE—

Culicoides sp.

CULICIDAE—

Anopheles costalis (Theo.).
Anopheles funestus (Giles).
Anopheles nili (Theo.).
Anopheles wellcomei (Theo.).
Anopheles pharoensis (Theo.).
Anopheles flavicosta (Edww.).
Stegomyia fasciata (F.).
Banksinella luteolateralis (Theo.).
Ochlerotatus cumminsi (Theo.).
Culex decens (Theo.).
Culex invidiosus (Theo.).
Culex tigripes (Grp.).
Culex grahami (Theo.).
Culiciomyia nebulosa (Theo.).
Mansonioides uniformis (Theo.).

HIPPOBOSCIDAE—

Hippobosca maculata (Leach).

NOTES ON AN INFUSORIUM OCCURRING IN THE INTESTINE OF MAN.

The patient, a European Official, aged 29 years, with 3 years service in S. & N. Nigeria, came under observation for Malaria on 13.9.18. Subtertian parasites were seen in the blood.

For some little time previously the patient had been suffering very much from indigestion, with pain and acid eructations after food.

These symptoms were most marked, and caused patient to seek relief several times.

The faeces were examined several times, and on 25.10.18, an Infusorium was discovered.

Two days previous to this, patient complained of a swelling in the Ischio-rectal fossa, this was incised on 25.10.18, and some thick odourless pus evacuated. The abscess was not connected with the bowel, and no infusoria could be discovered in the pus.

The abscess healed quickly.

There was no diarrhoea, except for a few days, 26 to 29.9.18.

After the discovery of the parasite, the case was treated with Salol and Mag. Sulph.

The Infusorium was seen up to 4th October, but not after that date.

A blood count taken on 23.9 gave (500 counted):—Polymorph. 74·8%:

Small Lympho., 11%: Large Lympho., 7%: Large Mono., 4. 6%: Transits., ·6%: Eosinos., ·4%: Mast Cells, 1. 6%.

A blood examination during the height of the fever on 29.9.18 showed absence of malaria parasites or pigment.

DESCRIPTION OF THE PARASITE.

The parasite was studied for some hours continuously under the microscope.

It exhibited two stages: (1) the "Active" stage, and (2) the resting or "Encysted" stage.

The various shapes assumed in the active stage are seen in the sketches. The general shape very much resembled a "clown's hat."

The "Encysted" stage—spherical.

There are two rings of cilia, one around the mouth cavity, used for sweeping in food particles, whilst the second ring encircled the posterior part of the body, and was presumably used for locomotion.

These posterior cilia were much shorter and less numerous than the anterior.

The posterior extremity suggested the existence of an excretory pore, but nothing was seen to pass out, though in one specimen showing active forward locomotion, an appearance as of something being excreted was seen.

The interior of the body presented a granular appearance, without distinct vacuoles, and the contents often exhibited a slow circular movement.

The parasite exhibited most active locomotion, travelling sometimes forwards, at other times backwards, but I never observed it to change this motion suddenly.

The path taken was either a large sweeping curve, or zigzag bounds.

On occasions it remained stationary for several minutes, feeding actively, the cilia around the mouth creating a regular swirl of the particles in the vicinity.

After feeding for some time the mouth ciliary movements gradually diminished in activity, and then, with lightning rapidity, the organism assumed a spherical form, in which it sometimes persisted for hours, but at other times, it unfolded fairly slowly, to become again immediately encysted, the process occurring as many as four times in a minute.

The fairly slow unfolding process enabled one to see that the whole of the mouth parts, and the posterior end of the body, behind and including the posterior ring of cilia were all folded into the sphere, which appeared tightly compressed, and therefore smaller in diameter than in the active stage.

I had no means of measuring the organism, but I should say it was approximately 30 to 40 (mu), in the spherical form.

The Infusoria were never numerous, 3 being the greatest number observed in one slide, while several slides had none.

I am of opinion that the gastric symptoms, and also the irregular temperature were caused by the presence of these organisms in the intestine.

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