

Annual medical report / East Africa Protectorate.

Contributors

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EAST AFRICA PROTECTORATE.

ANNUAL MEDICAL REPORT

FOR THE

YEAR ENDING 31ST DECEMBER, 1916.



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No. 16/507.

MEDICAL DEPARTMENT,

HEAD OFFICES,

NAIROBI,

20th December, 1917.

SIR,

I HAVE the honour to submit, for the information of His Excellency the Governor and for transmission to the Right Honourable the Secretary of State, the Medical Report on the health and sanitary condition of the East Africa Protectorate for the year 1916, together with the Returns, &c., appended thereto.

I have the honour to be,

SIR,

Your obedient servant,

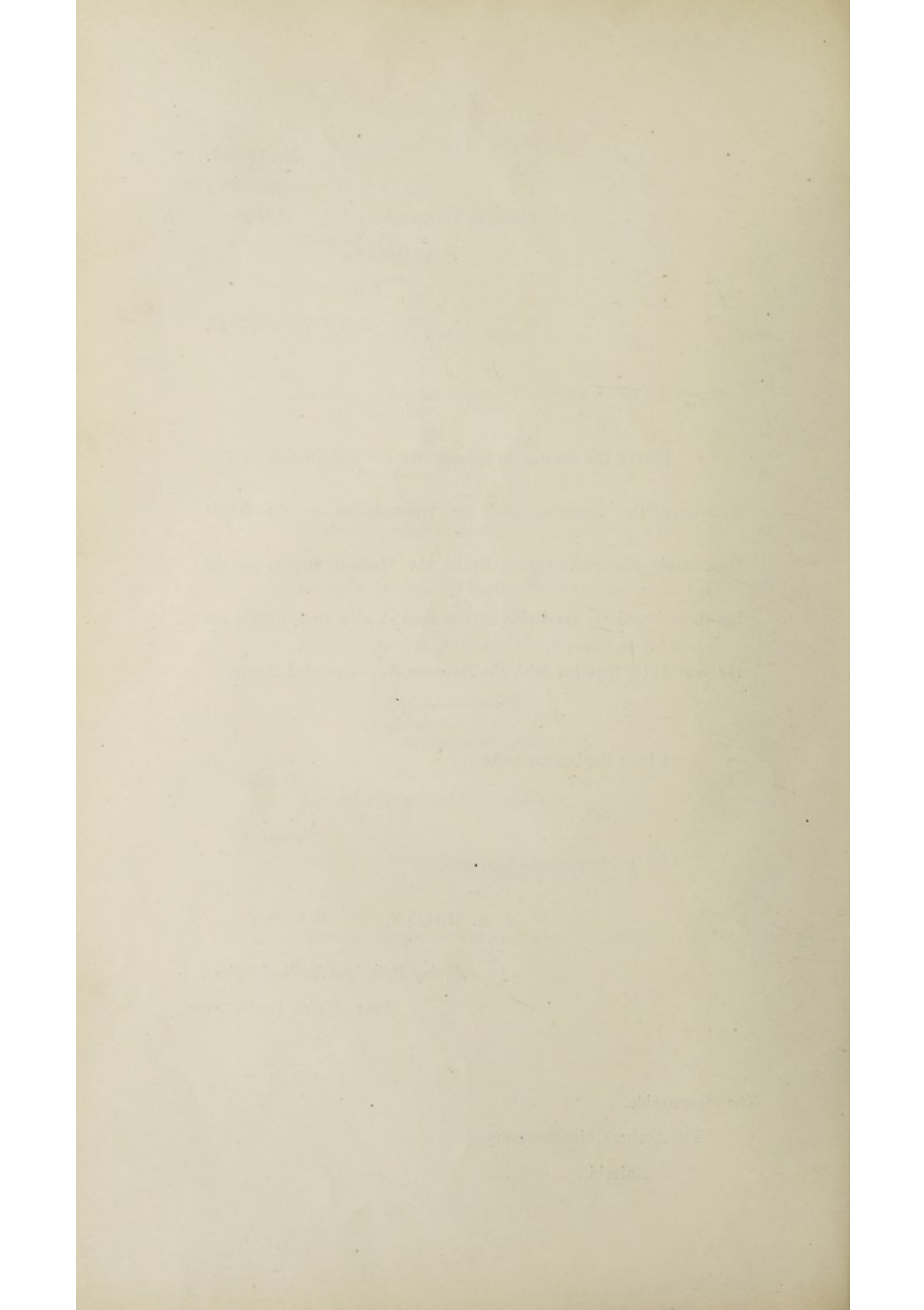
J. A. HARAN,

*Acting Principal Medical Officer,**East Africa Protectorate.*

The Honourable,

The Acting Chief Secretary,

Nairobi.



I.—ADMINISTRATION.

SECTION I.—DEPARTMENTAL.

1.—ESTABLISHMENT.

The Medical Staff of the Protectorate as sanctioned for the year 1916-17 was as follows :—

ADMINISTRATIVE DIVISION.

Principal Medical Officer	...	...	...	1
Deputy Principal Medical Officer	...	...	...	1
Office Superintendent	...	...	...	1
European Clerks	...	...	...	2
3rd Grade Clerks	...	...	...	2
4th Grade Clerks	...	...	...	3
Medical Storekeeper	...	...	...	1
Issuer of Medical Stores	...	...	...	1
Messengers and Packers	...	...	...	10

MEDICAL DIVISION.

Senior Medical Officers	...	...	...	2
Medical Officers	...	...	...	20
District Surgeon	...	...	...	1
European Dispensers	...	...	...	4
Matron	...	...	...	1
Nursing Sisters	...	...	...	9
Superintendent, Lunatic Asylum	...	...	...	1
Matron, Lunatic Asylum	...	...	...	1
Assistant Surgeons	...	...	...	6
Sub-Assistant Surgeons	...	...	...	40
Compounders	...	...	...	15
Menial Attendants	...	...	...	(as necessary)

SANITATION DIVISION.

Principal Sanitation Officer	...	...	...	1
Medical Officers of Health	...	...	...	3
Pathologist	...	...	...	1
Nurse	...	...	...	1
Sanitary Inspectors	...	...	...	7
Assistant Surgeons	...	...	...	6
Sub-Assistant Surgeons	...	...	...	4
Chief Vaccinator	...	...	...	1
Vaccinators	...	...	...	12
European Clerk	...	...	...	1
3rd Grade Clerk	...	...	...	1
4th Grade Clerks	...	...	...	5
5th Grade Clerk	...	...	...	1
Compounders	...	...	...	3
Engineers for Clayton Disinfectors	...	...	...	4
Menial Attendants	...	...	...	(as necessary)

2.—APPOINTMENTS.

MEDICAL OFFICERS.

The following temporary Medical Officers were confirmed in their appointments :—

Dr. T. H. Massey, 30th January, 1916.
 „ P. F. Nunan, 13th August, 1916.
 „ J. H. Thomson, 13th August, 1916.
 „ R. W. Spence, 3rd December, 1916.

DISPENSERS.

Miss F. L. Neave, 20th May, 1916.

ASSISTANT SURGEONS.

Mr. A. A. Parpia, 19th September, 1916.

CHIEF VACCINATOR.

Compounder Abdullah Ahmedi, appointed 1st February, 1916.

COMPOUNDERS.

Mr. J. A. D'Melle, 1st March, 1916.
 „ Umar Din, 12th October, 1916.
 „ Chettenram, 9th November, 1916.
 „ B. H. Bhatt, 15th December, 1916.

3.—REDUCTIONS IN STAFF.

RESIGNATIONS.

Dr. L. D. Lowsley, 31st July, 1916.
 Dispenser C. A. J. Speller, 18th January, 1916.

EXPIRATION OF TOUR.

Dr. G. Dunderdale, 19th December, 1916.
 „ W. Tudhope, 24th September, 1916.
 „ H. H. V. Welch, 4th October, 1916.
 „ J. M. Mackinnon, 13th January, 1916.

KILLED ON SERVICE.

Assistant Surgeon P. C. De Cruz, 2nd February, 1916.
 „ „ A. C. Marchant, 11th February, 1916.

INVALIDED.

Sub-Assistant Surgeon Z. K. Durani, 1st August, 1916.
 „ „ „ Hassan Khan, 16th December, 1916.

DIED.

Temporary Compounder J. A. D'Melle, 29th September, 1916.

DISMISSAL.

Sub-Assistant Surgeon B. B. Goomal, 20th March, 1916.

4.—PROMOTIONS.

Dr. C. L. Chevallier promoted Senior Medical Officer *vice* Dr. L. D. Lowsley, resigned on 1st August, 1916.

Compounder T. D. Nair promoted Sub-Assistant Surgeon, 1st October, 1916.

5.—ADDITIONAL STAFF.

The following Medical Officers were lent for temporary service from the West African Medical Staff, and arrived on the 21st December, 1916 :—

Dr. H. F. Hamilton.
 „ J. M. Clark.
 „ P. A. Clearkin.

6.—LEAVE OF ABSENCE.

Name.	Appointment.	Period granted.	
		From	To
Dr. L. D. Lowsley ...	Senior Medical Officer ...	29th November, 1915	31st July, 1916.
„ C. Dunderdale ...	Medical Officer, Lami ...	2nd June, 1916 ...	19th December, 1916.
„ W. Tudhope ...	Ag. M. O. H., Kisumu...	2nd June, 1916 ...	24th September, 1916.
„ H. H. V. Welch ...	Medical Officer ...	15th July, 1916 ...	5th October, 1916.
„ W. J. Radford ...	P. S. O. ...	15th October, 1916...	4th July, 1917.
„ A. D. Milne ...	P. M. O. ...	10th December, 1916	5th August, 1917.
Mr. H. Ogden ...	European Dispenser ...	30th May, 1916 ...	18th January, 1917.
„ E. E. Williams ...	Sanitary Inspector ...	26th November, 1916	18th April, 1917.
Miss M. A. Thomlinson	Nursing Sister ...	15th July, 1916 ...	23rd April, 1917.
Dr. T. F. Lumb ...	Medical Officer ...	} Seconded with military forces in Europe throughout year.	
Mr. T. Preston ...	Clerk ...		

7.—RESUMPTION OF DUTY.

Name.	Appointment.	Date.
Dr. J. A. Haran, C.M.G. ...	Deputy Principal Medical Officer...	22nd September, 1916.
Mr. W. Henfrey ...	Superintendent Lunatic Asylum ...	15th April, 1916.
Mrs. L. A. Henfrey...	Matron Lunatic Asylum ...	15th April, 1916.
Miss H. M. Whitburn ...	Nursing Sister ...	14th June, 1916.

8.—STAFF POSTINGS THROUGHOUT THE YEAR.

THE COAST ZONE.

Dr. C. L. Chevallier was confirmed in his appointment as Senior Medical Officer, and carried out the duties throughout the year.

Dr. Henderson and Dr. Shircore continued in medical charge of the European and Native Hospitals respectively at Mombasa throughout the year. The accommodation of these hospitals having been considerably increased last year they continued to be used as military hospitals for the reception of sick and wounded during military operations throughout the year.

Dr. G. Dunderdale continued in medical charge at Lamu until his departure for England in June, when he was relieved by Assistant-Surgeon R. Holmes, who continued in charge till the end of the year.

THE MOUNTAINOUS ZONE.

The undermentioned charges were held continuously throughout the year by the Medical Officers named :—

European Hospital, Nairobi ...	Dr. J. L. Gilks.
Native Civil Hospital, Nairobi	} Dr. J. H. Thomson.
Lunatic Asylum, Nairobi ...	
Native Civil Hospital, Nakuru	Dr. R. W. Spence.

The European and Native Hospitals, having had their accommodation increased last year to meet military requirements, continued to be used as military hospitals throughout the year.

Dr. W. H. Heard, locally engaged, temporarily remained in medical charge of Eldoret throughout the year.

THE KENIA AND NYANZA PROVINCES.

Dr. L. Pugh was in medical charge at Kisumu throughout the year. The Native Hospital, with increased accommodation, was used as a military hospital in connection with operations during the year.

Dr. P. F. Nunan was in medical charge at Fort Hall up to the middle of February, when he was posted for military duty in the Northern Frontier District. He was succeeded by Dr. H. H. R. Philip, who, in addition to his duties as District Surgeon, Nyeri, carried out those of Medical Officer, Kenia Province, till the end of the year.

THE DESERT ZONE.

Dr. G. R. H. Chell continued in medical charge of the Northern Frontier District throughout the year with headquarters at Moyale.

Dr. Nunan proceeded, in February, with a detachment of the K.A.R. for duty in the Northern Frontier District, and remained there throughout the year with his base at Wajheir.

Dr. T. H. Massey continued in medical charge at Kismayu until March, when he was relieved for military duty by Dr. E. Dias, locally engaged. The latter remained in charge till the end of year.

Assistant-Surgeon P. C. D'Cruz was in medical charge of the K.A.R. contingent at Serenli till February 2nd, when he was killed during a night attack on that post by Somalis.

9.—PROTECTORAL PERSONNEL ENGAGED ON MILITARY MEDICAL SERVICE.

The undermentioned members of the Protectorate Medical and Nursing Services served with the East Africa Medical Service and East Africa Nursing Service during the year :—

Dr. A. D. Milne ...	...	Lieut.-Colonel A.D.M.S. Protectorate Forces, and Officer Commanding E.A.M.S.
Dr. J. A. Haran, C.M.G. ...	...	Major, E.A.M.S., Dy.P.M.O., Protectorate Forces.
Dr. W. J. Radford ...	...	Major, E.A.M.S.
Dr. L. D. Lowsley ...	...	Major, E.A.M.S.
Dr. W. O. Prichard ...	...	Major, E.A.M.S.
Dr. C. L. Chevallier ...	...	Captain, E.A.M.S.
Dr. F. L. Henderson ...	...	" "
Dr. J. O. Shircore ...	...	" "
Dr. J. L. Gilks ...	...	" " (Local Major).
Dr. B. W. Cherrett ...	...	" "
Dr. J. Pugh ...	...	" "
Dr. C. J. Wilson ...	...	" "
Dr. N. P. Jewell ...	...	" "
Dr. A. D. J. B. Williams	...	" "
Dr. T. H. Massey ...	...	" "
Dr. J. H. Thomson ...	...	" "
Dr. P. F. Nunan ...	...	" "
Dr. W. Tudhope ...	...	" "
Dr. H. H. V. Welch ...	...	" "
Mr. R. Stanley ...	...	Captain and Adjutant, E.A.M.S.
Mr. J. S. Robertson ...	...	Captain, Officer in charge, Base Medical Stores.
Mr. F. Knott ...	...	Sergeant-Major, E.A.M.S.
Mr. H. Ogden ...	...	" "
Mr. C. A. J. Speller ...	...	" "

EAST AFRICA NURSING SERVICE.

Miss E. R. Brown ...	...	Matron.
" H. M. Whitburn ...	...	Senior Nursing Sister.
" L. Merryweather ...	...	" " "
" R. Paul, R.R.C. ...	...	" " "
" I. L. Majendie, R.R.C.	...	" " "
" I. Wilson ...	...	Nursing Sister.
Mrs. J. S. Harrison ...	...	" "
Miss A. E. Hobson ...	...	" "
" A. E. Drews ...	...	" "
" R. S. Blyth ...	...	" "

SECTION II.—EXTRA DEPARTMENTAL.

10.—REGISTRATION OF MEDICAL PRACTITIONERS AND DENTISTS.

The Ordinance governing registration came into force on the 24th September, 1910, since when and up to the end of 1916 the following have been placed on the Register :—

Registered Medical Practitioners	...	...	...	64
Licensed Medical Practitioners	...	...	...	6
Dentists	...	...	...	5

40 of the Medical Practitioners, including the Government Dentists, were in Government Service, and 35 were private practitioners.

During the year the following were admitted to the rolls :—

O'Brien, Russell James, M.D., C.M. (U. Edin.).
 Hamilton, Henry Fleming, M.B., Ch. B. (U. Edin.), F.R.C.S.,
 (U. Edin.).
 Clark, James McKillian, M.B., B.Ch. (U. Aberd.).
 Clearkin, Peter Alphonsus, M.B., B.Ch., B.A.O. (Q.U., Belf.).

The Board convened for the purposes of the Ordinance consisted of :—

Dr. R. W. Burkitt,
 „ C. L. Chevallier,
 „ W. Owen-Prichard,
 „ W. J. Radford,
 „ J. A. Haran,

with the Principal Medical Officer as President and Registrar.

The Board held two meetings during the year.

11.—THE DRUGS AND POISONS ORDINANCE, 1909.

This Ordinance controls the licensing of chemists and druggists as well as the sale of poisons throughout the Protectorate.

Fifteen names have been placed on the register since the introduction of the Act to the end of 1916. Of these three were by examination.

The Board appointed under the Ordinance consisted of the following :—

Mr. L. A. Howse,
 „ A. A. White,
 „ V. H. Kirkham,
 Dr. C. L. Chevallier,
 „ W. J. Radford,
 „ J. A. Haran, C.M.G.,

with the Principal Medical Officer as President and Registrar.

The Board held three meetings during the year.

II.—PUBLIC HEALTH.

(a) GENERAL REMARKS.

(i) GENERAL DISEASES.

THE PROTECTORATE.

The year 1916 found an appreciable proportion of the personnel of the Medical Department still rendering service in connection with the local campaign and a number of the hospitals of the Protectorate continuing to be utilised in the same connection. The line of battle, rapidly receding during earlier months into the depths of enemy territory, took with it not a few members of the East Africa Medical Staff, and left many others in home areas to continue to there assist in related professional work of a strenuous character.

While the above events were happening, incidents of infectious disease in various parts of the Protectorate demanded attention on the civil side. Small-pox manifested itself in more than one district, appearances of Cerebro-spinal Fever continued to be noted, and, during the latter months of the year, Plague commenced to show itself at Nairobi in what was destined to be one of its heaviest manifestations.

The establishment of the Department was incomplete throughout the year, a condition of things, not surprising in the present universal upset.

The year closed with unseasonable rain.

The total numbers of civil cases and deaths recorded during 1916 are noted hereunder, those for the previous three years being also given :—

			Cases.	Deaths.
1916	...	...	116,522	1,093
1915	...	...	117,573	649
1914	...	...	120,056	712
1913	...	...	108,520	1,052

THE COAST ZONE.

The Reports of the Medical Officers in the Coast Zone show that Small-pox prevailed about the middle of the year in some villages on the mainland near Lamu, as well as in the latter town itself. The adverse conditions under which the cases were treated and the fact that very few of the patients had been protected by vaccination was responsible for a considerable death rate.

A great reduction during the year of malarial cases among the Police at Mombasa is noted as a result of the system of quinine prophylaxis which had been rigidly carried out.

The comparative table of admissions and deaths for the past three years is as follows :—

			Admissions.			Deaths.		
			1914.	1915.	1916.	1914.	1915.	1916.
European Officials	...	...	159	141	89	—	3	2
Native Officials	...	...	1,105	946	535	—	3	1
European General Population	...	...	128	73	63	7	4	3
Native General Population	...	...	3,371	4,240	4,144	224	149	179

THE MOUNTAINOUS ZONE.

The usual outbreaks of dysentery and intestinal troubles among European children have been noted by Dr. Gilks as occurring at Nairobi coincidentally with spells of dry, dusty, and windy weather; the type of dysentery was, however, less severe than in previous years, and no fatal cases came under his notice. Dr. Thomson observes that now all forms of malaria are to be found in Nairobi. Formerly it was very rare to find quartan or benign tertian; such, however, is not now the case. Among Africans, pneumonia is stated to be, perhaps, the most virulent common disease, a mortality rate of 38% being noted for recorded cases in the Native Civil Hospital.

The total admissions and deaths for the past three years were :—

	Admissions.			Deaths.		
	1914.	1915.	1916.	1914.	1915.	1916.
European Officials ...	299	384	412	2	—	2
Native Officials ...	1,567	1,322	2,478	4	4	5
European General Population ...	352	594	767	13	13	11
Native General Population ...	3,775	3,683	3,864	281	332	512

THE KENIA AND NYANZA PROVINCES.

The general health of the residents of Kisumu is noted as not being so good as it might be if more precautions were taken, especially against malaria. There is no doubt that malaria can be contracted by residents in that township.

The war has been observed to have had a very deleterious effect on the health of the Kenia Province. It is also noted that rats have increased enormously in this administrative area during the past three years. Yaws are very common, and 100 outbreaks of small-pox are reported to have occurred in this territory. A serious outbreak of dysentery started at Meru in October, which resulted in 600 deaths in about a month, so far as can be estimated.

The comparative admissions and deaths for the past three years are as follows :—

	Admissions.			Deaths.		
	1914.	1915.	1916.	1914.	1915.	1916.
European Officials ...	57	31	61	1	—	—
Native Officials ...	316	271	288	5	—	—
European General Population ...	40	32	58	—	1	1
Native General Population ...	2,299	2,402	3,600	157	125	361

THE DESERT ZONE.

Tuberculosis is reported as being very common among the Somalis. An outbreak of beri-beri occurred at Yonti during the latter months of the year.

Attention is invited by the Medical Officer, Northern Frontier District, to the influence on the health of travelling officers exercised by the inadequate protection afforded against the sun by the ordinary tent. There is no doubt, he says, that inefficient protection from the sun does more to lower the general health than any other factor in this district.

The comparative admissions and deaths for the past three years are as follows :—

	Admissions.			Deaths.		
	1914.	1915.	1916.	1914.	1915.	1916.
European Officials	24	11	8	—	—	—
Native Officials	72	100	36	—	1	—
European General Population	1	1	—	—	—	—
Native General Population	722	877	1,082	18	15	16

(ii). COMMUNICABLE DISEASES.

MOSQUITO OR INSECT-BORNE.

THE COAST ZONE.

Malaria.—A total of 6,089 cases, with 16 deaths, is recorded for 1916.

Blackwater fever.—Two cases, with one death, are noted as having occurred among the native general population (including Asiatics).

Filariasis.—Twenty-four cases came under notice during the year. The Acting Medical Officer, Lamu, states that this disease is extremely common in Tanaland, but that very few of those afflicted with it present themselves for treatment.

THE MOUNTAINOUS ZONE.

Malaria.—The recorded number of cases for 1916 shows a further increase when compared with previous years :—

1916	...	...	...	...	6,144
1915	...	...	...	...	5,352
1914	...	...	...	...	3,851
1913	...	...	...	...	3,536

Blackwater fever.—During the year 1916, 17 cases of blackwater fever came to notice, one of which terminated fatally. Of this total 16 occurred in Europeans.

Filariasis.—The occurrence of one case among the native general population is noted.

Dengue.—One case is recorded.

THE KENIA AND NYANZA PROVINCES.

Malaria.—The increase in the incidence of this disease is still maintained, as can be seen from the following figures, viz. :—

1916	...	...	...	...	5,304
1915	...	...	...	...	4,687
1914	...	...	...	...	4,227
1913	...	...	...	...	3,267

The European admissions constituted 71 of the total.

Blackwater fever.—One case of this disease occurred among the native officials.

Filariasis.—Four cases were noticed in the native general population group.

THE DESERT ZONE.

Malaria.—A slight diminution in the number of admissions is noted for the year :—

1916	...	...	...	...	1,548
1915	...	...	...	...	1,666
1914	...	...	...	...	1,547
1913	...	...	...	...	2,125

Blackwater fever.—No cases of this disease are recorded as having occurred in 1916.

INFECTIOUS OR EPIDEMIC.

THE COAST ZONE.

Cerebro-spinal Meningitis.—Seven cases (all fatal) of this disease are reported as having occurred among the native general population. In 1915 27 cases with 12 deaths were recorded.

Dysentery.—A total of 498 cases with 30 deaths is recorded for 1916 among the various civil sections. Of this total 13 were Europeans, all of whom recovered.

Enteric.—Ten cases were admitted during the year, four of whom were officials, and six members of the European general population. In both sections a death occurred.

Leprosy.—Two fresh cases of this disease were admitted. The position regarding the provision of accommodation for patients of this class has not advanced since 1915.

Plague.—No cases came under treatment.

Small-pox.—Seventy-one cases with 23 deaths occurred among Africans.

Beri-beri.—One case came under treatment.

Tetanus.—Three cases (two of which were fatal) were observed amongst Africans.

THE MOUNTAINOUS ZONE.

Cerebro-spinal Meningitis.—Seventy-two cases with 31 deaths appear in the native general population statistics. There was no incidence among Europeans.

Dysentery.—The hospital statistics for the year include record of 2,168 cases, with 138 deaths. In this total were 159 Europeans, six of whom died.

These figures are heavier than those for 1915.

Enteric.—Thirty-four cases, with three deaths, are noted for the year. Of the total, 20 cases (with one death) occurred among Europeans, one among native officials, and thirteen (with two deaths) amongst Africans.

Plague.—Hospital statistics give the following incidence :—

One hundred and twenty-eight cases among the native general population.

One case (fatal) amongst Europeans.

For more complete details the Principal Sanitation Officer's Report should be referred to

Pneumonia.—Two hundred and sixty-nine cases, with 64 deaths, are recorded. The preponderant incidence of this disease was among Africans.

Venereal Disease.—The year's statistics include 392 cases of syphilis and 334 cases of gonorrhœa. Three deaths from the former cause are noted.

Scurvy.—The occurrence of 59 cases with two deaths is noted.

THE KENIA AND NYANZA PROVINCES.

Beri-beri.—Six cases occurred.

Cerebro-spinal Meningitis.—Nineteen cases, with 14 deaths, are noted. All these occurred among the native general population.

Dysentery.—Eight hundred and four cases, with 26 deaths, are recorded. The incidence of this disease was mostly among the native general population, but four cases having occurred amongst Europeans.

These figures do not include the Meru estimate already given.

Enteric.—No cases of this disease have been noted for 1916.

Leprosy.—Three admissions for this disease are recorded.

Plague.—The following observed incidence of this disease in Nyanza for 1916 is recorded :—

				Cases.	Deaths.
Europeans	...	...	...	1	1
Others	...	...	...	33	18

Small-pox.—Six hundred and thirty cases, with 212 deaths, are reported. All these occurred among the native general population.

Venereal Diseases.—Syphilis claimed 292 and gonorrhœa 220 victims. Five fatalities from the former cause occurred.

Yaws.—One hundred and forty-six cases of this disease have been registered, as compared with 126 in 1915.

Tetanus.—Three cases with one death are recorded.

THE DESERT ZONE.

Beri-beri.—The occurrence of 12 cases of this disease is noted in the statistics.

Cerebro-spinal Meningitis.—No cases of this disease are recorded.

Dysentery.—Ninety cases of this disease occurred, three of which were fatal.

Leprosy.—No cases came under notice during 1916.

Small-pox.—There was freedom from this disease during the year, so far as returns show.

Tetanus.—One case came under notice.

Scurvy.—Two cases of this disease were treated.

HELMINTHIC.**THE COAST ZONE.**

An interesting paper by Dr. J. O. Shircore, entitled "Notes on the Prevalence of Intestinal Parasites in East Africa," is included in this Report.

The hospital statistics show, as coming under treatment, 12 cases of *tænia solium*, 22 of trematoda, 101 of *ascaris lumbricoides*, 1 of *strongylus*, 115 of ankylostomiasis, 15 of *tænia saginata*, 1 of *dracunculus*, and 1 of oxyuris. Twelve deaths from ankylostomiasis occurred.

THE MOUNTAINOUS ZONE.

During the year 52 cases of *tænia solium*, 3 of *tænia saginata*, 13 of *ascaris lumbricoides*, 1 of oxyuris, and 2 of ankylostomiasis were treated.

THE KENIA AND NYANZA PROVINCES.

Hospital figures from these regions include 8 cases of *tænia solium*, 3 of trematoda, 472 of *ascaris lumbricoides*, 5 of *tænia saginata*, and 3 of oxyuris.

THE DESERT ZONE.

The following cases are noted as having been treated in this area, viz., 19 of *tænia solium*, 99 of *ascaris lumbricoides*, 4 of *strongylus*, 8 of oxyuris, and 3 of ankylostomiasis.

(b) EUROPEAN OFFICIALS.**GENERAL REMARKS.****THE COAST ZONE.**

The tables show that a larger amount of invaliding took place in 1916, as compared with previous years.

Ninety-two were on the sick list and 89 were treated as out-patients. The principal causes of illness were: malaria (59), dysentery (21), and diseases of the digestive system (32).

Two deaths occurred, one the result of enteric fever and one of bronchitis.

The invalidings were due to malaria (3), nervous disease (1), diseases of the circulatory system (3), other diseases of the digestive system (2), osteitis (1), and other general diseases (2).

THE MOUNTAINOUS ZONE.

The number of officials treated in hospital or in quarters was 419; the number treated as outdoor patients was 225. These figures are heavier than those for 1915.

Two deaths are recorded, both from dysentery.

The chief causes of illness were: malaria (192), diseases of the digestive system (107), dysentery (59), injuries (38), and respiratory diseases (60).

Twelve persons were invalided owing, respectively, to dysentery (1), malaria (2), tuberculosis (1), anæmia (1), neuritis (1), circulatory system

disease (1), dyspepsia (1), diseases of the urinary system (1), arthritis (1), and other general diseases (2).

THE KENIA AND NYANZA PROVINCES.

The number of officials treated in quarters was 61; the number treated as outdoor patients was 87.

These figures are larger than those for 1915.

No deaths occurred.

Two persons were invalided.

THE DESERT ZONE.

The number of officials shown as being off duty was 8; the number appearing on the outdoor list was 48. The total of these is heavier than that for 1915.

There were no deaths or invalidings.

TABLE SHOWING THE SICK, INVALIDING AND DEATH RATES AMONGST EUROPEAN OFFICIALS AT THE COAST ZONE.

	1914.	1915.	1916.
Total number of officials resident	242	238	247
Average number resident	158	137	148
Total number on sick list	159	141	92
Total number of days on sick list	1,284	1,243	678
Average daily number on sick list	3.52	3.40	1.85
Percentage of sick to average number resident ...	2.24	2.48	1.25
Average number of days on sick list to each patient ...	8.08	8.81	7.37
Average sick time to each resident	5.31	5.22	2.74
Total number invalided	4	5	12
Percentage of invaliding to total residents	1.63	2.10	4.86
Total deaths	—	3	2
Percentage of deaths to total residents... ..	—	1.26	.81
Percentage of deaths to average number resident ...	—	—	1.35
Number of cases of sickness contracted away from residence	—	—	—

TABLE SHOWING THE SICK, INVALIDING AND DEATH RATES AMONGST EUROPEAN OFFICIALS IN THE MOUNTAINOUS ZONE.

	1914.	1915.	1916.
Total number of officials resident	776	730	680
Average number resident	535	518	550
Total number on sick list	299	384	419
Total number of days on sick list	3,256	4,542	5,213
Average daily number on sick list	8.92	12.44	14.24
Percentage of sick to average number resident... ..	1.67	2.40	2.59
Average number of days on sick list to each patient ...	10.89	17.82	12.44
Average sick time to each resident	4.20	6.22	7.67
Total number invalided	8	16	12
Percentage of invaliding to total residents	1.03	2.19	1.76
Total deaths	2	—	2
Percentage of deaths to total residents... ..	.26	—	.29
Percentage of deaths to average number resident ...	.37	—	.36
Number of cases of sickness contracted away from residence	—	—	—

TABLE SHOWING THE SICK, INVALIDING AND DEATH RATES
AMONGST EUROPEAN OFFICIALS IN THE KENIA AND
NYANZA PROVINCES.

	1914.	1915.	1916.
Total number of officials resident	157	148	141
Average number resident	102	109	104
Total number on sick list	57	31	61
Total number of days on sick list	418	296	316
Average daily number on sick list	1.14	.81	.86
Percentage of sick to average number resident ...	1.12	.74	.82
Average number of days on sick list to each patient ...	7.33	9.55	5.18
Average sick time to each resident	2.66	2.00	2.24
Total number invalided	1	2	2
Percentage of invaliding to total residents	.64	1.35	1.42
Total deaths	1	—	—
Percentage of deaths to total residents... ..	.64	—	—
Percentage of deaths to average number resident ...	.98	—	—
Number of cases of sickness contracted away from residence	—	—	—

TABLE SHOWING THE SICK, INVALIDING AND DEATH RATES
AMONGST EUROPEAN OFFICIALS IN THE DESERT ZONE.

	1914.	1915.	1916.
Total number of officials resident	42	27	27
Average number resident	26	13	18
Total number on sick list	24	11	8
Total number of days on sick list	193	215	63
Average daily number on sick list	.53	.59	.17
Percentage of sick to average number resident ...	2.04	4.53	.94
Average number of days on sick list to each patient ...	8.04	19.54	7.87
Average sick time to each resident	4.59	7.96	2.33
Total number invalided	4	3	—
Percentage of invaliding to total residents	9.52	11.11	—
Total deaths	—	—	—
Percentage of deaths to total residents... ..	—	—	—
Percentage of deaths to average number resident ...	—	—	—
Number of cases of sickness contracted away from residence	—	—	—

TABLE SHOWING THE SICK, INVALIDING AND DEATH RATES
AMONGST EUROPEAN OFFICIALS IN THE EAST AFRICA
PROTECTORATE.

	1914.	1915.	1916.
Total number of officials resident	1,217	1,031	993
Average number resident	821	777	820
Total number on sick list	539	567	582
Total number of days on sick list	5,151	6,296	6,270
Average daily number on sick list	14.11	17.24	17.13
Percentage of sick to average number resident... ..	1.72	2.22	2.09
Average number of days on sick list to each patient ...	9.56	11.10	10.77
Average sick time to each resident	4.23	6.10	6.31
Total number invalided	17	26	26
Percentage of invaliding to total residents	1.40	2.52	2.62
Total deaths	3	3	4
Percentage of deaths to total residents	.25	.29	.40
Percentage of deaths to average number resident ...	.37	.38	.49
Number of cases of sickness contracted away from residence	—	—	—

(c) **NATIVE OFFICIALS.****THE COAST ZONE.**

The number of in-patients treated was 541; the number of out-patients 573. The principal diseases which came under notice were malaria (355), digestive system (240), nasal (116), nervous (47), and dysentery (13).

One death occurred as a result of malaria.

Six persons were invalided as a result, respectively, of rheumatic fever (1), keratitis (2), epilepsy (1), gonorrhœa (1), and other general diseases (1).

THE MOUNTAINOUS ZONE.

2,507 in-patients and 461 out-patients were treated. The chief ailments observed were malaria (989), respiratory diseases (485), injuries (389), and dysentery (187).

Five deaths were recorded following, respectively, malaria (2), pneumonia (1), broncho-pneumonia (1), and injuries (1).

Twelve persons were invalided owing, respectively, to malaria (4), rheumatic fever (2), tuberculosis (2), other eye diseases (1), dyspepsia (1), and other general diseases (2).

THE KENIA AND NYANZA PROVINCES.

Two hundred and ninety persons were treated as indoor patients and 138 as outdoor.

No deaths occurred. Four persons were invalided owing, respectively, to malaria (2), dyspepsia (1), and other general diseases (1).

The principal diseases treated were malaria (226), respiratory troubles (33), and dysentery (18).

THE DESERT ZONE.

Thirty-six indoor patients were treated and 87 outdoor.

The chief ailments observed were malaria (12) and digestive diseases (33).

There were no deaths nor invalidings.

**TABLE SHOWING THE SICK, IVALIDING AND DEATH RATES
AMONGST NATIVE OFFICIALS AT THE COAST ZONE.**

	1914.	1915.	1916.
Total number of officials resident	655	689	719
Average number resident	500	463	549
Total number on sick list	1,105	946	541
Total number of days on sick list	5,681	4,430	2,740
Average daily number on sick list	15.56	12.13	7.49
Percentage of sick to average number resident ...	3.11	2.62	1.36
Average number of days on sick list to each patient ...	5.14	4.68	5.06
Average sick time to each resident	8.67	6.43	3.81
Total number invalided	4	7	6
Percentage of invaliding to total residents	.61	1.01	.83
Total deaths	—	3	1
Percentage of deaths to total residents... ..	—	.43	.14
Percentage of deaths to average number resident ...	—	.64	.18
Number of cases of sickness contracted away from residence	—	—	—

TABLE SHOWING THE SICK, INVALIDING AND DEATH RATES
AMONGST NATIVE OFFICIALS IN THE MOUNTAINOUS ZONE.

	1914.	1915.	1916.
Total number of officials resident	1,037	1,015	1,051
Average number resident	736	678	822
Total number on sick list	1,567	1,322	2,507
Total number of days on sick list	12,148	7,730	18,110
Average daily number on sick list	33.28	21.17	49.48
Percentage of sick to average number resident ...	4.52	3.12	6.02
Average number of days on sick list to each patient ...	7.75	5.84	7.22
Average sick time to each resident	11.71	7.61	17.22
Total number invalided	15	9	12
Percentage of invaliding to total residents	1.44	.88	1.14
Total deaths	4	4	5
Percentage of deaths to total residents... ..	.38	.39	.48
Percentage of deaths to average number resident ...	.54	.58	.60
Number of cases of sickness contracted away from residence	—	—	—

TABLE SHOWING THE SICK, INVALIDING AND DEATH RATES
AMONGST NATIVE OFFICIALS IN THE KENIA AND NYANZA
PROVINCES.

	1914.	1915.	1916.
Total number of officials resident	240	275	293
Average number resident	166	198	215
Total number on sick list	316	271	290
Total number of days on sick list	775	1,680	1,635
Average daily number on sick list	2.12	4.60	4.47
Percentage of sick to average number resident ...	1.28	2.32	2.08
Average number of days on sick list to each patient ...	2.45	6.19	5.64
Average sick time to each resident	3.23	6.10	5.58
Total number invalided	1	1	4
Percentage of invaliding to total residents	.42	.36	1.36
Total deaths	5	—	—
Percentage of deaths to total residents... ..	2.08	—	—
Percentage of deaths to average number resident ...	3.01	—	—
Number of cases of sickness contracted away from residence	—	—	—

TABLE SHOWING THE SICK, INVALIDING AND DEATH RATES
AMONGST NATIVE OFFICIALS IN THE DESERT ZONE.

	1914.	1915.	1916.
Total number of officials resident	34	50	50
Average number resident	25	40	42
Total number on sick list	72	100	36
Total number of days on sick list	184	156	191
Average daily number on sick list	.50	.42	.52
Percentage of sick to average number resident ...	2.00	1.05	1.24
Average number of days on sick list to each patient ...	2.55	1.56	5.30
Average sick time to each resident	5.41	3.12	3.82
Total number invalided	—	—	—
Percentage of invaliding to total residents	—	—	—
Total deaths	—	1	—
Percentage of deaths to total residents	—	2	—
Percentage of deaths to average number resident ...	—	2.50	—
Number of cases of sickness contracted away from residence	—	—	—

TABLE SHOWING THE SICK, INVALIDING AND DEATH RATES
AMONGST NATIVE OFFICIALS IN THE EAST AFRICA PRO-
TECTORATE.

	1914.	1915.	1916.
Total number of officials resident	1,966	1,888	1,923
Average number resident	1,427	1,379	1,628
Total number on sick list	3,060	2,639	3,791
Total number of days on sick list	18,788	13,996	12,676
Average daily number on sick list	51.47	38.34	34.63
Percentage of sick to average number resident ...	3.61	2.78	2.12
Average number of days on sick list to each patient ...	6.14	5.30	3.34
Average sick time to each patient	9.56	7.41	6.59
Total number invalided	20	17	22
Percentage of invaliding to total residents	1.02	.90	1.14
Total deaths	9	8	6
Percentage of deaths to total residents... ..	.46	.42	.31
Percentage of deaths to average number resident ...	.63	.58	.36
Number of cases of sickness contracted away from residence	—	—	—

(d) **GENERAL EUROPEAN POPULATION.**

THE COAST ZONE.

The number of in-patients treated was 63; the number of out-patients 165.

Three deaths occurred due, respectively, to enteric fever, septicaemia, and hepatitis.

The chief diseases which came under notice were malaria (51), diseases of the digestive system (44), dysentery (22), and enteric fever (6).

The number of births registered was 9.

The number of deaths registered was 8.

THE MOUNTAINOUS ZONE.

767 indoor patients were treated and 1,151 outdoor.

Eleven deaths occurred due, respectively, to dysentery (4), enteric fever (1), blackwater fever (1), plague (1), pneumonia (3), and mental diseases (1).

The principal ailments noted were malaria (468), dysentery (138), injuries (105), rheumatic fever (21), enteric fever (20), and blackwater fever (15).

The number of births registered was 137.

The number of deaths registered was 48.

THE KENIA AND NYANZA PROVINCES.

58 indoor and 36 outdoor patients came under treatment.

One death occurred from plague.

The chief disease noted was malaria (31).

The number of births registered was 15.

The number of deaths registered was 1.

THE DESERT ZONE.

Three cases came under treatment on the out-patients' list, one for malaria and two for injuries.

No deaths occurred.

The number of births registered was one.

The number of deaths registered was nil.

(e) GENERAL NATIVE POPULATION.

THE COAST ZONE.

4,144 cases were treated as in-patients, and 23,355 as out-patients.

179 deaths occurred due, principally, to dysentery (30), pneumonia (30), small-pox (23), malaria (16), tuberculosis (12), ankylostomiasis (12), and cerebro-spinal meningitis (7).

The chief diseases which came under notice were malaria (5,624), injuries (5,704), diarrhoea (1,172), connective tissues (688), conjunctivitis (634), dysentery (442), splenitis (270), and ankylostomiasis (111).

There is no compulsory registration of births or deaths.

THE MOUNTAINOUS ZONE.

3,864 in-patients and 36,699 out-patients were treated.

512 deaths occurred as the result, chiefly, of dysentery (132), small-pox (106), pneumonia (60), plague (58), and cerebro-spinal meningitis (31).

The principal ailments which came under notice were injuries (9,641), bronchitis (7,596), malaria (4,495), dysentery (1,784), diarrhoea (1,638), small-pox (470), pneumonia (248), and plague (128).

Compulsory registration of Births and deaths does not exist.

THE KENIA AND NYANZA PROVINCES.

The total number of in-patients was 3,600, and out-patients 28,681.

361 deaths occurred due, principally, to small-pox (212), dysentery (26), plague (18), and cerebro-spinal meningitis (14).

The chief diseases observed were injuries (8,038), malaria (5,007), bronchitis (3,728), dysentery (782), small-pox (630), and plague (33).

Births and deaths are unregistered.

THE DESERT ZONE.

1,082 in-patients and 6,815 out-patients were treated.

16 deaths occurred, as a result of: Malaria (5), tuberculosis (4), dysentery (3), diarrhoea (1), liver abscess (1), Bright's disease (1), and puerperal septicaemia (1).

The chief ailments which were noted were injuries (1,695), malaria (1,364), nasal diseases (362), diarrhoea (117), and dysentery (87).

No births or deaths are registered.

III.—SANITATION.

REPORT BY DR. W. J. RADFORD, PRINCIPAL SANITATION
OFFICER, E.A.P.

(i.) ADMINISTRATION.

1. The personnel of the Sanitation Division at the commencement of the year 1916 was as follows :—

- 1 Principal Sanitation Officer.
- 3 Medical Officers of Health.
- 1 Nurse.
- 6 Sanitary Inspectors.
- 4 Assistant Surgeons.
- 3 Sub-Assistant Surgeons.
- 7 Clerks.

2. Appointments during the year :—

Nil.

3. Reductions during the year :—

Nil.

4. Leave during the year :—

- Principal Sanitation Officer.
- 1 Nurse.
- 1 Sanitary Inspector.

MILITARY DUTIES.

All the European members of the staff have been engaged in military duties, in addition to those devolving upon them in their civil capacity.

(ii.) LEGISLATION DURING 1916 AFFECTING THE MEDICAL DEPARTMENT.

East Africa Township Ordinance.

KISUMU.

- Sanitary Rules.
- Lodging House Rules.

MOMBASA.

- Reporting of Deaths Rules.
- Eating House Rules.

NYANZA PROVINCE.

- General Rules.

GENERAL.

- Township Protection of Health Rules.

Infectious Diseases Ordinance.

All townships declared infected areas in April, 1916.

(iii.) PREVENTIVE MEASURES.

MOSQUITO- AND INSECT-BORNE DISEASES.

MALARIA.

MALARIA, RECORDED CASES AND DEATHS.

	Year.	Cases.	Deaths.
	1913	15,656	81
	1914	15,096	119
	1915	18,175	283
	1916	18,238	206

Only observed cases that have been admitted into the civil Government Institutions are included.

Malaria is universal, and in comparison with last year its incidence remains practically unaltered throughout the Protectorate.

Anti-malaria measures under the Mosquito Rules were prosecuted in the chief towns—Mombasa, Nairobi and Kisumu.

In Nairobi, 689 mosquito breeding places were discovered, the percentage of anopheles to the total number of samples of mosquitos collected was 46; fewer breeding places (447) were discovered in Mombasa.

Considerable activity in clearing drains and filling in excavations was maintained; the number of yards so dealt with being—Nairobi, 66,686; Mombasa, 37,820; Kisumu, 46,213.

BLACKWATER FEVER.

Twenty cases with two deaths are reported as occurring among the civil population.

EPIDEMIC DISEASES.

PLAGUE.

In comparison with the number of cases reported in 1915 a decided increase is observed, and new areas have become invaded. This is the more unfortunate as that supervision and control that should have been undertaken was of necessity restricted to the more important towns, where the numerically limited staff were able in some measure to overtake the situation only.

It was reported (1915) that Plague incidence had been observed in the districts of Maragoli, Bunyore, Sagam and Seme in the Nyanza Province; to this list must be added that of Kitutu and Mugirango, where 200 deaths were reported in 1916 by administrative and other officers. There is also evidence that the disease is spreading in the vicinity of Nairobi, at Kyambu, towards the Native Reserve. Rat plague was also reported at Kibigori, where subsequently one case of human plague occurred.

LOCALITY.	CASES.				DEATHS.			
	Europeans.	Asiatics.	Natives.	Total.	Europeans.	Asiatics.	Natives.	Total.
Nairobi ...	2	66	83	151	2	53	64	119
Kisumu ...	1†	6	54	61	1	4	39	44
Nakuru ...	—	—	1	1	—	—	1	1
Kyambu ...	—	1	—	1	—	—	—	—
Nyanza Province ...	—	1	137	138	—	1	126	127
TOTAL ...	3	74	275	352	3	58	230	291

† A second European contracted Plague within the residence of the fatal case reported and died en route to Entebbe (Uganda) 24 hours after.

The types were bubonic, pneumonic and septicæmic in the proportions shown of observed cases :—

Type.	Cases.	Deaths.	Mortality.
Bubonic	134	86	64.00 %
Pneumonic	46	44	96.00 %
Septicæmic	33	33	100.00 %
TOTAL	213	163	—

ORIGIN OF LOCAL EPIDEMICS.

That Kisumu and the adjoining districts are endemic plague centres has been insisted upon for many years, and this menace to the whole Protectorate cannot be minimised.

The statistical references should be read in continuation with last year's report. It will then be seen that plague had spread from Kisumu along the trading routes into the interior and conveyed from the various trading centres situated upon those routes into the native areas. The existence of human and rat plague became established when a reported abnormal death rate had been investigated. Now we have evidence that the disease was brought direct from those areas to stations on the Uganda Railway and elsewhere. Rat and human plague at Kibigori was traced to infected hides that came from Nyakatch, where rat plague had been reported. Another instance is the death from plague on board s.s. "Husseni," the case hailing from Sio in the Mumias District.

It is surprising that these outbreaks do not occur with more frequency, as the dhow traffic at Kisumu engaged in trading with many Lake ports is practically without supervision from a plague point of view. It is but necessary to instance the case of an European who nursed his brother during his illness that terminated fatally, and then succumbed himself to the same disease (plague) at Entebbe within a day or so of leaving Kisumu, to emphasise the danger not only to ships, but to a contiguous country that must inevitably ensue if adequate preventive measures are not taken.

The first case of plague in Nairobi occurred in September, in the Indian Bazaar, it then spread to many quarters of the Town, from there it was traced through the medium of an Indian family to Kyambu station; and now rat plague has appeared in the Native Reserves near that station.

Though the origin of the first case in Nairobi was never traced, the fact of its appearing in an insanitary dwelling in the Indian Bazaar where a heterogeneous collection of goods was stored, and whose inmates, in common with their class, are permitted to travel practically without restriction into any part of the country, is strong presumptive evidence that the disease was brought from an infected area.

PREVENTIVE MEASURES.

a. RAT DESTRUCTION.

Locality.	1914		1915.		1916.	
	Number caught.	Number infected.	Number caught.	Number infected.	Number caught.	Number infected.
Mombasa	10,044	17	19,094	Nil.	11,734	Nil
Nairobi	6,839	17	10,932	1	6,858	25
Kisumu	11,084	19	5,309	7	2,911*	17
TOTAL	27,967	—	35,335	—	21,503	—

*Though many fewer rodents were actually trapped during the year, their destruction was accelerated by the continuous use of various poisons with great success.

In Kavirondo a rat destruction campaign was inaugurated, but statistics are not available.

b. PROPHYLACTIC INOCULATION (HAFKIN).

Locality.	1914.	1915.	1916.
Mombasa	9,447	Nil†	483†
Nairobi	6,839	113†	7,319
Kisumu	14,716	6,765	8,292
Other Localities...	—	—	2,179

† Voluntary Inoculation.

This work has of necessity been restricted, as prophylactic inoculation has been held to constitute a "criminal assault."

c. DISINFECTION AND FUMIGATION OF GOODS.

Early in the year the treatment of the accumulation of country produce (cotton and grain, etc.) and also hides obtained from areas where the plague was known to be in epidemic form, was undertaken, and a temporary fumigation plant was installed. All country produce was treated that had been carried by the Uganda Marine, and that brought into Kisumu by vehicles from the vicinity. All grain, hides and cotton seed was Claytonised before leaving Kisumu by boat or rail. This was satisfactory as far as other places were concerned, but could hardly be deemed a preventive measure as regards Kisumu itself. The possibility of dhows carrying infected cargoes has been mentioned; this traffic is not sufficiently organised at Kisumu, and is practically without supervision from a plague point of view.

The probability of Plague becoming permanently established in the country should not be lost sight of; or the disastrous effects its presence must inevitably exert on its prosperity minimised. At the moment, with a limited personnel to exercise supervision, and the very restricted resources available (which have still further been curtailed by transfer to the Military of some almost indispensable apparatus) to combat it, the outlook is grave.

The dissemination of disease is directly encouraged in all parts of the country through the medium of Indian trading centres, which are intimately associated with known infected foci in the principal towns, and it is in these latter centres that the public health cannot be said to be adequately safeguarded, or the observance of fundamental sanitary principles sufficiently enforced.

SMALL-POX.

Information regarding the incidence of small-pox on the Uganda Border and in the adjacent territory was included in the Annual Report, 1915. It soon became evident that the disease was spreading rapidly through Kavirondo, and extending from there to other provinces. Though only 2,513 cases were observed by the staff and 778 deaths recorded, the extent of the epidemic can be more fully appreciated after a scrutiny of the "death returns" reported by administrative officers and others in out districts, which reveal some 2,706 fatal results from small-pox.

The following table compares the number of observed cases during the last four years:—

	1913.	1914.	1915.	1916.
Cases of small-pox	166	8	38	2,513
Vaccinations	131,757	123,245	162,184	977,055

**STATEMENT SHOWING THE PLACES AND NUMBER OF
VACCINATIONS PERFORMED DURING THE YEAR 1916.**

STATIONS.	VACCINATIONS.			
	Number.	Perfect.	Failed.	Unknown.
Mombasa	106,733	125	7,242	99,366
Lamu	16,561	2,685	6,779	7,097
Kakoeni	11	—	—	11
Malindi	1,746	62	824	860
Kismayu	1,288	267	927	94
Gobwen	340	164	102	74
Mfudu	219	73	94	52
Machakos	17,132	3	685	16,444
Nairobi Police and Prison	391	50	341	—
Nairobi & District	150,503	—	—	150,503
Kaserini Special Prison	206	17	178	11
Kyambu	22,394	6	39	22,349
Makindu	5,706	15	309	5,382
Kitui	34,832	—	—	34,832
Nakuru	1,892	10	55	1,827
Naivasha	479	30	100	349
Eldama Ravine	7,925	305	1,728	5,892
Kabarnet	894	70	645	179
Kacheliba	1,588	140	1,399	49
Lokiriana	89	—	—	89
Fort Hall	95,332	—	—	95,332
Nyeri	57,045	31	2	57,012
Embu	9,803	—	—	9,803
Meru	17,414	6	120	17,288
Kisumu	102,659	369	9,748	92,542
Mumias	278,554	—	—	278,554
Kericho	17,080	34	989	16,057
Nandi	14,643	—	—	14,643
Kisii	12,281	—	—	12,281
Eldoret	509	46	198	265
By Missionaries and Private Practitioners	806	—	—	806
TOTAL	977,055	4,508	32,504	940,043

When it was realised that an epidemic was threatening, efforts were again made for the application of the Vaccination Ordinance throughout the Protectorate, and it became operative in Kavirondo, some portions of the Kenia and frontier districts, and in all townships; these measures were reinforced by the application throughout the protectorate of rules under the "Infectious Diseases Ordinance." The co-operation and assistance of all administrative officers was sought to supplement the activities of the officially appointed vaccinators, whose personnel was temporarily increased, and a strict vaccination campaign was conducted by the military.

The lymph used by both the military and civil departments was prepared by the Director of Laboratories. Owing to the doubtful efficacy in producing the immunity expected of it as evidenced by some persons who had been successfully vaccinated eventually succumbing to the disease, a new strain was prepared by the Laboratory Department in the early months of the year. The success of this was at once apparent, and confidence was restored in those districts where the natives had resented vaccination, and where they stated that small-pox incidence was directly attributable to the vaccination propaganda.

ENTERIC FEVER.

Considerable diminution in the number of cases reported during the year calls for comment, viz.—63 cases with 8 deaths as compared with 216 cases and 33 deaths.

Of these 36, with 6 deaths, were Europeans and the remainder other nationalities.

Voluntary double inoculations were performed in 199 instances among the European population of the Protectorate.

CEREBRO-SPINAL MENINGITIS.

A steady decrease in the number of cases reported during the last three years is observable.

	1914.		1915.		1916.	
	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.
	225	103	170	105	128	82

The prevalence of this disease during the cold weather but confirms the opinion previously recorded regarding its seasonal occurrence.

CHICKEN-POX.

411 cases were notified, with 1 death, as against 429 and no deaths in 1915.

MEASLES.

This disease has been responsible for 6 deaths in 294 reported cases. Owing to shortage of staff it has been impossible to estimate the extent of this condition within the districts enumerated last year.

DYSENTERY.

The observed number of cases has shown a steady increase during the last three years; all cases are those that have come under observation in Government civil institutions only, and the number bears no relation to the extent and distribution of this condition or that to be found within the military sphere of operations or on the lines of communication.

	1914.		1915.		1916.	
	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.
Europeans	96	1	134	1	246	6
Other Nationalities	2,717	144	2,588	167	3,323	191
Total	2,813	145	2,722	168	3,569	197

In addition to these numbers the Medical Officers of Health have reported 566 deaths from Diarrhoea and Dysentery occurring within the townships of Mombasa, Nairobi and Kisumu.

ANTHRAX.

Nine cases, with two terminating fatally, are recorded; only one case was treated with serum.

No properly equipped hospital for the reception of Europeans suffering from infectious and contagious disease exists in any part of the Protectorate. Mombasa, the chief port in the country, has no adequate accommodation for cases that may occur among any portion of the community; at Nairobi the buildings in the segregation camp leave much to be desired as far as sanitation is concerned. At Kisumu the available accommodation is represented by a few tents and grass huts, and a series of buildings that have been condemned as dangerous and insanitary for many years, used as a plague hospital situated

in the centre of the town. The need for adequate accommodation is evidenced in the attached table, showing the numbers accommodated in quarantine camps during the year.

The following table shows the number of patients treated in these camps :—

Disease.	Nairobi		Kisumu.		Mombasa.		TOTAL.	
	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	CASES.	DEATHS.
Cerebro-spinal meningitis	24	16	17	13	—	—	41	29
Chicken-pox ...	26	—	43	—	22	—	91	—
Anthrax... ..	6	1	2	—	—	—	8	1
Leprosy	—	—	2	—	—	—	2	—
Measles	68	2	86	5	—	—	154	7
Mumps	—	—	3	—	—	—	3	—
Plague	94	57	32	14	—	—	126	71
Pemphigus	11	—	39	1	—	—	50	1
Small pox	361	94	430	162	9	4	800	260
Yaws	—	—	1	—	—	—	1	—
Other Diseases ...	9	2	152	14	—	—	161	16
TOTAL	599	172	807	209	31	4	1,437	385

In addition to these, 1,752 contacts were interned—Nairobi, 591 ; Kisumu, 1,079 ; Mombasa, 82—total, 1,752.

HELMINTHIC DISEASES.

ANKYLOSTOMIASIS.

60 cases with 12 deaths were reported.

LEPROSY.

No advance has been made in the materialisation of the scheme for leper settlement during the year.

(iv.) GENERAL MEASURES.

SEWAGE DISPOSAL.

No water-borne system of sewage disposal has been initiated, no works for the treatment of sewage have been constructed in any part of the Protectorate; night soil is disposed of by dumping into the sea, trenching, incineration, collection in cesspools, or distribution on the ground.

SCAVENGING.

Street and house refuse is either burned, buried or dumped. The Conservancy Department at Kisumu is still under the direction of the Health Office, and most excellent work has been performed ; but in other towns the executive control of the Division is practically nil.

WATER SUPPLY.

The Mombasa water supply from the Shimba Hills reached the town in 1915 ; during this year an extension of the distribution to some parts of the town was possible, though the native population generally still relied on tank and well water. Owing to military exigencies the intake ground was occupied and efforts were directed to prevent serious contamination within that area.

The report by the Director of Laboratories and Government Analyst in August, 1916, on the water shows the necessity for safeguarding the source; it is reported that though there are no signs of dangerous pollution the samples were the worst ever analysed from the Shimba Hills. The water exerts a great solvent action on the pipes, and treatment by lime and sedimentation appear to be necessary.

NAIROBI. — During the year the water was analysed on five occasions, and the analytical results were on the whole satisfactory. The necessity of maintaining a constant supply of water both for civil and military requirements prevented the periodical cleansing of the reservoir taking place, with the result that the water became dirty and developed a mouldy taste, and an albuminoid figure four times in excess of the normal. There is apparent shortage of water within the town, due to the inadequacy of storage facilities; but in point of fact the amount lost in running to waste nearly approximates that consumed. No improvements have been effected in safeguarding the intake from possible pollution.

At Nakuru the water supply remains in practically the same state as last year.

DRAINAGE.

6,052 yards of new drains in Nairobi, 420 yards in Mombasa, 2,066 yards in Kisumu, were constructed during the year. The work of cleansing ditches and drains falls largely on the Health Offices in those towns, the work so accomplished has been:—

Mombasa	...	...	...	...	4,955 yards.
Nairobi	...	...	...	...	68,222 „
Kisumu	...	...	...	...	40,000 „

and has been well organised and sustained.

BUSH CLEARING.

Prosecution of this work has in some instances been curtailed owing to the shortage of labour and other causes incidental to the war.

The average kept clear in the chief towns was as follows:—

Mombasa	...	...	...	...	1,497 acres
Nairobi	...	...	...	...	2,710 „
Kisumu	...	...	...	...	17½ „

HOUSING.

Little advance has been made in the establishment of locations for the Asiatic and Native communities that are so urgently needed within townships; as a result overcrowding is universal, especially within the Asiatic Bazaars, and the dissemination of disease correspondingly increased thereby.

Inspection of premises inside the towns has been constantly maintained.

Mombasa	...	...	...	5,046
Nairobi	...	...	...	7,232
Kisumu	...	...	...	2,844

A sweeping and radical change of existing conditions, embracing the segregation of races and the application of sanitary principles to housing generally in the Protectorate, is an essential for its future well being.

(v.) CONDITION OF TRADES AND FACTORIES.

PUBLIC MARKETS.

Mombasa	...	...	...	2
Nairobi	...	...	...	2
Kisumu	...	...	...	1

The new public market at Mombasa remains unfinished, and the greater portion of the Jeevanjee Market, Nairobi, still remains unoccupied, while the native market in that town presents many insanitary features; and the control of the public market at Kisumu remains in private hands.

SLAUGHTER HOUSES.

Kisumu	...	...	...	2
Nairobi	...	...	...	2
Mombasa	...	...	...	2

Daily inspection of meat sold in the Mackinnon Market at Mombasa has had the effect of generally improving the quality of meat offered for sale. Portions of 1,538 carcasses were seized, and much time was spent instructing butchers in the more common diseased conditions. Constant supervision was maintained in the slaughter-houses and in cattle byres, necessitating 826 inspections during the year.

At Nairobi the arrangements at the abattoir are in the hands of the Municipality, and directly controlled by it. The water supply to the abattoirs remains in the same unsatisfactory state as reported last year.

AERATED WATER AND ICE FACTORIES.

79 inspections of these premises were made at Mombasa, 27 in Nairobi, and 12 at Kisumu; both premises and material have been generally maintained in an efficient state.

DAIRIES AND MILK SUPPLY.

The regulation of the supply of milk is urgently needed, and the necessary powers have not as yet been assumed by legislation.

The Analyst's report on the milk supply to Nairobi is attached.

Milk.—The following table shows the number of samples received and the number adulterated:—

Agency.	Adulterated.	Genuine.	Total.
Native Civil Hospital	6	2	8
Police	5	1	6
Private persons	2	3	5
Sanitary Inspector	0	2	2
European Hospital	1	0	1
Received	14	8	22

It will be seen that 64 per cent. of the samples received were adulterated, the extent of the adulteration varying from 11 per cent. up to 77 per cent. of added water.

Comparison with previous years :

Year.			Adulterated.
1913	...	...	34 %
1914	...	...	70 %
1915	...	...	73 %
1916	...	...	64 %

"Nairobi would hardly care to congratulate itself upon the slight improvement on the previous year, even if it were not, as it is, sublimely indifferent to the condition of its milk supply."

FOOD INSPECTION.

About 2½ tons of food, etc., were seized and condemned at Nairobi. At Mombasa 22,756 cases and bags were examined, of these 14,257 were condemned as unfit for human consumption.

SHIPPING.

Bills of Health issued :—

Port.	1914.		1915.		1916.	
	Steamers.	Dhows.	Steamers.	Dhows.	Steamers.	Dhows.
Mombasa	426	115	189	84	164	191
Lamu	17	378	13	—	10	118
Kismayu	55	46	38	51	27	44

These numbers do not include war vessels, transports or colliers.

Revenue derived from Bills of Health at Coast Ports :—

Mombasa	...	...	Rs. 1,432-50
Lamu	...	...	Rs. 960-00
Kismayu	...	...	Rs. 532-50
			— Total Rs. 2,925-00

RECOMMENDATIONS.

The promulgation of a Public Health Act in the Protectorate, and the organisation and maintenance of a Sanitation Department on basis of efficiency as detailed by Professor Simpson in 1913.

IV.—METEOROLOGY.

There is no bureau of meteorology in the Protectorate, and the Department which makes itself responsible for collating such statistical information as is available is the Agricultural.

Only at the Laboratory, Nairobi, are hygrometrical observations taken; nowhere are solar temperatures or notes as to the force and direction of the wind recorded.

TABLES SHOWING MEAN ANNUAL RAINFALL AT VARIOUS
POINTS IN THE DIFFERENT AREAS FOR THE THREE YEARS.

COAST AREA.

STATION.	1916.	1915.	1914.
Malindi... ..	33·90	46·16	35·40
Mombasa	42·37	57·45	33·27
Mazeras	33·85	67·30	31·14
Mackinnon Road	18·17	32·05	26·38
Voi (11 months)	26·63	22·38	18·62
Taveta	—	—	—

MOUNTAINOUS AREA.

Masongaleni	23·60	18·79	19·26
Makindu	68·89	18·90	18·03
Kiu	22·49	30·27	14·43
Athi River	27·58	18·07	31·68
Nairobi Laboratory	46·03	24·01	38·07
Kabete (near Nairobi)	46·55	37·21	45·27
Naivasha	36·49	20·20	21·61
Nakuru... ..	45·03	35·61	38·16
Molo	67·80	48·95	56·76
Eldama Ravine	55·55	43·49	51·75

NYANZA AND KENIA PROVINCES.

Lumbwa	54·58	43·10	49·31
Muhoroni	84·81	97·24	73·29
Kisumu... ..	56·28	46·87	48·86
Mumias... ..	79·76	76·26	79·89
Karangu	—	—	—
Kericho... ..	81·85	80·00	74·91
Nandi	83·83	54·25	72·18
Fort Hall	53·23	51·56	48·76
Nyeri	34·62	30·16	26·88
West Kenia	27·32	33·06	40·93

DESERT AREA.

Kismayu	19·45	16·65	14·64
Gosha Alexandra	22·33	17·97	21·24

V.—HOSPITALS, DISPENSARIES AND INSTITUTIONS.

1.—EUROPEAN HOSPITALS AT NAIROBI AND MOMBASA.

These hospitals continued to be available for military and civil use during the year. Of the total number of patients admitted 182 were officials and 116 were members of the European general population. (The figures for officials do not include numbers off duty and treated in their quarters.)

Administration.—The staffs of these hospitals were greater than what obtained in times of peace.

Mortality.—Of those patients admitted to Mombasa hospital, two died the one of enteric fever, the other of bronchitis. The chief cause of admission was malaria (29).

Of those patients admitted to Nairobi Hospital, one died of dysentery. The most common causes of illness among officials were observed to be malaria and dysentery, infection by which was contracted elsewhere in a large number of cases.

Blackwater Fever.—One case of blackwater fever occurred at Nairobi in the civil official section. The patient recovered.

Enteric Fever.—Four cases—one of which ended fatally—occurred at Mombasa in the civil official section.

Operations.—Two operations were performed at Nairobi on members of the civil official section, both of which were successful.

2.—THE CIVIL HOSPITALS AND DISPENSARIES.

Hereunder is reported the number of civil cases treated at the various hospitals and dispensaries of the Protectorate during 1915 and 1916, respectively :—

	1916.		1915.	
	In.	Out.	In.	Out.
Admissions	12,273	95,550	11,202	85,987
Deaths	1,068	—	621	—
Death rate per 1,000 admissions	87.02	—	55.43	—

The deaths include all those admitted to hospitals.

No new stations were opened during 1916.

The native hospital attendants' personnel remained expanded during the year at the hospitals concerned with military work.

3.—LUNATIC ASYLUM.

The following table sets forth the number of admissions and deaths during 1915 and 1916 respectively :—

	1916.		1915.	
	Admissions.	Deaths.	Admissions.	Deaths.
Males	76	24	52	19
Females	14	4	5	1
Total	90	28	57	20

The following is extracted from the report of Dr. J. H. Thomson, the Medical Officer in charge :—

On the 1st January, 1916, there were 32 patients in the Asylum. On the 31st December there were 47.

During the year 122 patients, were treated altogether. The daily average of inmates during the year was 50, about ten more than last year.

Admissions.—The number admitted was 90, which included 25 military cases. The military insane accounted to an appreciable extent for the large rise in admissions, but still a steady growth is shown in the admission rate, as the following table will show :—

	1916.	1915.	1914.	1913.
Admissions	90	57	44	32

58 more patients were admitted in 1916 than in 1913. If we exclude the military admissions, 33 more were admitted. Each year has its residue of chronic cases, and as the country becomes more under settled conditions and into closer touch with European influences many more will be sent to Asylums instead of being left at large as at present.

A glance at the table of admissions will show that they mostly come from large centres, in short, where they become a nuisance to the authorities. Nairobi itself accounts for more than half. A town growing at the same rate as Nairobi would in England be considering the prospects of building a borough asylum for itself. It must also be remembered, that the further down the scale of humanity you go the more insanity you get, and that there is relatively more insanity among native races than among Europeans.

The principal admissions were from mania, 45 ; melancholia, 5 ; dementia (including alcoholic), 17 ; delusional insanity, 5 ; idiocy 1.

Among the manias were included manic-depressive, and among the dementis, alcoholic and dementia precox. Other forms of insanity met with in the admissions were post-malarial, acute amentia, confusional insanity, epileptic, and a curious form which I have called by the native name "Ngoma," and which I have dealt with in a separate article.

It is very difficult to diagnose except on very broad lines. One must live among the patients, see them at all times and gain their confidence, which it is impossible for me to do. One must understand their life and customs and you must descend to their level in talking to them as they cannot rise to yours.

Again, it is very difficult to find out the state of mind of a person who speaks the same language as yourself: it is infinitely more so when you have to get an interpreter who does not appreciate the nicety of your question, and probably puts it in a different way altogether to what you wish.

European Admissions.—Eleven Europeans were admitted, of whom five were military. One European admitted was an epileptic idiot, who should never have been allowed into the country. One officer was admitted from Uganda with a most acute attack of confusional insanity. He was in a hopeless condition when admitted, and died soon after.

At the end of the year we had two Europeans, who apparently will spend the rest of their life in the Asylum.

Discharges.—Thirty-seven were discharged cured and eleven improved.

The ratio of cured to admitted was 41·1%. Last year it was 68·4%. In Britain in 1915 it was 32·7%.

Deaths.—The number of deaths was 28, being 31·1% of the admissions and 22·9% of the total number in the Asylum during the year. It is high, but the death rate of natives outside is high compared with European countries.

The overcrowding and the unhygienic conditions of the native part of the Asylum are not conducive to health.

Structural Changes.—None.

Escapes.—Two patients escaped, both natives. One altogether.

4.—GOVERNMENT DENTAL SURGERY.

The work performed for the year is set forth in Table IX.

5.—GAOLS.

Overcrowding at Nairobi Prison still continues.

Small-pox (9) and enteric fever (4) manifested themselves among those interned at that place, four patients succumbing from the former.

Cases of small-pox occurred in Kisumu Prison and an outbreak of dysentery and diarrhoea is noted as having occurred at Mombasa Prison between May and the middle of July.

TABLE SHOWING SICK AND DEATH RATES AMONGST PRISONERS AT THE MOMBASA, NAIROBI AND KISUMU GAOLS.

	Mombasa.		Nairobi.		Nairobi Branch Prison—Kassarini.		Kisumu.
	1916.	1915.	1916.	1915.	1916.	1915.	1916.
Total number of prisoners on 1st January ...	210	240	431	560	300	300	70
Number admitted during year	469	1,099	1,794	2,074	233	290	923
Average daily number in gaol	186	254	600	508	258	300	100
Total number placed on sick list	530	355	457	582	126	160	152
Total number of days on sick list	4,872	5,318	7,735	4,497	1,277	1,779	1,063
Average number daily sick ...	13·31	14·57	21·13	12·32	3·49	4·57	2·91
Total number of deaths ...	11	11	27	50	2	1	11
Percentage of deaths to average daily strength ...	5·91	4·33	4·50	9·84	·77	·33	11

The causes of death were as follows :—

Chicken-pox	...	...	...	...	...	1
Dysentery	...	...	...	...	...	16
Pneumonia	...	...	...	...	...	10
Small-pox	...	...	...	...	...	9
Tuberculosis	...	...	...	...	...	3
Anæmia	...	...	...	...	...	1
Nervous disease	...	...	...	...	...	1
Bronchitis	...	...	...	...	...	2
Broncho-pneumonia	...	...	...	...	...	1
Diarrhœa	...	...	...	...	...	3
Injuries ...	...	...	...	...	...	2
Cystitis ...	...	...	...	...	...	1
Natural causes	...	...	...	...	...	1
Insanity	...	...	...	...	...	1
Total...						52

The medical staff of the three prisons is as follows :—

Mombasa.—The Senior Medical Officer assisted by an Hospital Compounder.

Nairobi.—A visiting Medical Officer (who is also Medical Officer of the Native Civil Hospital, Lunatic Asylum, and Ukamba Province), assisted by a visiting Sub-Assistant Surgeon (who is also responsible for the neighbouring Loco. and Police Depot Dispensaries).

The Branch Prison at Kassarini has a resident Hospital Compounder attached.

Kisumu.—A visiting Medical Officer assisted by an Assistant Surgeon.

All prisoners are vaccinated on admission.

RETURNS.

TABLE I.

ADMINISTRATIVE DIVISION.

Dr. A. D. Milne...	...	Principal Medical Officer.
Dr. J. A. Haran, C.M.G.	...	Deputy Principal Medical Officer.
Mr. R. Stanley ...	...	Office Superintendent.
Mr. T. Preston ...	...	Clerk.
Mr. F. Cribb ...	...	"
Mr. J. S. Robertson ...	...	Medical Storekeeper.

MEDICAL DIVISION.

Dr. W. Owen-Prichard...	...	Senior Medical Officer.
Dr. C. L. Chevalier ...	...	" " "
Dr. F. L. Henderson ...	...	Medical Officer.
Dr. J. O. Shircore ...	...	" "
Dr. C. R. H. Chell ...	...	" "
Dr. T. F. Lumb ...	...	" "
Dr. J. L. Gilks ...	...	" "
Dr. J. Pugh ...	...	" "
Dr. C. J. Wilson ...	...	" "
Dr. V. G. L. van Someran ...	...	Dental Surgeon.
Dr. N. P. Jewell ...	...	Medical Officer.
Dr. A. D. J. Williams ...	...	" "
Dr. T. H. Massey ...	...	" "
Dr. P. F. Nunan ...	...	" "
Dr. J. H. Thomson ...	...	" "
Dr. R. W. Spence ...	...	" "
Dr. H. R. A. Philp ...	...	District Surgeon.
Mr. F. Knott ...	...	Dispenser.
Mr. H. Ogden ...	...	"
Miss E. R. Brown ...	...	Matron.
Miss H. M. Whitburn ...	...	Nursing Sister.
Miss L. Merryweather ...	...	" "
Miss R. Paul, R.R.C. ...	...	" "
Miss I. L. Majendie, R.R.C. ...	...	" "
Miss I. Wilson ...	...	" "
Miss S. J. Harrison ...	...	" "
Miss E. E. Hobson ...	...	" "
Miss A. B. Drewe ...	...	" "
Miss R. S. Blyth ...	...	" "
Mr. W. Henfrey ...	...	Supt. Lunatic Asylum.
Mrs. L. A. Henfrey ...	...	Matron, Lunatic Asylum.

TABLE I.—*continued.*

SANITATION DIVISION.

Dr. W. J. Radford	...	...	Principal Sanitation Officer.
Dr. R. Small	...	...	M. O. H., Mombasa.
Dr. B. W. Cherrett	...	...	M. O. H., Nairobi.
Mr. A. F. Dennett	...	...	Sanitary Inspector.
Mr. B. E. F. Wetkin	...	...	" "
Mr. W. H. Wood	...	...	" "
Mr. H. E. Williams	...	...	" "
Mr. F. Strawbridge	...	...	" "
Mr. P. Cairns	...	...	" "
Mr. J. F. Cook	...	...	" "
Miss M. A. Thomlinson	...	...	Nurse attached to Health Office, Mombasa

TABLE II.

FINANCIAL.

The sanctioned Medical Budget for the year 1916 was a total of £56,833, as compared with £51,797 for the preceding year.

Of the 1916-17 grand total, £41,918 were expended, leaving an unexpended sum of £14,915 as savings.

The savings were chiefly due to appointments provided for not being able to be filled, curtailment of leave and other matters due to the general upset resulting from the war.

The headings under which the vote was arranged were as follows :—

SCHEDULE XIV.—MEDICAL DEPARTMENT.

	Estimate.	Actual Expenditure.
	£	£
ADMINISTRATIVE DIVISION.		
Personal Emoluments	3,374	3,095
(Under this heading are included the salaries and any duty allowance granted, of the Principal Medical Officer, Deputy Principal Medical Officer, Office Superintendent, Medical Storekeeper, Clerical establishment, messengers and packers.)		
Other charges	640	266
(Under this heading are included Conservancy rates, contingencies, transport: passages, local travelling, travelling allowances, and carriage of goods.)		
MEDICAL DIVISION.		
Personal Emoluments	23,811	18,366
(Under this heading are included the salaries and any duty allowance granted, of the Senior Medical Officers, Medical Officers, Dispensers, Nurses, Superintendent and Matron Lunatic Asylum, Female Lunatic Asylum Attendants, Assistant Surgeons, Sub-Assistant Surgeons, Hospital Compounders, Native Hospital Attendants, Lunatic Asylum Attendants, and uniform allowances.)		

TABLE II.—*continued.*SCHEDULE XIV.—MEDICAL DEPARTMENTS—*continued.*

	Estimate.	Actual Expenditure.
	£	£
Other charges	12,402	6,893

(Under this heading are included contingencies, upkeep of European and Native Hospitals, Lunatic Asylum, medical and surgical stores, including books; transport: passages, local travelling, travelling allowances and carriage of goods; ration allowances to Medical Subordinates in Northern Frontier District and Serenli, uniforms for Medical Staff, furniture and equipment for hospitals, typewriters, conservancy rates, fees and expenses of Medical Officers attending courses of instruction in England, and electric lighting of hospitals).

SANITATION DIVISION.

Personal emoluments	10,070	5,871
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(Under this heading are included the salaries and any duty allowances granted, of the Principal Sanitation Officer, Medical Officers of Health, Sanitary Inspectors, Nurse, Assistant and Sub-Assistant Surgeons, Hospital Compounders, Vaccinators, Native Attendants for Infectious Diseases Hospitals, Leper Lazarette and Quarantine stations, clerical establishment, mechanics for Clayton disinfectors, office, gharry and boat boys).

Other charges	6,536	7,426
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(Under this heading are included epidemics, Sanitary station, Zanzibar; transport: passages, local travelling, travelling allowances and carriage of goods; typewriters, maintenance of Infectious Diseases Hospitals, disinfectants, bush clearing, mosquito and sleeping sickness preventive measures, contingencies, ration allowances, furniture and equipment for Infectious Diseases Hospitals and Quarantine Stations, ambulance services, upkeep of disinfectors, and uniforms).

REVENUE.

The total amount of revenue collected as hospital fees, sales of medicines and surgical stores, bills of health and registration fees, was as follows:—

	£
Hospital fees and sales of medicine ...	847
Bills of Health	180
Registration Fees	8
	£1,035

Last year the total revenue collected amounted to £1,225.

The decrease in hospital fees is due to the diminution of the civil population consequent on absorption for military service.

TABLE III.

RETURN OF STATISTICS OF POPULATION FOR THE YEAR, 1916.

EAST AFRICA.				Europeans and Whites.	Africans. Seychelles, etc.	Asiatics.
1. Number of Inhabitants in 1916	...	...	...	7,989*	3,000,000*	22,409*
2. Number of Births during 1916	...	...	...	162	†	†
3. Number of Deaths during 1916	...	...	...	57	†	†
4. Number of Immigrants during 1916	...	...	...	1,243	...	5,551
5. Number of Emigrants during 1916	...	...	...	1,128	...	4,038
6. Number of Inhabitants in 1915	...	...	...	7,769*	3,000,000*	20,896*
Increase ...	...	...	...	...	...	...
Decrease ...	...	...	...	...	...	...

* Approximately.

† Not registered.

TABLE IV.

1.—SUMMARY OF ROUTINE SANITARY WORK DONE DURING
THE YEAR IN THE TOWN OF NAIROBI.

FOR THE YEAR ENDING 31ST DECEMBER, 1916.

				Approximate Area.	Number of proclaimed Open Spaces.
1914	...	...	...	7 sq. miles	1 Public Park.
1915	...	...	...	7 " "	1 Public Park.
1916	...	...	...	7 " "	1 Municipal Forest.
					1 Public Park.
					1 Municipal Forest.

2.—POPULATION.

				Number of Natives.		Number of Europeans.		Total.
				Males.	Females.	Males.	Females.	Approx.
1914	...	...	...	18,000		2,000		20,000
1915	...	...	...	No estimate possible.		No estimate possible.		No estimate possible.
1916	...	...	...	Do.	do.	Do.	do.	Do.

3.—HOUSING.

				Number occupied by Europeans.	Number occupied by Natives and Asiatics.
Number of Houses :—					
1914	...	...	...	401	551
1915	...	...	...	418	565
1916	...	...	...	428	528

Number of Huts :—

1914	...	...	1,556
1915	...	...	1,598
1916	...	...	1,548

Approx. (not including Military).

This includes tin shanties, native servants' quarters, mud huts, etc.

TABLE IV.—*continued.*

4.—MOSQUITO PROTECTION OF HOUSES.

	1914.	1915.	1916.
Number of European houses wholly mosquito-protected ...	<i>Nil</i>	<i>Nil</i>	<i>Nil</i>
Number of European houses with mosquito room ...	"	"	"
Number rendered during the year wholly mosquito-protected	"	"	"
Number rendered during the year partially mosquito-protected	"	"	"

5.—ERECTION OF NEW BUILDINGS DURING THE YEAR.

	1914.	1915.	1916.
Number of public buildings erected with sanction as to site, construction, and relation to other buildings ...	2	1	1
Number of houses erected with sanction as to site, construction, and relation to other buildings ...	56	31	27
Number of huts erected with sanction as to site, construction, and relation to other buildings ...	62	81	15
Number of houses built without sanction ...	2	2	5
Number of huts built without sanction ...	12	...	...

ACTION TAKEN.

	Number of Prosecutions.		Number Demolished.	
	Huts.	Houses.	Huts.	Houses.
1914 ...	1	8	73	1
1915 ...	8	6	39	4
1916 ...	5	5	100 (Approx).	4

6.—MARKETS.

	Total number.	Number paved and drained.	Number unpaved.
1914 ...	2	1	1
1915 ...	2	1	1
1916 ...	2	1	1

7.—SLAUGHTER-HOUSES.

	Total number.	Number paved and drained.	Number unpaved.
1914 ...	1	1	<i>Nil</i>
1915 ...	1	1	"
1916 ...	1	1	"

TABLE IV.—*continued.*

8.—LATRINES.

	For Males.		For Females.	
	Number.	Number of Seats.	Number.	Number of Seats.
Number of public latrines :—				
1914	12	80	European.	
1915	23	202		2
1916	26	210		2
Number of new public latrines erected during the year :—				
1914	2	16	...	...
1915	11	104	...	...
1916	1	8	...	...
Number of public latrines repaired during the year :—				
1914	2	16	...	...
1915	1	8	...	...
1916	...	...	...	...
Number of public latrines demolished during the year :—				
1914	...	...	...	...
1915	1	4	...	...
1916	...	...	...	...

	1914.	1915.	1916.
Number of private latrines	1,529	2,283	2,372
Average number of pails of night-soil daily removed... ..	1,529	2,283	2,372
Average number of soiled pails removed and clean pails substituted	...	...	...
Number of night-soil men employed to clean latrines and to remove excreta	75	92	87
Number of cesspools	86	55	9
Number of cesspools cleaned	86	55	9
Number of new cesspools constructed during the year	1	...	...
Number of old cesspools abolished	16	31	46
Number of cesspools oiled regularly by Department	...	...	...

9.—REMOVAL OF REFUSE.

	1914.	1915.	1916.
Number of dustbins	602	1,307	1,310
Number of carts at work daily to remove refuse from streets	4	10	10
		(includes 6 sludgecarts)	(includes 6 sludgecarts)
Amount of refuse removed daily cart-loads	8	20	20
Number of carts at work daily to remove refuse from yards and premises cart-loads	16	19	19
Amount of refuse removed daily from yards and premises	32	36	36
Number of men employed for removing refuse	88	83	83

TABLE IV.—*continued.*

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

	Daily average number of pails of excreta.			Daily average number of cartloads of refuse.			Daily average number of cartloads of slaughter-house and market offal.		
	1914.	1915.	1916.	1914.	1915.	1916.	1914.	1915.	1916.
Buried or trenched	1,529	2,487	2,576	...	...	...	4	3	6
Burnt	...	...	...	40	44	44	...	1	1
Thrown into sea	...	...	...	...	...	...	...	...	...
Otherwise dealt with	...	...	...	...	...	...	...	...	...

11.—AVERAGE DAILY NUMBER OF CARTLOADS OF CANS, BOTTLES, BROKEN CROCKERY AND OTHER INCOMBUSTIBLE MATERIAL REMOVED FROM HOUSES, HUTS AND COMPOUNDS.

1914.	1915.	1916.
20	20	20

12.—WATER SUPPLY.

Nature of Water Supply.	1914.	1915.	1916.
Pipe-borne water:—			
Source (river, lake or spring)—	River and Spring.	River and Spring.	River and Spring.
Number of linear yards	495,234	508,118	510,698
Number of standpipes along roads	53	53	53
Number of standpipes in compounds and houses ...	769	889	1,030
Wells:—			
Public—			
Number	<i>Nil</i>	<i>Nil</i>	<i>Nil</i>
Number with pumps protected against surface water and mosquito-protected	"	"	"
Private—			
Number	2	1	"
Number with pumps protected against surface water and mosquito-protected	...	...	...
Tanks:—			
Public—			
Number underground	<i>Nil</i>	<i>Nil</i>	<i>Nil</i>
Number mosquito-protected and served by pumps ...	"	"	"
Number above ground	"	"	"
Number mosquito-protected	"	"	"
Number of 400-gallons capacity or less	"	"	"
Number above 400 gallons	"	"	"
Private—			
Number underground	<i>Nil</i>	<i>Nil</i>	<i>Nil</i>
Number mosquito-protected	"	"	"
Number above ground... ..	252	163	155
Number mosquito-protected	252	163	155
Number of 400-gallons capacity or less	92	43 approx.	43
Number above 400 gallons	160	120 "	112
Nature of tanks:—			
Wood	<i>Nil</i>	<i>Nil</i>	<i>Nil</i>
Iron	252	163	155
Concrete	<i>Nil</i>	<i>Nil</i>	<i>Nil</i>
Barrels:—			
Number	170	150 approx.	150 approx.
Number mosquito-protected	70	140 "	140 "

TABLE IV.—*continued.*

13.—DRAINAGE.

	Public.	Private.
Masonry Drains—		
Linear yards of masonry drains—		
1914	24,712	No information
1915	25,853	"
1916	31,905	"
Linear yards reconstructed during the year—		
1914	<i>Nil</i>	"
1915	"	"
1916	"	"
Linear yards repaired during the year—		
1914	2,200	"
1915	400	"
1916	500	"
Linear yards of new drains constructed during the year—		
1914	15,219	"
1915	1,141	"
1916	6,052	"
Earth Drains or Ditches cleansed—		
Number of linear yards of ditches cleansed—		
1914	No information	"
1915	60,176	"
1916	67,722	"
Number of linear yards of ditches dug and graded—		
1914	12,893	"
1915	9,520	"
1916	6,000	"
Average frequency of clearing ditches of grass—		
1914	When necessary	"
1915	"	"
1916	"	"

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

	1914.	1915.	1916.
Number of square yards of weeds, grass and vegetation cut and removed	6,016,120	5,575,680	13,319,680
Average frequency of clearance of rank vegetation on same area	When necessary	When necessary	When necessary

15.—EXCAVATIONS OF LOW-LYING LAND.

	1914.	1915.	1916.
Number of pools and excavations	43	20	20 approx.
Number of excavations filled up	65	34	334
Amount of low-lying and marsh land raised and drained	approx. 3 acres	approx. 5 acres	approx. 2 acres
Number of pools, marshes, etc., fish-stocked ...	<i>Nil</i>	<i>Nil</i>	<i>Nil</i>
Number of cubic yards of material used for filling up pools and excavations	No information	No information	No information
Number of persons fined for making new excavations	<i>Nil</i>	1	2
Average number of men daily employed in filling up pools, etc.	10	2	No fixed number

TABLE IV.—*continued.*

16.—OILING.

	1914.	1915.	1916.
Number of drains oiled			
Number of pools and excavations oiled			
Number of tanks and barrels oiled			
Average number of men daily employed for oiling drains, pools and water-tanks or barrels	2	4	4

} All mosquito breeding places are either removed or disinfected.

17.—INSPECTIONS AND PROSECUTIONS.

	1914.	1915.	1916.
Number of Inspectors employed	2	2	2
Number of houses inspected	1,552	8,196	8,766
Number of houses where larvæ were found	42	122	312
Number of notices served to remove conditions causing the breeding of larvæ	286	376	480
Number of persons fined for having mosquito larvæ on premises	1	...	1
Number of notices served to remove insanitary conditions on premises	1,080	891	924
Number of persons fined for not removing insanitary conditions after notice	94	36	38
Number of soda and aerated water factories inspected	2	2	4

TABLE IV.

1.—SUMMARY OF ROUTINE SANITARY WORK DONE DURING THE YEAR IN THE TOWN OF MOMBASA.

FOR THE YEAR ENDING 31ST DECEMBER, 1916.

	Approximate Area.	Number of proclaimed Open Spaces.
1914	Island, 8 $\frac{3}{4}$ square miles	...
1915	Native town area, 275 acres	1 public garden, 1·8 acres, ...
1916	European residential area, 194 acres ...	

2.—POPULATION.

	Number of Natives.		Number of Europeans.		Total.
	Males.	Females.	Males.	Females.	
1914	9,500	14,800	200	45	Approx. 24,545
1915	7,914	12,510	200	45	" 20,669
1916	7,862	12,458	189	38	" 20,547

TABLE IV.—*continued.*

3.—HOUSING.

	Number occupied by Europeans.		Number occupied by Natives and Asiatics.	
Number of Houses :—				
1914	105		890	
1915	103		900	
1916	110		1,127	

Number of huts :—

1914	3,423
1915	3,200
1916	3,553

4.—MOSQUITO PROTECTION OF HOUSES.

	1914.	1915.	1916.
Number of European houses wholly mosquito-protected ...	} Nil	} Nil	} Nil
Number of European houses with mosquito room			
Number rendered during the year wholly mosquito-protected			
Number rendered during the year partially mosquito-protected			

5.—ERECTION OF NEW BUILDINGS DURING THE YEAR.

	1914.	1915.	1916.
Number of public buildings erected with sanction as to site, construction, and relation to other buildings	Nil	Nil	Nil
Number of houses erected with sanction as to site, construction, and relation to other buildings	34	2	19
Number of huts erected with sanction as to site, construction, and relation to other buildings	78	139	240
Number of houses built without sanction	Nil	Nil	Nil
Number of huts built without sanction	Nil	Nil	Nil

ACTION TAKEN.

				Number of Prosecutions.		Number Demolished.	
				Huts.	Houses.	Huts.	Houses.
1914	4	2	135	Nil			
1915	Nil	10	145	12			
1916	1	7	63	8			

TABLE IV.—*continued.*

6.—MARKETS.

	Total number.	Number paved and drained.	Number unpaved.
1914	3	2	1
1915	3	2	1
1916	3	2	1

7.—SLAUGHTER-HOUSES.

	Total number.	Number paved and drained.	Number unpaved.
1914	2	2	<i>Nil</i>
1915	2	2	"
1916	2	2	"

8.—LATRINES.

	For Males.		For Females.	
	Number.	Number of Seats.	Number.	Number of Seats.
Number of public latrines :—				
1914... ..	7	16	<i>Nil</i>	<i>Nil</i>
1915... ..	23	89	4	12
1916... ..	17	40	3	5
Number of new public latrines erected during the year :—				
1914... ..	<i>Nil</i>	<i>Nil</i>	<i>Nil</i>	<i>Nil</i>
1915... ..	5	26	"	"
1916... ..	<i>Nil</i>	<i>Nil</i>	"	"
Number of public latrines repaired during the year :—				
1914... ..	2	<i>Nil</i>	<i>Nil</i>	<i>Nil</i>
1915... ..	<i>Nil</i>	"	"	"
1916... ..	"	"	"	"
Number of public latrines demolished during the year :—				
1914... ..	2	10	<i>Nil</i>	<i>Nil</i>
1915... ..	3	6	"	"
1916... ..	6	49	"	5
	1914.	1915.	1916.	
Number of private latrines	194	194	74	
Average number of pails of nightsoil removed daily	180	180	180	
Average number of soiled pails removed and clean pails substituted	Pails emptied and replaced nightly			
Number of nightsoil men employed to clean latrines and to remove excreta	15	39	17	Approx.
Number of cesspools	...	...	5,917	
Number of cesspools cleansed	63	72	126	
Number of new cesspools constructed during the year	82	63	278	
Number of old cesspools abolished	18	29	63	
Number of cesspools oiled regularly by Department	<i>Nil</i>	<i>Nil</i>	<i>Nil</i>	

TABLE IV.—*continued.*

9.—REMOVAL OF REFUSE.

	1914.	1915.	1916.
Number of dustbins	200	347	220
Number of carts at work daily to remove refuse from streets	17	17	17
Amount of refuse removed daily	20 tons	20 tons	20 tons
Number of carts at work daily to remove refuse from yards and premises	1 trolley	1 trolley	1 trolley
Amount of refuse removed daily from yards and premises ...	1 ton	1 ton	1 ton
Number of men employed for removing refuse	152	173	164

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

	Daily average number of Pails of Excreta.			Daily average number of Cartloads of Refuse.			Daily average number of Cartloads of Slaughter-house and Market Offal.		
	1914.	1915.	1916.	1914.	1915.	1916.	1914.	1915.	1916.
Buried or trenched	...	...	...	...	...	...	...	...	...
Burnt	...	175	...	42	42	42	...	...	...
Thrown into sea	180	180	180	...	...	...	...	...	...
Otherwise dealt with	...	...	...	...	...	...	Unmeasured, discharged direct into sea.		

11.—AVERAGE DAILY NUMBER OF CARTLOADS OF CANS, BOTTLES, BROKEN CROCKERY AND OTHER INCOMBUSTIBLE MATERIAL REMOVED FROM HOUSES, HUTS AND COMPOUNDS.

1914.	1915.	1916.
3	4	4

TABLE IV.—*continued.*

12.—WATER SUPPLY.

Nature of Water Supply.	1914.	1915.	1916.
Pipe-borne water—			
Source (river lake or spring)—	Well.	River.	River.
Number of linear yards	7,352	10,278	15,131
Number of stand-pipes along roads	12	12	17
Number of stand-pipes in compounds and houses ...	10	12	41
Wells:—			
Public—			
Number	28	28	28
Number with pumps protected against surface water and mosquito-protected	...	...	...
Private—			
Number	96	96	96
Number with pumps protected against surface water and mosquito-protected	...	...	...
Tanks:—			
Public—			
Number underground	..	...	...
Number mosquito-protected and served by pumps ...	...	...	...
Number above ground	...	...	...
Number mosquito-protected	...	...	...
Number of 400 gallons capacity or less	...	...	...
Number above 400 gallons	...	...	...
Private—			
Number underground	72	77	80
Number mosquito-protected	72	77	80
Number above ground	36	155	149
Number mosquito-protected	36	155	149
Number of 400 gallons capacity or less	...	111	105
Number above 400 gallons	108	121	124
Nature of Tanks:—			
Wood	..	...	...
Iron	36	155	149
Concrete	72	77	80
Barrels:—			
Number	Many hundreds. Impossible to estimate.		1,800 approx.
Number mosquito-protected	50%	50%	60%

TABLE IV.—*continued.*

13.—DRAINAGE.

Nature of Drainage.								Public.	Private.
Masonry Drains :—									
Linear yards of masonry drains :—									
1914	...	...	...	...	...	...	...	3,032	1,493
1915	...	...	...	...	...	...	...	4,937	1,493
1916	...	...	...	...	...	...	...	5,350	1,493
Linear yards reconstructed during the year :—									
1914	...	...	...	...	...	...	...	50	32
1915	...	...	...	...	...	...	...	50	Unknown
1916	...	...	...	...	...	...	...	...	...
Linear yards repaired during the year :—									
1914	...	...	...	...	...	...	...	Nil.	47
1915	...	...	...	...	...	...	...	101	Unknown
1916	...	...	...	...	...	...	...	35	do.
Linear yards of new drains constructed during the year :—									
1914	...	...	...	...	...	...	...	432	493
1915	...	...	...	...	...	...	...	286	Unknown
1916	...	...	...	...	...	...	...	420	do.
Earth drains or ditches cleansed—Number of linear yards of ditches cleansed :—									
1914	...	...	...	...	...	...	...	1,100	No record kept.
1915	...	...	...	...	...	...	...	15,690	do. do.
1916	...	...	...	...	...	...	...	4,920	do. do.
Number of linear yards of ditches dug and graded :—									
1914	...	...	...	...	...	...	...	1,359	do. do.
1915	...	...	...	...	...	...	...	4,354	do. do.
1916	...	...	...	...	...	...	...	1,935	do. do.
Average frequency of clearing ditches of grass :—									
1914	...	...	...	...	...	...	...	Bi-weekly during rains.	When necessary.
1915	...	...	...	...	...	...	...	...	...
1916	...	...	...	...	...	...	...	...	...

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

	1914.	1915.	1916.
Number of square yards of weeds, grass and vegetation cut and removed	111½ acres	1,744½ ac's	1,497 ac's
Average frequency of clearance of rank vegetation on same area	Cleared	twice per	year.

TABLE IV.—*continued.*

15.—EXCAVATIONS OF LOW-LYING LAND.

	1914.	1915.	1916.
Number of pools and excavations	27	27	27
Number of excavations filled up	43	30	11
Amount of low-lying and marsh land raised and drained ...	3,936	3,479	850
	sq. yds.	sq. yds.	sq. yds.
Number of pools, marshes, etc., fish-stocked	Nil.	Nil.	Nil.
Number of cubic yards of material used for filling up pools and excavations	800	1,319	690
Number of persons fined for making new excavations ...	Nil.	Nil.	Nil.
Average number of men daily employed in filling up pools, etc.	Casual labour.		7

16.—OILING.

	1914.	1915.	1916.
Number of drains oiled	1	1	2
Number of pools and excavations oiled	2	2	4
Number of tanks and barrels oiled	130	150	150
Average number of men daily employed for oiling drains, pools, and water tanks or barrels	Nil.	Nil.	Nil.

17.—INSPECTIONS AND PROSECUTIONS.

	1914.	1915.	1916.
Number of Inspectors employed	2	2 average.	2 average.
Number of houses inspected	4,097	7,359	5,046
Number of houses where larvæ were found	523	1,153	477
Number of notices served to remove conditions causing the breeding of larvæ	132	402	307
Number of persons fined for having mosquito larvæ on premises	4	26	23
Number of notices served to remove insanitary conditions on premises	649	634	798
Number of persons fined for not removing insanitary conditions after notice	42	95	55
Number of soda and aerated water factories inspected	5	5	5

TABLE IV.

1.—SUMMARY OF ROUTINE SANITARY WORK DONE DURING THE YEAR IN THE TOWN OF KISUMU.

FOR THE YEAR ENDED 31ST DECEMBER, 1916.

	Approximate Area.	Number of proclaimed Open Spaces.
1914	2½ miles	1
1915	2½ miles	1
1916	2½ miles	1

2.—POPULATION.

	Number of Natives.		Number of Europeans.		Total approx.
	Males.	Females.	Males.	Females.	
1914	4,778	219	75	25	5,097
1915	4,000	1,000	85	26	5,111
1916	4,000	1,370	93	26	5,489

TABLE IV.—*continued.*

3.—HOUSING.

	Number occupied by Europeans.	Number occupied by Natives and Asiatics.
Number of Houses :—		
1914	51	1
1915	55	...
1916	55	142
Number of Huts :—		
1914	...	1,083
1915	...	1,161
1916	...	...

4.—MOSQUITO PROTECTION OF HOUSES.

	1914.	1915.	1916.
Number of European houses wholly mosquito-protected ...	6	11	11
Number of European houses with mosquito room	1	1	1
Number rendered during the year wholly mosquito-protected...	2	5	...
Number rendered during the year partially mosquito-protected	5	1	1

5.—ERECTION OF NEW BUILDINGS DURING THE YEAR.

	1914.	1915.	1916.
Number of public buildings erected with sanction as to site, construction, and relation to other buildings	1	...	...
Number of houses erected with sanction as to site, construction, and relation to other buildings	12	10	3 landies.
Number of huts erected with sanction as to site, construction, and relation to other buildings	315	53	...
Number of houses built without sanction	...	...	...
Number of huts built without sanction	...	25	...

ACTION TAKEN.

	Number of Prosecutions.		Number Demolished.	
	Huts.	Houses.	Huts.	Houses.
1914	...	...	67	...
1915	...	...	80	...
1916	...	...	81	...

6.—MARKETS.

	Total number.	Number paved and drained.	Number unpaved.
1914	1	1 drained and unpaved.	...
1915	1	1 do.	1
1916	1	1 do.	1

TABLE IV.—*continued.*
7.—SLAUGHTER-HOUSES.

	Total number.	Number paved and drained.	Number unpaved.
1914	2	2	...
1915	2	2	...
1916	2	2	...

8.—LATRINES.

	For Males.		For Females.	
	Number.	Number of Seats.	Number.	Number of Seats.
Number of public latrines :—			Males and females use the same latrines.	
1914... ..	14	115		...
1915... ..	15	136		...
1916... ..	15	117		...
Number of new public latrines erected during the year :—				
1914... ..	3	18		...
1915... ..	4	45		...
1916... ..	...	...		...
Number of public latrines repaired during the year :—				
1914... ..	7	72		...
1915... ..	...	...		...
1916... ..	2	...		...
Number of public latrines demolished during the year :—				
1914... ..	...	...		...
1915... ..	2	12		...
1916... ..	1	...		...

LATRINES—*continued.*

	1914.	1915.	1916.
Number of private latrines	240	295	288
Average number of pails of nightsoil removed daily	589	700	622
Average number of soiled pails removed and clean pails substituted... ..	...	...	...
Number of nightsoil men employed to clean latrines and remove excreta	41	42	42
Number of cesspools	119	119	119
Number of cesspools cleaned	119	...	...
Number of new cesspools constructed during the year ...	6	...	...
Number of old cesspools abolished	7	...	...
Number of cesspools oiled regularly by Department ...	10	...	...

9.—REMOVAL OF REFUSE.

	1914.	1915.	1916.
Number of dustbins	612	840	470
Number of carts at work daily to remove refuse from streets	7	6	6
Amount of refuse removed daily (carts)	40	36	36
Number of carts at work daily to remove refuse from yards and premises	7	6	10
Amount of refuse removed daily from yards and premises (carts)	20	18	30
Number of men employed for removing refuse	29	36	33

TABLE IV.—*continued.*

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

	Daily average number of pails of excreta.			Daily average number of cartloads of refuse.			Daily average number of cartloads of slaughter-house and market offal.		
	1914.	1915.	1916.	1914.	1915.	1916.	1914.	1915.	1916.
Buried or trenched	589	700	622	25	...	22	1	1	1
Burnt	...	...	21	15	...	9	...	...	...
Thrown into sea	...	...	...	...	...	...	...	...	...
Otherwise dealt with	...	...	...	...	...	35	...	1	1

11.—AVERAGE DAILY NUMBER OF CARTLOADS OF CANS BOTTLES, BROKEN CROCKERY, AND OTHER INCOMBUSTIBLE MATERIAL REMOVED FROM HOUSES, HUTS AND COMPOUNDS.

1914.	1915.	1916.
2	2	5

12.—WATER SUPPLY.

Nature of Water Supply.	1914.	1915.	1916.
Pipe-borne water :—			
Source (river, lake or spring) —	Lake	Lake	Lake
Number of linear yards	10,636	11,506	12,000
Number of standpipes along roads	11	11	11
Number of standpipes in compounds and houses ...	65	67	72
Wells :—			
Public—			
Number	...	...	...
Number with pumps protected against surface water and mosquito-protected	...	...	...
Private—			
Number	...	...	...
Number with pumps protected against surface water and mosquito protected	...	...	...
Tanks :—			
Public—			
Number underground	...	...	...
Number mosquito-protected and served by pumps ...	...	...	...
Number above ground	...	...	...
Number mosquito-protected	...	...	...
Number of 400 gallon, capacity or less	...	...	...
Number above 400 gallons	...	...	...
Private—			
Number underground	...	...	...
Number mosquito-protected	...	...	...
Number above ground	184	192	193
Number mosquito-protected	130	Practically none satisfactory.	...
Number of 400 gallons capacity or less	60	62	63
Number above 400 gallons	124	130	130
Nature of Tanks :—			
Wood	...	...	...
Iron	124	78	79
Concrete	60	114	114
Barrels :—			
Number	...	...	...
Number mosquito-protected	...	...	...

TABLE IV.—*continued.*

13.—DRAINAGE.

	Public.	Private.
Masonry Drains :—		
Linear yards of masonry drains—		
1914	930	60
1915	930	60
1916	2,996	60
Linear yards reconstructed during the year—		
1914	...	...
1915	...	...
1916	...	...
Linear yards repaired during the year—		
1914	...	...
1915	...	...
1916	...	...
Linear yards of new drains constructed during the year—		
1914	...	60
1915	...	...
1916	2,066	...
Earth drains or ditches cleansed :—		
Number of linear yards of ditches cleansed—		
1914	Daily 700	...
1915	274,950 yds.	...
1916	40,000	...
Number of linear yards of ditches dug and graded—		
1914	108,365	...
1915	98,587	...
1916	550	...
Average frequency of clearing ditches of grass—		
1914	monthly	...
1915	fortnightly	...
1916	monthly	...

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

	1914.	1915.	1916.
Number of square yards of weeds, grass and vegetation cut and removed	2 sq. miles	988,683	84,450
Average frequency of clearance of rank vegetation on same area	twice a year	thrice yearly	four times yearly

TABLE IV.—*continued.*

15.—EXCAVATIONS OF LOW-LYING LAND.

	1914.	1915.	1916.
Number of pools and excavations	...	...	...
Number of excavations filled up... ..	25	...	11
Amount of low-lying and marsh land raised and drained ...	...	...	...
Number of pools, marshes, etc., fish-stocked	...	...	...
Number of cubic yards of material used for filling up pools and excavations	No record.	No record.	About 590.
Number of persons fined for making new excavations... ..	...	...	...
Average number of men daily employed in filling up pools, etc.	No record.	...	7

16.—OILING.

	1914.	1915.	1916.
Number of drains oiled	228	30	...
Number of pools and excavations oiled	319	20	...
Number of tanks and barrels oiled	12 tanks	...	...
Average number of men daily employed for oiling drains, pools and water-tanks or barrels	6 men occasionally	5	...

17.—INSPECTIONS AND PROSECUTIONS.

	1914.	1915.	1916.
Number of Inspectors employed... ..	2	1	1
Number of houses inspected	5 daily	1,074	2,844
Number of houses where larvæ were found	4	...	2
Number of notices served to remove conditions causing the breeding of larvæ	4	...	2
Number of persons fined for having mosquito larvæ on premises	2	...	...
Number of notices served to remove insanitary conditions on premises	264	103	312
Number of persons fined for not removing insanitary conditions after notice	2	4	13
Number of soda and aerated water factories inspected... ..	1	1	1

TABLE V.
METEOROLOGICAL RETURN FOR THE YEAR 1916.
KABETE FARM, NAIROBI.

MONTH.	TEMPERATURE.						RAINFALL.		WINDS.		Remarks.
	Solar Maximum.	Minimum on grass.	Shade Maximum.	Shade Minimum.	Range.	Max. and Min. Mean combined.	Amount in inches.	Degree of Humidity.	General Direction.	Average Force.	
January ...	...	...	76.8	50.4	...	63.6	3.76	...	...	...	
February ...	...	...	76.5	51.7	...	64.1	2.50	...	...	...	
March ...	...	...	77.3	52.3	...	64.8	3.42	...	...	...	
April ..	...	...	74.3	55.9	...	65.1	13.52	...	...	...	
May ...	...	...	72.5	54.5	...	63.5	8.10	...	...	...	
June ...	...	...	69.0	51.4	...	60.2	1.93	...	...	...	
July ...	...	...	68.3	46.9	...	57.6	0.11	...	...	...	
August ...	...	...	68.6	48.2	...	58.4	1.83	...	...	...	
September ...	...	...	73.3	49.3	...	61.3	3.10	...	...	...	
October ...	...	...	74.8	48.5	...	61.6	1.33	...	...	...	
November ...	...	...	71.7	52.1	...	61.9	4.25	...	...	...	
December ...	...	...	73.3	51.5	...	62.4	2.70	...	...	...	
Year Average	...	...	73.0	51.1	...	62.0	Total 46.55	...	...	...	

MOMBASA.

MONTH.	TEMPERATURE.						RAINFALL.		WINDS.		Remarks.
	Solar Maximum.	Minimum on grass.	Shade Maximum.	Shade Minimum.	Range.	Max. and Min. Mean combined.	Amount in inches.	Degree of Humidity.	General Direction.	Average Force.	
January ...	...	...	85.8	74.5	...	80.1	0.00	...	...	...	
February ...	...	...	85.7	75.1	...	80.4	0.00	...	...	...	
March ...	...	...	85.6	75.8	...	80.7	4.44	...	...	...	
April ...	...	...	84.2	74.9	...	79.5	12.42	...	...	...	
May ...	...	...	82.0	72.3	...	77.1	5.59	...	...	...	
June ...	...	...	81.0	71.6	...	76.3	4.75	...	...	...	
July ...	...	...	77.9	68.9	...	73.4	3.97	...	...	...	
August ...	...	...	77.8	68.8	...	73.3	3.96	...	...	...	
September ...	...	...	70.9	69.5	...	70.2	3.22	...	...	...	
October ...	...	...	81.8	71.7	...	76.7	1.42	...	...	...	
November ...	...	...	84.7	73.2	...	78.9	0.76	...	...	...	
December ...	...	...	85.0	73.6	...	79.3	1.84	...	...	...	
Year Average	...	...	81.9	72.5	...	77.2	Total 42.37	...	...	...	

TABLE V.—*continued.*METEOROLOGICAL RETURN FOR THE YEAR 1916—*continued.*

KISUMU.

MONTH.	TEMPERATURE.						RAINFALL.		WINDS.		Remarks.
	Solar Maximum.	Minimum on grass.	Shade Maximum.	Shade Minimum.	Range.	Max. and Min. Mean combined.	Amount in inches.	Degree of Humidity.	General Direction.	Average Force.	
January ...	...	...	87.1	66.5	...	76.8	5.92	...	...	...	
February ...	...	...	85.8	65.9	...	75.8	4.53	...	...	...	
March ...	...	...	86.6	66.6	...	76.6	4.46	...	...	...	
April ...	...	...	82.6	65.9	...	74.2	13.31	...	...	...	
May ..	...	...	79.8	64.9	...	72.3	9.01	...	...	...	
June ...	...	...	79.1	64.7	...	71.9	3.94	...	...	...	
July ...	...	...	79.1	63.9	...	71.5	0.24	...	...	...	
August ...	...	...	80.2	64.2	...	72.2	3.61	...	...	...	
September ...	...	...	82.1	63.9	...	73.0	4.13	...	...	...	
October ...	...	...	85.0	64.5	...	74.7	1.30	...	...	...	
November ...	...	...	86.3	65.1	...	75.7	1.21	...	...	...	
December ...	...	...	84.3	64.5	...	74.4	4.62	...	...	...	
Year Average ...	...	...	83.2	65.1	...	74.1	Total. 56.28	...	...	...	

FORT HALL.

MONTH.	TEMPERATURE.						RAINFALL.		WINDS.		Remarks.
	Solar Maximum.	Minimum on grass.	Shade Maximum.	Shade Minimum.	Range.	Max. and Min. Mean combined.	Amount in inches.	Degree of Humidity.	General Direction.	Average Force.	
January ...	...	...	80.9	58.9	...	69.9	2.38	...	...	...	
February ...	...	...	82.6	60.3	...	71.4	0.00	...	...	...	
March ...	...	...	83.8	62.5	...	73.1	5.21	...	...	...	
April ...	...	...	77.9	62.1	...	70.0	19.02	...	...	...	
May ...	...	...	77.7	66.5	...	72.1	5.77	...	...	...	
June ...	...	...	75.5	64.9	...	70.2	0.25	...	...	...	
July ...	...	...	72.1	60.7	...	66.4	0.57	...	...	...	
August ...	...	...	73.9	57.3	...	65.6	1.53	...	...	...	
September ...	...	...	75.9	57.6	...	66.7	3.39	...	...	...	
October ...	...	...	78.1	58.5	...	68.3	6.13	...	...	...	
November ...	...	...	75.6	58.6	...	67.1	7.19	...	...	...	
December ...	...	...	76.6	57.5	...	67.0	1.79	...	...	...	
Year Average ...	...	...	77.6	60.5	...	69.0	Total. 53.23	...	...	...	

TABLE VI.

RETURN OF DISEASES AND DEATHS (IN-PATIENTS) FOR THE YEAR 1916.

DISEASES.	EUROPEAN OFFICIALS.			NATIVE OFFICIALS.			GENERAL EUROPEAN POPULATION.			GENERAL NATIVE POPULATION.		
	Remaining in Hospital at end of 1915.	YEARLY TOTAL.		Remaining in Hospital at end of 1916.	Remaining in Hospital at end of 1915.	YEARLY TOTAL.		Remaining in Hospital at end of 1916.	Remaining in Hospital at end of 1915.	YEARLY TOTAL.		Remaining in Hospital at end of 1916.
		Admissions.	Deaths.			Admissions.	Deaths.			Admissions.	Deaths.	
INFECTIVE DISEASES:—												
Beri-beri										19		19
Cerebro-spinal fever										91	52	93
Chicken-pox	1		1		3		3			255	1	260
Cholera												
Dengue										1		1
Diphtheria												
Dysentery	2	60	2	62	1	206	207	2	4	116	4	120
Endocarditis—Infective										45	1187	191
Enteric	4	1	4		1		1	2	26	2	28	1
Erysipelas										4		4
Gonorrhoea	2		2		1		8	1	4		5	
Influenza	4		4		13		14		5			
Kala Azar												
Leprosy (a) Nodular												
(b) Anæsthetic												
Malaria (a) Tertian	4	108		112	1	1021	2	1038	14	36	36	12
(b) Quartan												
(c) Estivo-autumnal	3	132		135		385	1	397	3	6	339	30
(d) Chronic malaria												
(e) Blackwater			1		1		1		11	1	11	
Measles		2		2					2		2	
Malta fever									1		1	
Plague									2	2	2	
Pneumonia	1		1		4	1	5		11	3	11	9
Rabies												
Relapsing fever									5		5	
Rheumatic fever	3		3		63		66	1	9		10	4
Septicæmia									1	1	1	
Trypanosomiasis (Sleeping sickness)												
Small-pox	1		1		1		1		5		5	20
Syphilis (a) Primary					2		2					5
(b) Secondary	1		1									8
(c) Inherited												
Tetanus									1		1	
Tuberculosis	1		1		1		1		4		4	5
Whooping cough												
Yaws					1		1					
Yellow fever												
Mumps	1		1		1		1					3
Other Infectious Diseases												8
INTOXICATIONS:—												
Alcoholism												1
Morphinism												1
Others												
GENERAL DISEASES:—												
Anæmia	2		2		6		6		1		1	5
Anæmia—Pernicious												1
Diabetes												
Exophthalmic goitre												
Gout									2		2	
Leucocythæmia												1
Hodgkin's disease												
Myxœdema												
Purpura												
Rickets												
Scurvy	1		1		1		1					1
Other General Diseases	41		41	1	21		23		52		52	65
LOCAL DISEASES:—												
Diseases of the Nervous System:—												
Sub-section 1.												
Neuritis	2		2		2		2	1			1	15
Meningitis												3
Myelitis												3
Hydrocephalus												
Encephalitis												
Abscess of brain												
Congestion of brain												
Sub-section 2.												
Apoplexy												5
Paralysis	1		1		2		2		1		1	14
Chorea												
Epilepsy									1		1	6
Neuralgia	5		5		56		56		5		5	70
Hysteria	1		1									2
Other Nervous Diseases	7		7		9		9		8		8	49
Sub-section 3.												
Mental Diseases:—												
Idiocy									1		1	3
Mania									1	2	3	15
Melancholia					1		1		1	1	1	4
Dementia												11
Delusional insanity									5		5	19
Other Mental Diseases									1	4	5	18

TABLE VI.—RETURN OF DISEASES AND DEATHS (IN-PATIENTS) FOR THE YEAR 1916—(contd.)

DISEASES.	EUROPEAN OFFICIALS.				NATIVE OFFICIALS.				GENERAL EUROPEAN POPULATION.				GENERAL NATIVE POPULATION.				
	Remaining in Hospital at end of 1915.	YEARLY TOTAL.		Total cases treated. Remaining in Hospital at end of 1916.	Remaining in Hospital at end of 1915.	YEARLY TOTAL.		Total cases treated. Remaining in Hospital at end of 1916.	Remaining in Hospital at end of 1915.	YEARLY TOTAL.		Total cases treated. Remaining in Hospital at end of 1916.	Remaining in Hospital at end of 1915.	YEARLY TOTAL.		Total cases treated. Remaining in Hospital at end of 1916.	
		Admissions.	Deaths.			Admissions.	Deaths.			Admissions.	Deaths.			Admissions.	Deaths.		
LOCAL DISEASES—continued:—																	
Diseases of the Eye:—																	
Conjunctivitis		6		6		29		29	1	6		6		1	149		150
Keratitis										1		1		3	16		19
Ulceration of cornea						3		3							9		9
Iritis						1		1							1		1
Optic neuritis															1		1
Cataract										1		1		1	8		9
Other Diseases						36		36		6		6			29		29
Diseases of the Ear:—																	
Inflammation						3		3		2		2			12		12
Other Diseases		1		1		5		5	1	1		2			12		12
Diseases of the Nose																	
		3		3		92		92	1	1		1			60		60
Diseases of the Circulatory System:—																	
Pericarditis															1	1	1
Endocarditis																	
Valvular, Mitral										2		2			70	4	70
Aortic															4		4
Tricuspid																	
Pulmonary															1		1
Arterial sclerosis																	
Aneurism						1		1							2	1	2
Other Diseases		7		7		6		6		2		2			10	1	10
Diseases of the Respiratory System:—																	
Laryngitis		1		1		1		1	1	1		1			5	1	5
Bronchitis		21	1	21	2	391		393	5	11		12	3		478	19	481
Broncho-pneumonia						4	1	4		1		2	2		110	19	112
Abscess of lung																	
Gangrene of lung																	
Emphysema										1		1					
Pleurisy		1		1	2	6		8		1		1			32	4	32
Empyema										1		1	1		2	1	2
Other Diseases		1	18	19	2	36		36	1	5		6	1		40	3	40
Diseases of the Digestive System:—																	
Stomatitis						4		4							10		10
Caries of teeth						18		18		3	3	6		1	8		9
Glossitis															1		1
Sore throat		8		8		4		4		4		4			11		11
Inflammation of tonsils		10		10		9		9	1	4		4			19		19
Gastritis		8		8	1	24		25		3		3		1	16		17
Ulceration of stomach															1		1
Hæmatemesis															6		6
Dilatation of stomach															1		1
Stricture of stomach																	
Dyspepsia		3		3	1	28		29		5		5			25		25
Enteritis		4		4						4		4			20	4	20
Appendicitis		1		1	1					4		4			3		3
Colitis						2		2		1		1					
Ulceration of stomach intestines																	
Sprue										1		1					
Hernia		2		2		1		1		3	9	12	1	1	23	1	24
Diarrhoea		14		14		81		81		12		12		14	472	19	486
Constipation		2		2		18		18		1		1		1	44		44
Colic		1		1	1	59		60		3		3			106		106
Hæmorrhoids		6		6		15		15	1	2	5	7		1	5		6
Pancreatitis																	
Hepatitis (Acute)		2		2		2		2		1	1	1			16	3	16
Abscess															4	1	5
Cirrhosis															3	1	3
Jaundice										2		2			3	1	3
Peritonitis										2		2			6	6	6
Ascites															12	4	12
Other Diseases		8		8		29		29	1	3		4		1	26	3	27
Diseases of the Lymphatic System:—																	
Splenitis						19		19	1	1		1		1	57	1	58
Inflammation of lymphatic gland		1		1		4		5		2		2		1	58	1	59
Suppuration of lymphatic gland		1		1		4		5		1		1		1	9		10
Lymphangitis															6		6
Elephantiasis															1		1
Other Diseases						1		1									
Diseases of the Urinary System:—																	
Acute nephritis						1		1		1		1			3		3
Bright's disease										1		1			2		2
Pyelitis																	
Calculus										2		2					
Renal colic						2		2		1		1					
Cystitis		4		4		1		1		1		1			3	1	3
Vesical calculus						1		1									
Suppression																	
Hæmaturia										1		1					
Chyluria																	
Other Diseases						3		3		1		1			2	1	2

TABLE VI.—RETURN OF DISEASES AND DEATHS (IN-PATIENTS) FOR THE YEAR 1916—(contd.)

DISEASES.	EUROPEAN OFFICIALS.			NATIVE OFFICIALS.			GENERAL EUROPEAN POPULATION.			GENERAL NATIVE POPULATION.			
	Remaining in Hospital at end of 1915.	YEARLY TOTAL.		Remaining in Hospital at end of 1916.	Remaining in Hospital at end of 1915.	YEARLY TOTAL.		Remaining in Hospital at end of 1915.	YEARLY TOTAL.		Remaining in Hospital at end of 1915.	YEARLY TOTAL.	
		Admissions.	Deaths.			Admissions.	Deaths.		Admissions.	Deaths.		Admissions.	Deaths.
LOCAL DISEASES—continued—													
Diseases of the Generative System:—													
Male Organs:—													
Urethritis												6	6
Gleet												1	1
Stricture												6	6
Prostatitis													
Soft chancre											1	7	8
Condyloma												7	7
Inflammation of scrotum											2	2	2
Hydrocele					3	3					1	10	11
Orchitis		1	1		6	6				1	58	59	1
Epididymitis		1	1	1							7	7	
Abscess of testicle													
Other Diseases		1	1		6	6		2	2	1	12	13	
Female Organs:—													
Ovaritis													
Ovarian cyst								1	1				
Endometritis													
Displacement of uterus											1	1	
Vaginitis								1	1				
Amenorrhœa											1	1	
Dysmenorrhœa													
Menorrhagia								1	1	2			
Leucorrhœa													
Abortion								2	2		1	1	
Delayed labour											5	5	
Post-partum hæmorrhage													
Retained placenta											3	3	
Premature birth											1	1	
Puerperal septicæmia											1	1	
Mastitis													
Abscess of breast													
Other Diseases		1	1								1	1	
Diseases of the Organs of Locomotion:—													
Osteitis				1	1	2	1		1		13	13	
Arthritis		4	4	2	4	4		3	3		31	31	
Spondylitis													
Bursitis											5	5	1
Other Diseases		2	2		89	89	2	3	3		152	152	1
Diseases of the Connective Tissue:—													
Cellulitis		8	8		8	8		15	17		3	195	198
Abscess		1	1		22	22	2	5	7		8	227	235
Elephantiasis													
Other Diseases				1		1		3	3		17	17	
Diseases of the Skin:—													
Urticaria		1	1		10	10					17	17	
Eczema		1	1		5	5		1	1		1	23	24
Boil		2	2	1	15	16		4	4		50	50	1
Carbuncle								1	1		2	1	3
Herpes											1	4	5
Psoriasis													
Oriental sore											2	105	107
Tinea					2	2						4	4
Scabies					14	14					8	119	127
Acne													
Prickly heat											1	1	1
Other Diseases		7	7		10	10		4	4		7	266	273
Injuries—General													
Local		22	22	2	383	1 383	4	2 50	52	2 37	1261	15 1298	28
Gun-shot Wounds											6	32	38
Surgical Operations					2	2		26	26	5	47	52	1
Tumours		1	1		1	1		3	3	1	13	1	14
Malformations								4	4				
Poisons		2	2					1	1		30	2	30
Parasites—Animal													
Protozoa											4	4	
Trematoda (Flukes)													
Cestoda—													
Tænia solium		1	1					1	1		6	6	
Tænia saginata											2	2	
Nematoda—													
Ascaris					1	1					5	5	
Tricocephalus dispar													
Trichina													
Dracunculus													
Filaria											1	1	
Strongylus											1	1	
Ankylostomiasis				1	1	2					4	59	63
Oxyuris													
Insecta—													
Myiasis													
Other Diseases		1	1		4	4					26	26	5
TOTAL	12	570	4	582	10	53	3337	6	3390	37	888	15	927
											9	331	12690
											1068	13021	375

* Recorded under respective diseases.

TABLE VII.
RETURN OF DISEASES (OUT-PATIENTS) FOR THE YEAR 1916.

DISEASES.	EUROPEAN OFFICIALS.		NATIVE OFFICIALS (including Asiatics).		GENERAL EUROPEAN POPULATION (NON-OFFICIALS).		GENERAL NATIVE POPULATION.	
	Male.	Female.	Male.	Female.	Male.	Female.	Male.	Female.
Infective Diseases:—								
Beri-beri	...	...	...	...	...	...	5	...
Cerebro-spinal fever	...	...	...	...	...	...	6	1
Chicken-pox	...	...	1	...	...	...	150	2
Cholera	...	...	...	...	...	...	...	...
Dengue	...	...	...	...	...	...	...	...
Diphtheria	...	...	...	...	...	...	...	...
Dysentery	20	3	13	...	32	15	1,774	143
Endocarditis—Infective	...	...	...	...	...	...	...	...
Enteric fever	...	...	...	...	...	...	...	...
Erysipelas	...	...	...	...	2	1	4	...
Gonorrhoea	2	...	...	...	12	...	832	12
Influenza	4	1	2	...	5	5	29	...
Kala Azar	...	...	...	...	...	...	...	...
Leprosy (a) Nodular	...	...	...	...	...	...	2	1
(b) Anæsthetic	...	...	...	...	...	...	3	2
Malaria (a) Tertian	44	...	119	...	100	43	8,730	525
(b) Quartan	...	...	...	...	...	...	49	...
(c) Estivo-autumnal	12	...	85	...	22	10	3,161	858
(d) Chronic malaria	...	...	1	...	...	...	35	9
(e) Blackwater	...	...	...	...	3	1	...	...
Measles	...	...	...	...	7	1	47	1
Malta fever	...	...	...	...	...	...	...	...
Plague	...	...	...	...	...	...	32	...
Pneumonia	...	...	...	...	3	2	87	9
Rabies	...	...	...	...	...	...	...	...
Relapsing fever	...	...	...	...	...	...	...	...
Rheumatic fever	1	...	21	...	12	...	792	121
Septicæmia	...	...	...	...	...	...	...	1
Trypanosomiasis (Sleeping Sickness)	...	...	...	...	...	...	...	...
Small-pox	...	...	...	...	...	...	76	11
Syphilis (a) Primary	...	...	...	...	...	...	168	8
(b) Secondary	...	...	...	...	3	...	400	104
(c) Inherited	...	...	...	...	...	...	47	22
Tetanus	...	...	...	...	...	...	1	3
Tuberculosis	...	...	1	...	...	...	46	6
Whooping cough	...	...	...	...	...	1	29	9
Yaws	...	...	...	...	...	...	160	39
Yellow fever	...	...	...	...	...	...	...	...
Mumps	...	...	...	...	...	...	95	1
Other Infectious Diseases	...	...	...	...	...	...	11	1
Intoxications:—								
Alcoholism	...	...	...	...	...	...	4	...
Morphinism	...	...	...	...	...	...	...	...
Others	...	...	...	...	...	...	...	...
General Diseases:—								
Anæmia	2	...	7	...	17	21	278	86
Anæmia—Pernicious	...	...	...	...	...	...	9	1
Diabetes	...	...	...	...	1	...	1	...
Exophthalmic Goitre	...	...	...	...	...	...	...	...
Gout	...	...	...	...	2	...	6	1
Leucocythæmia	...	...	...	...	...	...	...	...
Hodgkin's Disease	...	...	...	...	...	...	...	...
Myxœdema	...	...	...	...	...	...	...	...
Purpura	...	...	...	...	...	...	...	...
Rickets	...	...	...	...	...	...	2	...
Scurvy	...	...	1	...	...	...	34	2
Other General Diseases	4	1	16	...	28	21	117	10
Local Diseases:—								
Diseases of the Nervous System	22	1	65	...	64	40	2,762	150
Mental Diseases	...	...	...	...	1	1	2	1
Diseases of the Eye	7	...	60	...	23	8	2,395	614
" Ear	16	...	32	...	17	3	1,215	177
" Nose	33	1	107	...	17	9	965	54
" Circulatory System	1	...	...	...	4	6	52	4
" Respiratory System	30	...	190	...	94	37	12,814	997
" Digestive System	118	6	465	...	266	110	13,869	1,621
" Lymphatic System	1	...	19	...	9	2	888	66
" Urinary System	1	...	6	...	5	...	71	2
" Generative System	4	...	9	...	5	42	506	194
" Organs of Locomotion	14	...	59	...	25	5	2,906	118
" Connective Tissue	12	...	23	...	14	2	1,654	123
" Skin	28	1	88	...	58	23	5,887	756
Injuries:—								
General	...	...	1	...	3	...	49	6
Local	49	...	298	...	68	5	21,933	1,907
Gun-shot wounds	...	...	...	...	...	...	...	...
Surgical Operations	1*	...	...	...	3*	...	335*	51*
Tumours	1	...	...	...	...	1	16	1
Malformations	...	...	...	...	...	...	...	...
Poisons	...	...	1	...	3	1	23	3
Parasites—Animal	9	...	8	...	8	6	982	536
TOTAL	435	14	1,683	...	933	422	86,231	9,319

* Recorded under respective Diseases.

TABLE VIII.
NATIVES (INCLUDING ASIATICS).
RETURN OF INFECTIVE DISEASES TREATED AT THE VARIOUS HOSPITALS AND DISPENSARIES IN THE PROTECTORATE DURING 1915.

DISEASES.	Mombasa.	Mulindi.	Lamu.	Kakoneu.	Nairobi.	Machakos.	Makindu.	Kyambu.	Naiyasha.	Eldoret.	Elthama.	Nakuru.	Kabarnet.	Kacheliba.	Lokitama.	Kisumu.	Mumias.	Nandi.	Kericho.	Kisumu.	Gobwen.	Moyale.	Alexandria.	Port Hall.	Embu.	Meru.	Nyeri.	Riftal.	Total.
Beriberi ...	1	...	...	...	5	...	...	...	...	...	...	...	...	...	...	6	...	...	...	12	...	...	...	...	...	...	...	...	24
Cerebro-spinal meningitis ...	7	...	...	...	39	27	...	...	...	...	1	4	1	...	18	...	...	...	...	...	...	...	1	...	...	...	...	...	98
Chicken-pox ...	25	1	...	2	394	2	...	3	5	...	2	3	...	...	45	...	...	...	11	1	3	...	4	...	...	...	...	...	411
Dengue ...	...	...	...	...	1	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1
Dysentery ...	435	14	5	1	1,002	89	343	26	102	48	5	252	7	83	558	17	32	29	32	22	14	22	39	32	8	96	3	25	3,323
Enteric fever ...	30	...	...	...	13	3	68	1	...	2	1	13	...	5	16	1	...	...	...	...	...	1	...	6	1	1	...	1	191
Leprosy ...	1	...	...	1	...	...	...	2	...	...	...	...	...	...	5	...	...	...	...	...	...	...	...	...	...	...	...	...	14
Malaria ...	2,815	872	1,969	323	2,940	366	364	84	182	90	154	467	75	630	2,366	267	142	252	513	492	283	304	424	103	279	144	1,356	1	18,238
Blackwater fever ...	2	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	4
Measles ...	4	...	...	6	102	1	...	2	...	12	4	...	...	...	92	...	...	...	...	...	...	...	1	...	...	...	...	...	232
Mumps ...	2	...	...	...	150	2	...	...	2	...	...	...	10	...	3	...	2	4	...	...	3	...	...	1	...	2	1	...	182
Plague ...	...	...	...	...	126	...	...	1	...	...	...	1	...	...	33	...	...	...	...	...	...	...	...	...	...	...	...	...	161
Small-pox ...	9	...	...	62	421	5	12	5	3	2	...	18	...	5	440	79	...	...	...	...	...	...	...	31	30	19	27	1	1,172
Tuberculosis ...	5	...	...	18	94	...	2	2	...	...	...	6	...	2	165	22	...	...	...	...	...	...	...	8	7	...	9	1	341
Yaws ...	20	17	7	...	8	...	1	1	1	...	...	6	...	2	11	...	...	...	1	13	3	4	1	2	...	1	2	...	101
	11	...	...	...	6	...	1	...	...	...	...	...	...	...	3	...	...	...	1	3	1	2	...	...	...	1	1	...	31
	25	27	...	2	...	...	2	...	...	...	...	9	...	1	47	4	...	...	8	6	4	...	...	48	...	21	18	...	992
	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...

N.B.—This Table only gives the numbers *actually* treated at Government Institutions.

TABLE IX.

TABLES SHEWING DENTAL TREATMENT DURING 1916.

Appointments	1,442
Officials	400
Officials' families	145
Military	184
Asiatics, etc.	5
	734

The following conditions were treated:—

Caries simplex	972
Pulpitis	104
Abscess	116
Periostitis—	
Alveolar	6
Pyorrhoea	65
Erosion, marked	5
Exostosis—	
Pulp stone	2
Gingivitis—	
Acute	4
Chronic, no pus present	22
Antrum disease—	
Simple... ..	1
Compound	1
Necrosis	—
Fractures—	
Dents	2
Mandibular	—
Maxillary	—
Dislocations—	
Dents	2
Gangrene, following acute pulpitis or dislocation	2
	1,304

TABLE II

Summary of the results of the experiments on the effect of the concentration of the solution on the rate of reaction

Concentration of the solution	Rate of reaction
0.1 M	0.01
0.2 M	0.02
0.3 M	0.03
0.4 M	0.04
0.5 M	0.05
0.6 M	0.06
0.7 M	0.07
0.8 M	0.08
0.9 M	0.09
1.0 M	0.10

APPENDIX I.

NGOMA.

(A TRANSIENT INSANITY OCCURRING IN THE KIKUYU AND OTHER TRIBES IN BRITISH EAST AFRICA).

By Dr. J. H. THOMSON.

Ngoma may be defined as a transient insanity with symptoms akin to acute mania. During the past two years I have been much struck with the numbers of natives brought before me for the purpose of certifying with symptoms of acute insanity, but who generally recovered in from two days to a week. On inquiries among the Kikuyu I found that it was a well recognised form among them. I have seen it also among other tribes, but have had more chance of investigating among the Kikuyu. The word "Ngoma" means a spirit. In the Kikuyu religion they have one supreme God called Ngai, who lives on Mount Kenia. During life the Ngojo or ego of the Kikuyu is the expression of the man's individuality—his spirit; at death the spirit ceases and another is born called "Ngoma." Ngoma can be good or bad, depending on the life led by the person whom he arose from. The Ngoma or spirits live under the ground, in hyenas, in fires, etc., and may travel any distance. The bad spirits are always trying to do harm, especially to go into people and drive them mad. They are blamed for every sort of sickness and bad luck, but the natives reserve the name practically for this form of insanity. It is said that any sex or age may get an attack, but I have mostly seen young men suffering from it. As to its causation I have been unable to find out. I thought at one time that it might be due to undue sexual excitement, too much dancing and beer drinking, or the influence of some drug. It occurred to me also that it might be a form of masked epilepsy, as there is a good deal of epilepsy among the natives, but the symptoms in each appear too much the same and are not authentic.

The natives themselves give the cause, as I have said, to be possession by a spirit, or demoniacal possession. When the patient is brought in front of me he has usually a wild vacant look. He strikes attitudes and makes gestures. He very rarely knows where he is. He seems to have no fear of the European, and very often approaches the table to see what I am writing or examines with interest the various articles in the office, but obviously not knowing what he is doing. When asked his name at times he gives it, but mostly answers something else. He may talk all the time or sing, laughing to himself. He is rarely very violent, though if made to move against his will may become so. In the Asylums the first night he usually shouts, tears his clothes, and is filthy in his habits. He bangs against the door and walls of his rooms. He will probably be quieter next day, and be practically better, though during the night he may break out again. He may have a relapse again into his former symptoms during the day, but usually in less than a week he is entirely normal. On admission his bowels are usually constipated and his skin dry. He has no temperature and is physically normal otherwise. I have seen one or two cases when the attacks recurred after several days with complete recovery between. Apparently they suffer from delusions and hallucinations during the attacks, but I have been unable to find out their precise nature. When the patient recovers, on being asked how he felt he usually replies with a motion of his hand round and round his head, saying "The same as this," meaning that his head went round and round.

The description of Ngoma given by an intelligent Kikuyu is as follows:—

There are three stages. In the first stage the one affected talks too much. In the second stage he wanders about and in the third becomes violent, then he recovers.

The attack usually lasts two days, and may recur again several times up to a month, but the patient ultimately recovers. In the second stage he may wander for hours and go into lonely places. He goes on walking and walking and perhaps the spirit will leave him, and he will get better. In some cases the spirit leaves him during the day, but comes back at night and makes him become very violent. When asked why he is violent he often says that strange people round about are trying to take him away. In the violent stage he will go into fire and water, will bite his children, and even eat his faeces. In this stage he is very strong and can lift his hut. He can also speak languages he cannot speak ordinarily and will roar like a lion or call like a cuckoo. The spirit leaves him as suddenly as it came and he gets quite well, but it may come back in a few days.

It is very difficult to diagnose it when the patient is in the acute stage, as it is so like acute mania, but a couple of days will usually show if it is this form.

As regards prognosis I have been unable to find out if the patient has recurrent attacks during life, but I have known of no failures to recover from the acute attack.

The treatment is very simple. When taken to the asylum or when treated outside, they should have a strong purgative administered, salts, or one to two drops of croton oil. If very noisy and restless during the night a sedative can be given. They take their ordinary food readily, and they should be kept from harming themselves or others.

The native treatment is by beating drums outside the patient's hut to drive the spirit away. Sometimes they make linear cuts over the stomach and chest as a prophylactic.

Mr. C. W. Hobley, C.M.G., in the journal "Man," June, 1906, in an article on Kikuyu medicines says "Chanja Muka (Tree); made from the leaves of the tree. If a person is suffering from a disease called Ngoma, which is apparently a species of temporary madness, a little of this medicine taken with oil cures the patient." I have had no opportunity of trying this.

In conclusion, this temporary insanity has a medico-legal aspect, as probably homicidal and suicidal attempts are made during the attack.

Also, I think that Medical Officers in out-stations should bear in mind this temporary insanity and keep under observation sudden cases among natives for at least three days, because it has frequently happened that, when certified and sent to the asylum immediately, especially if they are two or three days on the journey, they arrive entirely recovered.

APPENDIX II.

NOTES ON THE PREVALENCE OF INTESTINAL PARASITES IN
EAST AFRICA.

BY DR. J. C. SHIRCORE.

During the last quarter of 1914 a short series of microscopic examinations of the faeces of natives complaining of intestinal troubles admitted into or attending at the Native Hospital, Mombasa, were undertaken.

Of 100 examinations 83 per cent. were positive, 17 per cent. negative, and the percentages of the different Ova present were as follows:—

<i>Ankylostomum duodenale</i>	...	...	...	46 per cent.
<i>Ascaris lumbricoides</i>	...	...	...	44 "
<i>Trichocephalus dispar</i>	...	...	...	43 "
<i>Tænia saginata</i>	...	...	...	29 "
<i>Schistosomum mansoni</i>	...	...	...	5 "
<i>Oxyuris vermicularis</i>	...	...	...	2 "
<i>Strongyloides stercoralis</i>	...	...	...	3 "

On further investigation during part of 1915 and 1916 a total of 1,500 examinations were made not only of African Natives but of Indians of the Expeditionary Forces and Washihiri Arabs of the Arab Rifles.

Total Number of Observations	1,500	Positive 51·8 %	Negative 48·1 %
Indians	720	Positive 31·7 %	Negative 68·2 %
Arabs	83	" 62·6 %	" 37·3 %
Africans	689	" 71·8 %	" 28·1 %

It is necessary to state at the outset that all the subjects examined, Indians, Arabs, and Africans, were as a whole under conditions inseparable from active service. The percentages of infections may, with certain reservations, therefore be considered to be somewhat higher than would be under ordinary conditions of life for each of the above races.

No special distinction was drawn in the selection of patients for examination, as was for those shewn in the first table, but cases admitted for all diseases were included.

Considering the Indians of the civilian class following occupations such as those of clerks, railway men, merchants, traders and shopkeepers, it may be said that they rarely suffer from intestinal parasites.

What the figures for these may be it is impossible to say, but one cannot recollect having seen more than three cases during a period extending over two years at Mombasa.

The factors governing this are, cleanly habits, thorough cooking of food, protection of the feet by boots, latrines and the sanitary use of them.

The comparatively high degree of infections among the Indian troops is without doubt due to the converse of these conditions holding in the field, and although the different infections were more or less evenly distributed for most areas and seasons of the year, the sick sent in from one area in particular during the latter half of 1915 infected with *Ankylostomiasis*, contributed materially towards raising the total percentage.

APPENDIX II.—continued.

The Arab and African—for the class of native admitted, fighting men, followers and carriers—cannot be regarded as abnormally high when compared with work done elsewhere on institutional and village infection under similar sanitary or climatic conditions, or both. African troops, police and domestic servants, suffer far less from helminthic invasion than the villager, whose infection is due to promiscuous defæcation in any patch of scrub he finds convenient. This habit is universal, and probably more than any other factor accounts for the widespread distribution of Ankylostomiasis. It is not in any way unlikely that in this manner the fæces of one or two infected individuals, may, in a very short time, be the cause of the infection of the inhabitants of a whole village or series of villages.

Some points with reference to the ages of those suffering from Ankylostomiasis may be of interest. Children and young adults, unless heavily infected or suffering from intercurrent disease, do not apply for treatment as frequently as one might suppose. Of this type those who do so do not as a rule refer their symptoms to any particular system, but give vague histories of not feeling well or of vertigo, and in the case of Police Askari, usually approach one with the idea of obtaining a charge or transfer to stations in their own native districts, the reasons advanced being that the local food, water, salt breezes, or the want of them, dependent on the area in which they are at the time serving, have in some abstruse manner seriously affected their health.

These also frequently develop mental symptoms taking the form of home sickness, melancholia and delusional insanity. In all such instances the fæces should always be examined.

The adult coast native possesses as a rule a full knowledge of the disease, and when applying for treatment states that he is suffering from Ankylostomiasis, or "Safura," as he calls it, and the clinical picture is usually characteristic.

Ankylostomiasis is not uncommonly a terminal infection in the aged.

The first table immediately below gives details of the different causal parasites observed. The other two tables show the percentages by classes, combined and individual, for the five chief infections :—

	Total.	Indian.	African.	Arab.
Total...	1,500	728	689	83
Positive	778	231	495	52
Negative	722	497	194	31
<i>Ankylostomum duodenale</i> ...	347	110	208	29
<i>Ascaris lumbricoides</i> ...	270	63	195	12
<i>Trichocephalus dispar</i> ...	313	49	235	29
<i>Tænia saginata</i> ...	168	41	120	7
<i>Schistosomum mansoni</i> ...	29	1	24	4
<i>Oxyuris vermicularis</i> ...	2	1	—	1
<i>Hymenolepis diminuta</i> ...	1	—	—	1
<i>Schistosomum hæmatobium</i> ...	3	—	2	1
<i>Strongylus subtilis</i> ...	4	3	1	—
* <i>Hymenolepis nana</i> ...	2	1	*1	—
<i>Strongyloides stercoralis</i> ...	2	—	2	—
Double infections ...	197	34	146	17
Triple infections ...	63	3	54	6
Quad. infections ...	10	—	9	1
Quint. infections ...	1	—	1	—

* This infection occurred in one of the 19 Cape Boys mentioned below.

APPENDIX II.—*continued.*

INDIAN, ARAB AND AFRICAN, COMBINED.

					per cent.
Ank. D.	...	...	...	Positive.	23.1
Asc. L.	...	...	...	"	18.0
T. dispar	...	...	...	"	20.8
Tæn. sag.	...	...	...	"	11.2
Schis. man.	...	...	...	"	1.9
Double inf.	...	...	...	—	13.1
Tri. inf.	...	...	...	—	4.2
Quad. inf.	...	...	...	—	.6
Quint. inf.	...	...	...	—	.06

				728 Indian.	83 Arab.	689 African.
				per cent.	per cent.	per cent.
Ank. D.	...	...	...	15.1	34.9	30.1
Asc. L.	...	...	...	8.6	14.4	28.3
T. dispar.	...	...	...	6.7	34.9	34.1
Tæn. sag.	...	...	...	5.6	8.4	17.4
Schis. man.	...	...	...	.6	4.8	3.4
Double inf.	...	...	...	4.6	20.4	21.1
Tri. inf.	...	...	...	.4	7.2	7.8
Quad. inf.	...	...	...	—	1.2	1.3
Quint. inf.	...	...	...	—	—	.1

African natives of the following tribes or sub-tribes were examined :—

Wa-Bugu.	Wa-Kala.	Wa-Nyassa.
Bukedi.	Kemba.	Nyika.
Bajun.	Konde.	Nandi.
Barawa.	Kavirondo.	Zegua.
Chaga.	Kikuyu.	Ziba.
Dama.	Kisii.	Nyoro.
Digo.	Lendu.	Nyamwezi.
Dengereko.	Lumba.	Nyema.
Embu.	Yao.	Pokomo.
Ganda.	Makua.	Pemba.
Giriama.	Masamba.	Rabai.
Swahili.	Murua.	Sawa.
Gazija.	Meru.	Sagara.
Kakameka.	Nubi.	Segeju.
Kokoa.	Nduruma.	Sebei.
		Somali.

19 Cape Boys are included in the whole total for Africans.

APPENDIX II.—*continued.*

It is not, of course, suggested that figures deduced from examinations varying between 25 to 150 members of any one tribe, examined at a distance from their homes, can be taken as an index of the general and tribal distribution of Helminthiasis in East Africa.

Nevertheless, curiously enough, in nearly every instance in which the distribution of a disease was previously known an examination of the last table shows that the natives from those areas return a proportionately high rate on infection to a remarkable degree.

For example, Bilharzia is well-known on the Upper Nile, and a reference to the table immediately shows true by recording a high percentage figure for the tribes therefrom, the Nilotic Nubi giving a return of no less than 30·7 per cent.

It has also been recognised for some time past that the natives settled in the Nyika country, along the course of the Kibwezi and Sabaki Rivers, are infected with the same disease, and this is borne out by the 6·8 per cent. for *S. Mansoni* for the Wakamba.

The Wa-Giriana—the following figures not included in this paper—are also infected, probably very heavily, for of 18 porters sent for physical examination, who appeared to be in good health, a history of previous hæmaturia was obtained from 9, and of 4 of these, who also stated that they could pass blood at the time, and which was done, the terminal spined ova of *S. Hæmatobium* were demonstrated in all.

On the other hand the high figures for the tapeworm infections, almost all *T. Saginata*, are due, I believe, to the personal habits of the native of certain tribes, *i.e.*, the Wa-Kavirondo, Kikuyu and Kisil, who do not cook their meat sufficiently, but eat it practically raw, and their results are therefore correspondingly raised.

Variations in the distribution of the various infections are thus not only dependent upon geographical, climatic and seasonal conditions, but likewise on the tribal and individual habits of the native.

Parasitic human helminthiasis occupies an important position in its bearing on the question of native labour, more especially with reference to its relationship to the inefficiency and mortality which occurs whenever such labour is concentrated on works, whatever they happen to be.

From the administrative outlook the problem for the present must apparently confine itself to the practical sanitation of townships, stations and areas, necessarily circumscribed and selected, on which native labourers are employed in large numbers.

Expenditure incurred for such special and temporary reasons, and directed towards the attainment of immediate results, is not only justifiable but economic.

No ultimate and permanent results could be anticipated with reasonable expectation of success were the same principle to be applied to large areas, except at an entirely prohibitive cost, unless there were at the same time a decided advancement in the standard of education and civilisation of the native.

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