Annual medical and sanitary report / Nigeria.

COLONY AND PROTECTORATE OF NIGERIA

REPORT

ON THE

Medical and Health Services

FOR THE YEAR

1932

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OUTLINE MAP
OF
NIGERIA
SHEWING
MEDICAL FACILITIES
1932
REFERENCE
(1930 ABOVE SHOULD READ 1932)
WEST AFRICA
FRENCH
LAKE CHAD
SOKOTO
KANO
BORNU
NORTHERN PROVINCES
BAUCHI
NIGER
PLATEAU
ILORIN
ZARIA
KABBA
BENUE
ADAMAWA
OYO
ABEOKUTA
IJEBU
COLONY
ONDO
BENIN
WARRI
ONITSHA
OWERRI
CALABAR
OGOJA
CAMEROONS
BIGHT OF BENIN
BIGHT OF BIAFRA
Kaduna
Kano
Jos
Lokoja
Ibadan
Lagos
Enugu
Onitsha
Port Harcourt
Calabar
Benin City
Warri
Abeokuta
Makurdi
Bauchi
Yola
Maiduguri
Katsina
Buea
Victoria
Bamenda
Kumba
Forcados

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Report on the Medical and Health Services for the Year 1932.

I.—ADMINISTRATION.

A.—Establishment.

(*a*) European Staff.

Medical.

Director of the Medical and Sanitary Service.
1 Deputy Director of Medical Service (No provision).
1 Assistant Director of Medical and Health Service (Establishment—2).
1 Assistant Director of Medical Service (Establishment—4).
2 Specialist Medical Officers.
11 Senior Medical Officers.
1 Alienist Medical Officer (No provision).
1 Superintendent Medical Schools.
83 Medical Officers (Establishment—88).
4 Lady Medical Officers.
2 Dentists.
2 Pharmacists.

Clerical.

1 Assistant Accountant.
1 Office Assistant.
4 Chief Dispenser Storekeepers.

Nursing.

1 Matron (Establishment—2).
9 Senior Nursing Sisters.
51 Nursing Sisters.

Tsetse Investigation (Temporary).

1 Deputy Director.
1 Senior Sleeping Sickness Officer.
1 Entomologist.
1 Veterinary Pathologist.
1 Immunologist.
1 Technical Assistant.

Laboratory.

1 Deputy Director of Laboratory Service (No provision).
1 Senior Pathologist (No provision).
8 Pathologists.
1 Research Medical Officer (No provision).
2 Biochemists (No provision).
1 Immunologist (Seconded to Tsetse Investigation).
1 Entomologist (Seconded to Tsetse Investigation).
6 Technical Assistants (1 seconded to Tsetse Investigation).

Sanitation.

1 Deputy Director of Health Service.
1 Assistant Director of Health Service.

5 Senior Health Officers.
10 Medical Officers of Health (Establishment—11).
33 Sanitary Superintendents.

(*b*) African Staff.

7 Medical Officers.
3 Junior Medical Officers.
1 Assistant Accountant.
1 Chief Clerk (No provision).
4 Assistant Chief Clerks.
13 First Class Clerks (1 seconded to Tsetse Investigation).
40 Second Class Clerks and Probationers (1 seconded to Tsetse Investigation).
1 Chief Dispenser (Esatblishment—2).
7 Senior Dispensers.
20 First Class Dispensers.
80 Second Class Dispensers (1 seconded to Tsetse Investigation).
30 Medical Students.
40 Dispensers-in-Training.
1 Chief Storekeeper.
2 Assistant Chief Storekeepers.
3 First Class Storekeepers.
5 Second Class Storekeepers.
9 Senior Nurses (Establishment—11).
32 Charge Nurses.
72 First Class Nurses (Establishment—73).
215 Second Class Nurses (5 seconded to Tsetse Investigation).
160 Nurses-in-Training.
1 First Class Midwife.
11 Second Class Midwives.
15 Pupil Midwives.
1 Charge Attendant, Lunatic Asylum.
25 Attendants, Lunatic Asylum.
3 Senior Wardens.
10 Wardens.
2 Assistant Wardens.
10 Attendants, Leper Asylum.

Laboratory.

1 Senior Laboratory Attendant (No provision).
4 First Class Laboratory Attendants (1 seconded to Tsetse).
8 Second Class Laboratory Attendants (1 seconded to Tsetse).
9 Third Class Laboratory Attendants.
6 Laboratory Attendants-in-Training.

Tsetse Investigation.

1 First Class Clerk.
1 Second Class Clerk.
1 First Class Laboratory Attendant.
1 Second Class Laboratory Attendant.
1 Second Class Dispenser.
5 Second Class Nurses.

Sanitation.

10 First Class Sanitary Inspectors.
38 Second Class Sanitary Inspectors (Establishment—46).
33 Third Class Sanitary Inspectors.
18 Sanitary Inspectors-in-Training.
40 Sub-Inspectors of Sanitation.
64 Vaccinators.
1 Registrar of Vital Statistics.
2 Deputy Registrars of Vital Statistics.

B.—Legislation.

LIST OF ORDINANCES, REGULATIONS, ETC., AFFECTING PUBLIC HEALTH ENACTED DURING THE YEAR 1932.

Orders-in-Council.

Serial No.	Date.	Ordinance made under.	Provisions.
3	25.1.1932	The Births, Deaths and Burials Ordinance (Chapter 47).	Amendment to Order No. 23 of 1929 by insertion under head A immediately before the words Contagious Diseases Cemetery Ikoyi of Mohammedan Cemetery Epetedo. The Mohammedan Cemetery at Epetedo shall be a public burial ground for the township and is appropriated to persons of Mohammedan religion.
15	25.4.1932	The Births, Deaths and Burials Ordinance (Chapter 47).	Ordering the non-European Cemetery Aba shall be a Public burial ground for the township of Aba and the said Public burial ground is appropriated to persons of non-European descent.
16	27.6.1932	The Public Health Ordinance.	Ordering the Schedule to Order No. 16 of 1922 be amended by deletion (*a*) in Column I of the words "The area, which prior to the 2nd November, 1922, was known as township of Ibi, and (*b*) in Column II of the words "21st May, 1918."
17	15.8.1932	Order-in-Council.	Prohibiting importation into Nigeria of advertisements, notices or announcements relating to Venereal Disease.
18	15.8.1932	The Public Health Ordinance (Chapter 56).	Ordering the provisions of sections 3 and 22 of the Public Health Ordinance and of rules 1 to 25 and 82 of Rules No. 2 of 1917 shall apply to the whole of the Southern Provinces (including those portions of the Cameroons under British Mandate which lies to the Southward of the line described in the Schedule to the British Cameroons Order-in-Council, 1923.
19	—	The Dangerous Drugs Ordinance, 1927. (No. 16 of 1927).	Ordering that part III of the Dangerous Drugs Ordinance, 1927, shall henceforth apply to Acetyldihydrocodeinone and its salts and any preparation, admixture extract or other substance containing any proportion of Acetyldihydrocodeinone or is likely to be productive if improperly used of ill-effects, substantially of the same character or nature as or analogous to those produced by morphine or cocaine.

ORDERS.

Serial No.	Date.	Ordinance made under.	Provisions.
21	7.7.1932	The Townships Ordinance.	Under section 60 (*b*) of the Townships Ordinance those pieces of land containing 69·75 acres situated in the Township of Port Harcourt the boundaries of which are marked A and B constitute open spaces.

REGULATIONS.

4	25.1.1932	The Hospital Fees Ordinance (Chapter 49).	Amendment to the Hospital Fees Regulations, 1925 (No. 24 of 1925), by deletion of regulation 8 and by substitution of the following regulation "The Senior Medical Officer, the Medical Officer in charge, or an Assistant Treasurer may for any reason which he may deem sufficient remit altogether or in part any sum payable under the foregoing regulations." The preceding regulation shall apply to the Colony and Protectorate (including the Cameroons under Birtish Mandate).
2	19.7.1932	The Townships Ordinance (Chapter 57).	Under section 41 of the Townships Ordinance, the following Rules have been made and applied to the Township of Kaduna by the Governor. No person shall hawk goods, set up a stall or table or otherwise display goods for sale in any street or open space other than the market not being the property of a private owner without a written permit from the Local Authority. Penalty a fine of ten shillings. The charge for such permit which shall expire at the end of the month of issue shall be 1s. 6d.

C.—FINANCIAL.

	£	s.	d.
Revenue	8,104	10	11
Approved Expenditure 1932/33	433,816	0	0
Actual Expenditure for 1932	401,603	19	4

TABLE I.

FINANCIAL—CALENDAR YEAR 1932.

I.—EXPENDITURE.

(*a*) Personal Emoluments	265,955	19	3*
(*b*) Other Charges—			
Railway Transport	8,791	13	11
Medical, Surgical, Dental, X-ray and Laboratory Equipment and Supplies	20,977	19	7
Diets, Provisions and Necessaries ...	10,597	10	3
General Sanitary	22,179	16	0
Other Items	43,838	17	11
Total Other Charges	£106,385	17	8*
(*c*) Special Expenditure—			
Tsetse Fly Investigation	14,705	3	8
Plague Expenses	5,507	2	8
Other Items	9,049	16	1
	£29,262	2	5

SUMMARY.

	£	s.	d.
Personal Emoluments	265,955	19	3
Other Charges	106,385	17	8
Special Expenditure	29,262	2	5
Total	£401,603	19	4

II.—RECEIPTS.

	£	s.	d.
Hospital and Medical Receipts	8,025	8	3
Birth and Death Fees	13	1	2
Fumigation and Deratisation Fees ...	66	1	6
Total Receipts	£8,104	10	11

TABLE II.

FINANCIAL STATEMENT INCLUDING CHARGES FOR INTER-DEPARTMENTAL SERVICES FOR THE YEAR 1932.

REVENUE.

	£	s.	d.
Hospital and medical receipts	8,025	8	3
Birth and Death Fees ...	13	1	2
Fumigation and Deratisation Fees	66	1	6
Medical charges against the Nigerian Railway ...	19,103	5	0
Excess of expenditure over Revenue	412,852	19	10
	£440,060	15	9

EXPENDITURE.

	£	s.	d.
Marine services	1,628	8	7
P.W.D. services:—			
(*a*) Electric light £6,357 12 1	8,237	16	10
(*b*) Water £1,880 4 9			
Railway services	9,487	6	0
Personal Emoluments ...	277,417	12	3
Other Charges	114,027	9	8
Special Expenditure ...	29,262	2	5
	£440,060	15	9

* These amounts represent the net expenditure after deducting Railway Re-imbursements.

II.—PUBLIC HEALTH.

A.—General Remarks.

The Northern Provinces suffered from an unusually severe and widespread visitation of smallpox, which reached epidemic form in many districts, but with this exception no outbreaks of epidemic diseases occurred. No case of plague occurred during the year, only one case of suspected yellow fever was diagnosed, in an African patient, and relapsing fever and cerebro-spinal fever were conspicuous by their absence.

A full report upon the incidence of sleeping sickness appears as an Appendix to this report. The position is causing serious concern and it is hoped materially to increase the strength of the sleeping sickness treatment teams during 1933.

In the absence of compulsory registration of births and deaths, except in a few of the larger towns, it is difficult to obtain any general idea of the fertility and mortality rate of the population or to make comparison with previous years. Native Administrations are however being encouraged to improve and extend the system of notification already practised and rough figures are now obtainable from many of the provinces.

Notwithstanding the reduction of expenditure and of personnel which has been necessary it has been possible to maintain the hospital and dispensary system and returns show that the general population is appreciating medical facilities to an increasing extent. It reflects credit upon the clinical officers of the Medical Department that they have been able to deal with the increased work. 367,882 patients were treated at the Native Administration dispensaries during the year. At Government and Native Administration African hospitals the numbers of both in-patients and out-patients showed an increase compared with previous years. European cases treated were fewer owing to the smaller European population resident in Nigeria during the year:—

General Hospital Work.

Total cases treated.	1929.	1930.	1931.	1932.
Europeans:—				
In-patients	1,470	1,412	1,245	1,010
Out-patients	8,181	7,917	7,630	5,912
Total Europeans	9,651	9,329	8,875	6,922
Africans and other Non-Europeans:—				
In-patients	32,068	37,517	35,738	41,577
Out-patients	391,008	399,260	481,759	541,517
Total Africans	423,076	436,777	517,497	583,094

Progress in the improvement of hygienic conditions throughout the country is necessarily slow. There are, however, very definite indications of awakened interest amongst the more educated members of the population as evidenced by the interest shown by native chiefs in health subjects, the response by the population to "Health Weeks", and the steady improvement which is taking place in the larger towns. The new schools at Ibadan and Kano, built from a grant under the Colonial Development Fund, for training the sanitary inspectors employed by Native Administrations will undoubtedly improve the general standard of work.

I.—GENERAL DISEASES.

A return of diseases and deaths for 1932 is given in Tables IV and V at the end of this report. The incidence of disease groups is shown in diagramatic form overleaf.

Deficiency Diseases.

Mention has been made in previous reports of the lowered resistance of the population to disease caused by unbalanced diet and dietetic deficiency. Cases of retrobulbar neuritis associated with sore mouth and tongue and pruritis of scrotum have again been reported by Dr. Fitzgerald Moore as occurring in boarding schools. The subject is being more fully investigated.

Mention is made under Section III of the work of the Dietetics Pathologist and of the formation of a Dietetics Committee.

The part played by under-nutrition in the incidence of ulcers of the legs is uncertain but lowered resistance due to dietetic deficiency is probably a contributing cause. In 1932, 47,035 cases of leg ulcers were treated at Government hospitals, and 15,305 cases in the Northern Provinces and 32,429 cases in the Southern Provinces were treated at Native Administration dispensaries. These figures represent only a fraction of the total cases of the disease.

Nine cases of scurvy, ten cases of beri-beri and fifty-six cases of rickets were reported during the year.

II.—COMMUNICABLE DISEASES.

Mosquito or Insect Borne—Malaria.

Preventive measures are described under Section III. Comparative figures for the past three years of hospitalisation for malaria and blackwater fever are given below :—

	1930.		1931.		1932.	
	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.
EUROPEANS :—						
Malaria	1,334	1	1,170	...	876	...
Blackwater	17	4	18	4	15	1
AFRICANS AND NON-EUROPEANS :—						
Malaria	29,430	41	35,800	40	32,895	35
Blackwater	6	2	12	1	10	2

Trypanosomiasis.—A full report upon the work of the sleeping sickness survey teams in the Northern Provinces appears in Appendix B, and mention of the incidence in the Southern Provinces is made in Section III. It will be seen that the survey teams examined 150,808 persons during the year and diagnosed 13,514 cases of trypanosomiasis. In addition, 3,255 cases were diagnosed and treated at the Tsetse Investigation Laboratory and at hospitals throughout the country.

2.—Infectious Diseases.

Notes upon infectious diseases appear in Section III.

Venereal Diseases and Yaws.—The following table shows the number of African patients who have come under treatment at Government hospitals during the past five years :—

	1928.	1929.	1930.	1931.	1932.
Yaws	29,079	42,126	39,943	56,346	80,675
Syphilis	12,915	15,828	13,698	17,396	19,481
Gonorrhœa	8,927	12,018	12,940	13,716	12,975

In addition to the above 26,658 cases of yaws, 14,154 cases of syphilis and 11,163 of gonorrhœa were treated at Native Administration dispensaries.

Bismuth therapy is now accepted throughout the country as the routine treatment for yaws, sobita or bisoxyl being the main drugs used.

The combination of an anti-yaws campaign with the sleeping sickness campaign of which mention was made in the last annual report was not successful. The campaign was amongst pagan tribes in whom a chronic form of " crab " yaws was the prevailing form. Treatment was not welcomed and as it hindered the sleeping sickness work the campaign was stopped.

The intensive campaign against yaws commenced in 1931 in the Bamenda district in the mandated territory of the Cameroons, by means of local recruits from each village trained in the technique of giving sobita injections, shows evidence of success, and progress is being made in extending the scheme in the Bamenda district and in the Banso district. In the Bamenda district three villages examined carefully before commencement of the campaign showed 246, ninety-seven and 489 cases of yaws. One year after the campaign had started the same villages showed seventy-one, twenty-six and ninety-nine cases only.

Leprosy.—A new leper farm settlement with 340 acres of farm land was opened during the year at Uzuakoli in Owerri Province and 250 lepers were admitted. The cost of erection and maintenance is being borne by the Native Administration of Owerri and small grants have been made by the Nigerian Branch of the British Empire Leprosy Association. It is under the medical supervision of a mission doctor whose expenses are defrayed by the Native Administration.

The new camp at Ossiomo in Benin Province has been completed and crops amounting to one year's food supply have been harvested and stored. It has not yet been settled by the lepers owing to delay in the arrival of the mission doctor who will supervise it and who is expected early in 1933. This camp which will accommodate 500 lepers was built with a grant from the Colonial Development Fund and will be maintained by the Native Administration of Benin Province.

The largest farm Colony is that at Itu in Calabar Province which has now an average leper population of 1,252. A grant of £3,000 from central funds is made annually towards the upkeep of this Colony and towards the salaries of mission doctor and technician, and the Native Administrations of Calabar and adjoining provinces also contribute.

The camp opened at Bulu, near Victoria, in the Cameroons Province has not proved a success as yet, but efforts are being directed towards making it more attractive.

In the Northern Provinces excellent work has been carried out by the Church of the Brethren Mission at Garkida in Adamawa Province. A large farm colony has been established here for lepers and some 424 lepers were in residence at the end of the year. The Native Administrations of Adamawa, Bornu and Gombe contribute towards the expense of maintenance.

The main treatment centres, mostly farm colonies, which are now opened in Nigeria are shown below, together with the average leper population.

Central Government and Native Administrations :—

	Average Population.	*New Admissions.*
Southern Provinces and Colony:—		
Lagos (Yaba)	40	13
Benin Group*	267	2
Uzuakoli	250	250
Onitsha	99	124
Victoria (Bulu camp)	5	29
Kumba	12	57
Bamenda	83	130
Northern Provinces:—		
Zaria	130	44
Gusau	70	37
Katsina	336	89
Azare	37	10
Maiduguri	230	64
Bauchi	78	57
Medical Missions:		
Southern Provinces:—		
Itu	1,252	350
Ogbomosho	24	24
Northern Provinces:—		
Garkida	424	?
Mkar	224	?
Total	3,561	1,280

In addition 311 in-patients and 2,359 out-patients were treated at Government hospitals and 2,210 cases were treated at Native Administration dispensaries.

The extension of farm colonies for lepers as outlined above is encouraging, but it must be realised that the difficult problem of tackling leprosy amongst an African population of over 20,000,000 has not yet been faced. No complete survey of leprosy incidence has been possible; the census report on Nigeria for 1931 estimates sixty-two cases for 10,000 inhabitants in the Northern Provinces, and the medical census (an intensive examination in eight districts) gives eighty-one cases per 10,000 inhabitants in the Northern Provinces and twenty-nine cases per 10,000 in the Southern Provinces. These figures are influenced by the fact that leprosy is comparatively rare in the Yoruba states of the south-west and there is no doubt that the incidence in some parts of the country is appallingly high. A leprosy survey undertaken in the Kwale Division of Warri Province at the end of the year by Dr. R. C. Jones, Medical Officer of Health, showed 3,181 lepers amongst 29,782 persons examined in seven villages—*i.e.*, 10.68 per cent. of the population are suffering from leprosy. These figures were obtained by clinical examination only and it is possible that certain conditions simulating leprosy were included, but it is also likely that many early cases were missed. Enough has been said to indicate the magnitude of the problem. The solution appears to lie mainly in propaganda and general education in hygiene, aided by the establishment of farm colonies to which *early* cases of the disease will be encouraged to reside. Treatment campaigns within the limits of possible expenditure by the country at present are not likely to give results commensurate with the cost until

* Will be transferred to Ossiomo.

a general improvement of rural hygiene occurs. It is unfortunate that in spite of the adoption of modern methods of treatment by doctors especially expert in the treatment of the disease results generally are disappointing. Many cases, especially young adults, in whom the disease has apparently been arrested by treatment, return to the camps with recrudescence of the disease some time after they have been discharged.

B.—VITAL STATISTICS.

(1) General Population—African.

The estimated population of Nigeria, including the Cameroons under British mandate is 19,928,171 as calculated in the census 1931.

Registration of births and deaths is compulsory only in the Lagos Area, the statistics for which area are summarised in the following table :—

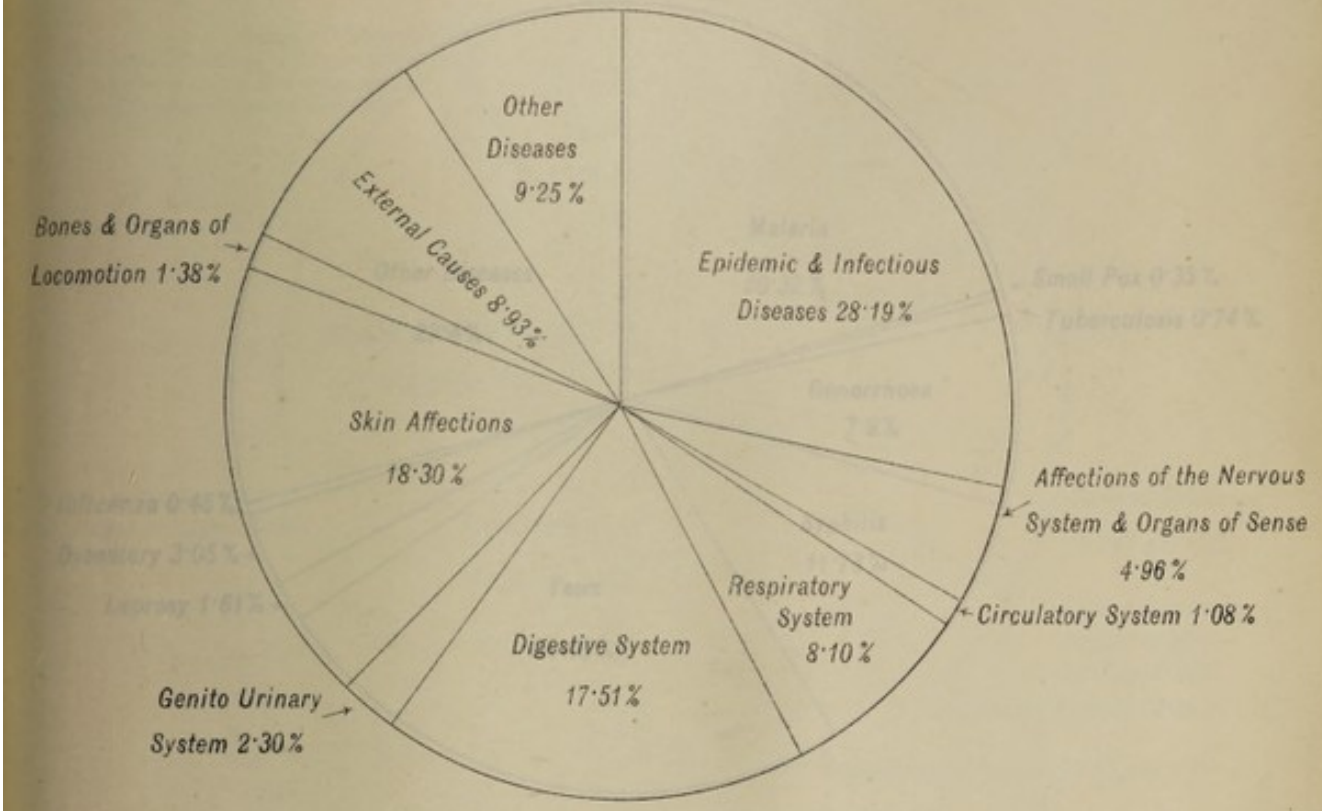
	1932.		
	Lagos.	Ebute Metta.	Total.
Estimated population (Lagos and Ebute Metta)	—	—	140,000
Total births	3,035	828	3,863
Birth rate per 1,000 population	—	—	27·5
Total deaths	1,460	359	1,819
Death rate per 1,000 population	—	—	12·9
Deaths—causation of—certified by Medical Practitioners—number	1,460	359	1,819
Deaths—causation of—certified by Medical Practitioners—per cent.	100%	100%	100%
Deaths—Infants under one year	323	70	393
Infantile mortality per 1,000 births	106·4	84·5	101·7
Deaths under one year—certified by Medical Practitioners—number	323	70	393
Deaths under one year—certified by Medical Practitioners—per cent.	100%	100%	100%
Deaths—Children under five years	479	98	577
Percentage of deaths of children under five years to total deaths	32·1	27·2	31·7
Total stillbirths	107	29	136
Stillbirths—proportion per cent. of the total births (normal and stillbirths)	3·4	3·3	3·4
Deaths uncertified by Medical Practitioners—number	Nil	Nil	Nil
Deaths uncertified by Medical Practitioners—per cent.	Nil	Nil	Nil

The following summary enables comparison to be made with previous years of births, deaths and infant mortality rates :—

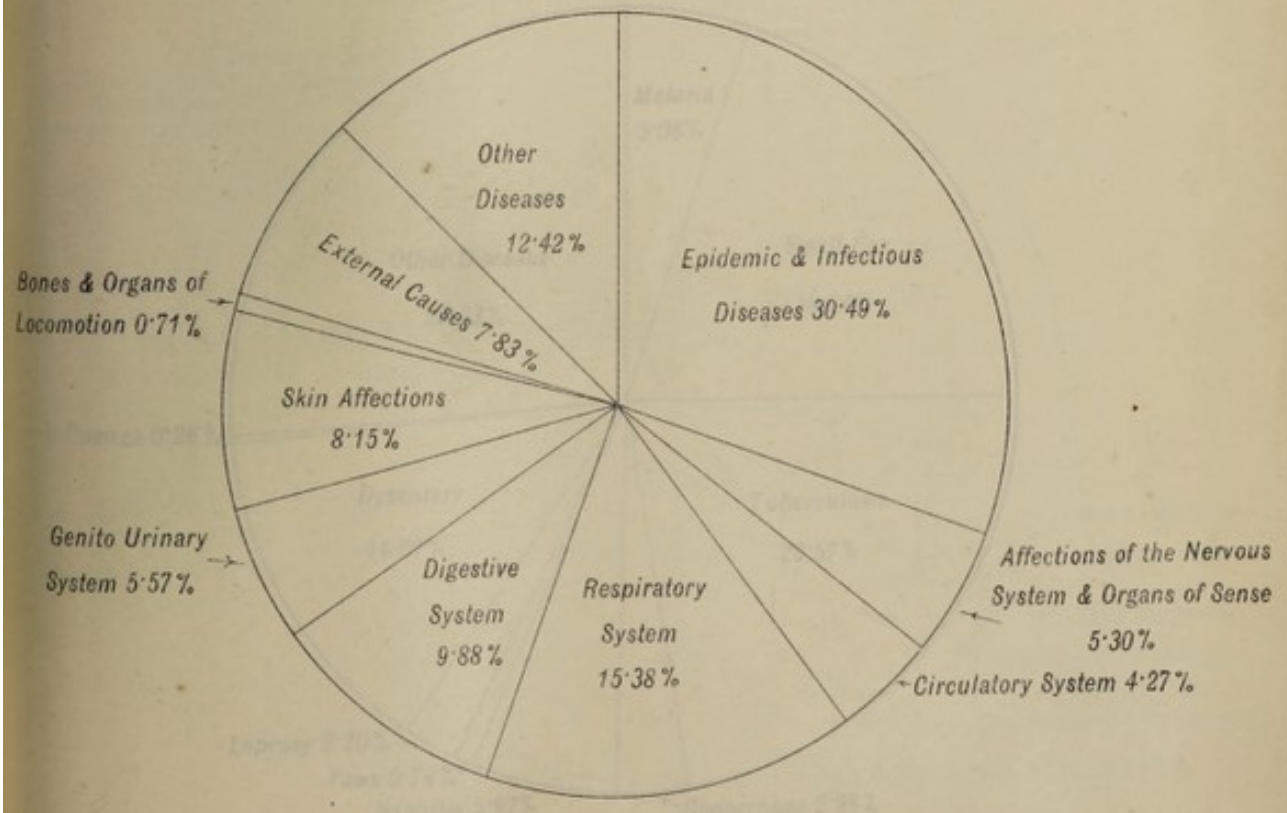
Year.	Total Births.	Birth Rate.	Total Deaths.	Death Rate.	Infant Mortality.
1909	2,576	42·4	2,259	32·7	315
1919	2,517	30·2	2,256	27·0	296
1927	3,305	28·9	2,312	20·2	174·9
1928	3,330	28·1	2,439	20·5	138·1
1929	3,451	28·2	2,141	17·5	134·1
1930	3,494	28·6	2,016	16·5	129·07
1931	3,451	24·6	1,776	12·6	111·8
1932	3,863	27·5	1,819	12·9	101·7

Mention has been made of the progress which certain Native Administrations are making in recording figures of births and deaths. Figures so obtained must be regarded as inaccurate, both birth and death rate being probably too low, but as these crude figures may be of interest later a few may be quoted :—

GENERAL SYSTEMIC & PREVENTABLE
DISEASES
TREATED IN GOVERNMENT INSTITUTIONS
TOTAL CASES 590,016
1932



TOTAL DEATHS 2,529



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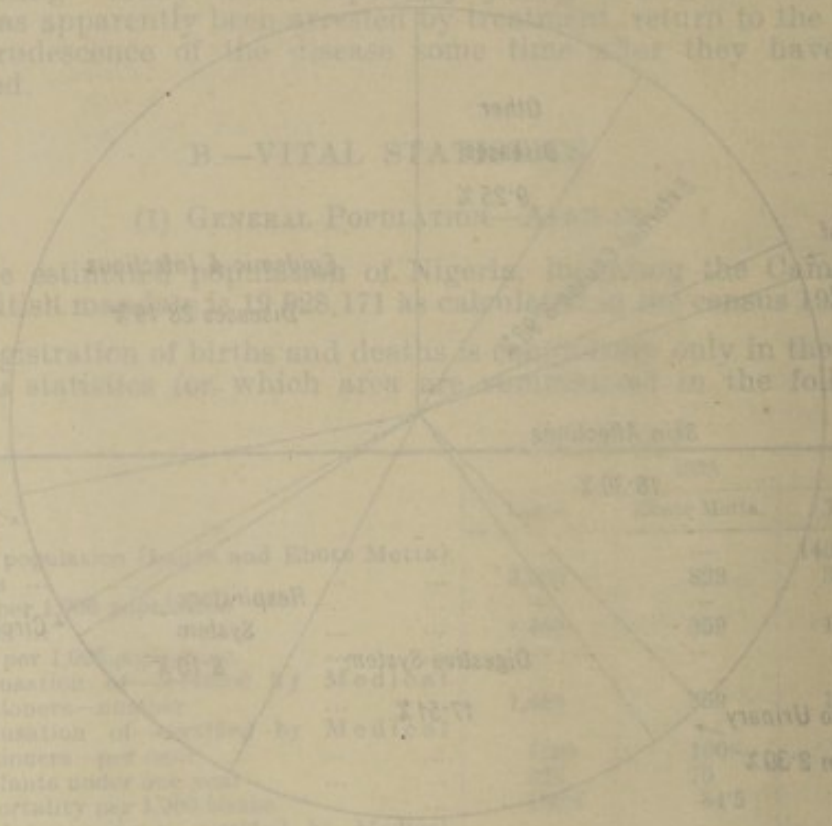
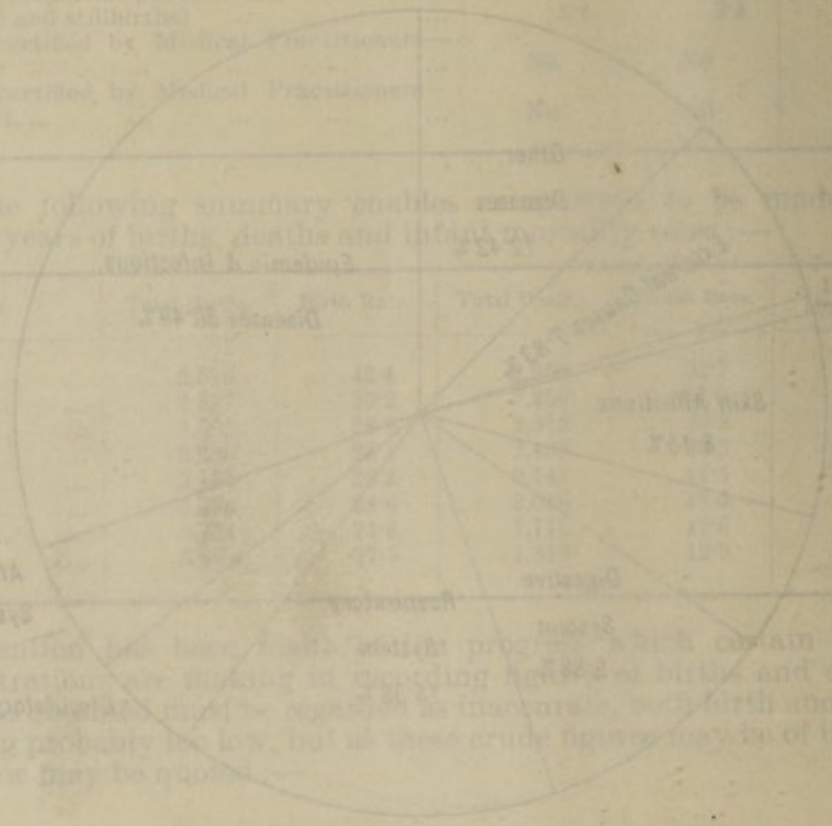
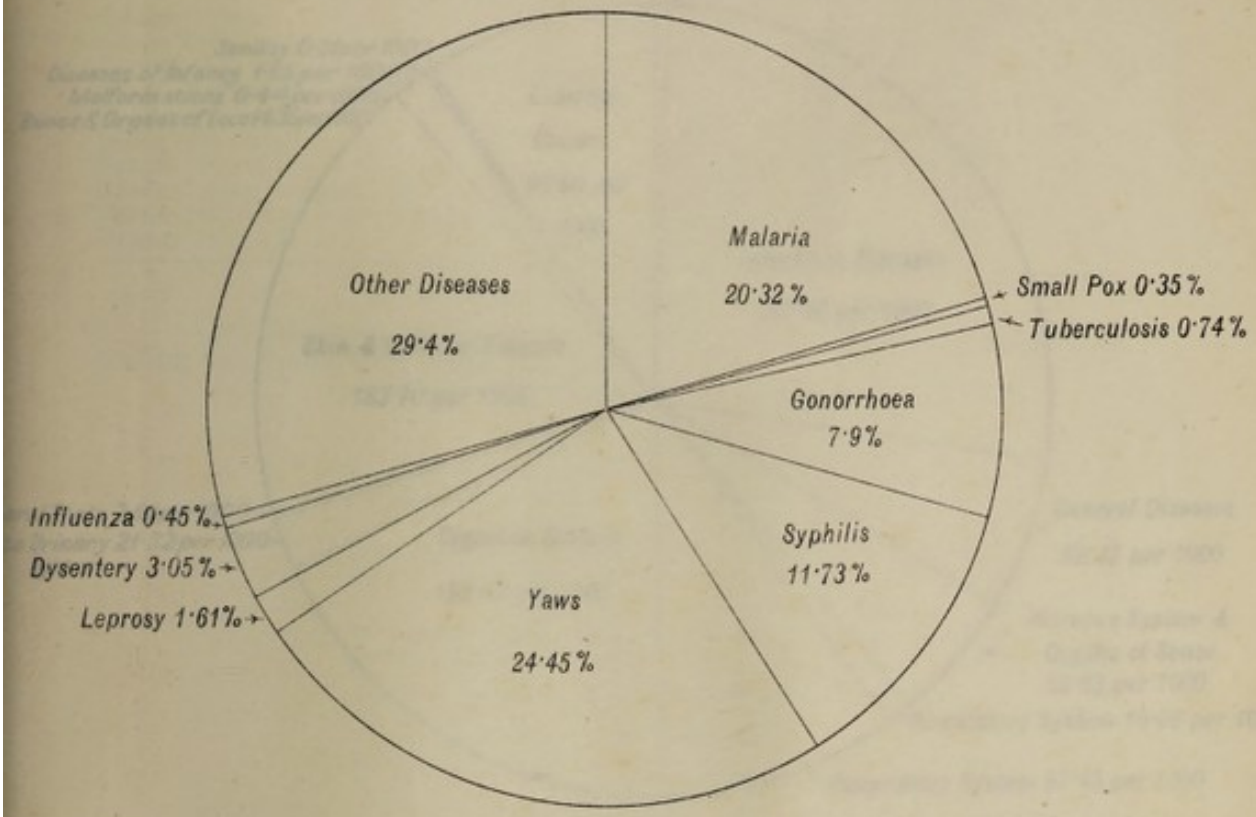
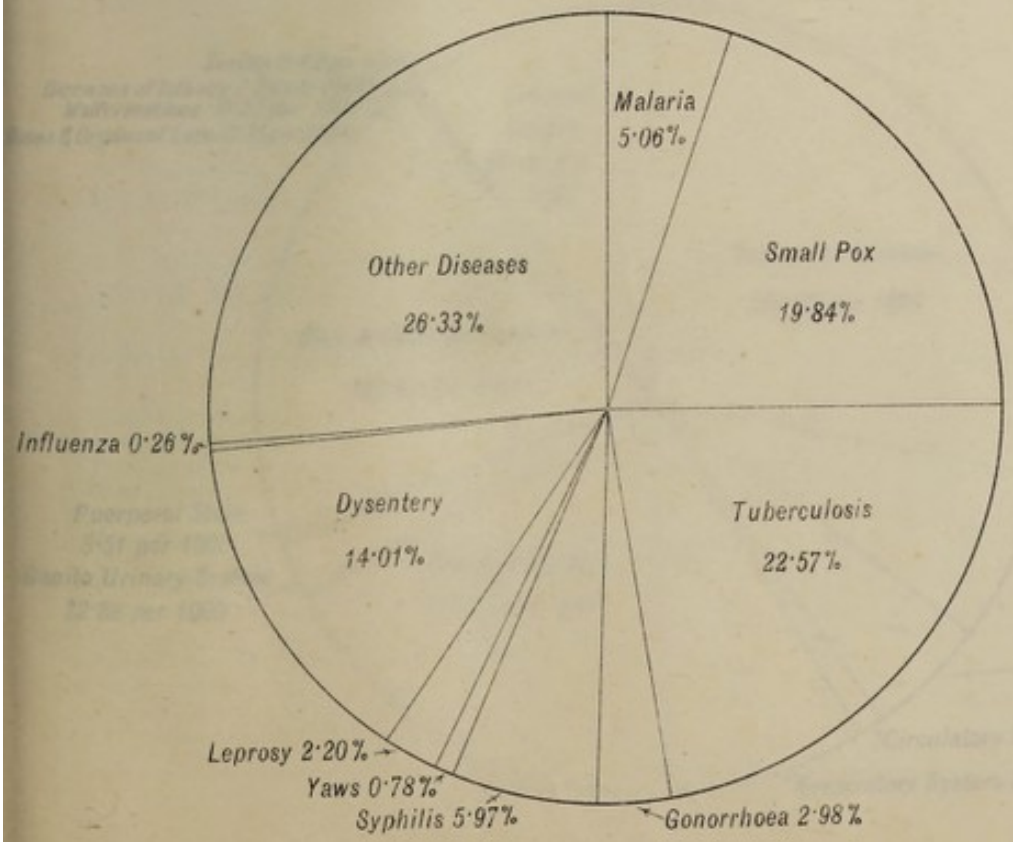




INFECTIVE DISEASES
TREATED IN GOVERNMENT INSTITUTIONS
TOTAL CASES 166,341
1932



TOTAL DEATHS 771



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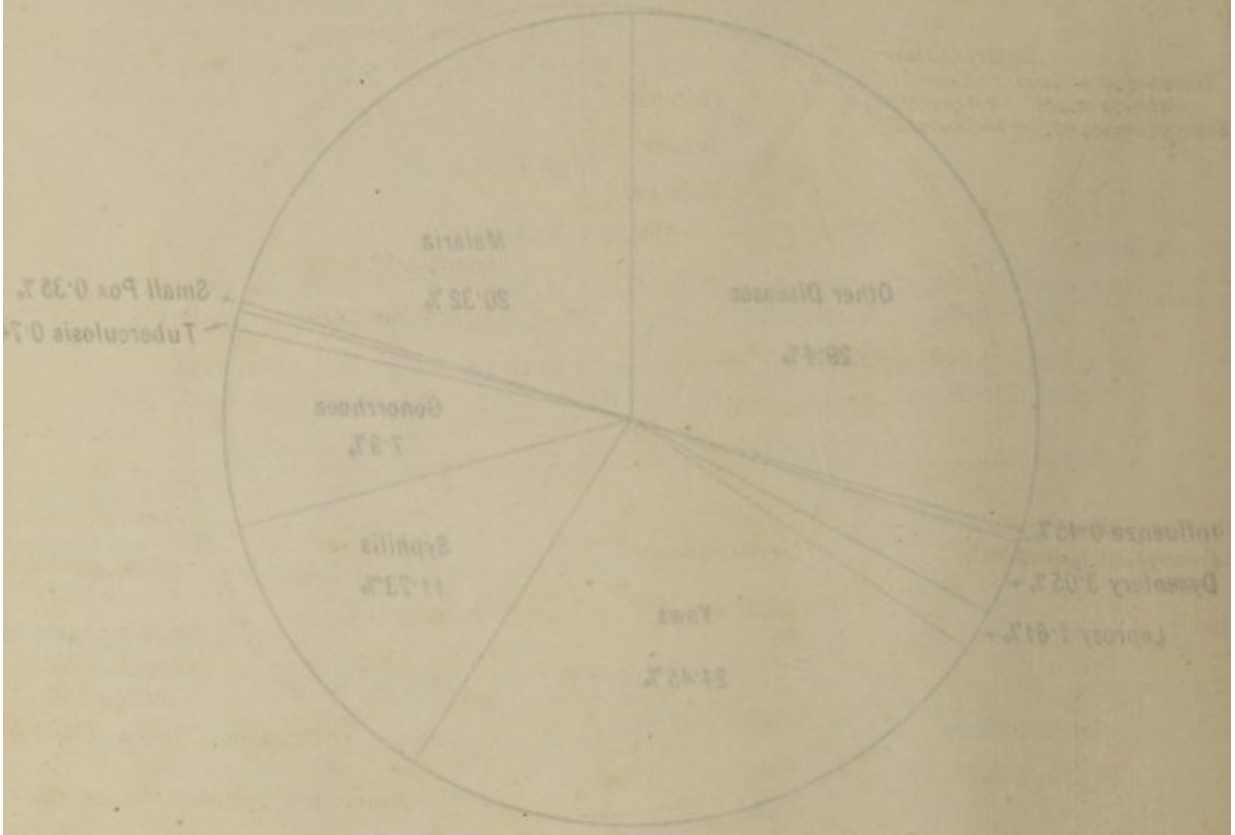
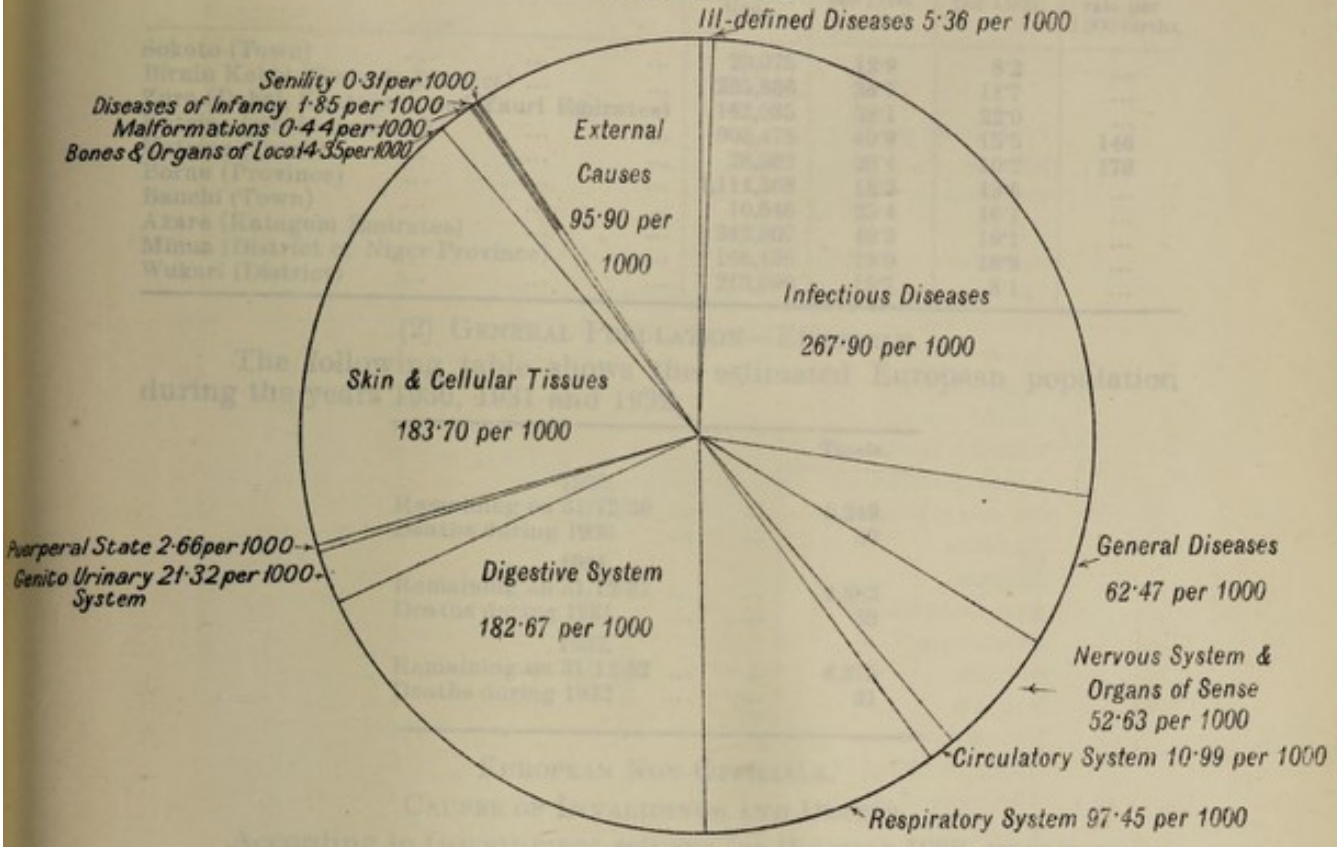
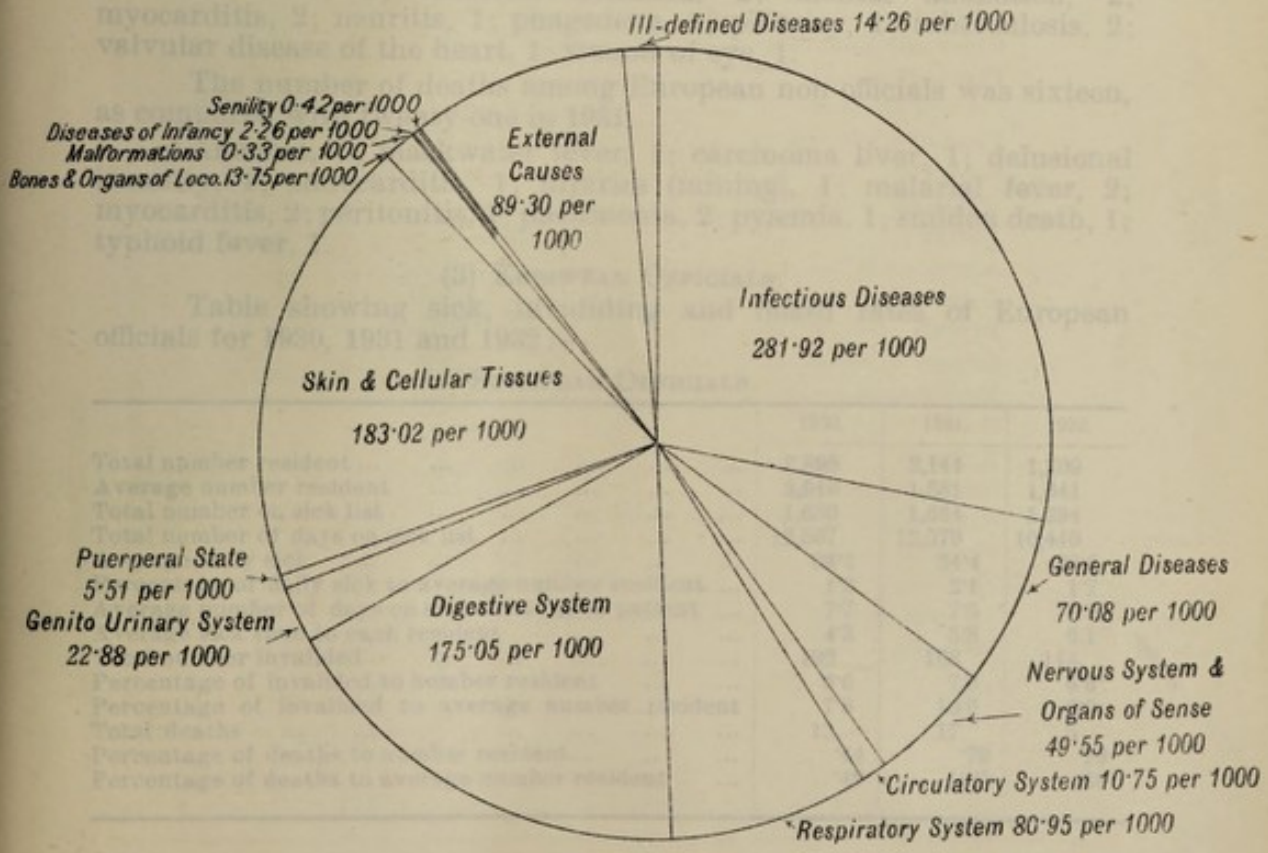


TOTAL DEATHS 771

COMPARATIVE DIAGRAMS
OF
DISEASE GROUPS
TREATED IN GOVERNMENT INSTITUTIONS
1931 & 1932



1931



1932

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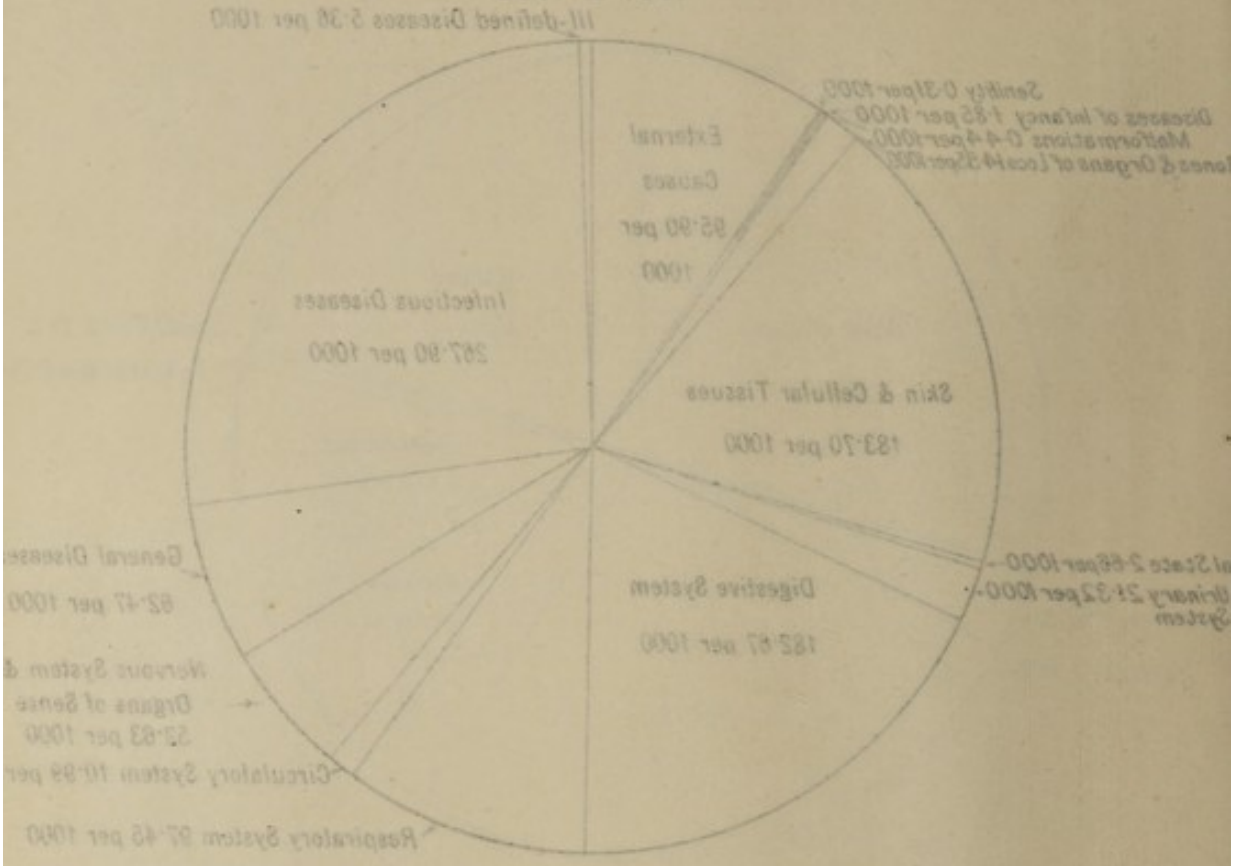
COMPARATIVE DIAGRAMS

OF

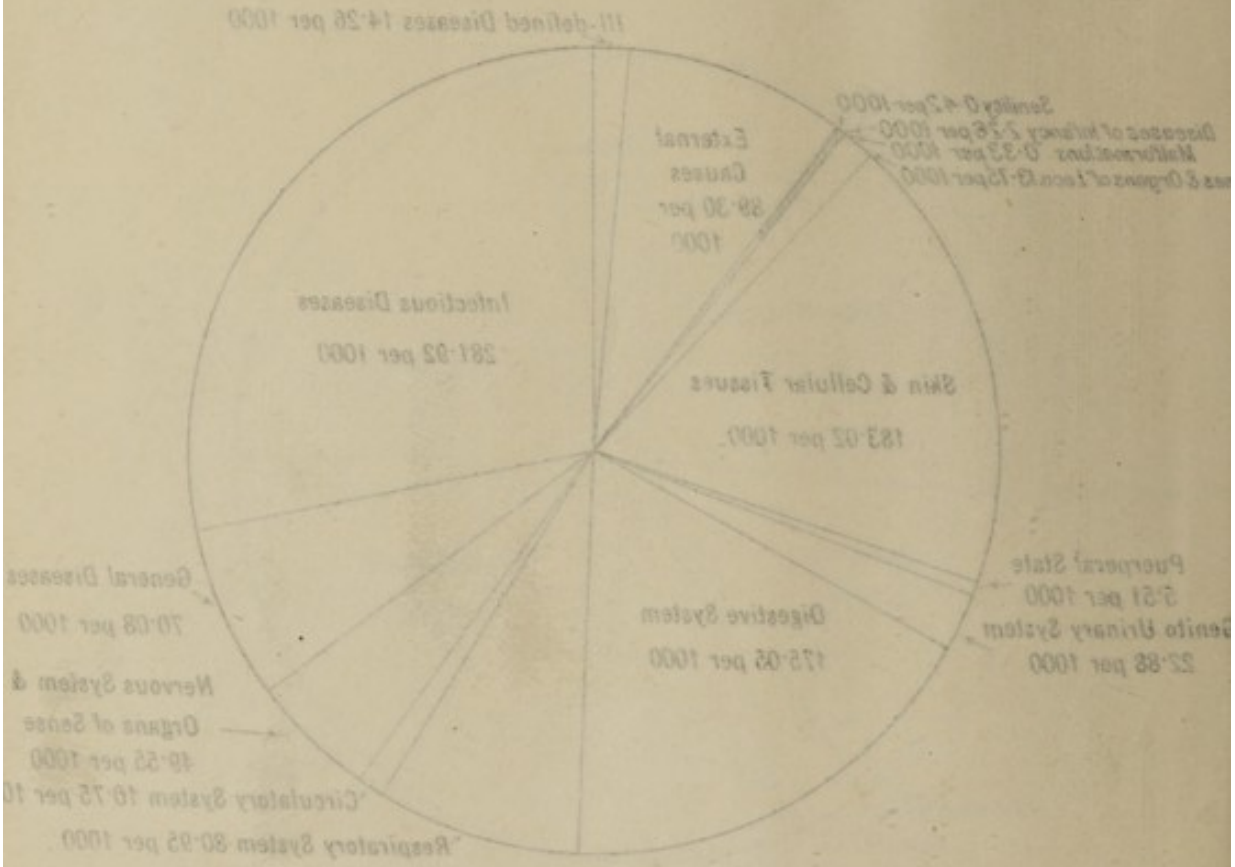
DISEASE GROUPS

TREATED IN GOVERNMENT INSTITUTIONS

1931 & 1932



1931



1932

Drawn & Reproduced by Nigeria Survey, Lagos, 19

District.	Estimated Population.	Birth rate per 1,000.	Death rate per 1,000.	Infant Mortality rate per 1,000 births.
Sokoto (Town)	20,075	12·9	8·2	...
Birnin Kebbi (Gwandu District)	285,886	36·7	11·7	...
Zuru (Dabai, Kontagora and Yauri Emirates)	162,035	38·1	22·0	...
Katsina (whole Emirate)	905,475	40·9	15·5	146
Katsina (Town)	28,362	20·4	10·2	178
Bornu (Province)	1,114,368	18·2	13·6	...
Bauchi (Town)	10,646	25·4	16·1	...
Azare (Katagum Emirates)	342,807	40·3	19·1	...
Minna (District of Niger Province) ...	166,436	19·9	18·9	...
Wukari (District)	213,099	15·7	8·1	...

(2) General Population—European.

The following table shows the estimated European population during the years 1930, 1931 and 1932.

	Totals.
1930.	
Remaining on 31/12/30	8,249
Deaths during 1930	30
1931.	
Remaining on 31/12/31	4,882
Deaths during 1931	38
1932.	
Remaining on 31/12/32	4,375
Deaths during 1932	21

European Non-Officials.

Causes of Invalidings and Deaths.

According to Government returns for the year 1932, twenty-seven European non-officials were invalided, as compared with fifty-nine in 1931 :—

Acute rheumatism, 1; anæmia, 3; appendicitis, 2; arthritis, 1; chronic dyspepsia, 1; concussion, 1; ectopic gestation, 1; fibroid, 1; malarial fever, 3; malarial cachexia, 2; mental alienation, 2; myocarditis, 2; neuritis, 1; phagedena, 1; pleurisy, 1; tuberculosis, 2; valvular disease of the heart, 1; wound of eye, 1.

The number of deaths among European non-officials was sixteen, as compared with twenty-one in 1931.

Anæmia, 1; blackwater fever, 1; carcinoma liver, 1; delusional insanity, 1; endocarditis, 1; injuries (mining), 1; malarial fever, 2; myocarditis, 2; peritonitis, 1; pneumonia, 2; pyæmia, 1; sudden death, 1; typhoid fever, 1.

(3) European Officials.

Table showing sick, invaliding and death rates of European officials for 1930, 1931 and 1932 :—

European Officials.

	1930.	1931.	1932.
Total number resident	2,895	2,144	1,709
Average number resident	2,649	1,581	1,641
Total number on sick list	1,630	1,664	1,294
Total number of days on sick list	12,567	12,579	10,440
Average daily sick	34·4	34·4	28·6
Percentage of daily sick to average number resident ...	1·2	2·1	1·7
Average number of days on sick list to each patient ...	7·7	7·5	8·06
Average sick time to each resident	4·3	5·8	6.1
Total number invalided	192	168	114
Percentage of invalided to number resident	6·6	7·8	6·6
Percentage of invalided to average number resident	7·8	10·6	6·9
Total deaths	13	17	5
Percentage of deaths to number resident...	·44	·79	·29
Percentage of deaths to average number resident ...	·49	1·07	·30

Invalidings and Deaths—European Officials.

Disease.	Invalidings.	Deaths.
Typhoid fever	1	—
Malaria	9	1
Blackwater	3	—
Diphtheria	1	—
Dysentery (amœbic)	2	—
Trypanosomiasis	2	—
Tuberculosis	2	—
Gonorrhœa	1	—
Cancer of liver	1	—
Cancer of lung	1	—
Tumours (unclassified)	2	—
Acute rheumatism	1	—
Chronic rheumatism	1	—
Diabetes	1	—
Anæmia	7	—
Auto-intoxication	1	—
Hemiplegia	1	—
Sciatica	1	—
Neuritis	1	—
Neurasthenia	17	—
Other affections of eye	5	—
Affections of ear	2	—
Myocarditis	1	1
Valvular disease heart	1	—
Diseases of arteries	2	—
Thrombosis	—	1
Chronic bronchitis	1	—
Lobar pneumonia	—	1
Asthma	2	—
Other affections lung	1	—
Pharyngitis	1	—
Ulcer of stomach	1	—
Ulcer of duodenum	1	—
Gastritis	4	—
Dyspepsia	3	—
Enteritis	2	—
Appendicitis	3	—
Hepatitis	1	—
Pyelitis	2	—
Urinary calculus	1	—
Epididymitis	1	—
Boils	2	—
Arthritis	2	—
Suicide by firearms	—	1
Over fatigue	2	—
Fracture	4	—
Asthenia	8	—
Tropical debility	4	—
Insomnia	1	—
Total	114	5

Recapitulation by Completed Months of Service.

Leave conditions.	Under 6 months.	Under 9 months.	Under 12 months.	Under 15 months.	Under 18 months.	Over 18 months.	Total.
New	9	6	6	40	47	—	108
Old	2	3	1	—	—	—	6
Total	11	9	7	40	47	—	114

Strength of officers under new leave conditions 1,563
" " " " old " " 146

(4) Summary of the Causes of Invalidings and Deaths of African Officials, 1932.

	Invalidings.	Deaths.
Acute gastritis	—	1
Acute rheumatism	—	1
Aneurism of the aorta	1	—
Angina pectoris	1	1
Arterio-sclerosis	2	—
Cardiac failure	1	1
Cellulitis	—	1
Cerebral hæmorrhage	1	—
Cerebral embolism	—	2
Cerebral softening	—	1
Choroiditis	1	—
Choroido-retinitis	1	—
Chronic hepatitis	1	—
Chronic jaundice	—	1
Defective vision	3	—
Delusional insanity	1	—
Diabetes	—	2
Enteric fever	—	1
Fracture of pelvis	—	1
Gangrene of lungs	—	1
General debility	1	—
General peritonitis	—	1
Myocardial degeneration	2	—
Meningitis	—	2
Gangrenous cellulitis of scrotum	—	1
Leukemia	1	—
Nephritis	—	1
Optic atrophy	4	—
Optic neuritis	1	—
Optic atrophy and retinitis	1	—
Organic disease of the nervous system ...	1	—
Paranoia	2	—
Partial paralysis of the right hand ...	1	—
Pericarditis	—	1
Pneumonia	—	7
Paraplegia	1	—
Strangulated hernia	—	1
Tetanus	—	1
Tuberculosis of the lungs	5	4
Traumatic neurasthenia	1	—
Valvular disease of the heart	1	—
Total	35	33

(5) Soldiers—Nigeria Regiment—R.W.A.F.F.

Average daily strength	3,064
Total number on sick list	5,326
Total number of days on sick list ...	41,336
Average daily sick	112.7
Total number of deaths	16
Death rate per thousand	5.2
Number invalided during the year ...	95

During 1931, the number invalided was sixty-nine, the number of deaths was thirty-three, and the death rate per 1,000 was 10.2.

(6) Police Force—Nigeria.

Average daily strength	3,611
Total number on sick list	2,729
Total number of days on sick list ...	16,346
Average daily sick	44.66
Total number of deaths	35
Death rate per thousand	9.6
Total number invalided	30

During 1931, the number invalided during the year was twenty-five, the number of deaths was seventeen, and the death rate per thousand was 4.6.

(7) Statistical Tables.

As in the report for 1931 the following statistical tables, numbered according to the type scheme submitted by the department of Bio-statistics of the London School of Hygiene, are rendered in so far as information is available :—

TABLES IV and *V*.

Births and Birth Rates and Stillbirths.

Estimated Population.	Province or District.	
	Whole of Nigeria.	Lagos Area including Ebute Metta.
Europeans and whites	5,442	1,209
Other non-natives and Africans ...	19,922,729	140,000
Live Births.		
Europeans and Whites:—		
Male	16	2
Female	9	4
Total	25	6
Rate per 1,000 population	4·6	5·0
Other Non-Natives and Africans:		
Male	—	1,990
Female	—	1,873
Total	—	3,863
Rate per 1,000 population	—	27·6
Stillbirths.		
Other Non-Natives and Africans:—		
Male	—	89
Female	—	47
Total	—	136
Rate per 1,000 population	—	·971

TABLE VII.

Deaths and Death Rates.

Deaths.	Province or District.			
	Whole of Nigeria including Lagos Area.	Southern Provinces.	Northern Provinces.	Lagos Area including Ebute Metta.
(Population)	5,442	2,408	1,825	1,209
Europeans and Whites:—				
Male	22	7	6	9
Female	5	2	2	1
Total	27	9	8	10
Crude rate per 1,000 living ...	4·96	3·73	4·3	8·2
Other Non-Natives and Africans:—				
Male	—	—	—	1,032
Female	—	—	—	787
Total	—	—	—	1,819
Crude rate per 1,000 living ...	—	—	—	13

TABLE IX.

CAUSES OF DEATH BY SEX AND AGE-PERIODS.

Other non-Natives and Africans, Lagos Area including Ebute Metta—Year 1932.

Ages at Death.	All Causes.		Specific Causes of Death.													
			Enteric Group.		Malaria.		Desentery.		Tuberculosis of Respiratory System.		Other Tuberculous diseases.		Cancer, Malignant diseases.		Pneumonia, all forms.	
	Male.	Female.	Male.	Female.	Male.	Female.	Male.	Female.	Male.	Female.	Male.	Female.	Male.	Female.	Male.	Female.
All ages* ...	1,032	787	...	1	34	27	17	12	80	50	28	20	10	17	136	87
0–1 ...	230	163	...	...	10	17	...	1	...	...	...	...	...	...	38	23
1–5 ...	102	87	...	...	21	8	1	2	1	1	2	5	...	...	20	25
5–10 ...	29	28	...	...	2	1	1	...	...	3	4	2	...	...	3	6
10–15 ...	21	16	...	...	...	...	...	...	1	2	2	1	...	...	2	2
15–25 ...	82	69	...	...	1	...	...	1	19	11	4	3	...	...	16	11
25–35 ...	144	79	...	1	...	...	8	2	29	14	5	5	1	1	16	9
35–45 ...	143	56	...	...	...	...	4	1	17	12	4	1	2	4	21	5
45–55 ...	85	40	...	...	...	...	3	...	4	2	5	...	1	1	13	3
55–65 ..	51	40	...	...	...	...	...	4	7	3	1	1	3	4	5	1
65–75 ...	71	72	...	...	...	...	...	1	1	2	1	1	3	5	2	2
75 and over	74	137	...	...	...	1	...	...	1	...	...	1	...	2	...	...

*=Total.

TABLE X.

SEASONAL INCIDENCE OF MORTALITY DEATHS—YEAR 1932.

	DEATHS.					
	EUROPEANS AND WHITES (Whole of Nigeria).			OTHER NON-NATIVES AND AFRICANS (Lagos including Ebute Metta).		
	Male.	Female.	Total.	Male.	Female.	Total.
January...	2	...	2	83	62	145
February	4	...	4	93	62	155
March	1	1	2	79	55	134
April	4	...	4	75	76	151
May	3	...	3	89	69	158
June	2	...	2	95	53	148
July	2	...	2	100	69	169
August	...	1	1	92	75	167
September	...	...	...	77	67	144
October	1	3	4	87	63	150
November	1	...	1	77	69	146
December	2	...	2	85	67	152
Total	22	5	27	1,032	787	1,819

III.—HYGIENE AND SANITATION.

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

I.—PREVENTIVE MEASURES.

(i) Mosquito and insect-borne diseases.

Malaria.—General anti-malaria work has been carried out in all stations by the various Medical and Health Officers and by the more organised Native Administrations on the advice of Health Officers. In the smaller stations this does not usually amount to more than the treatment of active cases, quinine prophylaxis, and oiling of known breeding areas, but in many of the larger towns extensive swamp drainage, reclamation, levelling and bush clearing have been carried out.

In Kaduna fifteen miles of stream and water-courses were cleared and canalised; three miles of new drains were dug, and about 2¼ square miles of swampy ground were drained and the existing dykes filled in. Drip barrels were erected in suitable places and a considerable amount of anti-larval work was done with fuel oil and paris green. Enormous borrow pits from which mud has been taken to build the thick-walled houses, are one of the features of the towns of the Northern Provinces. They are a potent source of mosquito breeding, though probably more often of *Mansonioides* than of any species of *Anopheles*. The filling in of borrow pits has made considerable progress at Kano, Zaria, Gusau, Makurdi, Bauchi and Lokoja. At Ibadan, Abeokuta, Enugu, and Port Harcourt ditching and regular oiling have been maintained and the schemes already in progress have been further extended.

In Onitsha township and its environs, where the problem of mosquito control is one of exceptional difficulty, an extensive drainage scheme involving the construction of four miles of ditching in the Nkesi valley alone, in addition to the reduction of the water level in the Otomoye swamp, which is half a mile long, and measures directed towards the obliteration of other smaller mosquito-producing areas, has been initiated by Dr. Drysdale Anderson, Medical Officer of Health, and it is anticipated that the present programme will be completed by June.

1933. Side by side with drainage, planting of sarcocephalous trees around seepage areas in the Nkesi valley has been introduced and nurseries of young trees of this group have been established in the area. Already a considerable reduction in the numbers of *A. costalis* and *A. funestus*, the principal malaria vectors in the district, has been effected.

A new scheme for extensive swamp drainage is also being put into operation at Itu, a town on the Cross River, where the existing difficulties of mosquito control are considerable.

In Lagos sixty-three deaths, 3.4 per cent. of all deaths in the township in 1932, were attributed to malaria. The Medical Officer of Health reports that there were heavy mosquito infestations, mostly culicine, in Lagos Island and Ikoyi during the second quarter of the year. Numerous foci were found in tree-holes in the inhabited areas as well as in neighbouring bush. A mixture of tar with a small proportion of cement is now being experimented with for filling up tree-holes.

A swampy area near the Victoria Beach road has been partially reclaimed by filling with fresh refuse and covering with sand. A heavy anopheline infestation in Ikoyi early in November due to the seasonal rise of the lagoon submerging the ditches and causing a good deal of flooding was speedily controlled by one generous application of crude oil.

Twelve thousand one hundred and eighty-five gallons of fuel oil and eighteen hundredweight of paris green were used in larvicidal work during the year. 1,012 wells were stocked with larva-eating fish.

Trypanosomiasis.—This disease is seldom reported in the Southern Provinces except in part of the Victoria division of the Cameroons Province. Recent extensive clearing for banana cultivation together with the systematic treatment of all known cases appears to have caused a diminution in the incidence of sleeping sickness in the Tiko area. Thus in two plantations employing over 900 labourers only six cases were reported in 1932 as compared with seventeen in the previous year. There does, however, appear to have been an extension of the disease in the Bimbia area, close to the town of Victoria, where one European case occurred and seventy-two African patients were treated. At Buea hospital and Tiko dispensary 104 cases received treatment and eleven cases were treated at Mamfe.

The very important problem of sleeping sickness in the Northern Provinces is fully dealt with elsewhere in the report of the tsetse investigation.

Yellow Fever.—The only case of yellow fever reported in Nigeria during the year was an African, native of Ibadan, living at Ikirun, who was treated at Oshogbo hospital in February and recovered. Later reports threw doubt on the diagnosis.

There were suspected cases in various places, but none of them was confirmed. One such case at Jos proved to be tetraform poisoning. Two African soldiers of the Royal West African Frontier Force died at Kaduna in September with symptoms which were strongly suggestive of yellow fever, but the post-mortem findings definitely negatived this diagnosis. At Mamfe in the Cameroons Province there were several African cases with symptoms suggestive of yellow fever, but these have not been confirmed. In all stations anti-ædes measures have been steadily continued. In Mamfe, where two fatal European cases occurred in 1931, extensive clearing has been carried out and rehousing of the African population has been completed.

The common practice of siting rest-houses in or in close proximity to villages exposes European officers, always highly susceptible, to serious risk of contracting yellow fever. It is strongly recommended that wherever possible rest-houses shall be at least a quarter of a mile from villages and preferably on the windward side.

Considerable stress has rightly been laid by various authorities on the importance of pipe-borne water supplies in the eradication of yellow fever. Much progress in this respect has been made in Nigeria during the last few years, though Ibadan is still a notable omission. It is to be regretted that in a number of places water from piped supplies is sold to the public. This inevitably leads to the use of water from undesirable sources and to the very domestic storage which it is desired to avoid. It is much to be hoped that this retailing of water will be replaced wherever possible by water rates.

The International Sanitary Convention for Aerial Navigation was considered at a conference of health officers at Cape Town convened by the League of Nations Health Organisation. It was agreed that the African Governments represented should be advised to ratify the Convention. By the terms of this Convention the whole of Nigeria will automatically come into the category of a territory in which yellow fever exists endemically, and in accordance with Article 36 it will be necessary for the Government to establish or compel aerial navigation companies to establish anti-amaryl aerodromes before any international air line can be permitted to pass through the country.

The Director of the West African Yellow Fever Commission has kindly given permission for the publication of the following summary of the work of the Commission during the year :—

The yellow fever protection test surveys which were begun in Nigeria in 1929 were continued on an increasing scale. 2,429 specimens from many towns and villages in Nigeria were tested during the year.

In South-western Nigeria numerous additional towns were included in the survey and the work was greatly intensified in some of those previously studied. A number of small towns near the border of Dahomey were studied in order to determine whether evidence could be elicited indicating a western limit to the endemic area of this part. The high percentages of positives in both children and adults suggest recent and possibly repeated epidemics in these towns rather than the continued presence of the disease.

Findings in Ibadan differed radically from those in Ilorin, Ogbomosho and Oyo. The percentage of positives in Ibadan increases with the age of donors from ten per cent. for those of five years or less to thirty-eight per cent. for those from five to ten years, and gradually increases to eighty per cent. for persons over forty years. In each of the other towns, on the other hand, the percentage remains very low, ten per cent. or under for persons up to and including fourteen years, when it rises suddenly in two and a little later in the third and reaches a maximum (up to 100 per cent.) in persons up to twenty-five or thirty years. Such findings, so similar in the three towns, can be explained only on the basis of one or several extensive and severe epidemics which were evidently present in that area from fifteen to twenty years ago. Ilorin, Ogbomosho, and Oyo have populations respectively of 80,000, 100,000 and 40,000; they are in close communication with one another and with the other towns of the region and all have a high index of stegomyia breeding. On the assumption that south-western Nigeria constitutes a vast endemic area, it is difficult to explain why such a large majority of the children escaped infection for fifteen years or longer, making such epidemics as undoubtedly occurred, possible. The findings rather support the view that " the nucleus of the endemic region is restricted to rather narrow limits and that relatively few of the cities in the area can independently maintain the infection permanently as seems to be the case in Ibadan ". Further intensive work is being carried out in these towns to confirm the foregoing observations.

In the Northern Provinces additional testing has confirmed the view, formed on the basis of a limited amount of work in the previous year, that yellow fever had permeated widely throughout the entire

north and that it had involved most of the larger cities and many of the smaller towns. The percentage of positives in children in the majority of towns in the north was decidedly low. Four towns—Sokoto, Yola, Potiskum and Katsina—were entirely negative, while one or two positive specimens in twenty-five were characteristic of many other villages and even large cities such as Kano and Zaria. This would indicate that as a rule infection when introduced into a town is not well maintained and endemicity is probably absent in the region.

Test on the sera of old European Residents.—A test of great interest was carried out on the sera of twenty-eight Europeans who had resided in different colonies of West Africa, but mainly in Nigeria, for an average of seventeen and a total of over 400 years. Lagos was represented by sixteen donors who resided there for over 116 years, and Ibadan by thirteen who lived there for more than eighty years. Residence in many other places was for much shorter periods of time. Quite a number of donors had had considerable contact with yellow fever cases but none of them reported a past illness suggestive of this disease. One Roman Catholic sister had been in Africa for twenty-four years and had nursed a number of fatal cases, and two physicians were included who had treated many cases of yellow fever. Another donor had on several occasions lived in houses where persons died of the disease, and others in towns where epidemics occurred. Under the circumstances, it was surprising to find that none of the sera showed protective properties. Freedom of these old residents from yellow fever infection is probably in part due to the fact that Europeans in West Africa live as a rule in reservation areas. However, this was not invariably true for some of the donors in this test and especially the Roman Catholic sisters resided in the African sections of their towns. The results are of interest in negativing for West Africa at least the belief held by epidemiologists of the western hemisphere that ten years' residence in endemic areas renders one immune to yellow fever as it is believed that no one can escape the infection for this period of time.

Further evidence of the specific character of the protection test is afforded by the results of the examination of the sera of a series of persons residing in Greece who had recently recovered from severe attacks of dengue fever contracted during the extensive epidemics of previous years. Of twenty-two specimens examined twenty-one were completely negative and one gave an inconclusive result.

An intensive mosquito survey in the towns of Lagos, Ibadan, Zaria and Kano, together with longevity experiments with *Aedes ægypti*, was completed during the year and will shortly be published.

Filariasis. *Loa loa* infection is extremely prevalent in parts of the southern divisions of the Cameroons Province, where *Chrysops* is found in large numbers throughout the greater part of the year. Practically every European stationed at Kumba for any length of time develops "Calabar swellings."

Chigoes.—It was reported in August by the District Officer, Jos, that chigoe infestation was very prevalent in certain villages of this division of the Plateau Province. Investigation by the Medical Officer of Health showed that in the affected area practically every household was infested and that very severe ulceration had resulted in many cases. Later information showed that a number of mining camps and other pagan villages were also badly infested. It is believed that until three years ago chigoes were of rare occurrence on the Bauchi-Plateau and the general opinion is that the opening of the Eastern Railway with the influx of natives from the Southern Provinces to the minesfield was the chief cause of their introduction. Itinerant Hausa traders were probably responsible for the subsequent spread and it is significant that Hausa settlements are invariably infested before the neighbouring pagan villages. Extensive ulceration and crippling occurred in many cases,

women and children being affected more than adult males, and the very old and very young suffering most of all. A few deaths occurred as the result of septic infection. As examples of severe degrees of infestation, one boy had 1,900 chigoes removed, another 500, and a third 300.

The principal causes of the present conditions are the very poor sanitary state of the pagan villages and the unwillingness of these primitive people to follow advice.

When the pagans learned that treatment could be obtained in Jos they came forward in such large numbers that the Infectious Diseases Hospital had to be opened to accommodate them. Between August and the end of the year about 1,000 persons received treatment for ulcers, and the greatest number in the camp at one time was about 300.

In November the Chamber of Mines asked for advice on the treatment of chigoes and one mining camp at Ropp treated 1,138 persons.

The measures recommended in the pagan villages were :—

(i) Daily sweeping of houses and compounds and collection of all refuse and burning.

(ii) Removal of chigoes and their destruction.

(iii) Early treatment of ulcer cases.

It is believed that the measures adopted in the area most seriously infested have proved adequate, and reliance must be placed on the gradual education of the people to deal with the chigoes themselves.

Relapsing Fever.—A few sporadic cases occurred in the Northern Provinces but no outbreak was reported.

(*ii*) *Epidemic Diseases.*

Plague.—It is satisfactory to report, for the first time since 1923, that no case of human plague or rat infection was notified in Nigeria during the year, but measures directed towards early detection and rat control have been in no way relaxed and an organisation exists which could be speedily expanded to meet any emergency.

The subjoined table gives details of rodents caught in Lagos during the year :—

Rodents.	Black.	Brown.	Bush.	Shrew.	Total Rats.	Mice.
Caught	37,449	2,438	998	2,533	43,418	33,842
Found dead	2,859	67	3	7	2,936	347
Total	40,308	2,505	1,001	2,540	46,354	34,189

Rodents.	Black.	Brown.	Bush.	Strew	Total Rats.	Mice.
Dissected	40,308	2,505	1,001	2,540	46,354	...
Females	24,547	1,487	518	...	...	...
Pregnant	3,253	131	79	...	...	...
Trapped on foreshore ...	3,971	390	88	429	4,878	2,346
Trapped on ships ...	380	6	...	11	397	10

Smears were taken from all the rodents dissected and no evidence of plague was detected.

Traffic inspection was discontinued at railway stations and the Yaba road post, but canoe inspection is still in force. Anti-plague scavenging, including deratting, was carried out on 8,965 premises. Rat destruction is carried out mainly by trapping, but cyanogas and

capex cartridges are also used when the conditions are suitable. It is improbable that the number of rats destroyed annually is sufficient to have any appreciable effect on the total rat population, but it does at least ensure that any plague infection would soon be detected; moreover, there is little doubt that the systematic deratting of houses and the action taken to get rid of rat holes and runs combined with the replacement of mud floors by concrete and other minor improvements is doing much to break the close association between the rat and man.

On the mainland the customary anti-plague measures were assiduously continued in the Ijebu and Abeokuta Provinces and in the towns of Ibadan and Port Harcourt. Outside Lagos, the anti-plague organisation is most complete in the Ijebu Province where in the principal towns registration of all deaths is compulsory. Wherever indicated, examination of bodies for evidence of plague infection is undertaken before burial is permitted, the number examined in this manner during 1932 being 6,475. The province is divided into thirty-eight rodent trapping areas, each incinerator keeper setting traps daily in his area, subsequent catches being sent by cycle messenger to Ijebu Ode or Shagamu for dissection. The subjoined table gives the number of rodents caught and examined in the various larger centres :—

Area.	Rodents caught.	Rodents examined.	Rodents plague infected.
Ijebu Ode	62,747	61,776	Nil.
Abeokuta	69,292	27,874	
Ibadan	11,417	8,277	
Port Harcourt	14,620	2,190	

Smallpox and Vaccination:

(*a*) *Southern Provinces.*—There were no really extensive outbreaks of smallpox in the Southern Provinces and in the Calabar and Owerri Provinces, where large epidemics occurred during 1929 and 1930, very few cases were reported. Early in the year there was an outbreak in Bamenda with seventy-one cases and sixteen deaths.

The principal ports have been comparatively free from the disease. In Lagos there were ten cases with three deaths. All these cases were unvaccinated.

At Calabar a series of cases imported from the hinterland resulted in the occurrence of the disease within the township and in a village just outside the boundary during the third quarter of the year. Although the outbreak never assumed epidemic proportions an extensive vaccination campaign was carried out in the town and its immediate environs, almost 22,000 vaccinations being performed.

The Medical Officer, Ijebu Ode, states that of the seventy cases which occurred in that province during the year a considerable number were traced to a case at Oru spread by Shopona (smallpox) worship.

Fines for Shopona worship in that area amounted to £93 and for concealment of cases to £42 10s. 0d.

There were notified altogether in the Southern Provinces 977 cases with 241 deaths.

Vaccination:

Number of vaccinations performed	537,245
Number inspected for results	392,555
Number successful	318,401
Percentage successful	81.1

(*b*) *Northern Provinces.*—There has been an unusually severe exacerbation of smallpox throughout the greater part of the Northern Provinces; Niger, Zaria, Kano, the mandated areas of Bornu and Adamawa, and Bauchi being the provinces principally affected and in that order. In parts of all these provinces it reached epidemic form. Bida Emirate was affected early in the year, the borders of Katsina and Zaria Emirates in the rains, the Northern division of Kano Province in August and again in November, Bornu and Adamawa at the beginning of the dry season.

This recrudescence differed from the one in 1926-27 in that it was in the villages and rural districts that the disease was most prevalent, the large towns being practically unaffected. As the percentage of vaccination in the people of the towns is still low it is difficult to attribute this immunity to vaccination alone, and it is more likely to be the effect of past epidemics. For example, a rough count at Jos indicated that approximately fifty-five per cent. of the population examined had already had smallpox.

In all the larger outbreaks a medical officer of health, medical officer or sanitary superintendent has been sent to investigate and take such action as was possible. Isolation of cases is almost universally impracticable in the Northern Provinces by reason of the absence of adequate staff and facilities and the temper of the people. Preventive measures have been mainly confined to vaccinations, which were carried out by vaccinators, sanitary inspectors and dispensary attendants, nearly all employees of the Native Administrations. These men have worked under the supervision of the medical officers, administrative officers, and district heads. It is useless to anticipate that smallpox will be brought under control in the Northern Provinces until, by a process of education, the Native Administrations have been brought to realise that the remedy is in their own hands.

The obvious remedy is, of course, compulsory infant vaccination and it is hoped that the Native Administrations will eventually be willing to introduce this measure. An endeavour will be made to begin this in Kano City in 1933. The attitude of the people towards vaccination is naturally greatly influenced by that of their rulers. An outstanding example was that of the Shehu of Bornu, who insisted on being vaccinated in spite of his advanced age and not very robust health.

Vaccination has been made compulsory in Gusau by the Sarkin Mussulmi of Sokoto. By the end of the year the outbreak had lessened but had not come to an end.

A total of 8,487 cases with 2,757 deaths was reported for the year.

172,675 vaccinations were performed; the proportion of successful results cannot be stated.

In the absence of a locally made vaccine lymph sufficiently stable for issue, lanolinated lymph supplied by the Lister Institute continued to be used throughout Nigeria and gave excellent results.

Dysentery.—Dysentery, usually amœbic, is found everywhere in Nigeria, but no outbreak of exceptional severity occurred during the year. An important group of cases with several fatalities was reported from Bamenda Prison during the first half of the year, but investigation showed that in the majority of cases the infection was a terminal feature in illness of other kinds, that it was amœbic in most instances, and that in all probability it had been acquired long prior to admission to gaol.

In institutions there is no doubt that the apparently healthy individual who is passing cysts has a good deal to do with the spread of the disease. In Mamfe prison stool examination of all inmates directly or indirectly concerned with food and water supplies was introduced

early in the year. It was found that approximately sixty per cent. of those to whom such duties are normally assigned were passing cysts of *Entamœba histolytica*. Treatment consisting of a course of twelve grains of emetin was administered in such cases and the incidence of the disease was in this manner limited. A medical inspection of cooks is usual in prisons and there can be little doubt that the systematic examination and treatment of all prisoners whose duties involve the preparation or handling of food or water is a great safeguard against the dissemination of diarrhœa, dysentery and the enteric group.

The following figures quoted by the Medical Officer of Health, Port Harcourt, show a satisfactory decrease in cases there, which is no doubt due, in some measure at least, to improved sanitary conditions.

Year.	Type.	Europeans.	Africans.
1929	Amœbic	7	112
	Bacillary	...	...
1930	Amœbic	10	180
	Bacillary	2	...
1931	Amœbic	...	36
	Bacillary	..	2
	Undefined	...	9
1932	Amœbic	...	...
	Bacillary	...	1
	Undefined	...	29

Enteric Fever.—Hospital returns show that in the whole country the enteric group was responsible for ten European cases with one death and thirty-two African cases with ten deaths. It does not therefore appear to be a disease of great importance in Nigeria. Investigation of a number of cases revealed little of help in establishing the source of infection.

Cerebro-Spinal Fever.—No case was reported in the Southern Provinces. An outbreak in the pagan area of Jen in the Adamawa Province with 146 cases and 113 deaths was investigated and dealt with by the Medical Officer, Yola. Sporadic cases to the number of thirteen were reported at various other places during the year.

Tuberculosis.—Except in Lagos exact information about the prevalence of tuberculosis is lacking, but it is clear from the hospital returns that in its pulmonary form it is a disease of great importance throughout Nigeria. The following table, prepared by the Medical Officer of Health, shows the deaths in Lagos certified as due to tuberculosis for the ten year period 1923-32.

Deaths certified as due to tuberculosis, 1923-32 :—

	Pulmonary tuberculosis.	Disseminated tuberculosis.	Tuberculosis of other organs.	Total.	Percentage of total deaths.
1923	71	4	7	82	3·2
1924	71	2	14	87	2·6
1925	77	7	3	87	3·1
1926	82	4	15	101	3·3
1927	99	27	13	139	5·9
1928	128	16	20	164	7·1
1929	136	7	16	159	7·4
1930	133	6	11	150	7·4
1931	131	28	18	177	9·8
1932	131	19	29	179	9·7

The chief hope for the future lies in the gradual improvement in housing conditions that is taking place in many parts of the country and in bringing home to the mass of the people by education and propaganda the practical measures necessary to prevent the spread of infection.

Rabies.—One fatal case diagnosed clinically in an African woman was reported from Opobo.

Canine rabies is by no means uncommon in Nigeria. Of twenty-three brains of dogs examined at the Medical Research Institute thirteen were reported to be positive from the following stations:—Lagos (4), Okigwi (2), Port Harcourt (2), Ilorin, Kaduna, Kumba, Umuahia, Zuru, one each.

Persons bitten by dogs suspected to be suffering from rabies are directed to the nearest hospital where there is a supply of ice for storage of vaccines and at the same time anti-rabic vaccine is forwarded from Lagos to the station in question. 4,140 c.c. of vaccine were issued in this way during the year.

The Dogs Ordinance, which applies in all townships, gives power to destroy diseased or stray dogs.

Anthrax.—At the end of April the Veterinary Department reported the occurrence of anthrax in cattle at Karim, Adamawa Province, and later outbreaks were notified at Ambursa, Sokoto Province, and Geidam, Bornu Province. These cases, though not the first to be diagnosed in Nigeria, probably constituted the first actual outbreak of the disease in the country. In connexion with the Karim outbreak it was reported that there had been several cases of illness amongst natives in the district subsequent to handling diseased meat. Later reports indicated that there had been twelve human cases with seven deaths, but bacteriological confirmation could not be obtained. A vaccine was prepared by the Veterinary Department and a memorandum on the diagnosis and prevention of anthrax was circulated widely to Government departments and native administrations.

(*iii*) Helminthic Diseases.

Dracontiasis.—With the aid of a grant from the Colonial Development Fund, research work on guinea-worm is being carried out by a Pathologist whose base is at the Tsetse Investigation Laboratory at Gadau. It was found that in the Gadau district wells with few exceptions appeared to be free from infection with cyclops, although it was discovered freely in pools. A well-sinking programme now being carried out in the Northern Provinces by the Geological Survey Department should have a very definite effect on the incidence of this very incapacitating disease.

Ascariasis.—The great prevalence of roundworm infections is indicated by the fact that out of 4,093 specimens of stools examined at the Pathological Laboratory of the African Hospital, Lagos, 2,334 or 57.1 per cent. contained ascaris ova. The remedy is to be found in the extension of improved methods of nightsoil disposal and in the inculcation of habits of cleanliness especially in the school children.

Schistosomiasis.—With the aid of a Colonial Development Fund grant a pathologist has been enabled to make a study, chiefly in the Zaria Province, of the incidence of urinary schistosomiasis. Of 4,574 males examined of an average age of 25.96 years, the presence of living ova of *S. hæmatobium* in the urine was demonstrated in thirty-two per cent. The excretion of ova has been found to increase rapidly up to about the age of fourteen and thereafter to fall quite sharply as age advances. The infection rate was found to vary from sixty-three per cent. at the age of fourteen to 12.5 per cent. at the age of fifty.

A snail of the genus *Bullinus* has been proved to be an intermediate host of *S. hæmatobium* in the Sokoto Province.

Urinary schistosomiasis was found to be common amongst the population of a village situated on Kumba Lake, about three miles from the Government station of Kumba. In view of the fact that this lake

serves as a water supply to the Government station and is used as a bathing place by the European residents the discovery of the infection gave rise to some apprehension. Snails resembling *Bullinus* were found in the area and of 175 examined furcocercous cercariæ were discovered in five. The infection, however, proved to be strictly localised to the village in question and, in view of the apparent absence of intermediate hosts elsewhere, the distance intervening between the affected area and the water intake and bathing place, and the enormous dilution afforded by a lake of this size and depth, the risk to the population of Kumba would appear to be negligible.

Tæniasis.—The large number of attendances for *Tænia saginata* infection at the native administration dispensaries in the Northern Provinces is an indication of the prevalence of this condition amongst the Hausa-speaking people, who eat a good deal of beef in a semi-raw state.

II.—General Measures of Sanitation.

(*a*) *Sewage Disposal*.—Lack of funds is delaying the introduction of water-carriage systems, but during the year a trough closet latrine and septic tank were installed in one of the colliery camps at Enugu and a similar type is to be adopted at Akure Hospital.

Throughout the country generally " salgas " (covered pits) are the commonest form of latrine, but in stations and townships the bucket system with disposal in deep fly-trapped pits is adopted wherever possible. The smoke-pit latrine is satisfactory if properly constructed and supervised; otherwise extensive fly-breeding takes place.

Bore-hole latrines will be tried next year where the conditions are suitable.

In view of the indefinite postponement of a comprehensive sewerage scheme for Lagos, efforts are being made to improve the present very unsatisfactory methods of nightsoil disposal. With the exception of a small number of private water-carriage installations the bucket system is practically universal in Lagos. Buckets are taken to two collecting depôts from which the nightsoil is removed by a sanitary tramway and tipped into the lagoon below the town from a dejection jetty.

A well-designed water carriage communal tank latrine of a type adopted in Colombo some time ago was erected near the lagoon in the Ebute-Ero quarter of Lagos by the Public Works Department and handed over to the Town Council. The tank extends under the whole latrine building, and is divided longitudinally into two separate tanks. The effluent is discharged into the lagoon. It is proposed to erect five similar public latrines in 1933 to replace the old bucket latrines, and also to construct a tipping dump connected to a disintegrator through which the nightsoil brought to the dump will be discharged into the lagoon by an outfall pipe laid under the new Carter Bridge. This will deal with the buckets now taken to one of the two collecting depôts, lorry transport being employed to a great extent.

If this scheme is successful, it may eventually be possible to dispose of all the nightsoil of Lagos in this manner, in which case the disposal by sanitary tramway and dejection jetty can be abandoned.

(*b*) *Scavenging and Refuse Disposal*.—Though a certain amount is dumped in creeks and rivers or used without previous burning for reclamation purposes, most of the refuse in townships is incinerated, non-combustible material being buried. In many smaller stations and villages incinerators with adjacent refuse drying sheds are now in use, mud structures of beehive pattern being the type commonly employed. These beehive incinerators are gradually replacing the drying hearth pattern of permanent materials in various townships. They are very much less costly to erect and are very efficient.

The Medical Officer of Health, Port Harcourt, who estimates that the township refuse amounts to more than one cubic yard per head of the population, states that treatment on the 'Bradford' system in a partially reclaimed area to the west of the town has met with remarkably good results. With the exception of two in the market area all the incinerators of Port Harcourt have been closed down.

In Lagos the refuse destructor was closed for repairs for some weeks at the beginning of the year. During this time fresh refuse was dumped in the swampy area of Oke-Suna. The dumping was carefully controlled, a smouldering fire kept going over the surface, and systematic covering with ashes was carried out to prevent fly and rat nuisances.

The blocks from discarded tins made by the baling press at the destructor have been in great demand for minor improvements both by the engineering and health branches of the Council.

(*c*) *Drainage and Reclamation.*—Reclamation of swamp by means of refuse, burned and unburned, is being carried out in many townships, the two largest schemes of this nature being in progress at Onitsha and Port Harcourt. At Onitsha, where refuse has for some time been systematically tipped near the outlet of the Otomoye swamp, enough ground has been reclaimed by this method to allow of the rebuilding of a fishing village which was formerly under water each year when the river rose.

Street drainage in many of the townships is an important and difficult problem. Progressive erosion of earth ditches and retention of soakpits lead to a considerable amount of mosquito breeding and other nuisances. The problem appears to be most acute in Port Harcourt, Enugu, Aba, and Benin-City: in none of which places has the township board the resources to proceed with a comprehensive scheme without considerable financial assistance from Government.

Permanent surface drainage is unfortunately costly and it is estimated that at Aba, for example, at least £5,000 will be required if adequate drainage is to be provided.

(*d*) *Water Supplies.*—The Director of Public Works has kindly supplied the following information about new water schemes.

Abeokuta.—It is proposed to supply 600,000 gallons per day to a population of 46,000. The project includes the utilisation of a portion of an existing partial supply. At the end of the year a portion of the material for the distribution system had been received and pipe-laying was in hand. The supply is from the Ogun River and will receive chemical treatment only.

Benin City.—The scheme provides for utilising and superseding a small partial supply system at present in operation, and is designed to supply 100,000 gallons per day to a population of 8,600. At the end of the year the construction of the service reservoir and laying of distribution pipes was proceeding. The supply is from percolation wells in the Benin sand on the bank of the Ogba River.

Okene.—The scheme is designed to supply 100,000 gallons daily to a population of 27,600 as a supplement to existing natural sources.

Ibadan.—A major scheme, prepared in 1931, remains in abeyance and will be subjected to revision in the light of recently revised population census figures. In the meantime augmentation and improvement in quality of existing supplies have been carried out. At the Ogunpa waterworks an additional main was laid and rapid sand filtration was installed, a clear water tank added, and soda ash treatment instituted. The result is a clear, neutral water in place of a turbid, acid water. The addition of filters has permitted the period of sedimentation to be reduced, and it is therefore possible to supply a larger quantity of water.

At the Moor Plantation waterworks the pumping station was converted to an electric drive and the mains were extended by 4,200 feet, bringing the total length of distribution to 6.1 miles. The water is fully treated and remained of excellent quality throughout the year.

Investigations were commenced or continued for supplies to Port Harcourt, Calabar, Ilorin, Bida, Jos, Ijebu-Ode, Ife, Iseyin, Song and other small towns.

At the Iju Valley waterworks, which supply Lagos, experiments on aeration, neutralisation, and flocculation led to a further improvement in the quality of the water and to more economical working of filters. Chlorination has been continued, 0.15 to 0.25 parts per million being used according to season. Further experiments are being conducted to ascertain the best means of preventing corrosion of mains.

In the Northern Provinces the Kaduna supply remains excellent. Chlorination has effected some improvement in the Kano supply, but the quality of the water delivered cannot yet be considered satisfactory.

The activities of the Geological Survey Department in sinking wells and obtaining good water supplies in districts hitherto practically waterless are of very great importance to the public health. The supplies produced in the Bornu and Sokoto Provinces have proved of so much benefit that the Native Administrations of Katsina and Kano have arranged for the services of the department.

(*e*) *Offensive Trades.*—Fellmongering is the only offensive trade of any importance in Nigeria. It is almost confined to the Northern Provinces, where the townships are divided into areas in which fellmongering is permitted and those in which it is prohibited. The nuisance caused is less than might be imagined.

(*f*) *Sanitary Inspections.*—The majority of the large towns and townships were inspected during the year by the Assistant Director of Health Service or senior health officers.

Routine inspections are carried out in the townships and in Government stations by African sanitary inspectors supervised by the European staff. Wherever possible visits by Sanitary Superintendents to outlying stations have been arranged and much benefit has resulted. The system of compound inspection has at last been introduced in the towns of Katsina, Maiduguri, Bauchi, Jos, Kano, Zaria and Sokoto. The Kano Native Administration has recently tried the experiment of employing a few local Hausa-speaking women as sanitary inspectors. They are wholly illiterate. After receiving a short course of simple instruction in practical hygiene they will carry out inspection of compounds and endeavour to teach the Moslem women a little elementary sanitation.

III.—School Hygiene.

In Lagos, owing to shortage of staff, no school medical officer was available for the greater part of the year, but the nursing sister engaged in infant welfare devoted part of her time to the school clinic, which is held at the Medical Headquarters building.

Six hundred and thirteen boys and 180 girls—793 in all—were systematically examined during the year. In general, their physique, nourishment, and development were found to be good.

Of helminths, *S. hæmotobium* was found in seven cases, *S. mansoni* in one case, *Ankylostomes* in 230 cases, *Ascaris* in 485, *Trichiuris trichiuris* in 490 cases. Subtertian malarial parasites were found in 131 cases and quartan parasites in one case. Skin conditions, chiefly tinea and scabies, were common. Defective vision (less than $\frac{6}{18}$) in one or both eyes was detected in forty cases.

There were 8,025 attendances at the school clinic and of these 2,278 were new cases. Medical inspection of school children has also been carried out at Katsina, Kano, Maiduguri, Yola, Bauchi, Bida and Sokoto in the Northern Provinces, and at Port Harcourt, Ibadan and Abeokuta in the Southern Provinces. Equipment for school clinics for the three last-named places was provided with the aid of a grant from the Colonial Development Fund.

In Abeokuta eighty children were examined in the latter part of the year and in Port Harcourt 391. Of the Port Harcourt children twenty-seven per cent. had very good development, thirty-two per cent. good, thirty-six per cent. fair, and five per cent. poor.

The subjoined table gives the percentages of the principal disabilities found :—

Skin diseases	13.6
Non-vaccinated	9.3
Glandular enlargements (mainly cervical) ...	37.1
Palpable spleen	20.1
Malaria parasites in blood	29.9
Teeth defects	3.0
Nose ,, ...	0.8
Throat ,, ...	26.8
Ear ,, ...	1.5
Eye ,, ...	1.8
Heart ,, ...	2.3
Lung ,, ...	0.9
Hernia (umbilical)	2.7

Throat defects and cervical gland enlargements are striking. Enlarged, inflamed or excavated tonsils were the commonest throat condition, but no evidence was obtained of associated cardiac or rheumatic conditions.

Throughout the country school premises are inspected by the Health staff wherever they are available.

IV.—Labour Conditions.

There is no contract or indentured labour in Nigeria. The labour camps in the tin fields of the Bauchi Plateau have diminished very much owing to restriction of output. A similar reduction has taken place in the labour employed on the Cameroons Plantations except in the Tiko area, where banana cultivation is being actively developed. The Deputy Director of Health Service will make an inspection of the plantations early next year.

V.—Housing and Town Planning.

The Chairman of the Lagos Executive Development Board has kindly furnished the following summary of the work of the Board during the year :—

" During 1932 the Lagos Executive Development Board proceeded with slum clearance for which His Excellency had issued instructions. Much work in filling and reclamation has been done in the neighbourhood of the Idumagbo Lagoon and the lagoon considerably reduced in size. A programme of slum clearance radiating from this centre was drawn up and the basin surrounding the lagoon subjected to survey and examination.

Considerable progress was made during 1932, about five acres of slums being demolished in what is known as area No. 7. In area No. 2 reconstruction has been done, that is to say roads, drains and water supply provided and plots sold or leased to persons who have built or are building substantial houses thereon according to the requirements of the new schemes. During 1932 a new main avenue sixty feet wide

called Idumagbo Avenue was completed. This avenue runs from Princess Bridge Street to Victoria Street and forms a valuable new highway between Victoria Street and the Eastern Marina, cutting through a very insanitary area which was cleared for this purpose.

The development of Yaba " Garden City " continues to progress on sound lines, the new houses built there by private enterprise providing a new standard of living for the people of Nigeria. There are now about 400 new houses either built or building and plans for more houses are being received from the public at the average rate, in 1932, of sixteen a month."

In all townships enforcement of the provisions of the Public Health and Townships Ordinances in relation to dwellings has been continued, while elsewhere efforts have been made to persuade the responsible authorities to introduce and enforce simple building rules in the more important towns and villages at present unaffected by the existing law. In spite of trade depression a large number of new dwellings are to be seen in course of erection in many parts of the country and on the whole the type of house being built shows marked improvement. In the large towns many buildings are being provided for use as lodging houses and it is in this type of house that unauthorised alterations, such as sub-division of rooms, are most frequently met with. In the absence of efficient township inspectors it is very difficult to prevent such contraventions of the building rules.

In the Northern Provinces there have been fewer new Government layouts this year—that of Zaria being the only one of importance.

The new headquarters of Jemaa Emirate has been properly laid out, as have the rapidly growing town of Nguru and the new extension to Maiduguri. The Kano Native Administration is contemplating a new layout for the area north of the city within the walls, which should go far towards removing some of the major sanitary problems of Kano City, such as the overcrowded state of the market and the present conditions of the slaughter-place. A scheme was started recently in the Kano Emirate whereby certain selected towns of importance are taken in hand and " cleaned up "; streets are widened and straightened, some planning is attempted and open spaces arranged, the market is laid out and rebuilt and some sanitary work done, such as the provision of communal latrines, or the sinking or improvement of wells. This work is being carried out by the Native Administration with the loan of some technical staff (*e.g.*, Surveyors) when required.

VI.—Food in relation to Health and Disease.

Regular inspection of foodstuffs has been carried out by the Health staff in shops and markets and in all the larger centres animals intended for sale for human consumption are examined both before and after slaughter. Cysticercus, liver fluke, pleurisy and pneumonia are amongst the commoner conditions which necessitate seizure and condemnation. At Ijebu-Ode there was an epidemic of pleuro-pneumonia and in one month 395 out of 504 cattle slaughtered were found to be affected. It was only found necessary to condemn as unfit three of the infected carcases and the disease fortunately died down towards the end of the year.

Tuberculosis in cattle is comparatively rare. No case was reported in cattle slaughtered in the whole of the Northern Provinces during the year, but in Lagos ten carcases were found to be affected.

Many improvements have been effected in the construction and control of markets and slaughter-houses during the year. In some of the markets of the Southern Provinces model stalls are being erected in the hope that the Native Administrations will follow the lead given and thus bring about more sanitary conditions in the sale of food.

In Lagos, in spite of numerous minor improvements, the slaughter-houses have lagged far behind in the general sanitary progress of the town and a modern abattoir is urgently needed. There is some hope that this may materialise next year. Regulations for the transport of meat from slaughter-house to meat markets by suitable motor vehicles came into force during the year. The butchers petitioned the Town Council asking that municipal transport be provided for the conveyance of the meat and this was eventually arranged at a charge of one shilling per carcase.

A large consignment of imported dried fish (stock-fish) was seized and condemned during the year owing to heavy infestation with *Dermestes vulpinus*.

Registration of corn-mills was introduced in Lagos in 1932. There were thirty-one premises so registered and, on the whole, their sanitary condition was good. They are small places to which customers bring their corn to be ground and it is not usually stored on the premises.

The problem of the numerous street markets in Lagos and their menace to health remains unsolved. A markets committee appointed during the year held numerous sittings. The result of the committee's findings had not been published by the end of the year.

Throughout the country aerated water factories and bakehouses are subjected to periodical inspection by the health authorities.

The Senior Health Officer stationed at Kaduna states that food has never been so plentiful or so cheap as it is at present, the prices of foodstuffs having fallen to a far greater extent than those of other local produce. Consequently so far as the necessities of life are concerned, the natives of the Northern Provinces are as well off as they ever were. Some distress has occurred amongst artisans, motor drivers, and clerks unemployed owing to the retrenchment of Government departments and business firms.

Numerous analyses of native foodstuffs were carried out during the year by the Dietetics Pathologist. One striking result was the high mineral content of the leaves of the Kuka (*Adansonia digitata*), which are much used by the people in their stews. A calcium content of 2.6 per cent. was found in the sun-dried leaves.

In consequence of a high sickness and death rate in the Kano Native Administration prison in 1931 a new diet scale was introduced in accordance with the recommendations of the Dietetics Pathologist, which appears to have had a very beneficial effect on the health of the prisoners. The dietary previously in use was found to be very unbalanced and extremely deficient in mineral salts and vitamins A and B. The staple food in Kano prison is guinea-corn. Subsequently diet scales were prepared for prisons in which cassava and sweet potato respectively form the main bulk of the ration.

An article on " Diet in Schools " by Dr. W. E. McCulloch was published in the West African Medical Journal for October, 1932.

Great importance is attached to the institution of school and prison gardens and stress is laid on the desirability of growing in such gardens the more valuable indigenous vegetables of the country rather than imported ones which are unfamiliar and often distasteful. If this is done, children are more likely to put into practice in their villages in after life the lessons they have learned in the school garden.

An important event was the formation during the year of a Dietetics Committee to secure co-operative action by the Agricultural, Forestry, Veterinary, Geological and Medical Departments with a view to improving the quality of the foods eaten in Nigeria.

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

Elementary hygiene is taught in all Government and assisted schools. Two series of attractive coloured posters mounted on linen and with rollers, and printed in English and Hausa, English and Yoruba, English and Ibo, English and Efik, were completed and issued to schools throughout the Northern and Southern Provinces and three further series are almost completed. The cost was met by a grant from the Colonial Development Fund.

The subjects of these posters are as follows:—

(i) "Eat more fruit", (ii) "This baby loves his bath", (iii) "Bury your empty tins and bottles", (iv) "Let the sun come into your house", (v) "Keep the house clean".

The second part of Dr. Mary Blacklock's "Elementary Course in Tropical Hygiene" has been translated into Hausa and is now in the press. Important discussions on health matters take place at the Conference of Emirs and Chiefs held annually at Kaduna. Medical officers and medical officers of health when touring their areas have frequent interviews with native rulers to discuss sanitary improvements. Native Administration sanitary inspectors, vaccinators and dispensary attendants all play a part in the teaching of hygiene to the mass of the people. Sanitary inspectors in particular are instructed to explain to householders the reasons for inspection.

A series of cinema films has been taken recently and will be exhibited at health weeks and on other suitable occasions. Amongst the subjects illustrated are the daily life of a sanitary inspector, small-pox and vaccination, guinea-worm, anti-tsetse clearing, anti-malaria measures, fumigation of ships, plague gangs at work in congested areas, infant welfare. The Medical Officer of Health, Kano, addressed meetings of women on "The importance of child welfare" and "Hygiene in the home".

A health week was again held at Port Harcourt following in general the lines of the previous year, the programme including physical culture displays by school children, essay competitions, a clean house competition, a baby competition, and public lectures on health subjects. Much interest was shown by the inhabitants and the enterprise was an unqualified success.

Grants from the Colonial Development Fund have been made to many of the Native Administrations for the provision of model sanitary structures such as market-stalls, latrines, incinerators, and wells. These are erected in the more important centres of native life in the hope that the Native Administrations themselves will adopt similar measures for the improved sanitation of their towns and villages.

In Lagos the ordinary routine sanitary work—inspection, anti-plague scavenging, etc.—remains the chief medium for educating the public in the elements of sanitation.

At the request of the Lagos Union of Teachers the Medical Officer of Health delivered a health talk at a meeting of the Union in August.

The School Medical Officer devotes a good deal of time to the instruction of teachers in all matters concerning the health of the school children.

The health visitors address the mothers at clinics on infant welfare matters such as the feeding and management of infants; demonstrations are given to teach the proper methods of feeding and bathing infants.

A Food Demonstration was held at Massey Street Dispensary in June, a large variety of locally obtainable foods suitable for infants at different ages and the best methods of preparation were exhibited and explained; unsuitable foods were also shown and the mothers were

warned against the use of them. A baby competition was held at the Health Office in July for which eighty-two babies were entered.

A series of lectures on mothercraft was given by the Senior Health Visitor to the elder girls of the C.M.S. Central School at the request of the school authorities. A number of senior girls from various schools have from time to time visited the Lagos clinics at work and have been shown round the maternity and children's wards.

C.—TRAINING OF SANITARY PERSONNEL.

Southern Provinces.—At the Lagos school sanitary inspectors-in-training attend lectures on three afternoons a week for a period of two years. The course is given by the Assistant Medical Officer of Health, but European sanitary superintendents lecture on special subjects from time to time. During the course visits are arranged to the waterworks, refuse destructor, plumbing installations, etc., and practical demonstrations on meat inspection are given.

After a few months' training every Sanitary Inspector-in-training is responsible for the routine inspection of a district and in this way he gains a thorough practical knowledge of sanitary inspection including the detection and control of mosquito breeding, anti-rodent work, and disinfection of premises. They are attached to the Port Health Office in rotation for a month at a time in order to become familiar with the fumigation of ships, disinfection of passengers and their baggage, and other such duties.

Individual inspectors are selected from time to time to work for a period in the Health Office; they summarise reports from the various districts, plot maps, collect any special statistical information required, and undertake special visits on the instruction or in the company of the Chief Sanitary Superintendent. This is found in practice to prove an excellent advanced training. It is expected that a local examination for the certificate of the Royal Sanitary Institute will be held in Lagos towards the end of next year.

A school for the training of Native Administration sanitary inspectors of the Yoruba tribe, built with the aid of a Colonial Development Fund grant, is in course of erection at Ibadan and will be opened next year.

Northern Provinces.—For several years the Medical Officer of Health, Kano, has held classes for the training of Hausa-speaking Native Administration sanitary inspectors, but has been greatly handicapped by the lack of a suitable building and proper equipment. This is now to be remedied as with the aid of a grant of £5,000 from the Colonial Development Fund a school building and hostel are about to be erected on an excellent site just outside the city walls. In future all Government and Native Administration sanitary inspectors for the Northern Provinces will be trained at Kano, and the Lagos school will be reserved for Government inspectors for the Southern Provinces. Every effort is being made to train a suitable proportion of the various tribes in order that they may work amongst their own people.

D.—RECOMMENDATIONS FOR FUTURE WORK.

1. The gradual introduction of systematic vaccination of infants in the Northern Provinces.

2. Additional piped water-supplies, especially a supply for the town of Ibadan, which is believed to be an important endemic focus of yellow fever.

With regard to the recommendations for future work in the last Annual Report, reference has already been made to the progress of the various water schemes.

Although no new building bye-laws have been passed, progress with town improvement schemes has been made by some of the Native Administrations.

School medical inspection is now in progress at Abeokuta, Ibadan, and Port Harcourt, and at a number of Government schools in the Northern Provinces.

An infant welfare centre has been established at Aba, and similar work is about to be started at Port Harcourt.

IV.—PORT HEALTH WORK AND ADMINISTRATION.

Owing to general trade depression there has been a considerable reduction in the amount of shipping entering Nigerian ports and in the number of deck passengers carried. In Lagos there has been little change in the routine of the Port Health organisation.

A seamen's clinic for venereal diseases at Apapa has been open for over a year. As Lagos is not a terminal port the number of cases applying for treatment is not numerous. The prophylaxis room, which is open all night when any ships are in port, has proved a popular feature and has earned the gratitude of both seamen and shipping companies. Undoubtedly this service has done much to reduce the incidence of venereal diseases contracted in this port.

All vessels enter the port "liable to quarantine" until boarded by the Port Health Officer. Bills of Health and Consular Visas are scrutinised and the answers to the questions on the Quarantine Schedule verified. All deck passengers and, where necessary, saloon passengers and crew are examined.

All who are unprotected against smallpox are vaccinated. The vessel is then granted immediate pratique. Vessels arriving from infected ports are subjected to a thorough examination and all passengers and crew are medically inspected. The systematic trapping of all vessels including local coastwise shipping by rat-catchers working under the supervision of a sanitary superintendent has continued throughout the year. All rodents recovered are submitted for bacteriological examination.

All vessels entering the port, not being in possession of a valid deratisation or deratisation exemption certificate, are immediately subjected to a thorough examination for signs of rodent infestation. At the end of the examination all the evidence is weighed and the condition of the vessel placed in one of four broad categories; no sign of rat infestation, a slight degree of infestation, moderately infested, heavily infested. Generally, ships falling into the first two categories are granted a deratisation exemption certificate; if into the latter two categories, the vessel is fumigated and a deratisation certificate issued. Since the almost universal adoption by maritime nations of Article 28 of the International Sanitary Convention, 1926, the condition of ships with regard to rat infestation has undergone a remarkable improvement.

As in former years, the strictest measures were maintained to limit mosquito breeding on the foreshore and on craft in the harbour. 8,350 craft inspections were made, the larval index being 0.12.

Six hundred and forty-one vessels entered the port during the year.

One hundred and seventy-nine ships were boarded and cleared at Calabar by the Medical Officer of Health during the year. It is hoped to provide facilities there for the examination of sea-going passengers and the disinfection of their baggage where necessary.

At Port Harcourt 324 ships entering the port were boarded and 320 vessels outward bound were cleared by the Medical Officer of Health. With the exception of a few cases of chickenpox no infectious disease was discovered. The usual inspections of harbour area, dockyard, and marine craft were made.

W. H. PEACOCK,
Deputy Director of Health Service.

V.—MATERNITY AND CHILD WELFARE.

The Government training centre for midwives is the Maternity Hospital in Lagos and three midwives completed two and a half years training here during the year and obtained the 1st Grade Certificate of the Midwives' Board. Maternity Hospitals are under construction at Ilorin and Aba and plans are completed for building a new centre at Calabar, all under grants from the Colonial Development Fund.

The following non-Government centres have been approved by the Midwives' Board as training centres for Grade II Midwives :—Egba Native Administration Welfare Centre, Abeokuta; C.M.S. Maternity Hospital, Iyi-Enu, Onitsha; Baptist Mission Hospital, Ogbomosho; Methodist Mission Society Hospital, Ilesha. The work of the C.M.S. Hospital at Iyi-Enu has increased greatly. In 1932, 822 births occurred at this hospital and 6,277 women received ante-natal treatment and advice.

The Government Maternity Hospital at Massey Street, Lagos, is steadily attracting more women. The figures for the past three years are as follows :—

	1930.	*1931.*	*1932.*
Admissions	362	440	837
Out-patients	8,182	9,850	11,162

The Child Welfare Centres instituted by the Lagos Town Council, assisted by a lady medical officer and nursing sister posted by the Medical Department, are popular and carry out valuable work. In 1932, 3,231 infants were on the register, with 7,174 attendances. 411 infants were referred for medical treatment. Of the mothers who attended 2,066 were occupied in trading or in crafts and 1,165 were unoccupied.

A staff of ten African health visitors is employed by the Lagos Town Council under the supervision of the medical officer of health and nursing sister. The work carried out by this staff is summarised below :—

New cases born in township	3,869
New cases born outside township	141
New cases visited	4,010
Babies alive at first visit	3,860
Babies dead at first visit	130
Mothers alive at first visit	3,982
Mothers dead at first visit	8
Cases not found	20
Revisits for the year	29,924
Cases attended by medical practitioners	836
Cases attended by native medicine men	3,152
Cases induced to attend dispensaries	211

The principal certified causes of infantile deaths at Lagos during the year have been :—

Debility	98
Broncho-pneumonia	64
Premature birth	46
Convulsions	38
Bronchitis	30
Malaria	23
Diarrhœa and Enteritis	19
Injury at birth	10

At Abeokuta the Child Welfare Centre of the Egba Native Administration, under Miss McCotter, continues to be astonishingly popular. In 1932 an average daily attendance of 350 was recorded;

2,959 new cases were registered with 108,450 attendances. 2,678 ante-natal attendances have been recorded since the centre was opened and considerable maternity work is carried out in the town.

A new centre was opened in April at Aba for child welfare and has proved very successful. It is run in connection with the hospital, the staff being assisted by voluntary help. 546 new babies were seen with an average weekly attendance of 100. A successful baby show was held.

At Ijebu Ode the new maternity ward had fifty-nine admissions as compared with sixteen in 1931 and it is satisfactory to note that mothers delivered at the hospital continue to attend the child welfare clinic.

Female admissions and child welfare work has increased greatly at Ibadan since the posting of a European Nursing Sister to the Native Administration hospital.

In the Northern Provinces, the female section of the Native Administration Hospital at Kano which was opened in 1930 has become very popular and a new ward is under construction. 407 in-patients and 2,024 out-patients were treated during the year. The nursing sister in charge, Miss Storrier, has gained the confidence of the people and although as yet only few maternity cases attend it is only a question of time before the maternity section becomes established.

At Katsina the new female section of the Native Administration Hospital was opened in August, consisting of two large wards built in concrete blocks. 276 in-patients were treated and many visits were made in the town to 'purdah' women. The people are highly conservative and it will be many years before maternity work can be carried out on a large scale in this town, although the encouraging increase of female patients coming to hospital will assist this object.

VI.—HOSPITALS AND DISPENSARIES.

A.—Hospitals and Hospital Statistics.

Owing to the financial position very little improvement or extension of hospitals has been possible during the year.

Twelve European hospitals with a total of 133 beds have been maintained.

Fifty-six African hospitals with 2,852 beds exist, of which nine hospitals with 555 beds were built and are being maintained by Native Administrations.

In the Southern Provinces two new hospitals were opened which have been built with Native Administration funds—at Okigwi and Owerri. At Okigwi the hospital contains fifty-five beds. At Owerri a country type hospital with forty-four beds has replaced the old bush hospital and the work has doubled since the new hospital was opened. A new operating theatre has been built at Obubra.

In the Northern Provinces a new hospital built by the Native Administration was opened in May at Sokoto. It contains fifty-two beds and is an immense improvement upon the old bush hospital which is now used for venereal diseases.

At Katsina two new permanent wards were opened to form a female section of the hospital. At Makurdi a new female ward is nearing completion and a pipe-born water supply has been put into the hospital. At Wukari a new hospital, built by the Native Administration was opened in May. It is a semi-permanent building containing two wards of twelve beds each, a female ward with six beds, out-patient block and operating theatre.

Statistics regarding the type, the number of beds, the number of patients treated and the number of the nursing staff for each hospital in the country are given in the following tables.

NIGERIA.

European Hospital Statistics, 1932.

No.	Hospital.	No. of Beds.	In-Patients Admissions. Remaining end 1931.	Male.	Female.	Total.	Remaining end 1932.	Out-Patients treated. Male.	Female.	Total.	Total Patients treated.	Number of Operations. Major.	Minor.	Nursing Staff. European Sisters.	African. Male.	Female.	Total.
1	Calabar	8	—	25	8	33	1	259	49	308	341	3	1	2	4	1	5
2	Enugu	12	3	64	11	75	—	230	71	301	376	—	—	2	6	1	7
3	Ibadan	14	4	80	13	93	1	207	32	239	332	—	3	1	7	1	8
4	Jos	14	6	59	24	83	1	238	65	303	386	3	19	2	5	1	6
5	Kaduna	14	—	117	12	129	7	208	50	258	387	4	7	3	7	1	8
6	Kano	12	—	122	30	152	—	397	63	460	612	4	26	3	6	1	7
7	Lagos	30	8	208	63	271	10	852	146	998	1,269	27	6	4	8	3	11
7a	Lagos E. B. E/Dispensary	—	—	—	—	—	—	422	26	448	448	—	14	—	—	—	—
8	Lokoja	3	—	5	—	5	—	42	4	46	51	—	—	—	1	—	1
9	Onitsha	4	1	13	5	18	—	70	11	81	99	—	—	—	2	—	2
10	Port Harcourt	10	3	60	10	70	—	358	51	409	479	3	14	3	6	1	7
11	Victoria	4	1	6	2	8	—	52	32	84	92	—	—	—	1	—	1
12	Warri	8	1	30	7	37	4	154	16	170	207	—	—	1	3	—	3

AFRICAN HOSPITAL STATISTICS, 1932.

NORTHERN PROVINCES.

No.	Type of Hospital.	Name of Hospital.	C.G. or N.A.	No. of Beds.	Remaining end 1931.	In-Patients admissions.			Remaining end 1932.	Out-Patients treated.			Total Patients treated.	Operations.	Nursing Sisters Average No.	African Nursing Staff.		
						Male.	Female.	Total.		Male.	Female.	Total.				Male.	Female.	Total.
1	D.	Ankpa	C.G.	18	—	161	28	189	—	1,448	568	2,016	2,205	56	—	1	—	1
2	E.	Azare	N.A.	22	75	398	103	501	77	1,713	378	2,091	2,592	75	—	2	—	2
3	D.	Bauchi	C.G.	42	48	594	150	744	70	4,484	774	5,058	5,802	152	—	3	—	3
4	E.	Bida	N.A.	32	—	220	45	265	8	2,381	400	2,781	3,046	84	—	2	—	2
—	E.	Birnin Kebbi ...	N.A.	—	—	101	—	101	13	6,161	1,770	7,931	8,032	63	—	—	—	—
—	C.	Gadau (Dispensary) ...	C.G.	—	—	—	—	—	—	1,361	455	1,816	1,826	4	—	7	—	7
5	D.	Gusau	C.G.	15	15	133	19	152	—	1,110	239	1,349	1,501	32	—	2	—	2
6	E.	Ilorin	N.A.	23	16	261	48	309	27	3,344	1,534	4,878	5,187	235	—	2	—	2
7	B.	Jos, African	C.G.	93	84	1,413	428	1,841	92	8,930	2,558	11,488	13,329	627	1	17	3	20
8	B.	Kaduna, African ...	C.G.	83	72	1,673	271	1,944	86	7,905	1,602	9,507	11,451	1,812	1	18	5	23
9	D.	Kafanchan	*C.G.	22	29	376	105	481	43	2,436	974	3,410	3,891	239	—	4	—	4
10	B.	Kano Fagge	C.G.	99	57	1,106	287	1,393	—	4,118	1,094	5,212	6,605	701	1	24	6	30
11	B.	Kano City	N.A.	70	60	778	—	778	—	4,707	293	5,000	5,778	423	½	—	—	—
	B.	Kano City Women's ...	N.A.	34	26	12	395	407	—	200	1,824	2,024	2,431	77	½	—	2	2
12	B.	Katsina Men's ...	N.A.	72	63	894	—	894	65	8,244	742	8,986	9,880	332	½	2	—	2
	B.	Katsina Women's ...	N.A.	38	29	4	301	305	33	42	589	631	936	181	1	—	1	1
13	D.	Lafia	C.G.	20	6	111	21	132	—	2,015	847	2,862	2,994	79	—	2	—	2
14	B.	Lokoja	C.G.	41	26	362	96	458	34	3,179	1,628	4,807	5,265	413	½	6	2	8
15	E.	Maiduguri	N.A.	80	70	949	118	1,067	86	7,206	1,804	9,010	10,037	137	—	4	—	4
16	C.	Makurdi	*C.G.	70	—	653	108	761	—	9,835	2,758	12,593	13,354	363	—	5	—	5
17	C.	Minna	C.G.	26	27	336	14	350	15	2,512	429	2,941	3,291	148	—	3	—	3
18	E.	Pankshin	N.A.	52	—	398	56	454	41	2,741	775	3,516	3,970	215	—	—	—	—
19	E.	Sokoto	N.A.	52	40	1,245	514	1,759	—	5,171	848	6,090	7,778	115	—	3	—	3
20	D.	Wukari	*C.G.	30	—	120	58	178	—	2,416	1,221	3,637	3,815	161	—	2	—	2
21	D.	Yola	C.G.	16	24	438	31	469	19	4,202	829	5,031	5,500	252	—	2	—	2
22	B.	Zaria	C.G.	99	61	930	121	1,051	73	9,012	1,175	10,187	11,238	315	1	14	3	17
23	D.	Zuru	C.G.	20	8	156	30	186	—	1,400	327	1,727	1,913	39	—	2	—	2

* Buildings whole or in part provided out of Native Administration Funds.

Types of Hospital :—B. Modern hospitals to which European Nursing Sisters are posted for duty and where the training of junior African Nurses is carried out.
C. Modern hospitals to which no European Nursing Sister is posted.
D. "Bush" Hospitals.
E. Hospitals at which the majority of the African Staff are engaged and paid by the Native Administration.

AFRICAN HOSPITAL STATISTICS, 1932.

SOUTHERN PROVINCES.

No.	Type of Hospital.	Name of Hospital.	C.G. or N.A.	No. of Beds.	Remaining end 1931.	In-Patients Admissions.			Remaining end 1932.	Out-Patients Treated.			Total Patients treated.	Operations.			Nursing Sisters Average No. in 1932.	African Nursing Staff.		
						Male.	Female.	Total.		Male.	Female.	Total.		Maj.	Min.	Total.		Male.	Female.	Total.
1	B	Aba	C.G.	50	40	383	301	684	—	10,884	5,766	16,650	17,334	59	266	325	1	6	5	11
2	C	Abakaliki	*C.G.	16	—	317	35	352	—	6,896	4,396	11,292	11,644	8	149	157	—	2	—	2
3	B	Abeokuta	C.G.	100	52	413	175	588	—	3,134	916	4,050	4,638	264	47	311	1	10	4	14
4	D	Afikpo	C.G.	4	—	30	1	31	—	1,992	878	2,870	2,901	—	15	15	—	—	—	—
5	C	Agbor	C.G.	22	13	223	91	314	22	5,528	2,449	7,977	8,291	40	240	280	—	5	—	5
6	C	Akure	C.G.	36	—	201	66	267	16	1,746	727	2,473	2,740	69	54	123	—	3	—	3
7	C	Bamenda	C.G.	50	—	777	307	1,084	53	11,039	6,566	17,605	18,689	133	250	383	—	3	—	3
8	D	Banso	C.G.	24	26	363	219	582	25	2,557	1,528	4,085	4,667	11	115	126	—	2	—	2
9	C	Benin City	C.G.	25	12	240	97	337	15	6,871	2,062	8,933	9,270	23	316	339	—	3	—	3
10	C	Buea	C.G.	40	4	246	41	287	18	4,761	1,769	6,530	6,817	16	133	149	—	2	—	2
11	B	Calabar	C.G.	110	102	992	414	1,406	99	13,668	6,886	20,554	21,960	201	714	915	1	16	8	24
12	C	Degema	C.G.	19	9	151	36	187	15	2,624	1,633	4,257	4,444	28	122	150	—	2	—	2
13	B	Enugu	C.G.	45	50	1,467	153	1,620	54	15,388	3,651	19,039	20,659	716	343	1,059	1	15	2	17
14	C	Forcados	C.G.	14	5	168	30	198	7	6,568	1,708	8,276	8,474	19	254	273	—	2	—	2
15	E	Ibadan, Adeoyo ...	N.A.	80	32	678	259	937	63	6,116	3,916	10,032	10,969	174	284	458	1	—	1	1
16	C	Ibadan, African ...	C.G.	34	23	364	36	400	9	3,951	387	4,338	4,738	8	62	70	1	4	2	6
17	C	Ijebu-Ode	C.G.	54	—	383	258	641	—	3,608	1,301	4,909	5,550	66	200	266	1	8	3	11
—	D	Ikom	C.G.	0	—	—	—	—	—	2,197	877	3,074	3,074	—	3	3	—	—	—	—
18	C	Ikot-Ekpene	*C.G.	18	39	499	108	607	28	5,140	3,129	8,269	8,876	69	39	108	—	4	—	4
19	C	Kumba	C.G.	49	33	460	104	564	39	4,594	2,272	6,866	7,430	66	250	316	—	3	—	3
20	B	Lagos, African ...	C.G.	202	118	2,648	526	3,174	147	29,521	11,100	40,621	43,795	607	1,010	1,617	3–4	51	12	63
21	B	Lagos, Massey Street ...	C.G.	20	5	108	752	860	18	2,354	8,808	11,162	12,022	25	173	198	1	—	21	21
	C	Lagos, I.D. (Yaba) ...	C.G.	80	4	120	18	138	4	—	—	—	138	—	—	—	—	3	—	3
	C	Lagos, Prisons ...	C.G.	17	4	164	—	164	4	1,674	110	1,784	1,948	—	—	—	—	1	—	1
21a	C	Lagos, Yaba Asylum ...	C.G.	—	157	190	—	190	162	224	97	321	511	—	13	13	—	—	—	—
	C	Lagos, E.B.A. Dispensary	C.G.	—	—	—	—	—	—	9,796	1,714	11,510	11,510	—	—	—	—	—	—	—
22	C	Mamfe	C.G.	42	18	437	60	497	10	2,697	1,390	4,087	4,584	60	52	112	—	3	—	3
23	C	Obubra	C.G.	10	2	168	47	215	11	2,378	1,470	3,848	4,063	105	39	144	—	1	—	1
24	C	Ogoja	C.G.	18	3	65	37	102	6	4,376	3,188	7,564	7,666	15	85	100	—	2	—	2
25	C	Okigwi	*C.G.	55	45	738	200	938	84	10,332	3,453	13,785	14,723	410	140	550	—	4	—	4
26	B	Onitsha	C.G.	72	175	726	164	890	178	16,995	10,983	27,978	28,868	226	510	736	¼	8	4	12
27	D	Opobo	*C.G.	30	8	196	33	229	8	23,289	19,242	42,531	42,760	28	33	61	—	2	—	2
28	C	Oshogbo	C.G.	35	—	227	69	296	14	3,047	1,417	4,464	4,760	31	107	138	—	4	2	6
29	C	Owerri	*C.G.	44	—	715	312	1,027	—	3,670	1,370	5,040	6,067	133	196	329	—	4	—	4
30	B	Port Harcourt	C.G.	147	78	1,441	472	1,913	111	11,892	3,384	15,276	17,189	364	659	1,023	1	26	8	34
31	C	Sapele	C.G.	24	5	264	51	315	6	3,526	1,078	4,604	4,919	24	42	66	—	4	—	4
—	C	Umuahia	C.G.	—	—	—	—	—	—	12,357	11,732	24,089	24,089	86	213	299	—	—	—	—
32	B	Victoria	C.G.	64	46	490	162	652	40	4,816	1,830	6,646	7,298	14	54	68	¼	7	3	10
33	B	Warri	C.G.	30	7	617	111	728	26	4,719	1,265	5,984	6,712	220	88	308	1	10	3	13

* Buildings whole or in part provided out of Native Administration Funds.

Types of Hospital :—B. Modern hospitals to which European Nursing Sisters are posted for duty and where the training of junior African Nurses is carried out.
C. Modern hospitals to which no European Nursing Sister is posted.
D. "Bush" Hospitals.
E. Hospitals at which the majority of the African Staff are engaged and paid by the Native Administration.

B.—Native Administration Dispensary System.

There are now 197 dispensaries functioning, eighty-six in the Northern Provinces, 108 in the Southern Provinces and three in the Colony. The scheme has proved successful and in most places the dispensaries are popular and are serving a very useful purpose. They serve as useful feeders to the base hospitals and will do so more efficiently when the ambulances purchased with a grant from the Colonial Development Fund are posted to the base hospitals early in 1933. They have also proved exceedingly useful as bases for vaccination campaigns, the dispensary attendants being trained as vaccinators. vaccinators.

The following table gives the situation of the dispensaries in the various provinces :—

NORTHERN PROVINCES.

Province.	Name of Dispensary.	Inspecting Officer.
Adamawa (8)	Jada	M.O. or I.M.O., Yola.
	Jalingo	do.
	Lau	do.
	Mayo Belwa	do.
	Numan	do.
	Shellen	do.
	Song	do.
	Yola	do.
Bauchi (6)	Duku	M.O., Bauchi.
	Gombe	do.
	Misau	M.O., Azare.
	Shira	do.
	Toro	S.M.O., Jos.
	Tula	M.O., Bauchi.
Benue (9)	Abinsi	M.O., Makurdi.
	Ibi	M.O., Wukari.
	Igbor	M.O., Makurdi.
	Katsina Ala	M.O., Wukari.
	Keffi	M.O., Lafia.
	Nasarawa	do.
	Okwoga	M.O., Makurdi.
	Oturkpo	do.
	Takum	M.O., Wukari.
Bornu (5)	Biu	I.M.O., Bornu.
	Damaturu	do.
	Dikwa	do.
	Geidam	do.
	Potiskum	do.
Ilorin (7)	Ajasse	M.O., Ilorin.
	Ilorin (2)	do.
	Kaiama	do.
	Lafiagi	do.
	Offa	do.
	Omu-Aran	do.
Kabba (6)	Dekina	M.O., Ankpa.
	Idah	do.
	Kabba	M.O., Lokoja.
	Koton Karifi	do.
	Lokoja	do .
	Okene	do.
Kano (9)	Bichi	I.M.O., Kano.
	Damberta	do.
	Daura	do.
	Dawaki	do.
	Gumel	do.
	Hadejia	do.
	Kazaure	do.
	Ringim	do.
	Wudil	do.

NORTHERN PROVINCES—*continued.*

Province.	Name of Dispensary.	Inspecting Officer.
Niger (10)	Abuja	M.O., Minna.
	Agaie	M.O., Bida.
	Gerki	do.
	Katcha	do.
	Kontagora	do.
	Kuta	M.O., Minna.
	Kutigi	M.O., Bida.
	Lapai	do.
	Lemu	do.
	Zungeru	do.
Plateau (10)	Barakin Ladi	I.M.O., Pankshin.
	Bokkos	do.
	Dengi	do.
	Fadan Karshi	M.O., Jos.
	Gerkawa	I.M.O., Pankshin.
	Gindiri	do.
	Kwoi	M.O., Kafanchan.
	Makafo	M.O., Jos.
	Shendam	I.M.O., Pankshin.
	Wamba	M.O., Lafia.
Sokoto (10)	Argungu	I.M.O., Birnin Kebbi.
	Birnin Kebbi	do.
	Gwadabawa	do.
	Jega	do.
	Kaura-Namoda	M.O., Gusau.
	Koko	I.M.O., Birnin Kebbi.
	Mahuta	do.
	Talata Mafara	M.O., Gusau.
	Tambawel	I.M.O., Birnin Kebbi.
	Yelwa	do.
Zaria (6)	Funtua	M.O., Katsina.
	Kankiya	do.
	Malumfashi	do.
	Mani	do.
	Musawa	do.
	Zaria	M.O., Zaria.

SOUTHERN PROVINCES.

Abeokuta (8)	Ado	I.M.O., Abeokuta.
	Aiyetoro	do.
	Ilaro	do.
	Imala	do.
	Lafenwa	do.
	Meko	do.
	Otta	do.
	Owode	do.
Benin (17)	Auchi	M.O., Agbor.
	Ehor	do.
	Ekenwan	do.
	Ekiadolor	do.
	Ewohimi	do.
	Ibillo	do.
	Ibusa	do.
	Igbodo	do.
	Iguobazua	do.
	Irrua	do.
	Oghada	do.
	Ogwashi-Uku	M.O., Benin City.
	Onicha Olona	do.
	Sabongida	M.O., Agbor.
	Ubiaja	M.O., Benin City.
	Uburukuwu	do.
	Ugo	do.

SOUTHERN PROVINCES—*continued.*

Province.	Name of Dispensary.	Inspecting Officer.
Calabar (12)	Afaba	M.O., Ikot-Ekpene.
	Amasa	do.
	Creek Town	M.O., Calabar.
	Eket	do.
	Ibiaku	do.
	Ikwek	M.O., Ikot-Ekpene.
	Nto Edino	do.
	Nung Ukum	M.O., Opobo.
	Ududu Ekpe	do.
	Ukam	do.
	Uma Ubam Umo ...	do.
	Uyo Offat	M.O., Ekot-Ekpene.
Cameroons (4)	Bali	M.O., Bamenda.
	Bamunka	do.
	Nyasoso	do.
	Tiko	M.O., Buea.
Ijebu Ode (7)	Idowa	M.O., Ijebu Ode.
	Ijebu Ife	do.
	Ijebu Igbo	do.
	Iwopin	do.
	Ode Remo	do.
	Owu	do.
	Shagamu	do.
Ogoja (9)	Abba-Omege	M.O., Ogoja.
	Aboabam	do.
	Bansara	do.
	Edda	do.
	Ediba	M.O., Abakaliki.
	Ezza	do.
	Ikwo	M.O., Ogoja.
	Obudu	do.
	Ukelle	do.
Ondo (9)	Ado	M.O., Akure.
	Effon	do.
	Egosi	do.
	Igbara-Odo	do.
	Ijero	do.
	Oka	do.
	Okitipupa	do.
	Ondo	do.
	Owo	do.
Onitsha (6)	Aguleri	S.M.O., Onitsha.
	Awgu	do.
	Eke	M.O., Enugu.
	Isuoffia	S.M.O., Onitsha.
	Nnewi	do.
	Obolo	M.O., Enugu.
Owerri (15)	Abua	M.O., Owerri.
	Agwa	do.
	Ahoada	do.
	Asa	M.O., Aba.
	Azumini	do.
	Bende	M.O., Umuahia.
	Ngor	do.
	Obohia	do.
	Oguta	M.O., Owerri.
	Oloko	do.
	Orlu	do.
	Owerrinta	M.O., Aba.
	Twon	M.O., Owerri.
	Umuarc	M.O., Aba.
	Umuduru	M.O., Owerri.

SOUTHERN PROVINCES—*continued.*

Province.	Name of Dispensary.	Inspecting Officer.
Oyo (17)	Agodi	I.M.O., Ibadan.
	Ede	M.O., Oshogbo.
	Fiditi	I.M.O., Ibadan.
	Gbongan	do.
	Ife	I.M.O., Ibadan or M.O., Oshogbo.
	Igbajo	M.O., Oshogbo.
	Ikire	I.M.O., Ibadan.
	Ikirun	M.O., Oshogbo.
	Ilesha	I.M.O., Ibadan or M.O., Oshogbo.
	Illa	M.O., Oshogbo.
	Ipetu-Ijesha	I.M.O., Ibadan or M.O., Oshogbo.
	Iseyin	I.M.O., Ibadan.
	Okeho	do.
	Oranyan	do.
	Oyo	do.
	Shaki	do.
	Ipetu Modu	I.M.O., Ibadan or M.O., Oshogbo.
Warri (4)	Abbi	S.M.O., Sapele.
	Okpara	do.
	Ukpe Sobo	do.
	Warifi	do.
Colony (3)	Badagri	Headquarters.
	Epe	M.O., Ijebu Ode.
	Ikorodu	do.

The following table indicates the main diseases treated at the dispensaries during 1932:—

	Disease.	Northern Provinces.	Southern Provinces.	Total.
1.	Relapsing fever	259	607	866
2.	Malaria	5,176	15,521	20,697
3.	Smallpox	153	49	202
4.	Chickenpox	74	147	221
5.	Influenza	146	295	441
6.	Trypanosomiasis	156	115	271
7.	Cerebro-spinal meningitis ...	32	110	142
8.	Dysentery	1,399	2,042	3,441
9.	Leprosy	912	1,298	2,210
10.	Yaws	14,397	12,261	26,658
11.	Syphilis	11,080	3,074	14,154
12.	Conjunctivitis	3,472	4,157	7,629
13.	Other eye diseases	2,133	1,281	3,414
14.	Otitis media	1,138	3,442	4,580
15.	Other diseases of ear ...	869	2,551	3,420
16.	Cough	7,832	11,747	19,579
17.	Pneumonia	621	791	1,412
18.	Tuberculosis of lungs ...	201	315	516
19.	Diseases of teeth and gums	1,898	4,047	5,945
20.	Dyspepsia	4,355	5,232	9,587
21.	Diarrhœa (infants)	398	1,445	1,843
	,, (adults)	861	2,957	3,818
22.	Constipation	14,705	18,487	33,192
23.	Hæmorrhoids	121	451	572

	Disease.	Northern. Provinces.	Southern. Provinces.	Total.
24.	Jaundice	568	980	1,548
25.	Dropsy, ascites	148	493	641
26.	Hernia, inguinal	273	182	455
	,, umbilical	520	34	554
27.	Tænia	7,494	1,958	9,452
28.	Ascaris	1,281	11,078	12,359
29.	Guinea worm	2,875	1,457	4,332
30.	Arthritis	1,791	2,015	3,806
31.	Chronic rheumatism ...	9,759	24,350	34,109
32.	Gonorrhœa	5,090	6,073	11,163
33.	Orchitis and epididymitis ...	222	182	404
34.	Hydrocele	752	49	801
35.	Leucorrhœa	81	260	341
36.	Abortion	28	30	58
37.	Boil	2,054	1,633	3,687
38.	Abscess	3,061	2,318	5,379
39.	Ulcer	15,305	32,429	47,734
40.	Scabies, craw-craw	4,507	12,710	17,217
41.	Other skin diseases	2,718	3,986	6,704
42.	Lymphadenitis, bubo ...	691	843	1,534
43.	Elephantiasis	88	88	176
44.	Chigoes	608	183	791
45.	Snake-bite	122	188	310
46.	Scorpion sting	174	66	240
47.	Burns	900	1,230	2,130
48.	Wounds and injuries ...	9,518	13,698	23,216
49.	Fractures	157	370	527
50.	Tumours	216	375	591
51.	Paralysis	39	114	153
52.	Mania	13	276	289
53.	Poisoning, native medicines	36	44	80
	,, juju obsessions	9	11	20
54.	Fits, epilepsy	84	162	246
55.	Tetanus	35	25	60
56.	Schistosomiasis	238	—	238
57.	Sore throat	704	11	715
58.	Ankylostomiasis	1,221	—	1,221
59.	Pleurodynia	684	—	684
60.	Lumbago	4,261	—	4,261
61.	Headache	3,374	—	3,374
62.	Debility	63	1,010	1,073
63.	Other diseases	399	—	399
	Total ...	154,549	213,333	367,882

C.—Medical Work of Religious Missions.

The following table summarises the work carried out by Mission Doctors and by Missionaries who hold " Missionary Permits ", and has been compiled from information kindly supplied by the Superintendents of the Missions :—

MEDICAL WORK OF MISSIONS, 1932.

Mission.	No. of Stations performing Medical work.	No. of Doctors.	No. holding Dispensers Permits.	Nature of Work.				Cases Treated.	Total Attendances.
				Hospitals.	Dispensaries.	Leprosy.	Maternity. and Infant Welfare.		
NORTHERN PROVINCES.									
Sudan Interior Mission	28	1	55	1	28	2	9	?	173,037
Sudan United Mission	24	3	52	1	19	2	5	21,583	46,222
United Missionary Society	6	...	6	...	2	...	...	?	13,223
Dutch Reformed Church	6	2	6	1	5	1	1	4,744	165,784
Christian Mission in many Lands	2	...	2	...	2	1	...	?	27,902
Church of the Brethren Mission	3	2	4	2	4	1	31	4,511	114,504
Church Missionary Society	1	2	2	1	1	1	1	2,679	40,042
SOUTHERN PROVINCES.									
Catholic Sacred Heart Hospital	1	1	3	1	...	1	1	1,935	16,247
Baptist Mission, Ogbomosho	3	3	1	1	3	2	2	3,799	38,923
Methodist Missionary Society	4	2	...	1	5	1	1	5,125	24,905
United Free Church of Scotland	13	1	...	4	9	...	4	32,073	51,247
Church of Scotland Mission Council ...	2	1	2	2	1	1	1	12,178	13,200
Qua Iboe Mission	10	1	14	1	9	1	5	12,455	46,900
Basel Mission	4	...	6	...	3	...	4	900	5,000
Church Missionary Society	6	3	2	1	2	...	2	17,332	34,893

D.—Dental Report.

Owing to the necessity of leave the two Government dental surgeons were on duty together for only two months of the year. During the remainder of the year the dental treatment centre at Lagos only was maintained, but visits were paid to Kaduna, Jos, Enugu and Port Harcourt.

The following table summarises the work carried out for European officers and for African officials and their wives and children :—

Fillings	1,250
Dressings	193
Extractions	648
Scalings	527
Root dressings	77
Stomatitis, treatment	79
Dentures—repairs	30
part	11
full	4

E.—Surgical Operations, 1932.

Nature of Operation.	Total.	Cured.	Relieved.	Unrelieved.	Died.
A. General.					
Amputations	407	371	18	3	15
Appendectomy	57	52	...	...	5
Bubonocele (radical cure) ...	105	99	5	1	...
Fractures plating, etc. ...	96	85	4	3	4
Herniotomy	1,673	1,599	13	5	56
Hepatic abscess (drainage, etc.)	1	...	...	...	1
Laparotomy	106	50	22	16	18
Hæmorrhoids (radical cure) ...	123	117	6	...	...
Colotomy	1	...	1	...	...
Excision, benign tumours and cysts	551	529	16	4	2
Excision (malignant tumours)	43	32	10	...	1
Excision glands	128	117	8	2	1
Excision breast	3	2	1	...	...
Enterectomy	1	1	...	...	...
Sequestrotomy	239	212	23	2	2
Osteotomy	53	49	3	...	1
Trephining	1	...	...	...	1
Splenectomy	8	4	...	...	4
Cholecystomy	1	1	...	...	...
Curettage general ...	142	117	22	3	...
Skin Grafting	404	384	15	5	...
Tonsillectomy	10	10	...	...	...
Thyroidectomy	7	7	...	...	...
Omentopexy	1	...	1	...	...
Ischio rectal abscess ...	7	7	...	...	...
Other operations	659	552	69	4	34
B. Eyes.					
Cataract	56	44	9	2	1
Enucleation	32	29	3	...	...
Iridectomy	11	11	...	...	...
Other operations	70	61	8	...	1
C. Ear.					
Mastoid Schwartze operation	7	7	...	...	...
Other operations	17	17	...	...	...
Carried forward ...	5,020	4,566	257	50	147

SURGICAL OPERATIONS, 1932—*continued.*

Nature of Operation.	Total.	Cured.	Relieved.	Unrelieved.	Died.
Brought forward ...	5,020	4,566	257	50	147
D. GENITO URINARY, MALE.					
External urethrotomy ...	36	34	...	...	2
Internal urethrotomy ...	17	16	...	...	1
Dilation of stricture ...	632	355	273	2	2
Elephantiasis of scrotum ...	141	137	...	1	3
Hydrocele (radical cure) ...	615	531	77	3	4
Varicocele „ „ ...	4	4	...	...	...
Circumcision	1,273	1,273	...	...	...
Cystotomy	64	46	13	1	4
Orchidectomy	28	28	...	...	...
Tumour of bladder ...	2	1	...	...	1
Other operations	139	119	20	...	...
E. GENITO URINARY, FEMALE.					
Abdominal hysterectomy ...	43	38	2	...	3
Elephantiasis	34	34	...	...	...
Ovariotomy	19	19	...	...	...
Salpingectomy	26	22	3	...	1
Hysteropexy	8	6	2	...	...
Perineorraphy	6	6	...	...	...
Endometritis (curettage) ...	143	99	44	...	...
Colporrhaphy	2	2	...	...	...
Other operations	63	49	8	4	2
F. OBSTETRICAL.					
Abortion—curettage ..	43	40	1	...	2
Forceps extraction ...	39	33	...	...	6
Podalic version	4	4	...	...	...
Craniotomy	6	1	...	...	5
Ectopic gestation ...	1	1	...	...	...
Cæsarian section	5	2	...	...	3
Retained placenta (currettage)	30	24	...	3	3
Other operations	44	25	14	...	5
G. MINOR SURGICAL OPERATIONS.					
Abscesses, general Injuries ...	9,811	8,857	841	57	56
Totals	18,298	16,372	1,555	121	250

F.—X-RAY DEPARTMENTS.

At Lagos 754 X-ray photographs or screenings were undertaken of which 489 were for various injuries. Eighty-three examinations of the alimentary tract were carried out. 170 new cases were treated by diathermy with 3,487 attendances, the results being very satisfactory in cases of persistent pain due to arthritis or other causes. The mercury vapour lamp gave excellent results in treatment of tineas and ulcers.

The new X-ray department at Kaduna has been much appreciated. 207 patients were screened or photographed and the electro-therapeutical section was fully used.

VII.—PRISONS AND ASYLUMS.

The following figures show the general health and the death rate of prisoners in Government gaols during the year, as contrasted with the previous year :—

	Northern Provinces.		Southern Provinces.	
	1931.	1932.	1931.	1932.
Average daily number in Prison ...	481	449	6,979	7,074
Total number on sick list	377	291	27,541	25,292
Total number of days on sick list ...	3,252	2,753	77,007	162,943
Average daily sick	1·03	7·36	59·17	69·11
Total number of deaths	6	4	119	97
Death rate per thousand	12·4	8·9	17·5	13·7

The following table shows the causes of deaths among prisoners :—

Northern Provinces.		Brought forward ...	27
Myocarditis	1	Meningitis	1
Pneumonia	2	Locomotor Ataxia ...	1
Septicæmia	1	Apoplexy: Hæmorrhage ...	3
		Thrombosis ...	1
Total	4	Paraplegia	2
		General Paralysis of the Insane	2
		Epilepsy	1
		Pericarditis	1
		Cardiac disease	13
Southern Provinces.		Bronchitis	3
Malaria	4	Pneumonia	25
Dysentery	12	Pleurisy	1
Leprosy	1	Ulcer of stomach-hæmorrhage	1
Tuberculosis, abnominal ...	1	Enteritis	6
Tuberculosis, disseminated, acute	2	Hernia strangulated ...	4
Gonorrhœa and its complications	1	Liver, cirrhosis of... ...	1
Septicæmia	2	„ abscess of	1
Cancer of the Liver... ...	1	Senility	1
Anæmia	3	Injury	2
Carried forward ...	27	Total	97

In the Native Administration prisons in the Northern Provinces a mortality rate of 19.83 per 1,000 of daily average of prisoners was recorded. This is a marked improvement upon previous years and appears to have followed the introduction of a better diet.

The scheme for a new large asylum for the Southern Provinces at Abeokuta could not be proceeded with owing to the financial situation. The existing asylums at Yaba and at Calabar were maintained and part of the prison at Lagos is set aside as an asylum for criminal lunatics. At the Yaba Asylum the average number of inmates was 122 and seven deaths occurred.

In the Northern Provinces part of the prison at Lokoja is set aside as an asylum and in the larger towns the Native Administrations maintain buildings attached to the prisons for the care of lunatics.

VIII.—METEOROLOGY.

Tables showing comparative monthly rainfall for Lagos and meteorological returns of various stations for 1932 are appended.

COMPARATIVE MONTHLY RAINFALL—LAGOS, 1922–1932.

Month.	YEAR.										
	1922.	1923.	1924.	1925.	1926.	1927.	1928.	1929.	1930.	1931.	1932.
January	0·59	0·89	1·94	1·50	...	2·49	1·77	·02	1·38	0·94	0·02
February	0·81	1·22	1·12	0·40	3·01	2·35	2·22	1·46	2·21	1·47	0·44
March	1·50	2·60	5·28	6·61	2·74	2·78	8·20	1·73	3·27	5·89	2·61
April	7·42	6·43	7·55	7·00	12·76	3·37	6·96	7·04	5·01	7·16	3·80
May...	8·13	13·55	3·45	12·16	13·69	8·19	15·33	11·34	8·61	8·87	11·34
June...	26·36	25·08	5·53	20·40	13·06	7·08	21·05	24·79	13·28	17·73	14·10
July	2·75	10·44	2·48	15·22	10·07	8·57	2·53	19·93	18·40	17·81	0·86
August	5·73	0·12	0·10	1·28	0·26	0·25	2·05	·81	·66	2·10	3·02
September	11·32	3·15	4·10	5·98	11·05	3·04	5·60	3·11	2·67	12·54	4·11
October	15·40	5·36	15·62	2·98	3·79	13·33	12·67	6·03	12·46	5·87	5·16
November	3·51	2·72	0·83	2·87	5·47	2·38	·54	4·10	1·88	2·24	2·63
December	0·85	...	1·92	...	0·07	1·17	·13	6·02	1·69	0·93	...
Total	84·37	71·56	49·92	76·40	75·97	55·00	79·05	86·38	71·52	83·55	48·09

TABLE III.

METEOROLOGICAL RETURNS FOR 1932.

STATION.	Absolute Shade Max.	Absolute Shade Min.	Average Max.	Average Min.	Relative Humidity.	Rainfall inches.
Ilorin	103	45	97·9	57·7	76·4	39·87
Kaduna	102	48	94·41	58·4	66·06	46·02
Maiduguri	113	45	104·7	59·4	55·2	29·77
Kano	108	50	98·3	60·8	49·9	39·59
Lokoja	101	53	97	65·7	81·4	43·46
Yola	105	58	97·9	66·04	69·6	26·77
Lagos	92	68	88·33	70·5	83	48·09
Ibadan	97	58	91·1	66·08	80·9	47·36
Calabar	93	68	89·2	69·5	88	90·72
Enugu	96	61	91·3	64·8	84·2	56·07

IX.—SCIENTIFIC.

The annual reports of the laboratory service and of the tsetse investigation appear as Appendices A and B. A report upon the medical schools is given in Appendix C. Notes upon dietetics problems appear as Appendix D.

W. B. JOHNSON,
Director of Medical and Sanitary Service.

RETURNS.

TABLE IV.

RETURN OF DISEASES AND DEATHS (EUROPEAN) FOR THE YEAR 1932.

Diseases.	IN-PATIENTS.						OUT-PATIENTS.		
	Remaining in Hospital at end of 1931.	Total. Admissions. Male.	Total. Admissions. Female.	Deaths.	Total cases treated.	Remaining in Hospital at end of 1932.	Male.	Female.	Deaths.
I.—*Epidemic, Endemic, and Infectious Diseases.*									
1. Enteric Group—									
(*a*) Typhoid Fever ...	...	2	...	1	2	...	1	1	...
(*b*) Paratyphoid A. ...	...	1	...	...	1	...	1	...	...
(*c*) Paratyphoid B. ...	...	...	...	...	...	...	...	...	...
(*d*) Type not defined ...	...	3	...	...	3	...	1	...	...
2. Typhus	...	...	...	...	...	...	...	...	...
3. Relapsing Fever	...	...	...	...	...	...	...	...	...
4. Undulant Fever	...	...	...	...	...	...	...	...	...
5. Malaria—									
(*a*) Tertian	1	6	1	...	8	...	9	2	...
(*b*) Quartan	...	...	...	...	...	...	...	...	...
(*c*) Aestivo-autumnal ...	4	218	30	...	252	4	502	86	...
(*d*) Cachexia	1	3	...	...	4	...	13	...	...
(*e*) Blackwater ...	...	7	2	1	9	...	5	1	...
6. Smallpox	...	1	...	...	1	...	1	...	...
Alastrim	...	2	...	...	2	...	...	...	...
7. Measles	...	5	...	...	5	...	10	5	...
8. Scarlet Fever	...	...	...	...	...	...	...	...	...
9. Whooping Cough	...	...	...	...	...	...	1	...	...
10. Diphtheria	...	...	...	...	...	...	1	...	...
11. Influenza	...	30	3	1	33	...	96	19	...
12. Miliary Fever	...	...	...	...	...	...	...	...	...
13. Mumps	...	2	...	...	2	...	2	...	...
14. Cholera	...	...	...	...	...	...	...	...	...
15. Epidemic diarrhoea ...	...	...	...	...	...	...	...	...	...
16. Dysentery—									
(*a*) Amœbic	1	25	6	...	32	...	41	14	...
(*b*) Bacillary	1	7	...	...	8	1	2	...	...
(*c*) Undefined or due to other causes ...	...	5	...	...	5	...	4	...	...
17. Plague—									
(*a*) Bubonic	...	...	...	...	...	...	...	...	...
(*b*) Pneumonic ...	...	...	...	...	...	...	...	...	...
(*c*) Septicaemic ...	...	...	...	...	...	...	...	...	...
(*d*) Undefined	...	...	...	...	...	...	...	...	...
18. Yellow Fever	...	...	...	...	...	...	...	...	...
19. Spirochætosis ictero-hæmorrhagica ...	...	...	...	...	...	...	...	...	...
20. Leprosy	...	...	...	...	...	...	...	...	...
21. Erysipelas	...	...	...	...	...	...	...	...	...
22. Acute Poliomyelitis ...	...	...	...	...	...	...	...	...	...
23. Encephalitis Lethargica ...	...	...	...	...	...	...	...	...	...
24. Epidemic Cerebro-spinal Fever	...	...	...	...	...	...	...	...	...
25. Other Epidemic Diseases—									
(*a*) Rubeola (German Measles)	...	5	1	...	6	...	9	2	...
(*b*) Varicella (Chicken-pox)	...	1	...	...	1	...	3	...	...
(*c*) Kala-azar	...	...	...	...	...	...	...	...	...
(*d*) Phlebotomus Fever ...	...	1	...	...	1	...	...	...	...
(*e*) Dengue	...	1	1	...	2	...	7	3	...
Carried forward ...	8	325	44	3	377	5	709	133	...

TABLE IV.—RETURN OF DISEASES AND DEATHS (EUROPEAN) FOR THE YEAR 1932—*continued.*

Diseases.	IN-PATIENTS.					OUT-PATIENTS.		
	Remaining in Hospital at end of 1931.	TOTAL. Admissions. Male.	TOTAL. Admissions. Female.	Deaths.	Total cases treated.	Remaining in Hospital at end of 1932.	Male.	Female.	Deaths.
Brought forward ...	8	325	44	3	377	5	709	133	...
I.—*Epidemic, Endemic, and Infectious Diseases*—contd.									
Other Epidemic Diseases—									
(*f*) Epidemic Dropsy ...	...	...	...	...	...	...	...	...	...
(*g*) Yaws	...	...	...	...	...	...	...	...	...
(*h*) Trypanosomiasis ...	...	3	...	...	3	...	3	...	...
26. Glanders	...	...	...	...	...	...	...	...	...
27. Anthrax	...	...	...	...	...	...	...	...	...
28. Rabies	...	...	...	...	...	...	1	...	...
29. Tetanus	...	...	...	...	...	...	...	...	...
30. Mycosis	...	...	...	...	...	...	1	1	...
31. Tuberculosis, Pulmonary and Laryngeal	...	2	1	...	3	...	4	1	...
32. Tuberculosis of the Meninges or Central Nervous System	...	...	...	...	...	...	...	...	...
33. Tuberculosis of the Intestines or Peritoneum	...	1	...	...	1	1	...	...	...
34. Tuberculosis of the Vertebral Column	...	...	...	...	...	...	...	...	...
35. Tuberculosis of Bones and Joints	...	...	.	...	...	...	...	...	...
36. Tuberculosis of other organs—									
(*a*) Skin or Subcutaneous Tissue (Lupus) ...	...	...	...	...	...	...	...	...	...
(*b*) Bones	...	...	...	...	...	...	...	...	...
(*c*) Lymphatic System ...	...	...	...	...	...	...	...	...	...
(*d*) Genito-urinary ...	...	...	...	...	...	...	1	...	...
(*e*) Other Organs ...	...	...	...	...	...	...	...	...	...
37. Tuberculosis disseminated—									
(*a*) Acute	...	1	...	...	1	...	1	...	...
(*b*) Chronic	...	...	...	...	...	...	...	...	...
38. Syphilis—									
(*a*) Primary	...	...	...	...	...	...	14	...	...
(*b*) Secondary	...	3	...	...	3	...	12	...	...
(*c*) Tertiary	...	...	...	...	...	...	8	...	...
(*d*) Hereditary... ...	...	...	...	...	...	...	...	...	...
(*e*) Period not indicated ...	...	1	...	...	1	...	...	...	...
39. Soft Chancre	...	...	...	...	...	...	13	...	...
40. A.—Gonorrhœa and its complications	1	7	...	...	8	...	118	1	...
B.—Gonorrhœal Ophthalmia ...	...	...	...	...	...	...	1	...	...
C.—Gonorrhœal Arthritis ...	...	...	...	...	...	...	1	...	...
D.—Granuloma Venereum ...	...	1	...	...	1	...	...	...	...
41. Septicaemia	...	1	...	...	1	...	...	...	...
42. Other Infectious Diseases ...	...	...	1	...	1	...	4	1	...
II.—*General Diseases not mentioned above.*									
43. Cancer or other malignant Tumours of the Buccal Cavity	...	2	...	1	2	...	...	...	...
Carried forward ...	9	347	46	4	402	6	891	137	...

TABLE IV.—RETURN OF DISEASES AND DEATHS (EUROPEAN) FOR THE YEAR 1932—*continued*.

Diseases.	IN-PATIENTS.						OUT-PATIENTS.		
	Remaining in Hospital at end of 1931.	TOTAL. Admissions. Male.	TOTAL. Admissions. Female.	TOTAL. Deaths.	Total cases treated.	Remaining in Hospital at end of 1932.	Male.	Female.	Deaths.
Brought forward	9	347	46	4	402	6	891	137	...
II.—*General Diseases not mentioned above*—contd.									
44. Cancer or other malignant Tumours of the Stomach or Liver	...	...	...	...	...	...	...	...	...
45. Cancer or other malignant Tumours of the Peritoneum intestines, Rectum	...	...	...	...	...	...	...	...	...
46. Cancer or other malignant Tumours of the Female Genital Organs	...	...	...	...	...	...	...	...	...
47. Cancer or other malignant Tumours of the Breast ...	...	...	...	...	...	...	...	...	...
48. Cancer or other malignant Tumours of the Skin ...	...	...	...	...	...	...	...	...	...
49. Cancer or other malignant Tumours of Organs not specified	...	1	...	...	1	...	3	...	...
50. Tumours non-Malignant ...	...	5	...	...	5	...	18	3	...
51. Acute Rheumatism	...	2	1	...	3	1	48	4	...
52. Chronic Rheumatism	...	8	...	...	8	...	83	13	...
53. Scurvy (Including Barlow's Disease)	...	...	...	...	...	...	2	1	...
54. Pellagra	...	...	...	...	...	...	...	...	...
55. Beri-Beri	...	...	...	...	...	...	...	...	...
56. Rickets	...	...	...	...	...	...	...	...	...
57. Diabetes (not including Insipidus)	...	1	1	...	2	...	2	...	...
58. Anæmia—									
(*a*) Pernicious	...	...	...	...	...	...	...	...	...
(*b*) Other Anæmias and Chlorosis	...	8	3	...	11	1	103	29	...
59. Diseases of the Pituitary Body	...	...	...	...	...	...	...	...	...
60. Diseases of the Thyroid Gland—									
(*a*) Exophthalmic Goitre ...	...	...	...	...	...	...	2	1	...
(*b*) Other diseases of the Thyroid Gland, Myxœdema	...	...	...	...	...	...	...	...	...
61. Diseases of the Para-Thyroid Glands...	...	...	...	...	...	...	...	...	...
62. Diseases of the Thymus ...	...	...	...	...	...	...	...	...	...
63. Diseases of the Supra-Renal Glands	...	...	...	...	...	...	...	...	...
64. Diseases of the Spleen ...	...	1	...	...	1	...	2	2	...
65. Leukæmia—									
(*a*) Leukæmia	...	...	...	...	...	...	...	...	...
(*b*) Hodgkin's Disease ...	...	...	...	...	...	...	...	...	...
66. Alcoholism	...	1	...	...	1	...	1	...	...
67. Chronic poisoning by mineral substances (lead, mercury, &c.)	...	...	...	...	...	...	...	...	...
68. Chronic poisoning by organic substances (Morphia, Cocaine, &c.)	...	...	...	...	...	...	...	...	...
Carried forward	9	374	51	4	434	8	1,155	190	...

Table IV.—Return of Diseases and Deaths (European) for the year 1932—*continued.*

Diseases.	IN-PATIENTS.						OUT-PATIENTS.		
	Remaining in Hospital at end of 1931.	Total. Admissions. Male.	Total. Admissions. Female.	Total. Deaths.	Total cases treated.	Remaining in Hospital at end of 1932.	Male.	Female.	Deaths.
Brought forward	9	374	51	4	434	8	1,155	190	...
II.—*General Diseases not mentioned above*—contd.									
69. Other General Diseases—									
Auto-intoxication	...	7	1	...	8	...	3	...	...
Purpura Hæmorrhagica ...	...	...	...	...	...	...	...	...	...
Hæmophilia	...	...	...	...	...	...	...	...	...
Diabetes Insipidus	...	...	...	...	...	...	...	...	...
III.—*Affections of the Nervous System and Organs of the Senses.*									
70. Encephalitis (not including Encephalitis Lethargica) ...	...	...	...	...	...	...	1	...	...
71. Meningitis (not including Tuberculous Meningitis or Cerebro-spinal Meningitis)	...	...	...	...	...	...	...	...	...
72. Locomotor Ataxia	...	...	...	...	...	...	2	...	...
73. Other affections of the Spinal Cord	...	...	...	...	...	...	...	...	...
74. Apoplexy—									
(*a*) Hæmorrhage	...	..	...	...	...	...	...	...	...
(*b*) Embolism	...	...	...	...	...	...	...	...	...
(*c*) Thrombosis	...	...	...	...	...	...	...	...	...
75. Paralysis—									
(*a*) Hemiplegia	...	...	...	...	...	...	...	...	...
(*b*) Other Paralyses ...	...	1	...	...	1	...	3	...	...
76. General Paralysis of the Insane	...	...	...	...	...	...	...	...	...
77. Other forms of mental Alienation	...	3	...	1	3	...	...	...	...
78. Epilepsy	...	...	...	...	...	...	...	...	...
79. Eclampsia, Convulsions (non-puerperal) 5 years or over ...	...	...	...	...	...	...	...	...	...
80. Infantile Convulsions	...	...	...	...	...	...	...	...	...
81. Chorea	...	...	...	...	...	...	...	...	...
82. A.—Hysteria	...	1	...	...	1	...	11	2	...
B.—Neuritis	...	11	1	...	12	...	40	14	...
C.—Neurasthenia	...	17	2	...	19	1	58	15	...
83. Cerebral Softening	...	...	...	...	...	...	...	...	...
84. Other affections of the Nervous System, such as Paralysis Agitans	...	1	1	...	2	...	10	...	...
85. Affections of the Organs of Vision—									
(*a*) Diseases of the eye ...	...	...	...	...	...	...	18	5	...
(*b*) Conjunctivitis	...	1	...	...	1	...	68	11	...
(*c*) Trachoma	...	2	...	...	2	1	1	...	...
(*d*) Tumours of the Eye ...	...	...	...	...	..	...	2	...	...
(*e*) Other affections of the Eye	...	...	...	...	...	...	42	6	...
86. Affections of the Ear or Mastoid Sinus	...	8	...	...	8	...	370	51	...
Carried forward	9	426	56	5	491	10	1,784	294	...

TABLE IV.—RETURN OF DISEASES AND DEATHS (EUROPEAN) FOR THE YEAR 1932—*continued.*

Diseases.	IN-PATIENTS.						OUT-PATIENTS.		
	Remaining in Hospital at end of 1931.	TOTAL. Admissions. Male.	TOTAL. Admissions. Female.	Deaths.	Total cases treated.	Remaining in Hospital at end of 1932.	Male.	Female.	Deaths.
Brought forward ...	9	426	56	5	491	10	1,784	294	...
IV.—*Affections of the Circulatory System*									
87. Pericarditis	...	...	...	...	..	...	...	...	...
88. Acute Endocarditis or Myocarditis	...	1	1	2	2	...	...	...	...
89. Angina Pectoris	...	...	...	...	...	...	1	...	...
90. Other Diseases of the Heart—									
(*a*) Valvular	...	1	...	...	1	...	1	...	...
Mitral	...	...	...	...	...	...	7	...	...
Aortic	...	...	...	...	...	...	...	2	...
Tricuspid	...	...	...	...	...	...	...	...	...
Pulmonary	...	...	...	...	...	...	1	...	...
(*b*) Myocarditis	...	4	2	2	6	...	3	1	1
91. Diseases of the Arteries—									
(*a*) Aneurism	...	1	...	...	1	...	...	...	...
(*b*) Arterio-Sclerosis ...	...	1	...	...	1	...	1	...	...
(*c*) Other diseases ...	...	1	...	...	1	...	2	...	...
92. Embolism or Thrombosis (non-cerebral)	...	...	...	...	...	...	...	...	...
93. Diseases of the Veins—									
Hæmorrhoids... ...	...	8	1	...	9	1	40	1	...
Varicose Veins... ...	...	...	...	...	...	...	11	3	...
Phlebitis	...	...	...	...	...	...	...	...	...
94. Diseases of the Lymphatic System—									
Lymphangitis... ...	...	...	...	...	...	...	3	...	...
Lymphadenitis, Bubo (non-specific)	1	10	...	...	11	...	40	4	...
95. Hæmorrhage of undetermined cause	...	...	1	...	1	...	2	...	...
96. Other affections of the Circulatory System	...	...	1	...	1	...	2	...	...
V.—*Affections of the Respiratory System.*									
97. Diseases of the Nasal Passages—									
Adenoids	...	...	...	...	...	...	1	1	...
Polypus	...	...	...	..	...	...	2	...	...
Rhinitis	...	1	...	...	1	...	26	7	...
Coryza	...	3	...	...	3	...	112	16	...
98. Affections of the Larynx—									
Laryngitis	...	...	1	...	1	...	29	5	...
99. Bronchitis—									
(*a*) Acute	1	8	1	...	10	...	95	9	...
(*b*) Chronic	...	...	...	...	...	...	19	3	...
100. Broncho-Pneumonia ...	...	1	...	1	1	...	...	...	...
101. Pneumonia—									
(*a*) Lobar	..	1	...	...	1	...	4	...	2
(*b*) Unclassified ...	...	...	...	...	...	...	...	...	...
102. Pleurisy, Empyema ...	...	3	...	...	3	...	2	2	...
103. Congestion of the Lungs ...	...	...	...	...	...	...	...	1	...
104. Gangrene of the Lungs ...	...	...	...	...	...	...	...	...	...
105. Asthma	1	7	...	...	8	...	22	...	...
106. Pulmonary Emphysema ...	...	...	...	...	...	...	...	...	...
107. Other affections of the Lungs...	...	1	...	...	1	...	...	...	...
Pulmonary Spirochætosis ...	...	...	...	...	...	...	1	...	...
Carried forward ...	12	478	64	10	554	11	2,241	349	3

TABLE IV.—RETURN OF DISEASES AND DEATHS (EUROPEAN) FOR THE YEAR 1932—*continued.*

Diseases.	IN-PATIENTS.						OUT-PATIENTS.		
	Remaining in Hospital at end of 1931.	TOTAL. Admissions. Male.	Female.	Deaths.	Total cases treated.	Remaining in Hospital at end of 1932.	Male.	Female.	Deaths.
Brought forward	12	478	64	10	554	11	2,241	349	3
VI.—*Diseases of the Digestive System.*									
108. A.—Diseases of Teeth or Gums	...	7	...	...	7	...	...	...	...
Caries, Pyorrhœa, &c. ...	...	...	...	...	...	...	191	32	...
B.—Other affections of the Mouth—									
Stomatitis	...	3	...	...	3	...	23	4	...
Glossitis, &c.	...	1	...	...	1	...	16	2	...
109. Affections of the Pharynx or Tonsils—									
Tonsillitis	...	16	1	...	17	...	92	17	...
Pharyngitis	...	...	...	...	...	...	56	17	...
110. Affections of the Œsophagus ...	...	...	...	...	...	...	...	...	...
111. A.—Ulcer of the Stomach ...	...	...	...	...	...	...	1	...	...
B.—Ulcer of the Duodenum ...	...	3	...	...	3	...	5	...	...
112. Other affections of the Stomach—									
Gastritis	...	25	1	...	26	1	126	13	...
Dyspepsia, &c.	...	10	...	...	10	...	214	51	...
113. Diarrhœa and Enteritis—									
Under two years	...	3	1	...	4	...	6	3	...
114. Diarrhœa and Enteritis—									
Two years and over ...	...	24	7	...	31	...	156	42	...
Colitis	...	10	5	...	15	1	31	11	...
Ulceration	...	...	...	...	...	...	...	...	...
114a. Sprue	...	...	...	...	...	...	...	...	...
115. Ankylostomiasis	...	1	...	...	1	...	2	...	...
116. Diseases due to Intestinal Parasites—									
(*a*) Cestoda (Tænia) ...	...	1	...	...	1	...	8	...	...
(*b*) Trematoda (Flukes) ...	...	...	...	...	...	...	1	...	...
(*c*) Nematoda (other than Ankylostoma)— ...	...	...	...	...	...	...	1	...	...
Ascaris	...	1	...	...	1	...	9	3	...
Trichocephalus dispar	...	...	...	...	...	...	...	...	...
Trichina	...	...	...	...	...	...	...	...	...
Dracunculus ...	...	...	...	...	...	...	...	...	...
Strongylus	...	...	...	...	...	...	...	...	...
Oxyuris	...	...	...	...	...	...	1	3	...
(*d*) Coccidia	...	...	...	...	...	...	...	...	...
(*e*) Other parasites ...	...	...	...	...	...	...	3	1	...
(*f*) Unclassified	...	...	...	...	...	...	1	...	...
117. Appendicitis	1	13	...	...	14	1	19	3	...
118. Hernia	...	2	1	...	3	...	5	...	...
119. A.—Affections of the Anus, Fistula, &c.	...	5	...	...	5	...	10	...	...
B.—Other affections of the Intestines	...	1	...	...	1	...	...	...	...
Enteroptosis	...	...	...	...	...	...	...	...	...
Constipation	...	2	4	...	6	...	70	11	...
120. Acute Yellow Atrophy of the Liver	...	...	...	...	...	...	...	...	...
121. Hydatid of the Liver	...	...	...	...	...	...	...	...	...
Carried forward	13	606	84	10	703	14	3,288	562	3

TABLE IV.—RETURN OF DISEASES AND DEATHS (EUROPEAN) FOR THE YEAR 1932—*continued.*

Diseases.	IN-PATIENTS.						OUT-PATIENTS.		
	Remaining in Hospital at end of 1931.	TOTAL Admissions. Male.	TOTAL Admissions. Female.	TOTAL Deaths.	Total cases treated.	Remaining in Hospital at end of 1932.	Male.	Female.	Deaths.
Brought forward	13	606	84	10	703	14	3,288	562	3
VI.—*Diseases of the Digestive System*—continued.									
122. Cirrhosis of the Liver—									
(*a*) Alcoholic	...	...	...	...	...	...	...	...	...
(*b*) Other forms	...	...	...	...	...	...	...	...	...
123. Biliary Calculus	...	...	...	...	...	...	...	...	...
124. Other affections of the Liver—									
Abscess	...	...	...	...	...	...	...	...	...
Hepatitis	1	6	...	...	7	1	20	2	...
Cholecystitis...	...	...	...	...	...	...	5	1	...
Jaundice	...	13	...	...	13	...	8	...	...
125. Diseases of the Pancreas ...	...	...	...	...	...	...	...	...	...
126. Peritonitis (of unknown cause)	...	2	1	...	3	...	1	1	...
127. Other affections of the Digestive System	...	...	...	...	...	...	...	...	...
VII.—*Diseases of the Genito-urinary System (non-Venereal).*									
128. Acute Nephritis	...	1	...	...	1	...	7	...	...
129. Chronic	...	...	...	...	...	...	3	...	...
130. A.—Chyluria	...	...	...	...	...	...	...	...	...
B.—Schistosomiasis	...	2	...	...	2	...	3	...	...
131. Other affections of the Kidneys—									
Pyelitis, &c.	...	3	1	...	4	...	5	...	...
132. Urinary Calculus	...	7	...	...	7	...	6	...	...
133. Diseases of the Bladder—									
Cystitis	...	5	1	...	6	1	30	12	...
134. Diseases of the Urethra—									
(*a*) Stricture	...	...	...	...	...	...	9	...	...
(*b*) Other	...	6	...	...	6	...	28	...	...
135. Diseases of the Prostate—									
Hypertrophy	...	...	..	...	...	...	...	...	...
Prostatitis	...	3	...	...	3	...	17	...	...
136. Diseases (non-Venereal) of the Genital Organs of Man—									
Epididymitis	...	6	...	...	6	...	12	...	...
Orchitis	...	3	...	...	3	...	7	...	...
Hydrocele	...	2	...	...	2	...	3	...	...
Ulcer of Penis	...	...	...	...	...	...	13	...	...
137. Cysts or other non-malignant Tumours of the Ovaries ...	...	...	...	...	...	...	...	3	...
138. Salpingitis—									
Abscess of the Pelvis ...	...	...	..	...	...	...	...	1	...
139. Uterine Tumours (non-malignant)	...	...	...	...	...	...	...	...	...
140. Uterine Hæmorrhage (non-puerperal)	...	...	...	...	...	...	...	2	...
141. A.—Metritis	...	...	1	...	1	...	...	3	...
B.—Other affections of the Female Genital Organs—									
Displacements of Uterus ...	1	...	2	...	3	...	...	3	...
Amenorrhoea	...	...	...	...	...	...	...	15	...
Dysmenorrhœa	...	...	1	...	1	...	...	11	...
Leucorrhœa	...	...	...	...	...	...	...	...	...
Carried forward	15	665	91	10	771	16	3,465	616	3

Table IV.—Return of Diseases and Deaths (European) for the year 1932—*continued.*

Diseases.	IN-PATIENTS.						OUT-PATIENTS.		
	Remaining in Hospital at end of 1931.	Total. Admissions. Male.	Total. Admissions. Female.	Total. Deaths.	Total cases treated.	Remaining in Hospital at end of 1932.	Male.	Female	Deaths.
Brought forward	15	665	91	10	771	16	3,465	616	3
VII.—*Diseases of the Genito-urinary System (non-Venereal)*—contd.									
142. Diseases of the Breast (non-puerperal)—									
Mastitis	...	...	2	...	2	...	...	...	...
Abscess of Breast	...	...	1	...	1	...	...	...	...
VIII.—*Puerperal State.*									
143. A.—Normal Labour	...	...	5	...	5	...	...	3	...
B.—Accidents of Pregnancy—									
(*a*) Abortion	1	...	10	...	11	...	...	16	...
(*b*) Ectopic Gestation ...	...	...	1	...	1	...	...	...	...
(*c*) Other accidents of Pregnancy	...	...	8	...	8	...	...	10	...
144. Puerperal Hæmorrhage ...	...	...	...	...	...	...	...	...	...
145. Other accidents of Parturition	...	...	2	...	2	...	...	...	...
146. Puerperal Septicæmia	...	...	...	...	...	...	...	...	...
147. Phlegmasia Dolens	...	...	...	...	...	...	...	...	...
148. Puerperal Eclampsia	...	...	...	...	...	...	...	...	...
149. Sequelæ of Labour	...	...	...	...	...	...	...	...	...
150. Puerperal affections of the Breast	...	...	...	...	...	...	...	...	...
IX.—*Affections of the Skin and Cellular Tissues.*									
151. Gangrene	...	...	1	...	1	1	2	...	...
152. Boil	...	13	...	...	13	...	153	10	...
Carbuncle	...	8	...	...	8	...	35	5	...
153. Abscess	...	13	1	...	14	...	41	5	...
Whitlow	...	5	...	...	5	...	20	8	...
Cellulitis	1	15	...	...	16	1	65	6	...
154. A.—Tinea	...	1	...	...	1	...	143	6	...
B.—Scabies	...	1	...	...	1	...	15	3	...
155. Other Diseases of the Skin—									
Brythema	...	...	...	...	...	...	...	...	...
Urticaria	...	1	...	...	1	...	26	9	...
Eczema	...	5	...	...	5	...	121	19	...
Herpes	...	...	...	...	...	...	25	2	...
Psoriasis	...	...	...	...	...	...	8	1	...
Elephantiasis	...	...	...	...	...	...	...	...	...
Ulcers	...	6	...	...	6	...	35	3	...
Myiasis	...	...	...	...	...	...	10	4	...
Chigoes	...	...	...	...	...	...	17	3	...
Cutaneous Leishmaniasis ...	...	...	...	...	...	...	...	...	...
Others	...	6	...	...	6	...	74	15	...
X.—*Diseases of Bones and Organs of Locomotion (other than Tuberculous).*									
156. Diseases of Bones—									
Osteitis	...	1	...	...	1	...	8	...	...
157. Diseases of Joints—									
Arthritis	...	5	...	...	5	1	29	3	...
Synovitis	...	5	...	...	5	...	29	3	...
158. Other Diseases of Bones or Organs of Locomotion ...	...	2	...	...	2	...	33	1	...
Carried forward	17	752	122	10	891	19	4,354	751	3

Table IV.—Return of Diseases and Deaths (European) for the year 1932—*continued.*

Diseases.	IN-PATIENTS.						OUT-PATIENTS.		
	Remaining in Hospital at end of 1931.	Total.			Total cases treated.	Remaining in Hospital at end of 1932.	Male.	Female.	Deaths.
		Admissions.		Deaths.					
		Male.	Female.						
Brought forward	17	752	122	10	891	19	4,354	751	3
XI.—*Malformations.*									
159. Malformations—									
Hydrocephalus	...	...	...	...	...	...	...	...	...
Hypospadias...	...	...	...	...	...	...	...	...	...
Spina Bifida, etc.	...	...	...	...	...	...	...	...	...
XII—*Diseases of Infancy.*									
160. Congenital Debility	...	1	1	...	2	...	2	1	...
161. Premature Birth	...	...	...	...	...	...	...	...	...
162. Other affections of infancy ...	...	...	...	...	...	...	...	...	...
163. Infant neglect (infants of three months or over) ...	...	...	...	...	...	...	...	...	...
XIII.—*Affections of Old Age.*									
164. Senility—	...	...	...	...	...	...	...	1	...
Senile Dementia	...	...	...	...	...	...	...	...	...
XIV.—*Affections produced by External Causes.*									
165. Suicide by Poisoning	...	...	...	...	...	...	...	...	...
166. Corrosive Poisoning (Intentional)...	...	...	...	...	...	...	...	...	...
167. Suicide by Gas Poisoning ...	...	...	...	...	...	...	...	...	...
168. Suicide by Hanging or Strangulation	...	...	...	...	...	...	...	...	...
169. Suicide by Drowning	...	...	...	...	...	...	..	...	...
170. Suicide by Firearms	...	...	...	...	...	...	1	...	...
171. Suicide by cutting or stabbing instruments	...	...	...	...	...	...	...	...	...
172. Suicide by jumping from a height	...	...	...	...	...	...	...	...	...
173. Suicide by crushing	...	...	...	...	...	...	...	...	...
174. Other Suicides	...	...	...	...	...	...	...	...	...
175. Food Poisoning	...	1	...	...	1	...	7	1	...
Botulism	...	...	...	...	...	...	...	...	...
176. Attacks of poisonous animals									
Snake Bite	...	1	1	...	2	...	5	...	...
Insect Bite	...	...	1	...	1	...	34	12	...
177. Other accidental Poisonings	...	...	...	...	...	...	2	...	...
178. Burns (by Fire)	...	1	...	...	1	...	11	2	...
179. Burns (other than by Fire) ...	...	1	...	...	1	...	7	3	...
180. Suffocation (accidental) ...	...	...	...	...	...	...	...	...	...
181. Poisoning by Gas (accidental)	...	...	...	...	...	...	2	...	...
182. Drowning (accidental)... ...	...	...	...	...	...	...	...	...	...
183. Wounds (by Firearms, war excepted)	...	2	...	...	2	...	6	...	...
184. Wounds (by cutting or stabbing instruments)...	...	3	...	...	3	...	23	2	...
185. Wounds (by Fall)	...	21	...	...	21	...	146	13	...
186. Wounds (in Mines or Quarries)	...	1	...	1	1	...	1	...	...
187. Wounds (by Machinery) ...	...	1	1	...	2	...	1	...	...
188. Wounds (crushing, *e.g.* railway accidents, &c.)	...	...	...	...	...	...	...	...	...
Carried forward	17	785	126	11	928	19	4,602	786	3

Table IV.—Return of Diseases and Deaths (European) for the year 1932—*continued.*

Diseases.	In-Patients.						Out-Patients.		
	Remaining in Hospital at end of 1931.	Total.			Total cases treated.	Remaining in Hospital at end of 1932.	Male.	Female.	Deaths.
		Admissions.		Deaths.					
		Male.	Female.						
Brought forward	17	785	126	11	928	19	4,602	786	3
XIV.—*Affections produced by External Causes*—contd.									
189. Injuries inflicted by Animals, Bites, Kicks, &c.	...	5	2	...	7	...	36	6	...
190. Wounds inflicted on Active Service	...	...	...	...	...	...	...	...	...
191. Executions of civilians by belligerents	...	...	...	...	...	...	...	...	...
192. A.—Over fatigue	...	1	...	...	1	...	6	...	...
B.—Hunger or Thirst ...	...	...	...	...	...	...	...	...	...
193. Exposure to Cold, Frost bite, &c.	...	...	...	...	...	...	...	...	...
194. Exposure to Heat—									
Heatstroke	...	1	...	...	1	...	6	1	..
Sunstroke	...	1	...	...	1	...	6	2	...
195. Lightning Stroke	...	...	...	...	...	...	...	...	...
196. Electric Shock	...	...	...	...	...	...	...	...	...
197. Murder by Firearms	...	...	...	...	...	...	...	...	...
198. Murder by cutting or stabbing instruments	...	...	...	...	...	...	...	...	...
199. Murder by other means ...	...	...	...	...	...	...	...	...	...
200. Infanticide (Murder of an infant under one year) ...	...	...	...	...	...	...	...	...	...
201. A.—Dislocation	...	1	...	...	1	...	5	...	...
B.—Sprain	...	8	...	...	8	...	83	7	...
C.—Fracture	1	21	3	...	25	2	37	4	...
202. Other External Injuries ...	1	17	1	...	19	...	182	11	...
203. Deaths by Violence of unknown cause	...	...	...	...	...	...	...	...	...
XV.—*Ill-Defined Diseases.*									
204. Sudden Death (cause unknown)	...	...	...	...	...	...	...	...	...
205. A.—Diseases not already specified or ill-defined—									
Ascites	...	...	...	...	...	...	7	1	...
Œdema	...	2	...	...	2	...	5	2	...
Asthenia	...	12	4	...	16	...	88	22	...
Shock	...	...	...	...	...	...	4	...	...
Hyperpyrexia	...	...	...	...	...	...	2	...	...
Pyrexia of Uncertain Origin	...	1	...	...	1	...	1	...	...
B.—Malingering	...	...	...	...	...	...	...	...	...
XVI.—*Diseases, the total of which have not caused 10 Deaths—*									
Total	19	855	136	11	1,010	21	5,070	842	3

TABLE V.

RETURN OF DISEASES AND DEATHS (NON-EUROPEAN) FOR THE YEAR 1932.

Diseases.	IN-PATIENTS.						OUT-PATIENTS.		
	Remaining in Hospital at end of 1931.	Total. Admissions. Male.	Total. Admissions. Female.	Total. Deaths.	Total cases treated.	Remaining in Hospital at end of 1932.	Male.	Female.	Deaths.
I.—*Epidemic, Endemic, and Infectious Diseases.*									
1. Enteric Group—									
(*a*) Typhoid Fever	...	19	5	10	24	1	...	...	...
(*b*) Paratyphoid A.	...	1	...	...	1	...	...	...	...
(*c*) Paratyphoid B.	...	1	...	...	1	...	...	...	...
(*d*) Type not defined	...	4	2	...	6	...	...	...	...
2. Typhus	...	...	...	...	...	...	...	...	...
3. Relapsing Fever	...	2	...	1	2	...	1	...	...
4. Undulant Fever	...	...	...	...	...	...	...	...	...
5. Malaria—									
(*a*) Tertian	...	8	14	1	22	...	21	8	...
(*b*) Quartan	...	2	2	...	4	...	5	8	...
(*c*) Aestivo-autumnal	18	1,511	236	32	1,765	15	21,333	9,580	3
(*d*) Cachexia	...	2	...	...	2	...	83	64	...
(*e*) Blackwater	...	4	2	2	6	...	2	2	...
6. Smallpox	1	223	56	66	280	2	154	105	86
Alastrim	...	1	1	1	2	1	19	9	...
7. Measles	1	22	13	...	36	...	129	54	...
8. Scarlet Fever	...	1	...	1	1	...	2	...	...
9. Whooping Cough	...	4	7	2	11	...	127	141	...
10. Diphtheria	...	8	...	1	8	...	1	...	...
11. Influenza	...	55	9	1	64	...	415	126	...
12. Miliary Fever	...	...	...	...	...	...	...	...	...
13. Mumps	...	48	9	...	57	...	352	137	...
14. Cholera	...	...	...	...	...	...	...	...	...
15. Epidemic diarrhoea	...	52	13	1	65	...	16	2	...
16. Dysentery—									
(*a*) Amœbic	11	785	162	88	958	23	1,966	795	...
(*b*) Bacillary	1	82	8	15	91	1	13	5	...
(*c*) Undefined or due to other causes	3	65	15	5	83	3	720	336	...
17. Plague—									
(*a*) Bubonic	...	...	...	...	...	...	...	...	...
(*b*) Pneumonic	...	...	...	...	...	...	...	...	...
(*c*) Septicæmic	...	...	...	...	...	...	...	...	...
(*d*) Undefined	...	...	...	...	...	...	...	...	...
18. Yellow Fever	1	...	...	...	1	...	...	...	...
19. Spirochætosis ictero-hæmorrhagica	...	...	...	...	...	...	...	...	...
20. Leprosy	6	266	39	15	311	79	1,671	688	2
21. Erysipelas	...	3	2	1	5	...	1	3	...
22. Acute Poliomyelitis	...	3	...	1	3	...	5	10	...
23. Encephalitis Lethargica	...	7	1	1	8	1	4	...	...
24. Epidemic Cerebro-spinal Fever	...	7	1	6	8	...	2	...	...
25. Other Epidemic Diseases—									
(*a*) Rubeola (German Measles)	...	61	6	...	67	...	31	24	...
(*b*) Varicella (Chicken-pox)	13	1,309	59	2	1,381	67	1,040	105	...
(*c*) Kala-azar	...	...	...	...	...	...	...	...	...
(*d*) Phlebotomus Fever	...	...	...	...	...	...	...	...	...
(*e*) Dengue	...	1	...	...	1	...	6	1	...
(*f*) Epidemic Dropsy	...	...	...	...	...	...	3	1	...
(*g*) Yaws	2	345	192	6	539	15	43,527	36,609	...
(*h*) Trypanosomiasis*	72	822	291	67	1,185	144	1,412	658	24
Carried forward	129	5,724	1,145	326	6,998	352	73,061	49,471	115

* Statistics of work of Tsetse Investigation shewn separately in Appendix B. 13,514 cases of Trypanosomiasis were diagnosed and 12,856 received treatment.

TABLE V.—RETURN OF DISEASES AND DEATHS (NON-EUROPEAN) FOR THE YEAR 1932—*continued.*

Diseases.	IN-PATIENTS.						OUT-PATIENTS.		
	Remaining in Hospital at end of 1931.	TOTAL. Admissions. Male.	Female.	Deaths.	Total cases treated.	Remaining in Hospital at end of 1932.	Male.	Female.	Deaths.
Brought forward	129	5,724	1,145	326	6,998	352	73,061	49,471	115
I.—*Epidemic, Endemic, and Infectious Diseases*—contd.									
26. Glanders	...	...	...	...	...	...	...	...	...
27. Anthrax	...	...	...	...	...	...	...	...	...
28. Rabies	...	...	...	...	...	...	...	...	...
29. Tetanus	...	67	20	48	87	3	13	9	3
30. Mycosis	1	5	6	1	12	2	26	12	...
31. Tuberculosis, Pulmonary and Laryngeal	17	295	69	143	381	12	280	143	1
32. Tuberculosis of the Meninges or Central Nervous System	...	2	1	2	3	...	1	1	...
33. Tuberculosis of the Intestines or Peritoneum	...	14	4	8	18	...	13	2	1
34. Tuberculosis of the Vertebral Column	4	28	4	2	36	4	38	16	...
35. Tuberculosis of Bones and Joints	2	39	5	2	46	3	41	13	...
36. Tuberculosis of other organs—									
(*a*) Skin or Subcutaneous Tissue (Lupus)	1	9	1	2	11	1	6	3	...
(*b*) Bones	...	2	2	...	4	1	8	2	...
(*c*) Lymphatic System ...	4	15	11	3	30	1	37	14	...
(*d*) Genito-urinary	...	...	...	...	...	...	2	1	...
(*e*) Other Organs	3	18	7	1	28	1	6	4	...
37. Tuberculosis disseminated—									
(*a*) Acute	...	13	...	7	13	...	8	1	1
(*b*) Chronic	...	3	1	1	4	...	2	...	...
38. Syphilis—									
(*a*) Primary	18	450	191	5	659	23	2,318	712	...
(*b*) Secondary	23	359	270	11	652	29	1,301	681	...
(*c*) Tertiary	15	167	72	6	254	14	7,248	4,970	...
(*d*) Hereditary	2	12	7	4	21	1	51	39	...
(*e*) Period not indicated ...	7	72	24	20	103	19	300	172	...
39. Soft Chancre	9	104	5	4	118	12	557	92	...
40. A.—Gonorrhœa and its complications	39	889	179	21	1,107	46	9,604	1,334	1
B.—Gonorrhoeal Ophthalmia ...	4	59	21	...	84	5	259	136	...
C.—Gonorrhoeal Arthritis ...	5	124	7	1	136	17	307	12	...
D.—Granuloma Venereum ...	4	26	1	...	31	2	13	...	...
41. Septicæmia	...	32	13	28	45	4	5	3	...
42. Other Infectious Diseases ...	...	4	1	...	5	...	544	135	...
II.—*General Diseases not mentioned above.*									
43. Cancer or other malignant Tumours of the Buccal Cavity ...	...	2	2	...	4	...	1	1	...
44. Cancer or other malignant Tumours of the Stomach or Liver	...	15	7	8	22	1	6	5	...
45. Cancer or other malignant Tumours of the Peritoneum intestines, Rectum	...	2	5	2	7	...	3	...	...
46. Cancer or other malignant Tumours of the Female Genital Organs	...	...	12	3	12	1	...	5	1
47. Cancer or other malignant Tumours of the Breast	...	1	6	1	7	1	...	4	...
48. Cancer or other malignant Tumours of the Skin	2	14	9	...	25	1	14	9	...
Carried forward	289	8,566	2,108	660	10,963	556	96,073	58,002	123

TABLE V.—RETURN OF DISEASES AND DEATHS (NON-EUROPEAN) FOR THE YEAR 1932—*continued.*

Diseases.	IN-PATIENTS.						OUT-PATIENTS.		
	Remaining in Hospital at end of 1931.	TOTAL. Admissions. Male.	Female.	Deaths.	Total cases treated.	Remaining in Hospital at end of 1932.	Male.	Female.	Deaths.
Brought forward	289	8,566	2,108	660	10,963	556	96,073	58,002	123
II.—*General Diseases not mentioned above*—contd.									
49. Cancer or other malignant Tumours of Organs not specified	4	33	22	8	59	3	45	20	...
50. Tumours non-Malignant	19	321	159	8	499	9	1,576	585	...
51. Acute Rheumatism	1	211	42	8	254	8	1,713	936	...
52. Chronic Rheumatism	11	306	67	2	384	12	20,438	9,558	...
53. Scurvy (including Barlow's Disease)	...	2	...	...	2	...	2	5	...
54. Pellagra	...	...	...	...	...	...	...	...	...
55. Beri-Beri	2	8	...	5	10	...	1	1	...
56. Rickets	1	4	2	1	7	...	25	25	...
57. Diabetes (not including Insipidus)	1	24	12	2	37	2	17	14	...
58. Anæmia:—									
(*a*) Pernicious	...	7	5	2	12	...	24	12	...
(*b*) Other Anæmias and Chlorosis	4	93	63	18	160	4	872	736	...
59. Diseases of the Pituitary Body ...	...	...	...	...	...	...	...	...	...
60. Diseases of the Thyroid Gland ...	...	...	...	...	...	...	...	...	...
(*a*) Exophthalmic Goitre ...	1	10	10	...	21	...	32	39	...
(*b*) Other diseases of the Thyroid Gland, Myxœdema ...	...	41	38	2	79	...	131	217	3
61. Diseases of the Para-Thyroid Glands	...	...	...	...	...	...	...	...	...
62. Diseases of the Thymus	...	...	...	...	..	...	...	...	...
63. Diseases of the Supra-Renal Glands	...	...	...	...	...	...	...	..	...
64. Diseases of the Spleen	2	68	20	7	90	4	1,363	801	...
65. Leukæmia:—									
(*a*) Leukæmia	...	2	1	...	3	1	16	7	...
(*b*) Hodgkin's Disease	1	4	2	1	7	...	11	2	1
66. Alcoholism	...	4	1	...	5	...	1	...	...
67. Chronic poisoning by mineral substances (lead, mercury, &c.) ...	...	2	...	...	2	...	2	...	...
68. Chronic poisoning by organic substances (Morphia, Cocaine, &c.)	...	...	...	...	...	...	...	...	...
69. Other General Diseases:—									
Auto-intoxication	...	1	...	1	1	...	2	1	...
Purpura Hæmorrhagica ...	...	1	...	...	1	...	..	...	...
Hæmophilia	...	...	...	...	...	...	1	...	...
Diabetes Insipidus	...	...	...	...	...	...	1	...	...
III.—*Affections of the Nervous System and Organs of the Senses.*									
70. Encephalitis (not including Encephalitis Lethargica)	...	7	...	3	7	...	10	...	...
71. Meningitis (not including Tuberculous Meningitis or Cerebro-spinal Meningitis)	1	26	4	19	31	3	4	3	...
72. Locomotor Ataxia	...	6	...	1	6	...	8	...	...
73. Other affections of the Spinal Cord	2	26	7	8	35	1	14	2	...
Carried forward	339	9,773	2,563	756	12,675	603	122,382	70,966	127

TABLE V.—RETURN OF DISEASES AND DEATHS (NON-EUROPEAN) FOR THE YEAR 1932—*continued.*

Diseases.	IN-PATIENTS.						OUT-PATIENTS.		
	Remaining in Hospital at end of 1931.	TOTAL. Admissions. Male.	Female.	Deaths.	Total Cases treated.	Remaining in Hospital at end of 1932.	Male.	Female.	Deaths.
Brought forward	339	9,773	2,563	756	12,675	603	122,382	70,966	127
III.—*Affections of the Nervous System and Organs of the Senses*—contd.									
74. Apoplexy:—									
(*a*) Hæmorrhage	...	26	5	15	31	...	10	3	1
(*b*) Embolism	...	5	...	5	5	...	...	...	...
(*c*) Thrombosis	...	5	...	2	5	...	1	...	...
75. Paralysis:—									
(*a*) Hemiplegia	4	62	7	14	73	3	91	17	...
(*b*) Other Paralyses	14	88	15	14	117	12	129	34	...
76. General Paralysis of the Insane	...	5	2	3	7	...	7	2	...
77. Other forms of mental Alienation	144	164	68	16	376	127	79	25	...
78. Epilepsy	1	72	23	5	96	7	318	125	...
79. Eclampsia, Convulsions (nonpuerperal) 5 years or over	...	3	9	5	12	1	17	12	1
80. Infantile Convulsions	...	19	13	14	32	...	54	54	1
81. Chorea	...	...	1	...	1	...	9	2	...
82. A.—Hysteria	...	13	5	...	18	...	84	22	...
B.—Neuritis	5	50	7	1	62	4	1,441	343	...
C.—Neurasthenia	2	25	3	1	30	1	303	64	...
83. Cerebral Softening	...	...	...	...	...	...	3	1	1
84. Other affections of the Nervous System, such as Paralysis Agitans	1	16	1	1	18	...	176	49	...
85. Affections of the Organs of Vision:—									
(*a*) Diseases of the eye	5	116	40	1	161	4	1,238	318	...
(*b*) Conjunctivitis	8	221	62	...	291	9	6,752	3,166	...
(*c*) Trachoma	1	11	11	...	23	...	53	48	...
(*d*) Tumours of the Eye ...	...	14	7	...	21	1	70	54	...
(*e*) Other affections of the Eye	4	263	51	1	318	10	1,392	635	...
86. Affections of the Ear or Mastoid Sinus	4	54	17	...	75	2	6,488	2,875	...
IV.—*Affections of the Circulatory System.*									
87. Pericarditis	1	9	4	4	14	...	5	5	1
88. Acute Endocarditis or Myocarditis	1	33	11	11	45	1	25	11	...
89. Angina Pectoris	...	2	1	...	3	...	6	4	1
90. Other Diseases of the Heart:—									
(*a*) Valvular	7	49	7	14	63	2	106	41	1
Mitral	8	85	27	29	120	4	209	104	...
Aortic	1	14	8	11	23	1	67	25	...
Tricuspid	...	...	...	...	...	...	...	...	...
Pulmonary	...	2	1	...	3	...	18	2	...
(*b*) Myocarditis	3	63	8	18	74	3	213	84	...
91. Diseases of the Arteries:—									
(*a*) Aneurism	1	16	3	2	20	2	30	8	...
(*b*) Arterio-Sclerosis	...	7	...	...	7	...	19	2	...
(*c*) Other diseases	...	5	1	1	6	...	7	1	...
92. Embolism or Thrombosis (noncerebral)	...	2	1	1	3	...	1	...	...
Carried forward	554	11,292	2,982	945	14,828	797	141,803	79,102	134

TABLE V.—RETURN OF DISEASES AND DEATHS (NON-EUROPEAN) FOR THE YEAR 1932—*continued.*

Diseases.	IN-PATIENTS.						OUT-PATIENTS.		
	Remaining in Hospital at end of 1931.	TOTAL. Admissions. Male.	Admissions. Female.	Deaths.	Total cases treated.	Remaining in Hospital at end of 1932.	Male.	Female.	Deaths.
Brought forward	554	11,292	2,982	945	14,828	797	141,803	79,102	134
IV.—*Affections of the Circulatory System*—contd.									
93. Diseases of the Veins:—									
Hæmorrhoids	1	129	40	2	170	8	638	229	...
Varicose Veins	...	5	1	...	6	1	41	3	...
Phlebitis	...	5	...	...	5	...	10	7	...
94. Diseases of the Lymphatic System—									
Lymphangitis	5	22	5	1	32	...	200	45	...
Lymphadenitis, Bubo (non-specific)	20	597	65	2	682	22	2,183	514	...
95. Hæmorrhage of undetermined cause	...	7	3	4	10	...	7	4	...
96. Other affections of the Circulatory System	1	4	...	...	5	1	11	4	...
V.—*Affections of the Respiratory System.*									
97. Diseases of the Nasal Passages—									
Adenoids	...	12	2	...	14	...	79	37	...
Polypus	...	6	4	...	10	...	24	7	...
Rhinitis	...	12	4	...	16	...	199	137	...
Coryza	4	88	9	1	101	1	3,265	1,303	...
98. Affections of the Larynx—									
Laryngitis	1	15	3	1	19	...	356	186	...
99. Bronchitis—									
(*a*) Acute	9	657	132	27	798	17	16,395	14,335	4
(*b*) Chronic	5	156	22	6	183	3	4,957	1,782	2
100. Broncho-Pneumonia	9	206	53	80	268	5	147	106	1
101. Pneumonia—									
(*a*) Lobar	29	744	103	213	876	21	266	55	1
(*b*) Unclassified	1	130	20	22	151	7	106	35	1
102. Pleurisy, Empyema	2	131	14	13	147	4	429	82	1
103. Congestion of the Lungs	...	31	3	2	34	...	19	4	...
104. Gangrene of the Lungs	...	4	2	4	6	...	3	1	...
105. Asthma	2	76	18	4	96	2	181	59	...
106. Pulmonary Emphysema	...	10	1	3	11	...	5	3	...
107. Other affections of the Lungs—									
Pulmonary Spirochætosis ...	1	6	3	...	10	...	16	3	...
VI.—*Diseases of the Digestive System.*									
108. A.—Diseases of Teeth or Gums—									
Caries, Pyorrhœa, &c.	...	41	13	3	54	...	4,890	2,166	...
B.—Other affections of the Mouth—									
Stomatitis	4	57	20	6	81	3	1,653	841	...
Glossitis, &c.	...	13	1	1	14	...	1,192	308	...
109. Affections of the Pharynx or Tonsils—									
Tonsillitis	1	77	28	1	106	2	1,115	567	...
Pharyngitis	...	23	2	2	25	...	676	248	...
Carried forward	649	14,556	3,553	1,343	18,758	894	180,866	102,173	144

TABLE V.—RETURN OF DISEASES AND DEATHS (NON-EUROPEAN) FOR THE YEAR 1932—*continued.*

Diseases.	IN-PATIENTS.						OUT-PATIENTS.		
	Remaining in Hospital at end of 1931.	TOTAL. Admissions. Male.	TOTAL. Admissions. Female.	TOTAL. Deaths.	Total cases treated.	Remaining in Hospital at end of 1932.	Male.	Female.	Deaths.
Brought forward ...	649	14,556	3,553	1,343	18,758	894	180,866	102,173	144
VI.—*Diseases of the Digestive System*—contd.									
110. Affections of the Œsophagus ...	...	4	...	1	4	...	4	...	...
111. A.—Ulcer of the Stomach ...	...	18	2	2	20	1	9	3	...
B.—Ulcer of the Duodenum ...	...	28	...	1	28	1	10	...	...
112. Other affections of the Stomach—									
Gastritis	1	101	18	4	120	3	1,481	777	...
Dyspepsia, &c.	2	110	26	...	138	7	3,918	2,121	...
113. Diarrhœa and Enteritis Under two years	...	114	48	13	162	5	1,482	902	1
114. Diarrhœa and Enteritis—									
Two years and over	5	349	63	21	417	4	3,211	3,268	2
Colitis	2	39	6	4	47	...	512	189	...
Ulceration	...	2	4	...	6	...	9	2	...
114a. Sprue	...	..	...	...	...	...	...	...	...
115. Ankylostomiasis	10	218	82	18	310	6	1,221	701	...
116. Diseases due to Intestinal Parasites—									
(*a*) Cestoda (Tænia)	1	128	28	...	157	...	8,141	1,496	...
(*b*) Trematoda (Flukes) ...	...	12	1	1	13	...	64	16	...
(*c*) Nematoda (other than Ankylostoma)	...	...	...	...	...	...	74	58	...
Ascaris	3	99	36	3	138	1	7,845	6,638	...
Trichocephalus dispar ...	...	...	...	...	...	...	1	...	...
Trichina	...	...	...	...	...	...	...	...	...
Dracunculus	10	624	43	3	677	13	2,476	461	...
Strongylus	...	...	...	...	...	...	15	...	...
Oxyuris	...	...	...	...	...	...	54	45	...
(*d*) Coccidia	...	...	...	...	...	...	...	...	...
(*e*) Other parasites	...	25	2	...	27	1	66	60	...
(*f*) Unclassified	...	3	3	...	6	...	1,780	1,422	...
117. Appendicitis	4	45	7	4	56	2	28	3	...
118. Hernia	64	1,802	92	65	1,958	86	1,895	115	...
119. A.—Affections of the Anus, Fistula, &c.	10	89	36	14	135	3	124	68	...
B.—Other affections of the Intestines	2	28	6	6	36	2	8	5	...
Enteroptosis	...	...	...	...	...	...	...	...	...
Constipation	1	113	45	...	159	2	22,221	7,156	...
120. Acute Yellow Atrophy of the Liver	...	3	2	3	5	...	...	...	...
121. Hydatid of the Liver	...	...	...	...	...	...	...	...	...
122. Cirrhosis of the Liver—									
(*a*) Alcoholic	...	...	...	...	...	...	...	...	...
(*b*) Other forms	7	42	6	11	55	2	18	13	...
123. Biliary Calculus	...	...	...	...	...	...	...	...	...
124. Other affections of the Liver—									
Abscess	4	76	7	19	87	5	46	8	...
Hepatitis	2	88	7	7	97	4	192	97	...
Cholecystitis	...	12	3	2	15	...	11	6	...
Jaundice	...	87	9	6	96	1	174	37	...
Carried forward	777	18,815	4,135	1,551	23,727	1,043	237,956	127,840	147

TABLE V.—RETURN OF DISEASES AND DEATHS (NON-EUROPEAN) FOR THE YEAR 1932—*continued.*

Diseases.	IN-PATIENTS.						OUT-PATIENTS.		
	Remaining in Hospital at end of 1931.	TOTAL. Admissions. Male.	Female.	Deaths.	Total cases treated.	Remaining in Hospital at end of 1932.	Male.	Female.	Deaths.
Brought forward	777	18,815	4,135	1,551	23,727	1,043	237,956	127,840	147
VI.—*Diseases of the Digestive System*—contd.									
125. Diseases of the Pancreas... ...	...	3	1	3	4	...	...	1	...
126. Peritonitis (of unknown cause) ...	1	25	13	19	39	...	11	6	...
127. Other affections of the Digestive System	...	6	4	4	10	...	56	22	...
VII.—*Diseases of the Genito-urinary System (non-Venereal)*									
128. Acute Nephritis	...	122	23	38	145	8	117	59	2
129. Chronic	2	70	20	27	92	8	81	29	3
130. A.—Chyluria	...	...	...	...	...	...	...	...	...
B.—Schistosomiasis	1	141	15	7	157	1	502	60	...
131. Other affections of the Kidneys—Pyelitis, &c.	2	20	6	5	28	...	65	9	...
132. Urinary Calculus	...	4	1	1	5	...	1	1	...
133. Diseases of the Bladder—Cystitis	1	76	34	8	111	3	379	180	...
134. Diseases of the Urethra—									
(*a*) Stricture	15	319	3	18	337	23	600	6	...
(*b*) Other...	3	87	8	2	98	4	282	26	...
135. Diseases of the Prostate—									
Hypertrophy	...	6	...	1	6	1	2	...	...
Prostatitis	...	12	...	1	12	...	35	...	...
136. Diseases (non-Venereal) of the Genital Organs of Man—									
Epididymitis	4	80	...	...	84	1	854	...	...
Orchitis	7	153	...	...	160	6	504	...	...
Hydrocele	9	486	...	5	495	26	672	...	...
Ulcer of Penis	1	123	...	...	124	5	609	...	...
Phimosis	...	150	...	...	150	2	967	...	...
137. Cysts or other non-malignant Tumours of the Ovaries	4	...	39	5	43	...	...	46	...
138. Salpingitis—Abscess of the Pelvis	4	...	89	2	93	3	...	188	...
139. Uterine Tumours (non-malignant)	5	...	59	2	64	1	...	72	...
140. Uterine Hæmorrhage (non-puerperal)	...	...	17	1	17	...	...	85	...
141. A.—Metritis	...	...	67	3	67	3	...	319	...
B.—Other affections of the Female Genital Organs—									
Displacements of Uterus ...	...	...	254	9	254	5	...	957	...
Amenorrhoea	...	...	19	...	19	...	...	692	...
Dysmenorrhœa	1	...	71	...	72	...	...	1,216	...
Leucorrhœa	...	...	22	1	22	...	...	408	...
142. Diseases of the Breast (non-puerperal)—									
Mastitis	3	8	45	...	56	1	11	387	...
Abscess of Breast	1	...	14	...	15	3	...	106	...
Others	...	...	...	...	...	...	...	8	...
Carried forward	841	20,706	4,959	1,713	26,506	1,147	243,704	132,723	152

TABLE V.—RETURN OF DISEASES AND DEATHS (NON-EUROPEAN) FOR THE YEAR 1932—*continued.*

Diseases.	IN-PATIENTS.						OUT-PATIENTS.		
	Remaining in Hospital at end of 1931.	TOTAL.			Total cases treated.	Remaining in Hospital at end of 1932.	Male.	Female.	Deaths.
		Admissions.		Deaths.					
		Male.	Female.						
Brought forward	841	20,706	4,959	1,713	26,506	1,147	243,704	132,723	152
VIII.—*Puerperal State.*									
143. A.—Normal Labour	4	...	513	7	517	10	...	95	...
B.—Accidents of Pregnancy—									
(*a*) Abortion	1	...	246	9	247	4	...	276	...
(*b*) Ectopic Gestation	...	...	7	2	7	...	...	1	...
(*c*) Other accidents of Pregnancy...	...	...	116	4	116	3	...	1,585	...
144. Puerperal Hæmorrhage	...	...	3	...	3	...	...	4	...
145. Other accidents of Parturition ...	2	...	79	15	81	3	...	24	2
146. Puerperal Septicæmia	1	...	18	8	19	...	...	64	...
147. Phlegmasia Dolens...	...	...	1	...	1	...	...	...	...
148. Puerperal Eclampsia	...	...	6	4	6	...	...	11	...
149. Sequelæ of Labour	...	...	36	2	36	...	...	67	...
150. Puerperal affections of the Breast	...	...	16	...	16	...	...	25	...
IX.—*Affections of the Skin and Cellular Tissues.*									
151. Gangrene	4	42	11	12	57	5	72	20	...
152. Boil	...	62	6	...	68	1	2,423	563	...
Carbuncle	...	47	2	...	49	1	308	123	...
153. Abscess	29	966	116	16	1,111	26	4,052	1,197	...
Whitlow	3	75	15	...	93	3	1,693	622	...
Cellulitis	26	709	118	29	853	26	3,807	1,092	...
154. A.—Tinea	1	42	14	...	57	1	7,906	2,254	...
B.—Scabies	...	93	23	...	116	4	13,136	3,843	...
155. Other Diseases of the Skin—									
Brythema...	...	1	...	...	1	...	50	56	...
Urticaria	...	17	3	...	20	...	649	280	...
Eczema	1	52	5	...	58	2	2,100	626	1
Herpes	1	11	...	...	12	...	176	99	...
Psoriasis	2	4	1	...	7	1	143	67	...
Elephantiasis	15	323	28	8	366	20	456	103	...
Ulcers	247	3,490	1,441	134	5,178	326	30,175	11,682	...
Myiasis	...	1	...	...	1	...	13	7	...
Chigoes	1	38	7	1	46	5	909	587	...
Cutaneous Leishmaniasis ...	...	6	...	...	6	...	...	...	...
Others	3	202	186	4	391	39	4,689	2,558	1
X.—*Diseases of bones and Organs of Locomotion (other than Tuberculous).*									
156. Diseases of Bones—									
Osteitis	21	202	50	9	273	26	1,025	625	...
157. Diseases of Joints—									
Arthritis	13	290	44	5	347	9	2,307	809	1
Synovitis	5	137	25	2	167	11	864	207	...
158. Other Diseases of Bones or Organs of Locomotion	10	100	13	1	123	3	1,067	171	...
Carried forward	1,231	27,616	8,108	1,985	36,955	1,676	321,724	162,466	157

TABLE V.—RETURN OF DISEASES AND DEATHS (NON-EUROPEAN) FOR THE YEAR 1932—*continued.*

	Diseases.	IN-PATIENTS.						OUT-PATIENTS.		
		Remaining in Hospital at end of 1931.	TOTAL. Admissions. Male.	TOTAL. Admissions. Female.	TOTAL. Deaths.	Total cases treated.	Remaining in Hospital at end of 1932.	Male.	Female.	Deaths.
	Brought forward	1,231	27,616	8,108	1,985	36,955	1,676	321,724	162,466	157
	XI.—*Malformations.*									
159.	Malformations	13	50	30	33	93	9	43	29	...
	Hydrocephalus	...	..	...	...	...	...	..	...	...
	Hypospadias	...	3	...	1	3	...	1	...	...
	Spina Bifida, etc.	...	5	3	2	8	...	16	3	...
	XII.—*Diseases of Infancy.*									
160.	Congenital Debility	...	31	24	14	55	4	147	87	1
161.	Premature Birth	...	8	6	7	14	...	20	18	1
162.	Other affections of infancy ...	3	26	45	21	74	1	347	491	3
163.	Infant neglect (infants of three months or over)	1	11	17	2	29	...	29	24	...
	XIII.—*Affections of Old Age.*									
164.	Senility	2	26	8	11	36	1	87	103	3
	Senile Dementia	1	6	2	3	9	...	4	8	...
	XIV.—*Affections produced by External Causes.*									
165.	Suicide by Poisoning	...	...	1	...	1	...	...	1	1
166.	Corrosive Poisoning (Intentional)	...	1	...	1	1	...	...	...	...
167.	Suicide by Gas Poisoning	...	...	...	...	...	...	...	...	...
168.	Suicide by Hanging or Strangulation	...	2	...	1	2	...	2	...	1
169.	Suicide by Drowning	...	...	...	...	...	..	...	...	...
170.	Suicide by Firearms	...	...	...	...	...	...	...	...	...
171.	Suicide by cutting or stabbing Instruments	...	10	1	4	11	...	2	...	1
172.	Suicide by jumping from a height	...	...	...	...	...	...	...	...	...
173.	Suicide by crushing	...	...	...	...	...	...	...	...	...
174.	Other Suicides	...	1	...	...	1	...	1	...	1
175.	Food Poisoning	...	3	1	...	4	...	6	4	...
	Botulism	...	2	...	...	2	...	...	...	...
176.	Attacks of poisonous animals ...	...	...	...	...	...	...	...	...	...
	Snake Bite	1	56	8	2	65	1	104	29	...
	Insect Bite	...	7	...	...	7	...	258	86	...
177.	Other accidental Poisonings ...	1	8	7	3	16	...	15	22	...
178.	Burns (by Fire)	7	110	49	22	166	16	1,188	510	...
179.	Burns (other than by Fire) . .	4	53	20	2	77	4	410	213	...
180.	Suffocation (accidental)	...	2	...	...	2	...	...	...	...
181.	Poisoning by Gas (accidental) ...	...	1	...	...	1	...	1	36	...
182.	Drowning (accidental)	...	...	...	...	...	...	...	...	..
183.	Wounds (by Firearms, war excepted)	10	136	12	11	158	3	75	12	1
184.	Wounds (by cutting or stabbing instruments)	33	739	86	23	858	15	7,817	1,648	3
185.	Wounds (by Fall)	9	201	44	22	254	5	3,903	958	...
186.	Wounds (in Mines or Quarries) ...	1	25	...	1	26	...	1,905	6	...
187.	Wounds (by Machinery)	...	28	2	...	30	...	184	26	...
	Carried forward	1,317	29,167	8,474	2,171	38,958	1,735	338,289	166,780	173

TABLE V.—RETURN OF DISEASES AND DEATHS (NON-EUROPEAN) FOR THE YEAR 1932—*continued.*

Diseases.	IN-PATIENTS.						OUT-PATIENTS.		
	Remaining in Hospital at end of 1931.	TOTAL. Admissions. Male.	TOTAL. Admissions. Female.	TOTAL. Deaths.	Total cases treated.	Remaining in Hospital at end of 1932.	Male.	Female.	Deaths.
Brought forward	1,317	29,167	8,474	2,171	38,958	1,735	338,289	166,780	173
XIV.—*Affections produced by External Causes*—contd.									
188. Wounds (crushing, *e.g.* railway accidents, etc.)	2	115	25	21	142	14	316	44	...
189. Injuries inflicted by Animals, Bites, Kicks, etc.	4	85	20	5	109	...	901	297	...
190. Wounds inflicted on Active Service	...	...	...	...	...	...	...	...	...
191. Executions of civilians by belligerents	...	...	...	...	...	...	...	...	...
192. A.—Over fatigue	...	2	...	1	2	...	2	...	...
B.—Hunger or Thirst	...	27	8	8	35	1	6	2	1
193. Exposure to Cold, Frost bite, etc.	...	...	...	...	...	...	...	...	...
194. Exposure to Heat—									
Heatstroke	...	...	...	...	...	...	...	1	...
Sunstroke	...	1	...	...	1	1	...	...	...
195. Lightning Stroke	...	5	...	...	5	...	...	1	...
196. Electric Shock	...	3	...	...	3	...	1	...	...
197. Murder by Firearms	...	...	...	...	...	...	1	...	1
198. Murder by cutting or stabbing instruments	...	2	...	1	2	...	...	...	...
199. Murder by other means	...	2	...	2	2	...	...	...	...
200. Infanticide (Murder of an infant under one year)	...	1	...	...	1	...	...	...	...
201. A.—Dislocation	3	41	7	...	51	1	113	27	...
B.—Sprain	3	137	6	1	146	3	2,274	279	...
C.—Fracture	55	487	86	37	628	49	405	96	...
202. Other External Injuries	30	774	146	18	950	33	21,053	2,902	1
203. Deaths by Violence of unknown cause	...	...	...	...	...	...	...	...	...
XV.—*Ill-Defined Diseases.*									
204. Sudden Death (cause unknown)	...	1	...	...	1	...	5	...	...
205. A.—Diseases not already specified or ill-defined—									
Ascites	6	139	39	40	184	8	132	59	1
Œdema	1	46	13	7	60	5	177	59	...
Asthenia	9	89	19	21	117	5	1,187	4,557	...
Shock	1	6	3	1	10	...	8	...	...
Hyperpyrexia	...	9	4	4	13	...	6	4	...
Pyrexia of uncertain origin ...	...	...	...	...	...	...	622	243	...
B.—Malingering	...	74	68	...	142	6	276	70	...
XVI.—*Diseases, the total of which have not caused 10 Deaths.*									
Ainhum	...	8	...	...	8	...	71	21	...
Avitaminosis	...	6	...	...	6	...	54	31	...
Gangosa	...	...	1	...	1	...	54	91	...
Total	1,431	31,227	8,919	2,338	41,577	1,861	365,953	175,564	177

APPENDICES.

APPENDIX A.

REPORT OF THE LABORATORY SERVICE.

LABORATORY SERVICE.

The posts of Deputy Director Laboratory Service and of Senior Pathologist have remained unfilled during the year and the European staff has consisted of eight pathologists and five technical assistants besides the officers attached to the tsetse investigation. Two of the pathologists have been engaged upon research in schistosomiasis and guinea-worm under a grant made from the Colonial Development Fund and one pathologist has remained engaged fully upon dietetics research. The Medical Research Institute at Yaba and the Clinical Laboratories at Lagos, Port Harcourt and Kaduna have been maintained. The pathologists stationed at Lagos and Yaba have undertaken the teaching of pathology, bacteriology and histology at the medical school.

Medical Research Institute.

Tumours received.—The following is a list of tumours, classified into benign and malignant, which were received throughout the year.

No.	Site.	Benign.	Malignant.
1	Skin	—	Rhabdo-myo-sarcoma.
2	Skin (Axilla) ...	—	Spindle cell sarcoma.
3	Rib	Osteo-chrondroma	—
4	Colon	—	Adeno-carcinoma.
5	Gland	—	Lympho-sarcoma.
6	Skin	—	Secondary adeno-carcinoma.
7	Finger	Epulis	—
8	Eye	—	Solid carcinoma.
9	Liver	—	Primary carcinoma.
10	Gland	—	Lympho-sarcoma.
11	Hand	—	Round cell sarcoma.
12	Thyroid	—	Spindle cell-sarcoma.
13	Gland	—	Lympho-sarcoma.
14	Neck	—	Angio-endothelioma.
15	Skin wart	Papilloma	—
16	Gland	—	Lympho-sarcoma.
17	Skin	—	Kaposi type of sarcoma.
18	Skin wart	Naevus	—
19	Foot	—	Melanotic sarcoma.
20	Uterus	Hydatid mole	—
21	Jaw...	Epulis	—
22	Penis	—	Squamous carcinoma.
23	Gland	—	Lympho-sarcoma.
24	Liver	—	Glandular carcinoma.
25	Foot	—	Melanotic sarcoma.
26	Antrum (Maxillary)	Adamantinoma	—
27	Skin wart	Papilloma	—
28	Abdomen	—	Mucoid carcinoma.
29	Thyroid	Adenoma	—
30	Jaw...	Epulis	—
31	Axilla	—	Adeno-carcinoma.
32	Gland	—	Lympho-sarcoma.
33	Eyelid	Papilloma	—
34	Ovary	—	Adeno-carcinoma.
35	Breast	—	Adeno-carcinoma.
36	Uterus	Fibro-myoma	—
37	Jaw...	Adamantinoma	—
38	Breast	—	Carcinoma.
39	Liver	—	Primary adeno-carcinoma.
40	Liver	—	Primary adeno-carcinoma.
41	Breast	Fibro-adenoma	—
42	Liver	—	Spindle cell sarcoma.
43	Uterus	Fibro-myoma	—
44	Neck	Mixed tumour	—
45	Gland	—	Lympho-sarcoma.
46	Ovary	Cyst-adenoma	—
47	Tongue	Papilloma	—
48	Breast	—	Adeno-carcinoma.
49	Scrotum	—	Kaposi type of sarcoma.
50	Breast	—	Adenoma-carcinoma.
51	Testis	—	Round cell sarcoma.
Total 51	...	18	33

Of the thirty-three malignant tumours it will be seen that the sarcomata preponderate, the lympho-sarcomata alone numbering seven. It is interesting to note the presence of two superficial sarcomatous lesions of the " Kaposi " type.

The adamantinomata are placed in the benign column mainly on account of the clinical nature of these two cases.

Rabies.—Twenty-three dogs' brains were received from the various stations as shown in the following list. Of these, thirteen were positive.

Station.	Number of Brains received and found positive for Negri bodies.
Ilorin	1
Kaduna...	1
Kumba	1
Lagos	4
Okigwi	2
Port Harcourt	2
Umuahia	1
Zuru	1

Other materials received included :—

(1) Blood films sent by the Medical Officer of Health, Lagos, from a boy aged 2. He was suffering from jaundice and enlarged liver and spleen. Films showed the presence of large numbers of nucleated red cells, many being in a state of mitosis. A diagnosis of von Jaksch's anæmia was suggested. Malaria parasites (subtertian) were also present.

(2) Skin from ten cases were sent for examination for leprosy. Of these, one was positive for acid-fast bacilli, six were suggestive histologically and the remaining three were definitely negative.

(3) Sputum sent by Dr. Pasqual, Medical Officer, Mamfe, containing operculated ova. This is interesting since in the 1931 report a specimen of sputum containing ova identical with paragonimus was noted. This latter specimen came from Bamenda.

(4) Tissue infected with red-grain mycetoma, sent by Dr. Hall, Medical Officer, Kano. Tissue from knee region, infected with a black grain mycetoma (identified by Dr. Duncan, London School of Hygiene and Tropical Medicine, as *Madurella mycetomi*) sent by Dr. Bean, Medical Officer, Maiduguri.

Hodgkin's disease.—Only three positive diagnoses were made during the year, two being glands and one a spleen. Diphtheroids were obtained in culture from one. The monkeys, four in number (Macacus rhesus) which had been inoculated during the previous year were killed and examined, after a period of six months. Beyond an active proliferation of the axillary lymph glands no changes were found in the tissues. Emulsions of the glands were cultivated but no organisms (Diphtheroids) were obtained. In the recent work on Hodgkin's disease at St. Bartholomew's Hospital (Rose Research Memoir) the presence of a virus in the glands from cases of Hodgkin's has been demonstrated. It is hoped to continue investigations along this line.

Tropical ulcers.—It was found possible to isolate the fusiform bacilli in pure culture from cases of tropical ulcer. The cultures were maintained over a period of several months. No transition into spirochætes was noted. Inoculations made into human volunteers did not reproduce the ulcerative condition.

ANTI-VARIOLA VACCINE.

The experiments with the neuro-testicular strain described in the Annual Report for 1931 were continued and a full report will be published in the West African Medical Journal. The difficulty caused by rapid deterioration has not been overcome and this method of vaccine

production has therefore been abandoned. Experiments with sheep, dwarf cattle of the Southern Provinces and calves of the humped cattle of the Northern Provinces have been carried out and plans have been made for production of calf lymph in co-operation with the Veterinary Department.

Intestinal Complaints.

Dysentery.—The claims of other work prevented any further extension of research in bacillary dysentery during the year and deterioration of the various type Flexner sera rendered accurate typing impossible without extensive absorption work.

Bact. dysenteriæ (shiga) was isolated for the first time since 1928, eight cases being found during the year.

Bact. dysenteriæ Flexner still remained the most common cause of dysentery. Twenty cases were found during the year but the organisms could not be accurately typed owing to the very considerable drop in titre of the various sera. Enough was done however to show that as in previous years the types were diverse.

The most interesting strain was one of Bact. dysenteriæ Sonne isolated from a native. This makes the fourth, and last, classical type of dysentery bacillus which has been isolated in Lagos in the last few years as several cases of Schmitz dysentery have been found. Identification of the Sonne strain has been very kindly confirmed by Dr. W. M. Scott, Pathologist, Ministry of Health Laboratory.

The study of bacillary dysentery in Lagos presents a fascinating epidemiological problem. Doubtless the very excellent water supply prevents explosive outbreaks of the disease such as are common in other tropical towns yet the sanitary conditions, especially as regards the sale of foodstuffs, are not such as to prevent localised outbreaks, and it is difficult to understand the remarkable diversity of the types which are found. It is only rarely that one can associate one case with another.

In addition to cases of true bacillary dysentery there are numerous cases of pseudo-dysentery. Such cases, it has been observed, occur at the beginning and at the end of each series of true bacillary dysentery. (*N.B.*—While cases are found throughout the year, a graph showing the frequency would show a series of waves, yet in each series the types may be diverse and the patients collected from all over the area). It may be that the agency conveying true bacillary strains may also convey the organisms causing pseudo-dysentery but another possibility is that some other factor beyond the organism itself is involved in the mechanism of infection. A very suggestive fact is that a number of coliform organisms from cases of pseudo-dysentery agglutinate to a certain extent with type dysentery sera Shiga, Flexner and Sonne. Many of the plate cultures from pseudo-dysentery cases show indications of bactoriophage action and the part played by bacteriophage has yet to be determined.

Typhoid.—This disease has been reported from various localities during the year and a number of Widals have been done. Four strains of *Bact. typhosum* isolated from patients have been examined and all were found to be non-motile on isolation. In two instances motility was recovered only after the employment of the technique described by Colquhoun and Kirkpatrick (Jour. of Pathology and Bacteriology, Vol. 35, p. 367). One of these strains was isolated post-mortem, the patient's serum having failed ante-mortem to give a positive Widal.

Such a case emphasises the need for the employment of strains which will give an " O " form of agglutination. The suspension used for the Widal test was an Oxford Standard " H " emulsion. There can be little doubt that the formalin preservative together with local climatic conditions destroyed any " O " antigen which was originally present. The infecting strain being non-motile, no " H " agglutinins were developed in the patient and the result was a negative Widal.

The preparation of emulsions from locally and recently isolated strains is strongly indicated. If such emulsions were used throughout the Protectorate there would be no risk of different pathologists giving different results for one and the same serum. The expense of standard "O" emulsions is prohibitive for general use and the preservation of strains in an adequately smooth condition requires resources not readily available to the smaller laboratories.

It is regrettable that more recourse to early blood culture is not adopted by clinicians. The advantage of this technique could be offered even to medical officers remote from the laboratories by the use of vaccine bottles containing bile salt media.

Tuberculosis.—Towards the end of the year a commencement was made with the typing of tubercle bacilli in Lagos. As it is obviously desirable to correlate the laboratory findings as to type and pathogenicity in animals with the pathogenicity in man, it is proposed for the present to confine the study to cases reaching the post-mortem table where an accurate assessment of the lesions is possible.

Five strains had been isolated by the end of the year.

Miscellaneous examinations.—These include various cultures for identification, pathological exudates for organisms and a number of tinned foodstuffs for fitness for human consumption.

PUBLICATIONS MADE DURING THE YEAR BY MEMBERS OF THE STAFF OF THE INSTITUTE.

1. An Atlas of Skin Disease in the Tropics.
   (John Bale Sons and Danielsson, London).
2. A case of Malaria with a blood picture suggestive of splenic anæmia.
   (West African Medical Journal).
3. Tropical Ulcer. The distribution of B. fusiformis and S. schaudinni in the lesions.
   (Proc. Royal Society of Medicine).
4. A case of abdominal lympho-sarcoma with associated splenomegaly.
   (Trans. Royal Soc. Trop. Med. and Hygiene).
5. Congenital diverticula of the jejunum.
   (West African Medical Journal).
6. Ulcus Tropicum.
   (West African Medical Journal).

CLINICAL LABORATORIES.

TABLE I.

BLOOD EXAMINATIONS—EUROPEANS.

	Lagos.	Port Harcourt.	Kaduna.
Total Examinations	352	254	208
Subtertian parasites	42	61	21
Crescents	2	...	...
Quartan parasites	...	...	...
Benign Tertian parasites	...	...	...
Trypanosomes	...	...	...
Microfilariæ	2	1	1
Spironemata	...	...	...
Total R.B.C....	3	...	16
Total W.B.C.	4	2	14
Differential W.B.C....	8	3	130

TABLE II.

Blood Examination—Africans.

	Lagos.	Port Harcourt.	Kaduna.
Total Examinations	3,839	1,661	1,943
Subtertian parasites	384	213	265
Crescents	15	...	13
Quartan parasites	11	...	...
Benign Tertian parasites	1	...	...
Trypanosomes	...	...	7
Microfilariæ	125	25	38
Spironemata	...	...	...
Total R.B.C....	82	9	20
Total W.B.C.	83	9	24
Differential W.B.C....	83	5	30

TABLE III.

Examination of Fæces—Europeans.

	Lagos.	Port Harcourt.	Kaduna.
Total Examinations	200	41	214
T. Saginata	1	...	...
Ascaris	9	1	...
Ankylostome	3	...	3
T. trichiura	8	2	1
Strongyloides	2	...	...
Flagellates	8	1	...
E. histolytica (free)	8	1	1
E. histolytica (cysts)...	2	2	4
E. coli (free)	4	3	2
E. coli (cysts)	2	2	3
S. mansoni	...	...	...
Blood	42	5	20
Mucus...	48	6	10
Cellular exudate	44	4	19
Othor protozoa	2	...	...

TABLE IV.

Examination of Fæces—Africans.

	Lagos.	Port Harcourt.	Kaduna.
Total Examinations	3,893	1,108	1,837
T. Saginata	24	10	104
Ascaris	2,316	449	117
Ankylostome...	1,682	731	413
T. trichiura	2,349	572	54
Strongyloides	218	85	20
Flagellates	330	86	28
E. histolytica (free)	30	6	44
E. histolytica (cysts)...	5	...	212
E. coli (free)	265	88	62
E. coli (cysts)	355	115	118
S. mansoni	16	1	29
Blood	199	52	81
Mucus...	310	78	39
Cellular exudate	265	28	78
Other protozoa	12	2	1

TABLE V.

Sputum Examination—Africans.

	Lagos.	Port Harcourt.	Kaduna.
Total Examinations	449	114	519
Tubercle bacilli	80	21	41

TABLE VI.

Urine Examination—Africans.

	Lagos.	Port Harcourt.	Kaduna.
Total Examinations	3,559	1,364	1,943
Albumen	1,566	296	43
Sugar	89	46	4
Phosphates	350	64	...
Casts	70	40	34
Pus	1,163	231	764
Blood	141	70	97
S. haematobium	30	8	53
Bile Salts	184	1	7
Bile pigments	12	1	...
Acetone	9	76	1
Di-acetic acid...	...	...	...

TABLE VII.

Kahn Tests.

	Lagos.	Port Harcourt.	Kaduna.
European.			
Number of tests	56	21	64
Positive	15	5	23
African.			
Number of tests	1,906	122	1,004
Positive	1,179	50	374

TABLE VIII.

Agglutination Tests (Widal).

	Lagos.	Port Harcourt.	Kaduna.
European.			
Number of tests	4	2	13
Positive	2	1	5
African.			
Number of tests	97	4	39
Positive	18	1	16

Bacteriological examination of stools at Lagos gave :—

Flexner dysentery	13
Shiga ,, ...	4
Sonne ,, ...	1
B. typhosus	2

The pathologist at Kaduna records the finding of the ova of hymenolepis nana in the stools of four African patients. He also records the presence of lamblia intestinalis in four Africans and six Europeans and of balantidium coli in seven cases, none of which were associated with dysenteric symptoms.

A case of diphtheria occurred in a European at Kaduna. The wife and servants of this officer were examined and virulent bacilli were obtained from the throat of one of the African servants, one of whose children had died shortly before from unknown cause.

Tumours.—Section of tumours led to the following diagnoses :—

Benign.		Malignant.	
Adamantinoma	1	Lympho-sarcoma	3
Adenoma	4	Myo-sarcoma	1
Fibroma	5	Fibro-sarcoma	2
Fibro-adenoma	1	Melanotic sarcoma	2
Fibro-myoma	4	Sarcoma	10
Fibro-myxoma	2	Myeloid epulis	1
Fibro-cystoma	1	Endothelioma	2
Epulis	3	Epithelioma	4
Chondroma	2	Carcinoma	14
Neuro-fibroma	1	Hydatid mole	1
Papilloma	2		

Post-mortem examinations.—The following causes of death were found by pathologists as the result of post-mortem examinations. They have been classified into disease groups :—

Enteric fever	2
Blackwater fever	1
Trypanosomiasis	1
Tetanus	1
Respiratory diseases (excluding tuberculosis)	27
Tuberculosis (various forms)	22
Diseases of circulatory system	12
Abdominal diseases (excluding dysentery)	9
Dysentery and diarrhœa	8
Diseases of nervous system	2
Nephritis	14
Sepsis	2
Marasmus, senility	1
Malignant disease	3
Injuries	4
Drowning	2
Ruptured tubal pregnancy	2
Unknown and various	16

APPENDIX B.

REPORT OF THE TSETSE INVESTIGATION

BY

H. M. O. LESTER, M.R.C.S., L.R.C.P.

Deputy Director, Tsetse Investigation.

TSETSE INVESTIGATION.

During the year there has been a big increase in the amount of sleeping sickness work done in the field although laboratory research work at Gadau has suffered to some extent through a further depletion of the research staff. Dr. R. D. Mackenzie, Immunologist, and Mr. A. W. Taylor, Entomologist, resigned from the West African Medical Service to take up appointments at home. Dr. W. E. S. Merrett originally attached to the investigation for sleeping sickness work, remained at Gadau and has carried out some interesting research on the histo-pathology of cattle trypanosomiasis. It is hoped that a new Entomologist will be appointed sometime in 1933.

The following scientific papers have been published. " The development of West African strains of *T. gambiense* in *G. tachnoides* under normal laboratory conditions and at raised temperatures " by A. W. Taylor. " The Influence of Cyclical transmission of *Glossina tachinoides* on a strain of *Trypanosoma brucei* made resistant to human serum " and " Sleeping Sickness in Northern Nigeria, a review of events leading to adoption of present methods ", by H. M. O. Lester. Papers dealing with (1) the characteristics of some local strains of the polymorphic trypanosomes, and (2) the bionomics of *Aedes ægypti* in Northern Nigeria, are being prepared for publication.

At a meeting of the Committee of Animal Health held at Katsina various problems of trypanosomiasis were discussed, the work done for the committee considered and a future programme of work agreed upon. This was followed by the first meeting of the newly formed dietetics committee. One of the resolutions passed by this committee affects the tsetse investigation very closely and so is given here in full " That the committee advocates the clearing and farming of fringing thicket and kurumi (patches of dense bush near water) within two miles radius of towns and villages in tsetse areas ". It is felt that the one chance of tsetse control in this country lies in persuading the people to protect themselves by clearing and farming the dangerous areas near their villages. Sleeping sickness is so wide spread that it is quite impossible for any government department to carry out the enormous amount of protective clearing that would be required. It is hoped that Native Administrations in sleeping sickness areas will endeavour to persuade the people themselves to undertake this work through their village organisations. In many areas this should not be too difficult as the people recognise the great value of the kurumi soil for farming purposes.

Laboratory Work.

In 1930 cattle experiments were complicated by the fact that *G. morsitans* in the wet season spread throughout the cattle grazing grounds right up to the station and so infected the controls. Last year work had to be arranged in such a manner that experiments would be completed before the time of this wet season spread. In January of this year a complete block clearing was made for about 1,200 yards all round the station. Careful observations made in the wet season showed that tsetse did not spread into the cleared area, though at one time the fly density in the savannah skirting the clearings rose to 1.5 per boy hour. Cattle were kept as close to the station as possible and were not allowed to graze within 500 yards of the savannah.

Effect of the Administration of Minerals on Trypanosomiasis of Cattle.

At the 1931 meeting of the Animal Health Committee it was decided that experiments should be conducted at Gadau to show the effect on cattle trypanosomiasis of feeding small quantities of the following minerals (*a*) sodium bicarbonate (*b*) kanwa (a native alkaline

salt) (*c*) iron (*d*) iodine and (*e*) iron and sodium bicarbonate. Sixty animals were given a double infection of *T. congolense* and *T. vivax* and divided into groups of ten. In the first attempt the disease had run a normal course for three weeks when the animals contracted rinderpest.

In view of this outbreak of rinderpest the whole experiment had to be repeated, this time using only animals which had been given a double inoculation against this disease. They were given the extra minerals for a month then inoculated with a double infection of *T. vivax* and *T. congolense*. This disease ran a very rapid course and within six weeks fifty-five out of the sixty animals had died. The mortality and course of the disease was similar in all the groups, the small doses of minerals appearing to have no effect whatsoever. At one time the disease was so acute and the post-mortem findings so striking that we were led to think that some other disease must have been present as a complication. Later evidence leads us to believe that this was not the case and that the severity of the disease was caused by the abnormally high virulence of the *T. vivax* strain used.

The Treatment of Bovine Trypanosomiasis with Antimony Tartrate.

In the 1931 report mention was made of our lack of success in treating a group of infected cattle with tartar emetic. It was realised that further work would be required before we could form an opinion as to the value of this drug in the treatment of cattle infected with Nigerian *T. congolense* and *T. vivax* strains.

The results obtained to date are summarised below. In each case the animals were given a double infection of *T. congolense* and *T. vivax* by syringe passage.

(*a*) *Premunition experiment (1931).* Out of thirty animals treated with tartar emetic, nineteen were dead at the end of five months, a death rate of sixty-three per cent. With a control group of ten untreated beasts six died in the same period, a death rate of sixty per cent.

(*b*) After the rinderpest outbreak, all the animals having been given serum treatment, there were forty-six survivors, all of which were suffering from the double trypanosome infection and were in poor general condition. These were given doses of tartar emetic in accordance with their weight and condition, an animal of 300 kilos receiving one gramme of the drug at a time. At the end of six months thirty-four animals had died in spite of treatment, a death rate of seventy-six per cent.

(*c*) An experiment was devised to compare the result of treating infected cattle with full weekly doses of tartar emetic and with small increasing doses given at short intervals, the total quantity of drug given being the same in each case. Thirty animals were used, ten being treated by each of these two methods and ten being left untreated. The differences between the two tartar emetic groups were hardly significant and it would appear that the extra labour involved in giving graduated doses over a longer period of time is not justifiable. Considering the treatment as a whole, out of twenty treated animals fourteen died within six months, a mortality of seventy per cent. whereas with the controls all died within two and a half months, a mortality of 100 per cent.

The one conclusion that can be drawn is that cattle in an advanced stage of the disease and suffering from a double infection derive little benefit from treatment with tartar emetic. It should be emphasised that these observations do not in any way show that tartar emetic may not be of great value to beasts suffering from a naturally acquired single infection. Experiments are being carried out in an attempt to throw some light on this point.

A Comparison of the behaviour of *T. vivax* and *T. congolense* in Cattle.

There is some confliction of evidence as to whether *T. vivax* or *T. congolense* is of the greater economic importance in Nigeria. In South and East Africa it is generally recognised that *T. congolense* is not only the killing trypanosome but also the one most refractory to drug treatment, while *T. vivax* usually has a low degree of virulence. Our experience in Nigeria has been that *T. vivax* is the trypanosome most often met with and that on many occasions it has a high degree of virulence.

Twenty cattle were divided into two equal groups one of which was infected with *T. vivax* and the other with *T. congolense*. Both strains were obtained from wild *G. morsitans* and had undergone one syringe passage only. Careful records of temperature, weights, red cell counts, etc., were kept for both series of animals. At the end of five months all the *T. vivax* cattle were dead; with the *T. congolense* animals however the disease took a very chronic course and all the animals were alive at the end of the same period.

Direct Infection with *T. vivax*.

Out of 170 clean animals purchased in October 126 rapidly became infected with *T. vivax* and none of them with *T. congolense*. As the possibility of infection with tsetse can be excluded it is obvious that this must have been an instance of direct infection by *stomoxys* or other biting flies. Conditions were ideal for the occurrence of direct infection as a very virulent *vivax* strain was present and large numbers of cattle were herded together in comparatively small paddocks at a time when biting flies were very numerous. When once the remaining clean cattle were separated from the infected beasts, no more cases occurred. The infected cattle are being used in various treatment experiments.

Histopathology of Bovine Trypanosomiasis.

Up to the present only a small number of animals suffering from the double infection have been examined and this infection was of the acute and not of the more usual chronic type. So far it has not been possible to prove the presence of trypanocidal deposits described by Peruzzi as occurring in monkeys. On the other hand the cellular infiltrations are remarkably similar in character and distribution to those described by this author. All the organs were examined microscopically but the heart has been the most constant seat of lesions in our cases. The epicardium round the coronary artery and its branches was disorganised. There were areas of fatty degeneration combined with a very extensive infiltration of different kinds of cells. The chief infiltrating cells seen were large mononuclears, polyhedral cells with basophile cytoplasm, macrophages and morular cells. Lesions also occurred in the liver, kidney, spleen, lymphatic glands, etc., and they all had this striking cellular infiltration.

The Characteristics and Nature of some Nigerian Strains of the Polymorphic Trypanosomes.

The work described in previous reports has been continued and is yielding some interesting results. One strain, Ayu 6, isolated from an untreated sleeping sickness case in Ayu district, Plateau Province, an area where there is no great quantity of game and no *G. morsitans*, has all the characteristics ascribed to *T. rhodesiense*. Its virulence was similar to that of many of our local *T. brucei* strains and with some small animals stained blood films showed a high percentage of posterior nuclear forms. When tested against human serum all trypanosomes were killed within three hours while it was so resistant to tryparsamide

in guinea-pigs that a dose of about 0.30 grammes per kilogram of body weight was needed for complete disappearance of trypanosomes from the peripheral blood.

Some strains from human cases have all the characteristics of classical *T. gambiense* while others seem to occupy an intermediate position between these extremes. For example Ayu 5 was only moderately virulent to small laboratory animals and yet blood films showed a high percentage of posterior nuclear forms. In guinea-pigs the strain was very sensitive to tryparsamide, trypanosomes being cleared from the peripheral blood by a dose of less than 0.01 grammes per kilo. It was also completely insensitive to human serum.

These results afford strong support to the theory that *T. rhodesiense* and *T. gambiense* are really one species and that the differentiation of African human trypanosomes into two species is artificial and unnecessary.

Observations are being carried out in an endeavour to throw light on the vexed question of the relationship of the game trypanosome *T. brucei* to human trypanosomiasis. It has been shown that when once a strain of *T. brucei* has acquired an artificial resistance to normal human serum this resistance can survive cyclical transmission through *Glossina*. Using a strain of *T. brucei* which is killed in three hours by normal human serum, the trypanocidal power of the serum of healthy and sick natives is being tested in vitro. So far some 150 tests have been carried out the serum being derived from healthy labourers and from a series of cases other than sleeping sickness attending the Gadau dispensary. So far no case has been found in which the serum has lost its trypanocidal power, in fact in no case was this property markedly diminished.

This same strain of *T. brucei* was injected subcutaneously into the arms of three European volunteers and forty African volunteers. Blood was taken from an infected white rat and was diluted with citrated saline to such a degree that each dose contained about ten million living trypanosomes. In every case the result was negative.

The Effect of Cyclical Transmission on the Virulence of a Strain.

Observations have been made which show that the virulence of a trypanosome strain may be diminished very greatly by cyclical transmission through *G. tachinoides*. This was particularly well seen with one strain of *T. brucei*. Before cyclical transmission the behaviour of this strain in mice was in accordance with the classical description. Trypanosomes appeared in the blood after a short incubation period and increased in numbers steadily until the death of the mouse. After passing through tsetse there was a long incubation period, trypanosomes were not numerous in the blood and there were numerous relapses. Several mice lived more than six months showing only an occasional scanty infection in the blood. Similar results were obtained with a strain of *T. rhodesiense* which had been kept going for many years in London laboratories. Prior to cyclical passage this strain was very virulent and would kill a guinea-pig in about ten days. After transmission through *G. tachinoides* the strain was almost avirulent and had little or no effect on a guinea-pig. Later work has shown that with more recently isolated strains, the characteristics of which had not been changed by constant syringe passage, cyclical transmission may have little effect on the virulence.

Cultivation of Trypanosomes.

In view of the report by Lwoff that hæmatin when added to a vegetable peptone medium greatly facilitated the cultivation of trypanosomes, an attempt was made to grow *T. gambiense* on Fildes medium. Results were negative on this medium whereas V. Razha's medium gave a fair growth.

Entomological Work.

The tsetse investigation was without the services of an entomologist for the greater part of the year as Mr. A. W. Taylor proceeded on leave in April.

He was able to prove that the temperature at which tsetse are kept during infecting feeds plays an important part in determining the infection rate. By subjecting batches of *G. tachinoides* to a temperature of 37°C for varying periods during the infecting feed on various *T. gambiense* strains, infection rates of from eleven per cent. to seventy per cent. were obtained.

The entomologist also carried out some interesting work with mosquitoes. He found a large fauna of true tree-breeding mosquitoes in this arid district, these included six species of *Aedes* (*ægypti, metallicus, luteocephalus, simpsoni, unilineatus and furcifer*).

Attempts were made to transmit *Wucheria bancrofti* by laboratory bred mosquitoes. In *A. costalis* development took place readily eleven infections being found in ninety-seven mosquitoes dissected at intervals of from five to seventeen days after the infecting feeds. Negative results were obtained with *Aedes ægypti*.

Yaws Research.

While working in the southern division, Plateau Province an attempt was made to combine a yaws campaign with the mass examination of sleeping sickness. Dr. Bean and afterwards Dr. Shearer carried out a series of Kahn tests in order to estimate the efficiency of sobita in the treatment of yaws. It was found that although after two or three injections of sobita the clinical signs tend to clear up, the patient is not cured of the disease when tested serologically by the Kahn test. The amount of sobita needed to cure a case of yaws depends on the stage to which the disease has progressed at the time treatment is started; a case of framboesial yaws would appear to be cured by seven injections while a case of crab yaws required considerably more.

Out of 200 patients taken at random at Nunku thirty-five had clinical signs of yaws and all these were found to be positive seriologically; 100 cases had a history of having had yaws at one time or other but had no clinical signs of the disease at the time of examination; of these eighty-eight were positive to the Kahn test. Out of the remaining sixty-five with no history of yaws eleven were positive to the Kahn test. These figures show that in the area examined there is a high percentage of latent yaws cases.

Sleeping Sickness.

There has been a considerable extension of the system of mass examination and treatment. At the beginning of the year the investigation had two teams working but in September we were able to put a third team into the field. Some 150,808 persons have been examined and 13,514 cases of sleeping sickness diagnosed. Of these 10,620 were given a full course of 24-30 grammes of tryparsamide, 872 received partial treatment and 1,364 are still under treatment. A further 3,255 cases have been treated at general medical stations.

The training of African staff is proceeding. A number of dispensary attendants-in-training have been engaged which brings our present strength up to twenty-four dispensary attendants and forty-eight dispensary attendants-in-training. Many of them are doing very well particularly those that have come from Zaria, Bauchi and Kano middle schools. They show a considerable aptitude for this type of work and are reasonably trustworthy provided that they have ample supervision.

The position with regard to sleeping sickness in this country is very disquieting and we feel that we are still only touching the fringe of the matter. This year we found about 7,000 cases in the comparatively

small area of the Katagum and Hadejia survey. When the size of this area is compared with the whole extent of the country which is known to be infected, the magnitude of the problem will be realised. In the Plateau Province new surveys were made in the Kaleri district of Pankshin division, the Doka areas of Shendam division and the Miango and Kwall areas of Jos division, these gave total infection rates of 15.2 per cent., 11.6 per cent. and 11.6 per cent. respectively. In Lafia division of Benue Province the total infection of the districts surveyed was found to be 11.9 per cent. while Lafia, Keana and Awe towns gave infection rates of 20.3 per cent., 24.3 per cent. and 30.8 per cent. respectively.

A preliminary survey was made in the Abuja and Kuta divisions of Niger Province and sleeping sickness was found to be wide spread in both these divisions. Reports from District Officers throughout the north show that the disease is prevalent in many areas which have never been visited by our staff. Dr. J. C. Paisley's report follows.

The Work of the Sleeping Sickness Staff.

Sleeping sickness work in the field during the year has been carried out entirely by means of the mass survey and treatment system described in the report for 1930.

The following areas have been dealt with.

Bauchi Province.—Galadima district and parts of Gamawa and Sokwa districts, in Katagum division.

Kano Province.—The districts of Sarkin Dawaki and Chiroma in Hadejia Emirate.

Plateau Province.—The districts of Nunku, Wamba, Mama and part of Wana in the southern division; the Kaleri district in Pankshin division; and the districts of Ganawuri and Kwall in Jos division.

Benue Province.—Lafia Beriberi town and Keana district, in Lafia division, and Awe district in Wukari division. These surveys will now be described.

Bauchi Province.—The survey mentioned in the 1931 report was extended into parts of northern Sokwa district. The total figures were :—

Area Examined.	Total Population.	Number examined.	S.S. Cases.	Infection Rate.
				%
Galadima District	18,744	18,195	2,119	11·7
Northern Gamawa	10,050	9,631	636	6·6
Northern Sokwa	2,721	2,620	52	2·4
Total	31,515	30,446	2,807	9·2

When treatment of these cases was commenced, forty-one others from neighbouring areas came seeking treatment. These were treated with the rest. During the interval that elapsed between the survey and treatment, eighty cases died and during treament there were five deaths. In the areas of Gwololo and Bursali, forty-six positive cases, mainly Fulani, left their homes and ran away. The total number treated was thus 2,717.

When treatment was completed here, the survey team was moved into the neighbouring districts of Sarkin Dawaki and Chiroma in Hadejia Emirate.

Kano Province.—These two districts were found to be fairly heavily infected, particularly in the south. Infection rates in the

various centres of examination varied from 2.2 per cent. to 29.7 per cent. The total figures are shown below.

District.	Population counted.	No. examined.	S.S. Cases.	Infection Rate.
				%
S. Dawaki	19,691	19,691	2,130	10·8
Chiroma	17,042	17,042	1,964	11·5
Total	36,733	36,733	4,094	11·1

During treatment of these cases, 103 other cases came in voluntarily and were treated with the others. Thirty-two patients ran away. During the interval between the survey and treatment, thirty-nine died, and a further sixteen died during treatment. The total number treated is therefore 4,110.

Thus, in these two adjacent epidemic areas in Bauchi and Kano Provinces, out of a population of 67,179, 7,045 cases of sleeping sickness were diagnosed, 6,847 received full treatment, 140 died (for the most part before receiving treatment) and seventy-eight refused treatment and ran away. The success of these two surveys was largely due to the interest and co-operation of the Emirs and the Native Administrations concerned, the Emir of Hadejia being particularly helpful. The survey is to be extended to the east into Bedde Emirate along the course of the Hadejia, Katagum and Misau rivers early in 1933.

Plateau Province.—Southern Division.—Wana district could only be partly surveyed, owing to the people having dispersed for farming purposes, and also (later) owing to the unpopularity of the yaws treatment.

Nunku district was successfully surveyed as also were Wamba and Mama. The survey figures are shown below :—

District.	Population. counted.	Population examined.	S.S. Cases.	Infection Rate.
				%
Wana	9,931	9,796	655	6·7
Nunku	19,278	19,159	731	3·8
Wamba	9,556	9,540	458	4·8
Mama	6,753	6,676	707	10·6
Total	45,518	45,171	2,551	5·6

Treatment was successful in all the districts.

Figures are as follows :—

District.	No. of Cases.	No. receiving complete treatment.	% Completely treated.	Deaths.
			%	
Wana	655	644	98·3	10
Nunku	731	704	96·3	17
Wamba	458	445	97·1	10
Mama	707	647	91·5	17
Total	2,551	2,440	95·6	54

The population of this division is almost entirely composed of primitive pagans, who are difficult to persuade of the benefit of completing treatment.

Pankshin Division.—The Kaleri district borders on Mama, but is situated at the top of the escarpment, while Mama lies at the foot. The people here are similar to the Mama people, and their farms are for the most part at the foot of the escarpment in Mama country. The neighbouring village area of Bargesh in Ron district was included in the survey.

Figures are :—

District.	Population counted.	Population examined.	S.S. Cases.	Infection Rate
Kaleri	6,560	6,424	1,024	16·0 %
Bargesh ...	—	610	28	4·6

Unfortunately, a serious accident occurred in treatment of these Kaleri cases. At the Kamwai treatment centre, after the second injection of tryparsamide, many of the patients became violently ill. Some sank into a state of coma and died from three to seven days after the injection. Others became blind, and others recovered completely. In all twenty-four patients died, and thirty-five became blind. The cause is thought to be that the solution of tryparsamide was made with hot water instead of cold water. As a result of this accident, the majority of the cases refused full treatment. Out of the total of 1,052 268 received a complete course of tryparsamide.

Shendam Division.—Sleeping sickness was reported from the Jorto tribal area by the District Officer, Shendam, and cases had been attending both the Pankshin and Lafia hospitals from this area. It was accordingly decided to attempt a mass survey.

The figures were :—

Population counted.	Population examined.	S.S. Cases.	Infection Rate.
5,083	5,053	590	11·6%

These patients are still under treatment and are attendnig very satisfactorily.

Jos Division.—In spite of the survey and treatment in 1931, the Ganawuri tribe was reported to be still heavily infected, and was accordingly re-surveyed. The rest of the Ganawuri district was not done, as it was not considered necessary. The figures were as follows :—

Population counted.	Population examined.	S.S. Cases.	Infection Rate.
4,127	4,073	621	15·2%

In addition to this the Hausa settlement produced eighteen cases and the wandering Fulani two cases. Last year figures for the tribe were :—

Population counted.	S.S. Cases.	Infection Rate.
4,350	679	15·6%

In spite of the removal of the tribe to fly-free country, they have been returning to their old farms and villages and to their religious groves and have been nearly as much exposed to infection as before their removal. An attempt was made to trace as many as possible of the 1931

cases. The result showed that of these 13.4 per cent. are dead and 54.6 per cent. are still infected.

During the period 1928-1930, over 2,000 of the Ganawuris received treatment with tryparsamide. Unfortunately they did not attend regularly—many of them returning for a few injections only when they again felt ill, and very few completed an adequate course of treatment. As a result of these frequent small doses many cases have now become completely resistant to tryparsamide. The only hope for the tribe would appear to be the absolute prohibition of visits to their old farms and village sites.

The neighbouring district of Kwall has also been surveyed. Out of the 5,550 people examined in this area 650 infected cases were found, an infection rate of 11.6 per cent. In Miango the infection rate was very much lower and out of 8,728 people examined only 123 positive cases were found. Treatment is still going on and attendances are fairly satisfactory.

Benue Province.—The survey of Keana, Awe and Lafia was undertaken as a result of the preliminary survey made last year. The figures were as follows :—

District.	Population counted.	Population examined.	S.S. Cases.	Infection Rate.
				%
Keana	6,860	6,107	526	8·6
Lafia Town	3,794	980	199	20·3
Awe District	2,357	853	208	24·3

The infection rate was high in the towns of Keana and Awe, being 24.3 per cent. and 30.8 per cent. respectively. At the commencement of the survey of Lafia town, the population took fright and stampeded and it was difficult to persuade them to return for examination or treatment. Similar difficulties were met with in the other areas so that this survey can have done little good from the point of view of prophylaxis. Out of the 933 cases diagnosed 141 completed a full course of treatment and 250 others received incomplete treatment.

Treatment of cases attending voluntarily has been continued at Gadau, and in all 619 cases have been treated here during the year. These cases have come chiefly from the Bedde Emirate, the Jafun district of Kano and the districts of Sarkin Auyo and Wambai in Hadejia, where as stated in the 1931 report, the survey was not very successful owing to the antagonism of the inhabitants. It is hoped to re-survey parts of these Hadejia districts in 1933.

An attempt was made to combine yaws treatment with the sleeping sickness campaign in the southern division, Plateau Province. The figures for the four districts were :—

District.	Population examined.	Yaws Cases.	Infection Rate.
			%
Nunku	19,159	377	1·9
Wana	9,796	914	9·3
Wamba	6,676	628	9·4
Mama	9,540	899	9·4

Treatment consisted of eight weekly injections of Sobita, the dose per injection for an adult being four grains. It was given intramuscularly. The results were good in cases of frambœsial yaws, and in most cases considerable improvement was produced in crab yaws. Treatment was controlled by the Kahn test. The painful effects of Sobita made treatment so unpopular that it has had to be discontinued for the time being.

APPENDIX C.

REPORT OF THE MEDICAL SCHOOL AND SCHOOLS OF PHARMACY

BY

G. TAYLOR, M.R.C.S., L.R.C.P., *Superintendent, Medical Schools.*

MEDICAL TRAINING COLLEGE, YABA, AND SCHOOL OF PHARMACY, ZARIA—SUMMARY OF REPORT FOR 1932.

The following report is submitted in two parts :—

(*a*) that dealing with the Medical Training College, Yaba, and

(*b*) that dealing with the School of Pharmacy, Zaria.

A. Medical Training College, Yaba.

1. Premises.

The following premises were in use throughout the year :—

Lagos:

(*a*) The upper floor of the pathological block, African Hospital, consisting of one lecture room, one laboratory and a lecturer's office.

(*b*) One cloak-room and study for students. This was formerly part of a temporary ward in the African Hospital and was converted to its present purpose in December.

(*c*) One urine-testing laboratory.

Yaba:

(*a*) One laboratory in the Medical Research Institute.

(*b*) The Medical Training College premises, consisting of one combined chemical and physical laboratory, one pharmaceutical laboratory, two lecture rooms, one pharmacognostical museum, one lecturers' office, and two store rooms.

(*c*) An anatomical block in course of construction.

Staff.—The staff consisted of the Superintendent, Dispensers' Training School, whose title was changed in December by Gazette notice to Superintendent, Medical Schools. One Medical Officer detailed as Medical Tutor, one Medical Officer, detailed as Surgical Tutor, and one Pharmacist.

The Superintendent proceeded on leave on July 23rd, and returned on November 3rd.

The Medical Tutor and the Pharmacists proceeded on leave on July 23rd, and returned on November 17th.

In addition to their normal duties the following persons have conducted classes in the medical school, since November.

Dr. G. M. Gray—Civil Medical Practitioner.

Dr. A. Blair Aitken—Civil Medical Practitioner.

Dr. E. C. Smith—Pathologist.

Dr. J. A. Young, M.C.—Pathologist.

Dr. B. G. T. Elmes—Pathologist.

Mr. F. W. Randoll—Technical Assistant, Laboratory Service.

Two second-class dispensers of the African staff were, as before, permanently attached to the pharmacy school as teachers. Both are chemists and druggists, the junior member taking this qualification in July.

Students:

(i) First Year Medical.

Until November there were sixteen students in this class and all having passed the first professional examination they were promoted to the second year.

Since November, therefore, there has been no first year class at the medical training college, the pre-medical subjects now being taught at the Higher College.

(ii) Second Year Medical.

Until November there were twelve students in this class and all having passed the second professional examination they were promoted to the third year.

(iii) Third Year Medical.

This class was formed for the first time in November, with twelve students, as stated above.

(iv) Pharmaceutical Students.

The number of registered pharmaceutical students who were in attendance during the year was fifty-three, a decrease of eight from the previous year. Of this number twenty-one were subsisted by Government, the remainder being private students.

Duties of Staff:

1. *Superintendent.*—Before proceeding on leave the superintendent performed the administrative duties of the college. He also lectured to the first year medical students in botany, to the second year medical students in anatomy, organic chemistry and chemical physiology, and to the pharmaceutical students in urine analysis.

On his return from leave he again performed the administrative duties of the college and lectured as follows:—To the second year medical students in anatomy and chemical physiology, and to the third year medical students in pharmaceutics, therapeutics, materia medica and pharmacology.

He certified invoices of a total of 710 showing spiritual medicinal preparations exempt from Customs Import Duty.

He was appointed by the Board of Medical Examiners to be a member of each of the sub-committees appointed to conduct the following examinations:—

February, 1932—Dispensers examination.

July, 1932—Dispensers and Chemists and Druggists examinations.

November, 1932—First and second professional examinations for medical students.

He also conducted the examination of entrance for pharmaceutical students in October, 1932.

Medical Tutor.—The medical tutor until he proceeded on leave lectured to the first year medical students in zoology and to the second year medical students in anatomy, physiology and histology.

On his return from leave he lectured to the second year medical students in physiology and conducted the classes in systematic medicine for the third year medical students at the African hospital. He was appointed by the Board of Medical Examiners to be a member of the sub-committee which conducted the first and second professional examinations in November.

Surgical Tutor.—The surgical tutor assumed duties at the college in November and has since conducted classes in surgery for the third year medical students at the African hospital.

Pharmacist.—The pharmacist, (or the Assistant Superintendent of the Dispensers Training School) was responsible to the superintendent for the administration of the school of pharmacy.

Before proceeding on leave in July he lectured to the first year medical students in chemistry and physics and to all pharmaceutical students in pharmacy.

Since his return from leave in November he has lectured to the second year medical students in organic chemistry, to the third year medical students in pharmaceutics and to all pharmaceutical students in pharmacy, pharmacognosy, forensic pharmacy, and to the second year in pharmaceutical chemistry.

He was appointed by the Board of Medical Examiners to be a member of the sub-committee appointed to conduct each of the following examinations :—

February, 1932—Dispensers examination.
July, 1932—Dispensers examination and Chemists and Druggists examination.
November, 1932—First and second professional examination for medical students.

African Staff.—In addition to their teaching duties the senior member of the permanent African staff acted as Secretary to the Board of Medical Examiners and the junior member acted as Assistant in the college office.

The three members of the African staff were responsible to the Assistant Superintendent for the teaching of the following subjects :—

Senior member : Botany.
Pharmaceutical chemistry (third year).
Junior member : Physics.
Prescription reading.
Temporary member : Chemistry.

Honorary Staff.—The honorary staff, since November, have conducted classes, or performed other duties, as follows :—

Dr. G. M. Gray—Consultant.
Dr. A. Blair Aitken—Consultant.
Dr. E. C. Smith—Pathology (third year medical students).
Dr. J. A. Young, M.C.—Bacteriology (third year medical students).
Dr. B. G. T. Elmes—Histology (second year medical students).
Mr. F. W. Randoll—Prepared anatomical diagrams, and collected and prepared material for the histology class.

Medical School Committee.—A medical school committee was formed in November in order to act as a governing body to the college. The committee consisted of the following :—

Dr. G. M. Gray—Consultant.
Dr. A. Blair Aitken, Consultant.
The Senior Medical Officer, Lagos Area, African Hospital.
The Superintendent, Medical Schools.
The Medical Tutor.
The Surgical Tutor.

Duties of Students.—As in former years the pharmaceutical students assisted in the clearing and tidying of their premises.

Under the supervision of the staff the senior Government students prepared and bottled ethyl esters of hydnocarpus oil, clarified hydnocarpus oil and dispensed mixtures of oil and esters for the British Empire Leprosy Relief Association.

Large quantities of arsenical antidote were also dispensed for the Agricultural Department and distributed to the Residents and other officers in charge of anti-locust campaigns.

The students also contributed by voluntary labour in the task of destroying locusts in the " hopper " stage in the districts surrounding the college.

Owing to the great demand for ethyl esters of hydnocarpus oil two Government students attended in the laboratory each day, except Saturdays, from 2.30 p.m.—4.30 p.m., another two from 4.30 p.m.—6.30 p.m. and another two from 6.30 p.m.—9.30 p.m.

Curriculum.

(i) Medical Students.

(*a*) *First Year.*—Until November, first year medical students received instruction according to the curriculum set out in the report for 1931. Since November they have received instruction in anatomy, physiology, histology, organic chemistry and chemical physiology as set out in Appendix B of last year's report. The histology syllabus was amended.

(*b*) *Second Year.*—Until November, second year medical students continued to receive instruction in accordance with the curriculum set out in Appendix B of last year's report. Since November they have received instruction in medicine, surgery, pathology, bacteriology, materia medica, pharmacology, pharmacy, therapeutics and surgical anatomy. Reports from each of these departments are appended.

(ii) Pharmaceutical Students.

The curriculum for pharmaceutical students was the same as last year, except that since November, special attention has been paid to the "British Pharmacopœia, 1932" and to the more modern aspects of pharmacy such as sterilisation, evaporation under reduced pressure, biological and chemical assays, etc.

Every attempt has been made to keep the pharmacy course in line with recent developments in medicine, so that students who complete the course will be prepared for any duty in a modern dispensary.

Examinations:

(i) Medical Students.

The first and second professional examinations were conducted by the Board of Medical Examiners in November. All the candidates passed.

(ii) Pharmaceutical Students.

In February the Board conducted the Dispensers examination. Six candidates sat and one passed.

In July the Board conducted the Chemists and Druggists examinations and the Dispensers examination. In the former three candidates were admitted and all passed; in the latter seven sat and three passed.

These apparently low results were attributed more to carelessness than to any other cause. The Board at no time permits a candidate to pass who displays carelessness in dispensing.

Class examinations were held in March and July.

The examination of entrance for pharmaceutical students was held in October. Twenty-nine candidates sat and thirteen passed.

Vacations.—In addition to the public holidays the whole college was closed for vacation during the month of August.

During September and October, while the members of the permanent European staff were still on leave, revision classes were conducted under the supervision of the Medical Officer, Ebute Metta and the African staff of the college. The Senior Medical Officer, African Hospital supervised the work of the second year medical students at the African Hospital.

Health of the Students.—The health of the students was, on the whole, good, several cases of minor ailments being treated at the African Hospital, Lagos, and the dispensary at Ebute Metta.

One second year medical student had to be confined in the Infectious Diseases Hospital for a short time with chicken-pox.

Discipline.—During the year three Government subsisted pharmaceutical students were dismissed, two for insubordination and one for lack of efficiency. In each case ample warning was given and every chance for improvement.

Apart from these cases the discipline of the college was very good.

General:

(i) *Tours.*—As indicated in last year's report the permanent members of the European staff received permission to proceed on leave after a tour of about nine months. This arrangement was found to be most satisfactory from every point of view and is being continued.

(ii) *Practical Anatomy.*—With the erection and equipping of the new anatomical block, and the proposed passing of an Anatomy Ordinance to legalise the dissection of human cadavers, this subject towards the end of the year gave promise of being taught on a high standard. The dissection of monkeys was discontinued as being unsatisfactory.

(iii) *Sports.*—Football and tennis, especially the latter, were the most favoured pastimes.

Special Reports:

(*a*) *Medical Tutor's Report.*—Classes in systematic and clinical medicine for third year medical students were commenced in November. A tentative syllabus was formulated but will have to be revised in the light of experience. Lectures were given in medicine, commencing with malaria and clinical demonstrations were given on selected patients.

(*b*) *Surgical Tutor's Report.*—The teaching of surgery has consisted of systematic lectures, clinical lectures in out-patients' departments, clinical lectures in the wards, and lectures in surgical anatomy, etc.

Systematic Lectures.—These were started on 28th November, 1932. Three lectures of fifty minutes each are given every week. Up to the end of 1932, the following subjects were introduced:—inflammation, pyæmia, septicæmia, gangrene, tetanus, syphilis, yaws, tuberculosis, tumours, and diseases of blood-vessels.

It is hoped to cover the whole field of systematic surgery in an elementary fashion during the session 1932/33. During the session 1933/34, the gaps will be filled in and those subjects of local importance will be dealt with in greater detail, in a course of senior lectures.

Clinical Demonstration in Out-patients' Departments.—Three demonstrations of one hour each are given each week. The material is chiefly selected from the morning's attendance at the out-patient department. These demonstrations constitute the most valuable part of the teaching

Clinical Demonstrations in the Wards.—One demonstration of one hour is given weekly. Students have not yet been allocated cases in the surgical wards. They have not yet covered sufficient ground to profit much from this.

Lectures in Surgical Anatomy, etc.—One lecture is given weekly in surgical anatomy, surface marking, etc. The work here has not been very systematic, but has been adapted to illustrate the clinical material met with during the previous week.

In addition to the above, two students have been allocated to attend in the consulting-room during the morning attendance on out-patients, and two have been allocated to act as dressers in the out-patient department. The students have fortnightly spells at these duties. Those in the consulting-room assist the medical officer, by taking histories, taking temperatures and in other ways. When they have progressed a little further this aspect of the work should be of great assistance both to the students and to the medical officer.

It will be seen that the training is deficient in certain directions. No provision is made for attendance at operations, more ward-work is necessary, a course of demonstrations on bandaging, anæsthetics, etc., is required. These defects will be remedied, it is hoped, later in the session. Much ground can be covered during the two months " revision " which falls due in August and September.

With one, or possibly two, exceptions, the students have made really satisfactory progress. They are keen and interested. One or two of them should develop into really useful clinical assistants.

The greatest difficulty in teaching arises from the fact that there is no suitable text book to which reference can be made.

(*c*) *Pathologist's Report.*—Classes were commenced in the above subject in the beginning of December and daily instruction was given for one and a half hours with the exception of Saturdays. The instruction included lectures, practical demonstrations of sections and specimens, demonstration of post-mortem material and general routine of post-mortem procedure. Each student is required to assist the lecturer at one or more post-mortems (depending upon the number of post-mortems performed).

The subjects dealt with in the lectures were :—

Inflammation.
Repair.
Organisation.
Examples of inflammation in serous membranes :—
Endocarditis—pericarditis—pleurisy—peritonitis—meningitis—synovitis.
Examples of inflammation of mucous membranes :—
Simple gastritis and colitis—dysentery—typhoid and paratyphoid infections—schistosomiasis of the bowel—tuberculosis of the bowel—appendicitis—cholecystitis.
Examples of inflammation of particular organs :—
Lungs—The pneumonias.
Liver—Abscess (amœbic).

Cirrhosis (various types of).

(*d*) *Report on Bacteriology.*—The short period available in 1932 was utilised in dealing with the subjects of bacteriology and parasitology on broad lines with the view of enabling the students to appreciate at an early date certain points which might arise in the clinical tutorials.

Three lectures were given in bacteriology, one defining and outlining the field covered by the science, a second dealing with infection and resistance and the third dealing with disinfection.

Four lectures were given in parasitology consisting of brief descriptions of the parasitic protozoa and helminths.

These lectures were given merely as introductory ones and the students were not required to take notes as each subject is being treated in greater detail in the systematic lectures being given next year.

(*e*) *Special Report on Histology.*—The course in histology was commenced in December and classes were held on Mondays and Thursdays from 2.30-4.30 p.m. The first hour on each day was devoted to a lecture, the remaining hour being occupied in practical work and demonstrations. The following sections of the syllabus were completed by the end of the year :—

SECTION A.

Introductory:

(1) Definition of histology.
(2) Cytology—structure of cells—cell division.
(3) Formation of the tissues.
(4) Microscope.

SECTION B.

The Blood:

(1) Composition.
(2) Red cells.
(3) White cells.
(4) Blood platelets.
(5) Hæmapoiesis.
(6) Hæmolysis.

The technical assistant has devoted considerable time to the preparation of diagrams and histological tissues as well as assisting in the demonstrations and practical work.

(*f*) *Report on Pharmacology and Therapeutics.*—Twelve third-year medical students attended the lectures on these subjects every Saturday morning during the latter part of November and the whole of December at the Medical Training College, Yaba.

The special terms now employed to designate the different divisions of the old term " Materia Medica " were explained in the preliminary lectures and the following subjects were dealt with subsequently :—

Methods of administering medicines: the important routes employed for the introduction of remedies. Posology: conditions which modify the effects of drugs, with special reference to age, idiosyncrasy, habit, and cumulative action.

Incompatibilty, physical, chemical, therapeutical and pharmaceutical.

(*g*) *Report on Pharmacy and Materia Medica.*—Since November the assistant superintendent has lectured for one hour per week to the third year medical students in accordance with the syllabus.

B. SCHOOL OF PHARMACY, ZARIA.

1—Premises.

No structural alteration in the premises took place during the year. The small lecture room was fitted up for instruction in botany and pharmacognosy.

2.—Equipment.

Several fresh pieces of apparatus were obtained from England to facilitate the teaching of chemistry and botany.

The school received a gift from the West African Drug Company of a very fine materia medica cabinet with specimens.

A petrol gas apparatus, dismantled from the Calabar laboratory was forwarded to the school. It is now in process of being fitted up.

3.—Staff.

The staff consisted of an assistant superintendent and one member of the African staff of the school of pharmacy.

The assistant superintendent proceeded on leave from Zaria on May 24th, and returned arriving at Zaria on October 22nd. During his absence revision work was conducted by the African member of the staff.

The African member of the staff proceeded on leave for fifteen days in August. During his absence, the school was closed for the annual school holidays.

4.—Students.

On November 7th nine fresh students were enrolled making a total of nineteen; eighteen subsisted by Government, and one a private student subsisted by the Kano Native Administration. Eighteen of the students received their preliminary training at Katsina Higher College, and one at the C.M.S. School, Zaria.

5.—Duties of Staff.

(i) Assistant Superintendent.

The assistant superintendent performed the administrative duties of the school and lectured in all subjects.

(ii) African Staff.

The African member of the staff conducted tutorial classes in most subjects. He further supervised the revision course of work during the absence on leave of the assistant superintendent.

6.—Duties of Students.

As formerly the students regularly cleaned and tidied the school premises. Two senior students were detailed to supervise this work. A roster of students was drawn up for the compounding of laboratory reagents.

Two senior students commenced in November to assist the staff by demonstrating and conducting a few tutorial periods to first year students.

7.—Sessions.

Session 1931-32 terminated on May 21st, 1932. Revision work then proceeded under the guidance of African staff. Session 1932/33 commenced on November 7th.

8.—Vacations.

Apart from public holidays, the school was closed for vacation during the month of August.

9.—Classes.

For the duration of session 1931/32, a second year pharmacy course was in progress. At the commencement of session 1932/33, the students were divided into two years, first and third. The first year students commenced their studies concentrating on chemistry, physics and botany. The third year students continued with their studies from the previous session.

10.—Examinations.

Oral, written and practical tests were given at frequent intervals. Terminal examinations were held in April and December. The results were recorded together with brief reports on the progress of each student.

11.—Work of Students.

The majority of students worked consistently throughout the year. Progress was satisfactory and practical work was on the whole fairly good.

12.—Health of Students.

The health of the students was fairly good, minor ailments being treated at the African Hospital, Zaria.

13.—Hostel.

Upon the entry of new students the hostel accommodation proved too small. Five married students are living in Zaria City; the remainder, fourteen in number, reside in the hostel, single students being allocated one room only.

14.—Games.

The school produced creditable teams in both cricket and football. A fairly full fixture list has been prepared for 1933.

15.—General.

The school commenced to supply arsenical antidote to the Northern Provinces in May, for the anti-locust campaign, but this work was taken over by the School of Pharmacy, Yaba, when the assistant superintendent proceeded on leave.

A number of evening lectures were arranged during the year on subjects of scientific and general interest, the students proving more than willing to attend.

APPENDIX D.

DIETETICS NOTES

BY

W. E. McCULLOCH, M.D., *Pathologist, Dietetics Research.*

DIETETICS RESEARCH.

The following abstract is quoted from a memorandum prepared by Dr. McCulloch for the information of the members of the newly formed dietetics committee, a sub-committee of the Animal Health Committee. It will be understood that suggestions made in this memorandum by Dr McCulloch were put forward for discussion and are not necessarily considered practicable immediately :—

D. General Condition of the Hausa People.

The Hausa are not a healthy race. Parasitism is widespread, the most important parasites being malignant malaria, intestinal amœbæ, intestinal worms, schistosomes, and trypanosomes. It is difficult to imagine a native entirely free from all five of these parasites and the result is that there is a high morbidity rate. That the high rate of ill-health is only beginning to be realised is shown by the great numbers of the ailing who attend the " bush dispensaries " from the moment that they are opened.

The birth rate as a whole is low, and in Katsina Town the average over a seven year period is 20.2 per thousand. In the six towns in which children are being examined every six months it appears that there are about fifteen children between the ages of four to fifteen (years of age of examination) per 100 of the population, this is far too low and is of course lower than it actually is because no force is used to bring the children for examination. It is however certain that the great majority do turn up to be examined. We cannot arrive at the infantile death rate at present but it is undoubtedly very high. In Katsina Town, where there is a system of recording, the average for four years was the appalling total of 412 per thousand infants. This figure was raised by the presence of epidemic disease, but I feel confident that the normal infantile death rate is not less than 300 per thousand.

If we apply the calculations of Sundbarg of Stockholm to the statistics of Meek and of Katsina Town it appears that 20.0 per cent. of the English and 10.3 per cent. of the Hausa live to be over fifty years of age. This great disparity is what one expects from a general knowledge of the Hausa population. Rubin enunciated the law that the square of the number of deaths divided by the number of births gives a diminishing quotient as conditions get better. Applying this equation we get some startling figures. In New South Wales the quotient is 2, in England 8, in France 18, in Katsina Emirate 17.1. As France has the lowest civilised birth rate and its population is getting less, this can only mean that the polygamous Hausa, who exercises no birth control whatever, is breeding under very great disadvantages.

Fertility.

The disadvantages under which the Hausa breed are of two varieties, from without and from within. There is an extremely high infantile mortality rate conditioned by inherited disease, chiefly venereal, inherited poor physique, and terrible environmental conditions. There is also a poor fertility rate. The slightest consideration would make this extremely probable. The house servants of Europeans have a steady income, must keep themselves clean, and they marry under better conditions than the average of their class. It is very rare to find a Hausa servant who has several children and I believe that the majority are childless. This is partly because polygamy is not encouraged in the household of Europeans, and so the man has not as many chances of proving his fertility as he would in his own proper environment. But there is experimental proof of the lack of fertility. White rats and guinea-pigs in the nutrition laboratory are fed on guinea-corn and pearl millet maize and sesame with the ground grain moistened with milk. On this regime they live and increase in weight

but the litters are very few and very small (3-4 being an average). This is so well known now that when the writer is on leave, the animals are kept rigidly on this ration and there is no great increase of the stock. As soon as young rats or guinea-pigs are wanted the ration is increased by the addition of lettuce. In one month there will be as many litters as desired and the average litter will be nine to twelve young rats. The millets and milk (the vast bulk of the Hausa food) are thus clearly shown to be deficient in Vitamin E, the fertility vitamin. There is evidence that mineral deficiency also plays a part in the low Hausa fertility rate but this is not yet proven. One extremely interesting observation is this. Bakori is a town which is famous for its fertile women. Many women have as many as nine children, and it is a matter of pride to them. Bakori is built in a grove of kuka trees and the people certainly have more kuka leaves to eat per head than any other town which I know. The kuka leaf is one of the richest leaves in calcium which I have yet analysed. On the basis of the edible portion, just as put in the stew, it contains over 2.0 per cent. calcium. This result is consistent for leaf from all over Northern Nigeria. As mineral deficiency can most certainly prohibit fertility this observation is being followed up by experimental feeding.

The Children.

The growth rate for height is very much the same as the growth rate of white children up to the age of fifteen to sixteen. The Hausa then lags and is eventually a little shorter than the European.

The condition is very much different for growth in weight. In every age group the Hausa child is very much inferior to the European child. At fifteen years of age the boys are as much as 15-20 lb. below weight, while the girls are 4-5 lb. below.

The *Muscular Strength* of Hausa boys bears no comparison to the strength of the white school boy. He is very often as much as 1/3 less on the hand grip dynamometer. The girls appear to be as strong as the boys but the figures have not yet been worked out in detail. They are certainly very nearly the same.

The vital capacity of both groups bears no comparison to European children. Here again the girls are quite as good as the boys.

In general, it may be said that the average Hausa boy would be treated in Britain as " a weed " by the school medical officer and he would most certainly be given special attention in the clinic. The girls are by no means so poor physically and the reason will soon be seen. This is a very serious state of affairs, and it is not confined to one town as the 3,000 children examined are in towns as much as 140 miles apart. There cannot be the slightest dubiety about the general conclusion that the boy-hood of the Hausa people is not a fit boy-hood.

It is quite clear from the examination of the children that the impulse for growth is there, but there is an outstanding deficiency in weight and strength. Weight depends on the formation of bone and of muscle. The Hausa boy is thin and wiry and we have seen that his muscles are also weak. There is a definite muscular defect. The very high incidence in one year of 1,295 fractures as opposed to 396 dislocations without fracture also demonstrates the defective strength of bones. The incidence of fractures would certainly be higher if there were facilities for examination of sprains of the wrists and ankles by radiography. As the musculature depends on the protein eaten this is a clear indication that all is not well in the protein moiety of the dietary. The development of bone depends on the mineral content of the dietary and as this is apparently defective we here have a second reason, with defective fertility, to suspect the mineral content of the dietary of the Hausa people. At the moment what is quite clear is that physically the children of the Hausa are a very poor group and so inquiry from the dietetic standpoint was justified.

E. Experimental.

The results here reported were obtained by—

(*a*) analysis of individual foodstuffs.
(*b*) analysis of a day's food thoroughly mixed, dried and ground three times to a very fine powder.
(*c*) experimental feeding of children and prisoners.
(*d*) experimental feeding of white rats and pigeons.

Analyses of Prisoners Food.

The food of the prisoners in Katsina gaol averaged a total weight of four kilograms per day as issued and contained 544 G of dry matter with a calorific value of 2,700 only. The protein content was seventy-one grams, of which all was from vegetable sources, except on two days per week when 10 G came from meat. The fat content was exceedingly low being only 26 G per day. The phosphorus pentoxide content was 0.96 G per day which was too low and 0.22 G of calcium which was exceedingly low. The vitamin content was low for all varieties of vitamin. All this has been changed by a properly planned diet and the morbidity has dropped to a very great degree.

In Kaduna Government gaol the conditions were very much better and the protein and calcium were the parts of the ration which were too low.

In Kano Native Administration gaol the conditions were very much as they were in Katsina, with the added fault that the dietary was very short of vitamins and beriberi was present. Last year there were 132 deaths from ill-defined causes with no epidemic, and a very great deal of morbidity. The rations were scientifically planned in January of this year and there have been eight deaths so far, from well defined causes only, and a most marked reduction in the morbidity rates. The case of Kano prison can be regarded as a large scale experiment (on 800 prisoners) which has had the most fortunate results. It completely illustrates the fact that although this large group of men were receiving a dietary which had many faults, and caused grave disturbances of health, yet no complaints were made as the ration was one which was apparently better than that to which the criminal classes were accustomed. The thing that saved the people when free was the chance, which was no doubt taken, of having sour milk and odd pieces of food in market places and so on. The little extras, which could not be expected in prison, made all the difference between vague ill-health and apparent well being. This prison clearly demonstrated that the bulk of the Hausa food is of very poor biological quality.

Analyses of Food of the Labouring Classes.

Practically the same conditions were found as for Katsina prison rations before they were changed. The meat eaten was a little more and there was more fat because groundnut oil was more used. This food failed to maintain rats to the third generation as the young were invariably eaten by their under-nourished mothers. The removal of the meat from the ration gave rise to cannibalism amongst the adults.

Analyses of Food of Girls in Emir's House.

As was to be expected from the differences found in the physique of the children in Emir's and District Head's houses the food was of a very different quality to what was consumed by the prisoners and people in general. Analyses gave the following averages for samples taken on three successive days and three with odd intervals between them.

Protein	73 grams
CaO	1·334 G or 1·05 G of Calcium
P_2O_5	3·37 G or 1·46 „ „ Phosphorus.
Total Ash	14·8 G
Soluble Ash	12·5 G
Total Calorific Value...	2,400.

The quality of the dishes prepared was very superior to the ordinary people's food and there was very much more meat and milk and oil consumed. It would appear that to the growing child the protein content was quite adequate and was of good biological quality as well. It is notable that the calcium and phosphorus were present in very much the same quantities as are regarded as standard for the child, namely one gram of calcium and 1.32 G of phosphorus per day. The outstanding deficiency of this food was the lack of Vitamin A and the lack of the Vitamin B complex. There was no reason to believe that Vitamin C was being consumed either and the conditions of the girls' mouths seemed to indicate this. It was advised that limes be given to the household rather more frequently than had been the habit in the past, and a mixture of yeast, cod-liver oil and calcium carbonate was given to the children daily. This proved conclusively that there had been a vitamin deficiency as this group of fifty odd children grew more rapidly than the controls in the houses of District Heads.

It has been noticed that the morbidity has decreased amongst them, and colds, for one thing, are very much less frequent.

Experiments on Prisoners.

The great criteria of growth, maintenance and reproduction cannot be applied to dietetic experimentation on adult human beings. Their growth finished, it would never be justified to subject human beings to any regimen which might cause an impairment of their health, and prisoners cannot, obviously, be the subject of reproductive experiments. This field is the only one really open to human experimentation at present and it is the most barren of all. The aims of the experiments have had to be to add supplements to the prison rations and note changes in weights and changes in the composition of the blood. Work done in Kaduna was exceedingly difficult of interpretation because the prisoners were on a basal diet which was better than what they ordinarily had outside the prison. In Kaduna prison it was of significance that the group which gained most weight were those prisoners who were receiving a supplement of groundnuts (good protein and oil and minerals). The second best group was the one which received a supplement of milk (good protein and minerals again). As the grain used was whole ground and red palm oil was the fat used and limes were a constant issue there was no reason to suspect any vitamin deficiency, and recent work has borne that out. The deficiencies in the Government scale of rations were sub-optimal amounts of biologically good protein and minerals especially iodine and calcium.

The Katsina experiments are not yet finished but it is quite clear that the addition of meat daily to the ration makes for a greatly improved physique. The addition of red palm oil (very rich in Vitamin A precursor) has also had a very marked effect and the addition of calcium has been more carefully controlled than in Kaduna and shows that it is very valuable. This work will not be finished for another two months, but it seems that the case is already proven that vitamins, proteins and minerals are the great need of the Hausa people.

Experimental Feeding of Rats and Pigeons.

A series of repeat experiments have been set up so as to demonstrate to the committee the conditions to be described. The foods under test have been guinea-corn, pearl millet, sesamum indicum (Beniseed), ghee, kuka leaves, and sour milk (Nono). It is probably much clearer to summarise the knowledge gained under the headings of the names of the foods.

Guinea-corn.

Pigeons will grow and hatch eggs when fed on this grain alone, but the young either die early or die when half grown. I have never been able to get successful reproduction. It is to be noted that Plimmer

of University College, London, gets entirely different results. He, however, feeds fish meal with his millets and that is a powerful protein and mineral supplement.

Rats will not breed or live for longer than six months on guinea-corn. Cannibalism becomes rife. If guinea-corn is prepared in the native manner (Wankaken Dawa) and fed to pigeons they die of polyneuritis in about two months. Rats develop pellagra first and later beri-beri. This proves that the native method of extraction of the bran takes away most of the vitamin B complex as in the case of all other cereals.

When rats are fed on guinea-corn alone the average gain in weight is 54 G in 155 days. If casein (vitamin free) is added to the guinea-corn the average gain in weight is 131 G in 155 days. This is clear proof of the poverty of the protein of guinea-corn. Chemically, it is known that this cereal contains none of an essential element of good protein and very little of two others.

Using the same method of additions of pure supplements to the basal ration of guinea-corn flour prepared in a native household for cooking, it is clearly shown that guinea-corn, as eaten, is deficient in all vitamins, protein, fat and minerals. It is one of the poorer cereals and is dietetically very much inferior to wheat or maize. It is not a crop that should be encouraged.

Pearl Millet.

This cereal is better in every way than guinea-corn. The protein it contains is a complete protein and it does not need the same amount of supplements as does guinea-corn. As prepared for cooking it has in it more vitamin B complex than guinea-corn. Its chief deficiencies are fat, vitamin A, and minerals. It is a much better food than guinea-corn.

Beniseed.

This seed is remarkable for its high content of first class protein, fat, calcium and phosphorus. It is apparent that the plant exercises a very highly selective action on the soil as there has been found to be remarkably little variations in the composition of the seed from localities as far apart as the Benue valley and French country north of Katsina. Since the discovery of its remarkable mineral content it has been in use in the ordinary laboratory ration for two years and the only mineral supplement added has been rock salt. This seed supplies all the protein and most of the minerals necessary for growth, maintenance and reproduction. It is so remarkable a food that it could hardly be expected to be also rich in vitamins and it is not. It is very poor in the vitamin B complex, vitamin E seems to be entirely absent, and there is very little vitamin A.

Ghee.

The work is not yet finished the rats are growing well still and therefore it probably contains enough vitamin A for all ordinary purposes.

Kuka Leaves.

These are under test because it has been found that this most popular of the edible leaves contains a remarkable amount of calcium. The extra calcium fed to prisoners under experiment has been contained in this leaf, and it has been very well absorbed indeed. Because of the availability of this calcium the leaf is now under test for its vitamin A, D content. It, like ghee is apparently supplying adequate amounts fed at a five per cent. level.

Sour Milk.

This extremely complicated mixture has been tested in a general way. It has been in a general way. It is, of course, a good food and the effect of it on the population must be incalculably great as the greater

part of their food is composed of the millets. No detailed work has been done on sour milk as yet as its properties are already so well known and the more urgent problem was finding out the biological values of the millets.

Summary of Experimental Results.

Examination of 3,000 Hausa children has proved that there is a grave defect in the national growth rate. Experiment has proved that guinea-corn, the staple food of this part of the country, is so poor in all but carbohydrate and phosphorus that it cannot be considered as being anything but a very poor food. It is also very likely that its phosphorus is not present in a form that is easily absorbed.

The experimental feeding of prisoners, children and animals has shown that the chief deficiencies of the Hausa dietary are protein of first class quality, vitamins, and minerals particularly calcium and, from one experiment, probably iodine also.

F. Recommendations.

This section of the report is the one which I hope will illustrate the value of a committee. The suggestions which I am putting forward are to the last degree tentative and I hope that discussion will enable us to get a policy of food improvement which will be to the benefit of the Hausa people. I am not concerned with the methods which will be used to overcome the deficiencies in the Hausa dietary, but I am most deeply concerned to see that something is done. Each department represented on the committee knows its own problems best, and no doubt from their past experience they can say with authority that this or that is feasible. Once feasibility of a line of action is apparent it is then necessary for the administrative service to put that action into gear, so to speak, and this co-operating service is the only one that will get any experimental work translated into practical politics. I do desire it clearly to be understood that if not a single recommendation of mine is acceptable to the committee that I shall not mind in the slightest degree as long as something is decided to the benefit of the people. One point, I know, needs emphasis, there is no great difficulty in introducing new crops and new dietary habits if they can be shown to be worth while. In East Africa maize was imported and made the staple crop because the people saw its advantages over their millets. It is now a staple food. Famine in Ireland introduced maize and it is now the greatest maize producing country in Europe. The time factor will vary but introduction of better crops is always a practical proposition.

What are the Dietary Requirements.

Certain standards have been generally accepted for the white races and all discussions as to the requirements in the tropics are agreed that there is no evidence to show that a different standard is necessary. Breinl and Young reviewed the literature on tropical dietaries and came to the conclusion that " in general, the requirements in calories of white men or coloured natives, does not differ appreciably from European standards ". Orr and Gilkes say that " there is no reason to expect that there would be much difference in the relative proportions of the different constituents required ". My work on prisoners showed that an intake of eighty-two grams per day of protein could with advantage be reinforced by an increase, and so did the work on calcium. It is therefore apparently correct for Nigeria as well, that the negro requires about the same standards as the European to be applied to his dietary. The following are the generally accepted standards.

Protein	100	grams daily.
Fat	60-70	,, ,,

Carbohydrate to bring the calorific value to 3,400, for ordinary life. It is very important that the distribution of the calories between these proximate principles should be.

Protein from 10-15 per cent. of total calories.
Fat about 35 per cent. of total calories.
Carbohydrate the rest.

The vitamin dosage has not yet been worked out with such accuracy but a tentative scale has been suggested by American workers, for future reference it is well to give it.

Vitamin A 2,000-3,000 Shermann units.
Vitamin B (complex) 900 Shermann units.
Vitamin C 15 Shermann units.

The mineral requirements are probably receiving more attention, at the moment, than most of the other constituents of a diet, and it is already generally accepted that the following scale is correct.

Calcium, a minimum of 0.45 G and for growth 1.0 gram.
Phosphorus, a minimum of 0.9 G and for growth 2.0 gram.
Iron, a minimum of .015 gram.
Iodine, excessively small amount.

It is always to be remembered that an excess of phosphorus in the ratio of 2.4 to 2.7 times the calcium and over, leads to a reduction of blood calcium and an increased blood phosphorus. These conditions were seen to be present in Kenya and are present in the Hausa.

Protein.

The importance of good protein cannot be over-estimated in a diet. McCollum, who has had unrivalled experience in the interpretation of dietetic studies, says :—

" There is no instance in our experience where a diet " satisfactory in all other respects, but supplying just sufficient " protein of good quality to support growth at approximately the " maximum rate to the full adult size, has been found to promote as " satisfactory nutrition over the entire span of adult life as would " the same diet containing a more liberal supply of the protein " factor. It has been frequently assumed by students of nutrition " that after growth has been attained the nutritive needs of the " body for protein can safely be met by a dietary in which the " protein content is lower than is essential for optimal growth. Of " the numerous experimental data from the work of McCollum and " Simmonds, none support this view. They all point to the " conclusion that when the life history of the individual is " considered, a generous protein ingestion or one allowing a fair " margin of safety over the lowest percentage which just suffices to " induce maximal growth in the young serves to maintain vigour " for the longest possible period."

No vegetable protein has yet been found which is as efficient as animal protein in nutrition. Many vegetable proteins are now known which are very nearly as efficient as meat, but require to be consumed at a higher level of intake so as to be adequate substitutes. These proteins are nearly always found in oil bearing seeds. In Nigeria the groundnut and beniseed contain protein in large amounts which is of first class biological value. There are therefore four obvious methods of making available good protein to the Hausa, through an increase of consumption of meat, milk, beniseed and groundnuts.

Meat and Milk.

The problem of greater meat consumption is, I feel, as in all European countries, an economic problem. The more money available, the more meat will be eaten. In Nigeria, granted the economic possibility, which does not of course exist, there would then arise the question of the supply of meat. That is a problem which exercises the Veterinary Department to a great degree. From the dietetic point of view there is this to be said. The meat is of wretched quality and it is

exceedingly poor in fat. The importance of the fat content of meat lies in its content of vitamins A, D and E, as vegetable oils as a whole do not contain those vitamins in any amount which justifies their use for supplying these vitamins. The reason of the meat being so poor lies chiefly in the system of cattle ownership which obtains in Nigeria. Only old stock is sold and it is trekked long distances to the slaughter places. The animal is thin and its muscles are full of lactic acid (note very early post-mortem rigidity) and as the meat must be eaten at once the result is a stringy, tough, tasteless joint. While the present system obtains I can see no hope of good meat and a plentiful supply of it in *Northern Nigeria*. The conditions as regards the south can be made entirely different however. I believe that European enterprise alone will be able to supply meat and that this enterprise will give the cattle industry of the north that stimulus which will make just that difference between prosperity and the conditions which now obtain for the Fulani owners.

Groundnuts.

The groundnut contains about twenty-five per cent. of protein which is of first class biological value and the content of the extremely important, because indispensable, di-basic amino acids is high. In all experimental work it has been shown that groundnut meal, of average composition of protein 47, fat 10, carbohydrate 40 is completely adequate for growth and some authors claim that it is " markedly superior " to meat for reproduction. If this is so the contained fat must be richer than meat fat in vitamin E. Nigerian groundnut meal contains on an average—

Dry matter	89.7	per cent.
Protein	46.8	,, ,,
Oil	7.5	,, ,,
Total ash	5.8	,, ,,
Calcium	0.21	,, ,,
Phosphorus	0.555	,, ,,

which is in every respect much richer than meat, but it is not of animal origin. There is an enormous production of groundnuts in Nigeria every year, and the vast bulk of the crop is exported. We therefore are exporting out of a protein starved country, a first class protein of enormous potential value to the people, and there is not even the satisfaction that it is being adequately paid for by the purchasers. If the prices issued by the Ministry of Agriculture of Britain are compared to the prices paid in Nigeria it is seen that the price of groundnut cake does not vary as does the price of the oil and the price of the whole nut in Nigeria. The oil content determines the price.

Sesame.

Nigerian seed has the average composition of protein 23.46, fat 52.6, carbohydrate 16.0. The protein content is that of a biologically first class protein as all essential amino acids are abundantly present with high tryphophane content. This protein has served for growth, reproduction and maintenance to an eminently satisfactory degree for the past two years in this laboratory. The mineral content of beniseed is also of astonishing magnitude. Nigerian cake has the following composition, which is compared to analyses of other well known cakes.

	Sesame cake.	Cotton seed meal.	Linseed meal.
Dry matter	93.0	91.3	88.8
Protein	41.9	42.1	29.5
Oil	8.6	0.9	9.5
Total ash	7.1	6.0	9.1
Calcium	1.53	0.265	0.4
Phosphorus	1.1	1.19	0.75

The value of sesame cake in first class protein, calcium and phosphorus makes it a really great food. In the whole range of foodstuffs I know only cheese (concentrated milk) which is comparable. No one eats cheese in vast amounts because of its richness which makes it indigestable, whereas the low fat content of beniseed cake would tend to prevent indigestability.

Bolton, one of Britain's authorities, says :—

> " The neglect of sesame in this country is difficult to understand, and it is hardly possible to think that it can continue. There are great possibilities for expansion of its cultivation within the Empire, particularly since the seed is so easy to crush and the oil to refine ".

Here is a crop which can grow all over Northern Nigeria that supplies an oil cake which is unique in its combination of mineral and protein content. The Hausa people are suffering from just these deficiencies and the British oil cake manufacturers are importing over three quarters of a million tons of extra-imperial oil seeds per annum.

Oil Cake Manufacture.

Soya bean (Glycine Max) has been tried by the Agricultural Department of Nigeria but I do not know with what result. As there are about 1,000 varieties of this legume and nearly all of them have been tried by the United States Department of Agriculture under the most diverse conditions of climate, it should not be difficult to get information as to what varieties would be worth trying in Northern Nigeria. The soya bean contains vitamin A, and is a good source of the vitamin B complex. The twenty per cent. or so of oil that it contains also contains vitamin A. The importance of this crop would be however its very high content of first class protein which may be as high as forty per cent. This protein is of first rate commercial importance as cattle feed and many invalid foods and milk substitutes are made from it. Its importance as an infant food, in a milk substitute, would be enhanced by its vitamin content as it is apparently richer than sesame in vitamins. It would probably be an exceedingly valuable crop to the children of Southern Nigeria, and in hospital practice in the north.

Soya bean cake contains the following on average.

Moisture	12.7	per cent.
Protein	38.82	,, ,,
Fat	11.07	,, ,,
Carbohydrate	32.36	,, ,,
Ash	5.05	,, ,,
	100.00	

G. Needed Help Suggested to Forestry Department.

It is unfortunate that the red palm oil of the south is not an article of general use in the north. I do not see how it can become so in the near future. The great sources of vitamins to which we should look will be more milk being available, I presume by mixed farming, and the increase of the green leaves and fruit eaten by the people. The problems of meat and milk production are the concern of others than myself and work is being done on the matter. It is not so obvious however which green leaves contain the best supply of vitamins and minerals. The climatic conditions of the north prevent vegetable gardens in the ordinary sense, and it seems to me that in this connection the Forestry Department can do most useful dietetic work. This department has been conducting experiments on the planting of *exotic* trees amongst crops, that is in the middle of farmed lands. In this I think lies the opportunity which we desire. Could not the Forestry Department

experiment with the planting of indigenous useful trees in the farms more or less under its control, find out the best methods of planting out seedlings and then have nurseries of these trees at each local, already established, headquarters, and from there distribute the seedlings at the start of the rainy season. That there will be a demand for these trees I feel sure as the trees of economic importance are very jealously possessed by the people that own them, even if they do not farm the land below them at the moment, and I was extremely impressed with the fact that in Kano, mango seedlings are sold by the Native Administration for as much as a shilling each.

The obvious trees to start with are the baobab, the silk cotton tree, the ben, and the mango. Already the Forestry Department has been planting thousands of the locust bean tree and so there is information as to best methods of propagation and planting. The importance of these five trees cannot be over-estimated from a dietetic point of view because of the vitamin and mineral starvation of the Hausa.

The Baobab (*Kuka—Adansonia digitata*) is probably the most urgent need of the people because its leaves contain vitamin A and they are exceedingly rich in calcium and phosphorus. The acid and mucilagenous fruit has a great variety of dietetic uses and makes a very pleasant, and healthful acid drink for Europeans in the tropics.

The *seed* is much used in " Dandawar kuka " which is not, however, as popular as the black fermented cakes of the same generic name from the seeds of the locust bean tree.

The composition of the seed is—

Protein	10·9	
Moisture	12·0	
Fat	12·0	
Carbohydrate	61·6	(rich in fibre however)
Ash	3·5	
Ca 0	0·31	
$Na_2 0$...	0·25	
$K_2 0$	1·08	
$P_2 0_5$	1·20	

It is noticeable how rich the components of the fruits are in potassium and in countries such as this in which cereals are the main food, this alkaline property of the fruit will be of importance, as cereals are of course acid forming foods.

Unquestionably there are vast numbers of baobab trees in Northern Nigeria, but they are distributed with no regard to the population.

Even to-day we see papers in the scientific journals proving that sun-dried leaves are not of such vitamin giving value as leaves dried in the shade, and it is not more than five years ago that this was first proved by one of the great animal husbandry experts of the world. It is therefore very astonishing that the dried baobab leaves which are sold in the market give a bright green colour when pounded into powder as is universally done before cooking in the stews. The reason is that the leaves are plucked when still soft and non-fibrous and dried in the shade. No amount of questioning can elicit any conscious reason for this, beyond the statement that it has always been done. Modern research methods being a habit of a primitive people would have forced investigation even if the leaf was not so universally eaten.

The Locust Bean Tree (*Dorowa-parkia filicoidea*).—This leguminous tree has been the care of the Forestry Department for some years. This tree yields about 120 lb. of pods annually which is used as food. The red flower balls are much eaten by children and it has a distinctly sweet taste.

ANALYSIS OF THE SEEDS.

Moisture	9·2	*per cent.*
Protein	29·0	„ „
Fat	14·6	„ „
Ash	4·0	„ „
Carbohydrate ...	43·2	„ „
Ca 0	0·75	„ „
$P_2 0_5$	1·07	„ „

ANALYSIS OF DADAWA.

(the black fermented cake of the seed).

Protein	42·0	*per cent.*
Ca 0	0·75	„ „
$P_2 0_5$	1·54	„ „
Total Ash	4·7	„ „
Insol. Ash	1·6	„ „

The fall in the calcium content I am unable to explain. The *Imperial Institute* gives the following analyses :—

	From Gold Coast.		From Nigeria.	
	Yellow powder.	Seeds.	Powder and seeds.	Powder and seeds.
Moisture	13·7	10·1	12·14	9·35
Crude Proteins	4·2	28·5	14·70	16·00
Fat	2·0	16·8	8·39	6·14
Sugars (reducing)	19·2	—	10·9	20·87
Sugars (non-reducing)	8·5	3·5	6·34	1·53
Other Carbohydrates	35·8	28·9	32·83	30·33
Crude Fibre	12·6	8·3	10·74	11·0
Ash	4·0	3·9	3·96	4·78

It is thus clearly shown that the seeds contain a lot of protein and it is very significant that the popular dadawa cake contains as much as forty-two per cent. of protein.

The Ben or Murunga (Zogalagandi—Mounga pterygosperma—Horse Radish Tree)—This tree is planted a great deal around compounds and it grows very rapidly. The seeds are the source of the " Oil of Ben " of which forty per cent. is a white solid fat. The liquid oil is used in the manufacture of perfume in the enfleurage process. The young seed pods are edible and are not unlike ordinary string beans, they should be a valuable addition to the stews in institutions such as prisons and schools. The name horse-radish tree is due to the fact that the roots are pungent and edible and not unlike the flavour from which it gets its name. The Hausa use the leaves to a great extent in their stews, and that the tree is very hardy is shown by the way it lives in spite of the extremely rough treatment to which it is subjected. At the end of the dry season it is not uncommon to see trees which are apparently dead, as the growing tip of the stem has been torn off as well as all the ends of the branches. The Porto Rican Department of Agriculture has demonstrated that cattle and pigs are very fond of the leaves of this plant, and that they have a high nutritive value. No analyses have yet been done of this popular and very useful tree. There is a description of a large variety of mounga from the Phillipine Islands, the imature pods of which are as long as twenty inches and are in great demand as human food. This variety might possibly be tried in Nigeria.

The mango (Mangifera indica) is of great importance in the dietary of the West Indian negro, indeed in Jamaica the mango season is said to be the season of highest fertility amongst negroes, and the leaves

and fruit are generally regarded as being most nutritious to farm stock. Recent work has shown that the mango is very rich in vitamin A and in vitamin C. This makes it an important fruit to the Hausa, as he will certainly eat it if he can get it. There are over 500 varieties lying in six species groups, and care should be taken not to introduce any of the almost uneatable turpentine flavoured varieties.

The silk cotton tree (Rimi-Eriodendron orientale) is of dietetic importance because of its edible leaves. They are much eaten around Zaria where there are many magnificent trees. The Hausa does not appreciate that this tree is easily propagated by large (4-6 feet) stakes. The French have realised the importance of the " Kapok " produced by these trees, and they are actively laying down large plantations. It is also to be remembered that the seeds contain as much as twenty-seven per cent. of oil which is finding an expanding market both for human food and for soaps. The oil cake is used in the east especially in Malaya, so that it is seen that this tree also supplies many products of use to man.

In this section it is to be noticed that I have not mentioned the *Shea Butter* tree. This is because it is receiving much attention from the Agricultural Department of the Gold Coast, and we shall no doubt hear of the result without resorting to duplication of experimentation here in Nigeria. Mr. Greenwood's report on Nigerian shea butter covers all that we know of this crop here.

" H " Needed Help Suggested to Agricultural Department.

The great agricultural problem from the dietetic point of view is the institution of other foods for guinea-corn, or, alternatively, the supplementing of this food with others which will make good its deficiencies. There is a school of dietetics which maintains that cereals are actively harmful foods to the human organism. Although the Medical Research Council of Britain has made no definite statement on the matter, the pronouncements of its secretary, support this view. To this view I cannot subscribe, and so it is now clear that my condemnation of guinea-corn is based purely upon experimental evidence, and that the other great cereal of the country pearl millet, does not share in the condemnation.

Maize.—I suggest that one of the first crops which need experimentation is yellow maize. It is perfectly useless to try to introduce a white variety of maize as it is devoid of vitamin A and vitamin E, two deficiencies in guinea-corn which yellow maize can correct. There are many varieties of yellow maize which are grown in the desert areas of Arizona, and it would probably be worth while to try and introduce these. In Gwarri and Nupe the pagans grow a bright yellow maize which matures in ninety days, and they therefore get two crops in some areas by sowing at the beginning and the middle of the rains. This variety, instead of Lagos white, would probably give good results eventually in the north if selection was to play a part in the work. Maize is one of the great foods of the world, and the value of yellow maize in any scheme of mixed farming for a tropical country can hardly be overestimated. The native already eats some yellow, rapidly growing maize, and he could probably be induced to grow it extensively in the first instance for export, and for local sale to Government institutions as food for man and cattle, I presume that there would be a market in the south as well. The desert varieties from America would probably be well worth a trial, alongside any yellow varieties that are quick maturing and indigenous to West Africa.

Rice.

The native rices are extremely popular in the areas in which they are grown, but extension of the area under crop is necessarily limited by the areas which are flooded. It seems (from the Kwarri Irrigation Farm

Report) that native rices mature in about 110 days, whereas the exotic varieties, which gave much higher yields, matured in about 120 days. The Senior Agronomist of California University assures me that there are very many varieties of quickly maturing rices which take about eighty to ninety days for maturity. It is therefore probable that trial of these varieties would find some which it would be possible to plant in flood areas which dry up in about that time, and they would be reaped before any damage was done by rapidly receding waters. Actually time would be gained by irrigation nurseries in these areas by digging shallow wells and each farmer irrigating his small nursery by the usual native method of the bucket balanced on a lever by a lump of mud. An important point from the dietetic point of view would be to find a rice which hulls so easily that no parboiling whatever would be necessary. Sierra Leone is probably the greatest rice country of West Africa and in the Timani country they have a rice which is generally regarded as being of the finest quality grown in the country. It is very significant that this grain requires no parboiling and is only submitted to prolonged drying and then pounding.

In Sierra Leone there are also several varieties of rice grown which are entirely dependent on the rainfall to grow. These take as long as five months to mature but produce forty bushels per acre as against the fifteen bushels of the quick maturing varieties, which are apparently choked out with weeds. I don't know how far selection has gone of native rices at Kwarri, it is probable that some indigenous varieties have been found which are entirely suitable to this country.

Beniseed.

I have stressed the great nutritive value of beniseed, and I would suggest that selection experiments be carried out. There is no doubt that the yield varies enormously depending on the size of the seeds. Sampson in his report on the Gambia, where he points out the conditions are similar to Northern Territories and Northern Nigeria, stresses the importance of this crop, and emphasises the fact that if it is sufficiently closely planted there is no need for weeding. The possibility of a second crop is one worth while bearing in mind. The Chief Veterinary Officer of the Gold Coast has, however, just told me that he cannot get the crop to grow when planted in the late rains. Seed from such a crop from Benue Province might make all the difference.

Citrus Fruits.

The native grows limes and it is admirable stock for other varieties of citrus fruit. The popularisation of limes alone would be eminently worth while as in hospital practice scurvy is not a rare disease. In my own experience I have found all citrus trees, except limes, difficult to grow and even then need attention for two years. For this reason it would probably be wise to advise that lime seedlings should be planted in compounds where they could be tended, and if necessary watered without any trouble.

The Agricultural Department will no doubt be able to draw on the experience of other tropical countries to suggest crops which will enrich guinea-corn or replace it. I should be very glad to supply information as to the known dietetic value of any crops which they may contemplate.

"H" Institutions and Improvement of Dietary.

Prisons.—There is some objection to prison gardens which I have not been able to fathom. It appears to me to be desirable that some prisoners should be used to cultivate the green vegetables which they eat. This would be an admirable method of getting rid of their night soil and the educative value would be high. The whole modern tendency is to use the criminal in productive labour because its reclamation value is

beyond dispute. In all prisons in the north there is a sanitary gang who could also be the garden gang. Instead of sewage farms producing nothing, they can be made to produce green vegetables in profusion, and there would be very very little, if any, expenditure incurred. The prisons would save as much as one half-penny per day per man on the ration scale, and the men would perhaps, be made really to work, at least when drawing water from the wells. Above all, I believe that the fact of productive work would make a happier prisoner. It has always been a striking fact to me that the happiest prisoners and the most cheerful, were those doing kitchen work in which they certainly work harder than the rest of the inmates. Prison gardens should grow only native foods and on no account whatever should the produce from these gardens be sold to Europeans because of the risk of infection.

The prisoners who are now alleged to work on roads in the towns could do really useful work by planting trees between compounds and along streets and watering them along with their interminable sweeping.

I. School Boys.

Schools are far more widely scattered through the emirates of the north than are prisons. Manual labour has received a new dignity from the public schools of Britain, and it is presumably correct to assume that it has even greater claims for the great farming population of Hausaland. Could not these district schools, as distinct from the headquarters school of the division, be used as distributing centres for seedlings? If each school had a garden in these areas, the produce would be divided amongst the boys to take home, and it would have its educative influence. These gardens would grow native onions, spinach, tomatoes, etc., and the environs of the school would be planted out with pawpaw, mango and the trees produced by the Forestry Department. At the season of planting, the seedlings for distribution in that area would be sent to the school from the headquarters nursery, and it could be made a matter of pride that the school which showed best results each year in the viability of the seedlings which it distributed should have a prize, such as an extra holiday known as the day for the " Men of the Trees ". To appeal to Hausa mentality there should probably be a prize which could be seen and handled as well.

J. Famine.

In years of scarcity there are an enormous number of trees and shrubs of which parts are used for food. The Forestry Department has probably got a complete list of these. It is suggested that it would be worth while to plant more of these near to large centres of population. In Katsina the most popular varieties in famine times seem to be *Dinya* (Vitex-Cienkowskii) of which the young leaves and seeds will be eaten. Giginya (Borasus flabellifer) of which the fruit is eaten. The eating of the " muruchi " or germinated shoot is common at all times and so the Forestry Department has had to be making new plantations which are protected.

Ingududu—(Cratæva Adansonii) of which the leaves are eaten.

Chediya—(Ficus Thonnengii) of which the young leaves are eaten. The figs eaten cooked at any time.

Chichiva—(Mærua Angolensis) of which the leaves and seeds are eaten.

Zure—Of which the leaves are eaten.

Is there a possibility that the sago palm will grow where the fan palm does? This palm would be an exceedingly valuable famine reserve. The tree could be bled and sugar produced annually, and the tree itself could be conserved until years of famine. One sago palm will produce 200 pounds of very valuable sago, and if areas are found where it can be grown it would probably be the cheapest and the best method of

famine relief for this country. The method of preparation of sago is simplicity itself and it could be used in exactly the same way as the people use their millets in time of plenty.

It is regretted that so short a time lies between the issuing of this report and the meeting of the committee. There were many small points which had to be checked in the laboratory before I was sure and that made it one month later at least than I had intended. I do hope at the meeting that criticism will be free and lively, and all I hope for positively is that it will be realised that the dietary of the Hausa needs improving, and that all of us will have to work towards that end.

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11. 11. 32.