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Government of Northern Rhodesia.

MEDICAL REPORT

ON

Health and Sanitary Conditions for the Year 1935.

Price 2*s.* 6*d.*

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Government of Northern Rhodesia.

MEDICAL REPORT

ON

Health and Sanitary Conditions for the Year 1935.

NORTHERN RHODESIA.

Medical Report on Health and Sanitary Conditions for the Year 1935.

SECTION I.

ADMINISTRATION.

(a) Staff.

EUROPEAN.

The authorised staff is given in Table I at the end of this report. The chief changes during the year are as below :

Appointments.

Dr. J. F. C. Haslam, Director of Medical Services.
Dr. A. J. Board, Medical Officer.
Mr. R. H. Thomas, Health Inspector.
Miss K. E. Butler, Nursing Sister.
Miss L. Brooke-Thompson, Nursing Sister.
Miss D. Swarbreck, Nursing Sister.
Miss E. A. Woolley, Nursing Sister.
Miss F. Kirch, Nursing Sister.
Miss I. C. M. Thomas, Nursing Sister.
Miss M. C. Adams, Nursing Sister.
Miss S. P. Rowse, Welfare Sister.
Mrs. F. D. Morton, Temporary Clerk.
Miss M. E. Bulterman, Ward Attendant.
Miss V. Elderkin, Ward Attendant.
Miss N. Celliers, Ward Attendant.
Miss S. Sandberg, Ward Attendant.

Resignations.

Miss W. K. de Meillon, Nursing Sister.
Miss Z. P. Ross, Nursing Sister.
Miss E. Glover, Nursing Sister.
Miss J. McKeurtan, Nursing Sister.
Mrs. F. Adam Thomson, Nursing Sister.
Miss J. A. Turner, Ward Attendant.
Miss S. Sandberg, Ward Attendant.
Mrs. F. D. Morton, Clerk (Termination of temporary appointment).

Once again it has to be recorded with regret that financial considerations have prevented replacement of the officers retrenched as an economy measure in 1933. The present situation as regards medically qualified staff may be put succinctly by saying that for a population of a million and a half, scattered over an area as big as France, there are fifteen Medical Officers, including any who may be on leave, one Surgeon, one Administrative Officer and no special health Officer. There are three sanitary inspectors employed by Government and three employed by local authorities. There are two Matrons and twenty-seven Nursing Sisters for hospitals totalling 132 European and approximately 975 native beds ; three Nursing sisters are employed by Government on welfare work and one is similarly employed by the Livingstone Welfare Society, which is subsidised by Government. There are also 98 native medical orderlies, 75 of whom are employed at stations where a Medical Officer is placed and 23 in conducting dispensaries for the most part at the stations of District Officers. These orderlies are, for the most part, very imperfectly trained.

The difficulties of this exiguous staff in meeting the task which confronts it are enhanced both by actual scarcity of roads and by the fact that many roads and tracks are impassable by motor traffic for months during the rains.

(*b*) Ordinances and Regulations affecting the Public Health enacted during 1935.

Medical Practitioners and Dentists (Amendment) Ordinance, 1935.
Central Board of Health, Appointment of
Public Health (Building) (Amendment) Regulations, 1935.
Public Health (Building) (Amendment) (No. 2) Regulations, 1935.

(*c*) Finance.

The following figures for the calendar year 1935 have been provided by the Treasury :

Total revenue of the Protectorate, £833,483 10*s*. 2*d*. of which sum £5,964 8*s*. 2*d*. was derived from the activities of the Health Department as follows :

	£	s.	d.
Hospital Fees	5,803	2	6
Medical Subsidies	37	10	0
Sale of Drugs and Vaccines	123	15	8
Total Revenue from Health Department	£5,964	8	2

Expenditure by Health Department :	£	s.	d.
Personal Emoluments	34,587	10	6
Other Charges	25,841	17	10
TOTAL	£60,429	8	4

This sum is equal to 7.49 per cent. of the Territory's total expenditure.

The cost to the Territory of the Health Department in 1935, *i.e.*, the Department's expenditure (£60,429), less revenue brought in (£5,964) was £54,465 which is equal to 6.54 per cent. of the total revenue.

SECTION II.

PUBLIC HEALTH.

General Remarks.

So far as can be judged from the reports of district medical officers, from those of officers of the Administration and from very imperfect statistical records, the health of the population showed in 1935 neither remarkable improvement nor notable deterioration. There were no major epidemics and no food shortage amounting to famine.

Comparative figures of the work of hospitals for the past five years are given below :

	EUROPEANS		NATIVES	
	In-patients	Deaths	In-patients	Deaths
1931	1,525	44	8,603	436
1932	1,442	37	7,046	362
1933	1,349	30	8,376	325
1934	1,483	25	9,078	398
1935	1,666	28	10,643	397

The following table shows the total cases treated in each of twelve native hospitals, number of deaths and mortality rates per cent. for the past three years :

	CASES TREATED			DEATHS			MORTALITY PER CENT.		
STATION	1933	1934	1935	1933	1934	1935	1933	1934	1934
Livingstone	1,194	1,274	1,408	72	99	102	6.03	7.77	7.24
Choma	240	247	264	9	10	6	2.75	4.04	2.26
Mazabuka	605	588	635	9	18	8	1.48	3.06	1.25
Lusaka	874	960	981	67	60	74	7.66	6.25	7.54
Broken Hill	1,070	1,515	1,833	57	62	58	5,32	4.09	3.16
Ndola	968	1,008	1,257	42	57	62	4.33	5.65	4.93
Fort Jameson	393	420	332	22	20	15	5.59	4.76	4.52
Kasama	475	285	299	11	9	12	2.31	3.15	4.01
Fort Rosebery... ...	426	399	416	6	11	6	1.40	2.78	1.44
Abercorn			146			1			.68
Mongu	1,147	1,138	1,061	19	34	39	1.65	2.98	3.67
Balovale	984	1,244	1,536	11	18	14	1.11	1.44	.91

(1) General Diseases.

There is little to record under this head but it is worth while to mention that the medical officer, Mongu (Dr. Gilbert), notes that rheumatic conditions in the Zambezi Plain are a major cause of incapacity. Syphilis deserves a special note. It is particularly prevalent in the western section of the Territory, namely in the Namwala District among the Baila people and in Barotseland. At Mongu native hospital out of 10,500 treated as out-patients over 3,000 suffered from syphilis and 261 others were treated as in-patients for that disease. Treatment is mainly by intra-muscular injections of bismuth-sodium-tartrate (sobita) and, as always, difficulty is experienced in getting native patients to complete a course of treatment, disappearance of obvious symptoms being their criterion of cure. Lack of a laboratory in the Territory deprives one of knowledge of the serum reaction after such treatment as is undergone. In general, native sufferers come freely for treatment of syphilis, regarding it no differently from other diseases. It is calamitous to note, from the report of one Medical Officer, that this readiness to confess syphilis and seek treatment is beginning to disappear under the teaching of certain missionaries. I have been informed that certain missionaries who profess to undertake medical work refuse to treat cases of venereal disease. The circumstances are being investigated and will be reported to Government.

Late nervous sequelae of syphilis are rarely encountered and stricture seems seldom to follow untreated or partially treated gonorrhoea. One Medical Officer suggests that in Europe over-treatment plays a real part in the causation of stricture.

Chest complaints are extremely common among the natives. Sometimes they are fairly trivial and of indefinite character. Frequently they are either associated with influenza or are pneumonic in character, and both the medical officers stationed in Barotseland refer to pulmonary tuberculosis being more common than is generally recognised. These conditions are referred to under infectious diseases.

(2) Communicable Diseases.

(*a*) Mosquito or Insect-Borne.

Malaria and Blackwater Fever.

Malaria was the chief cause of sickness among Europeans, the admissions to hospital numbering 457 as compared to 413 in 1934. Blackwater cases among Europeans numbered 8 with 4 deaths as compared with 6 cases and 3 deaths in 1934. The incidence of malaria among natives cannot be stated but it seems clear that adults possess a considerable degree of immunity, while malaria probably causes many deaths in early life.

Year	European Population	Deaths Malaria	Deaths Blackwater	Rate per 1,000
1931	13,846	22	19	2.96
1932	10,553	17	22	3.69
1933	11,278	3	20	2.03
1934	11,464	10	12	1.92
1935	14,000	8	13	1.50

A table showing European death-rates per 1,000 Europeans from malaria, blackwater fever and total all causes for the past 20 years is subjoined as usual but I doubt its value since the European population is not estimated but guessed.

Year	Blackwater Fever	Malaria	Total All Causes
1916	4.64	1.85	18.11
1917	3.23	.92	18.93
1918	2.80	.83	17.80
1919	2.00	2.40	28.40
1920	2.40		12.80
1921	2.70	1.80	15.40
1922	2.75	.82	14.30
1923	3.40	1.05	13.42
1924	1.80	.45	9.04
1925	1.52	1.30	13.70
1926	2.14	.71	11.10
1927	1.23	1.10	9.89
1928	2.65	.53	12.87
1929	1.00	1.10	9.32
1930	1.66	2.08	13.58
1931	1.37	1.59	15.16
1932	2.08	1.61	11.08
1933	1.77	.26	9.13
1934	1.04	.87	9.42
1935	.92	.57	7.14

The malaria and blackwater fever admissions to Government European hospitals, with deaths, for the past five years are shown in the following table :

Station	1931		1932		1933		1934		1935	
	Malaria	Black-water	Malaria	Black-water	Malaria	Black-water	Malaria	Black-water	Malaria	Black-water
Livingstone ...	216 (2)	4 (2)	124	7 (4)	79	5	111	—	102(1)	1 (1)
Lusaka	88	5 (2)	111	7 (3)	120	—	65 (1)	1	85	3 (1)
Broken Hill ...	131 (1)	4 (1)	82 (1)	7 (2)	53	5 (1)	111	1	77	1 (1)
Ndola	41	1	70 (2)	—	87	4 (1)	108	4 (3)	178	3 (1)
Kasama	6	—	7	1	3	—	7 (1)	—	1	—
Mongu	1	—	—	—	—	—	1	—	1	—
Fort Jameson ...	15	1	11	—	3	—	10	—	13	—
Totals ...	498 (3)	15 (5)	405 (3)	22 (9)	345	14 (2)	413 (2)	6 (3)	457 (1)	8 (4)

NOTE.—Figures in brackets indicate fatal cases.

Relapsing Fever.

Tick-borne relapsing fever is less common than one would expect from the frequency with which *O. moubata* is encountered. The total of cases recorded in 1935 was 131 with one death. In general it yields readily to neosalvarsan. Mongu, in Barotseland, is a centre of this disease ; there were 94 native cases and one European case, this latter proving very resistant to treatment.

Sleeping Sickness.

The total cases recorded for the year 1935 was 49 with 14 deaths, compared with 13 cases and one death in 1934. Towards the end of the year it became apparent that a number of casse were occurring in the Mumbwa area not previously regarded as a home of endemic trypanosomiasis and not recorded as such in standard books on tropical disease. This was investigated in December by Dr. Gilkes, whose report is printed as an appendix to this report. *Glossina morsitans* is the vector in this new area and 29 cases were recognised and recommendations were made with regard to placing of native villages. The enthusiasm and skill of the district officers at Mumbwa enabled a small hospital to be built at that station at negligible cost, a competent native medical orderly administers treatment and the medical officer of Lusaka station visits once a month. This monthly visit is facilitated by there being at Mumbwa an excellent all-weather landing ground for aeroplanes. Seven cases were discovered at Tafuna's village in the Abercorn District near Lake Tanganyika. There is no previous record of cases in that village but this has long been recognised as a dangerous area where *Glossina palpalis* is the vector.

(3) INFECTIOUS DISEASES.

Notifications were as follows :

Diseases	Europeans	Deaths	Natives	Deaths
Variola	—	—	32	2
Cerebro-spinal fever ...	—	—	11	4
Meningococcal meningitis ...	—	—	3	2
Typhoid fever	10	1	38	6
Paratyphoid " A " ...	1	—	—	—
Trypanosomiasis	—	—	49	14
Influenza	—	—	176	—
Scarlet fever	3	—	—	—
Undulant fever	1	—	—	—
Relapsing fever	2	—	129	1
Diptheria	2	—	—	—
Measles	44	—	1,003	39
Dysentery balantidial ...	—	—	1	—
Dysentery bacillary ...	7	—	12	3
Dysentery amoebic ...	19	—	77	5
Dysentery	3	—	49	—
Chickenpox	16	—	135	—
Yaws...	—	—	383	—
Tuberculosis—pulmonary	2	2	59	14
Tuberculosis, non-pulmonary ...	—	—	23	5
Leprosy	—	—	189	1
Tropical ulcers	—	—	534	—
Whooping-cough	77	—	59	1
Anthrax	1	—	2	—
Mumps	2	—	2	—
Puerperal fever	—	—	1	1
Erysipelas	1	—	—	—
Rubella	2	—	—	—

Enteric Group.

The hospital incidence of this group is given in the table below :

	1933				1934				1935			
	Europeans		Natives		Europeans		Natives		Europeans		Natives	
	Cases	D'ths	Cases	D'ths	Cases	D'ths	Cases	D'ths	Cases	D'ths	Cases	D'ths
Livingstone ...	5	2	31	5	13	—	8	1	—	—	—	—
Lusaka... ...	—	—	—	—	1	1	—	—	—	—	1	1
Broken Hill ...	2	—	1	1	6	—	—	—	5	—	—	—
Ndola	1	—	—	—	—	—	—	—	2	1	3	2
Mongu	—	—	—	—	1	—	1	—	—	—	—	—
Balovale ...	—	—	—	—	—	—	5	—	—	—	—	—
Fort Jameson ...	—	—	—	—	—	—	—	—	—	—	1	1

Influenza.

Influenza epidemics occurred as follows : In Broken Hill, in August and September, where neither the extent nor virulence of the disease was considerable ; in Fort Jameson in mild form but accompanied in many cases by symptoms of cholecystitis in August, and in severe form with painful colitis and associated orchitis in November and December ; in the Fort Rosebery medical district along the course of the Luapula River from Kapalala to Chiengi and on Lake Bangweulu in the latter part of the year with high native mortality ; in mild form in the Kasama district ; in the Abercorn area in mild form in August ; in the Mongu and Senanga areas in the first quarter of the year with many deaths ; in the Balovale area, where influenza is described by the medical officer as the chief cause of mortality, in the first quarter of the year.

Measles.

Measles occurred in epidemic form as follows : In the Mkushi area of Broken Hill medical district with appreciable mortality among the very young from August to September ; on the Luapula River in Fort Rosebery medical district in March with much eye trouble and a considerable amount of residual blindness ; round Fort Rosebery itself in August ; at Kapalala in October ; east of Lake Mweru, in the Abercorn medical district in several epidemic waves ; in the southern part of Barotseland from January to April the disease was wide-spread and severe with many infant deaths, 680 cases with 17 deaths (all under two years) being treated in Mongu native hospital. On several occasions reports of smallpox with high mortality have been found on investigation to refer to measles, the character of the rash as seen in natives giving rise to this mistake.

Smallpox.

No variola major was seen during the year. Thirty-two cases of variola minor were reported. 12,239 vaccinations were performed.

Plague.

Suspected plague was reported from the Luangwa Valley east of Chinsali. The nearest Government medical officer was in hospital with chickenpox at the time ; the nearest Medical Missionary was unable to undertake the journey to the suspected village ; there is no health officer in the Service ; and no medical officer could be spared from his station long enough to make investigations in the remote area concerned, which is some 500 miles from Lusaka and nearly 100 miles from any motor road. Accordingly there is doubt as to what really occurred. Reports eventually received from a district officer seemed to negative a diagnosis of plague. Those who died did so within twenty-four hours of being taken ill, and those who recovered did so in three or four days. It is true that natives are said to have reported prevalence of rats and of fleas, but I think these reports were in response to leading questions, and from one chief a statement was obtained that just before the disease broke out, rats began to bite the feet of villagers. Native reports stated that no buboes occurred but a native medical orderly from Lubwa Mission says that he got pus from a bubo and in a dried film of this, Dr. Brown of the same mission thinks he found the plague bacillus. Huts were burnt in the suspected village and the disease, whatever it was, died out.

Pneumonia.

Pneumonia continues to be a serious cause of morbidity and mortality among the native population. Dr. Fisher, a medical officer of the Rhokana Corporation, reports a diminished mortality among pneumonia cases since all employees have been treated for hookworm infection. The mortality from pneumonia in hospital-treated cases is tending to diminish as treatment is sought earlier but many still come to hospital already moribund.

Tuberculosis.

Both medical officers stationed in Barotseland state that pulmonary tuberculosis is commoner than is generally recognised. Tuberculous adenitis is also seen and a study of the real incidence of the disease in its various forms and of the type of bacillus responsible is highly desirable.

(4) Helminthic Diseases.

We possess no accurate knowledge of the distribution and degree of seriousness of these infestations. The medical staff of the Rhokana Corporation examine the stools of all labour recruits for evidence of hook worms and find the eggs in 31.53 per cent. of those examined. On the whole infestations in this Territory appear to be light, and when correlated with physical condition, tend to support the view that hook-worm infestation exists without concurrent existence of anything which can justifiably be called hook-worm disease. The medical officers of Kasama and Livingstone report the presence of hook-worm eggs in the stools of a high proportion of patients admitted to hospital for other complaints.

Schistosomiasis is reported as prevalent in the Livingstone and Mazabuka medical districts. No exact knowledge is available of the sources of infection but it seems certain the Maramba River near Livingstone is heavily infected. Both *S. mansoni* and *S. haematobium* are encountered.

Infection by taenia is specially referred to by the two medical officers stationed in Barotseland. At these two medical stations, Mongu and Balovale, one sees in hospital, even more frequently than elsewhere, cases of severe burning caused by falling into the fire during some form of fit. One cannot help thinking of the possibility that the fits are not truly epileptic but due to the cystic stage of a tape-worm in the brain. I was interested to learn in Southern Rhodesia, where autopsies are easier to procure than in this Territory, that the discovery of taenia cysts in the brain in cases of fits is by no means rare.

(5) Rabies.

The frequency of rabies among dogs and the frequency with which persons are bitten by rabid animals shows a disquieting tendency to increase. The following figures are taken from a recent report by the Director of Veterinary Services :

	1929	1930	1931	1932	1933	1934	1935
Number of outbreaks reported	6	14	7	14	24	26	33
Number of cases proved positive	4	9	5	11	14	17	8

VITAL STATISTICS.

(1) Native Population.

The following estimates have been given of the native population in recent years :

1930	1931	1932	1933	1934
1,331,231	1,372,235	1,382,705	1,371,213	1,366,425

Beyond saying that the native population is at present about a million and a quarter, no estimate worth quoting is obtainable. It is valueless therefore to attempt to calculate rates, and no figures of total births and deaths are obtainable.

(2) European Population.

The European population is somewhere about 14,000. It fluctuates constantly and at times changes quickly. Immigrants are recorded but not emigrants so that no clear estimate is possible. European births registered during 1935 numbered 283 (male 142, female 141). European deaths numbered 100 in 1935. The chief cause of death among Europeans was blackwater fever, which caused 13 of the 100 deaths. The deaths, according to age periods, for the past five years are shown in the following table :

	Under 1 year	1-5	6-15	16-25	26-35	36-45	46-55	56-65	66-75	Over 75 years	Unknown	Total
1931	28	21	4	21	31	27	36	24	13	–	5	210
1932	24	7	2	12	21	23	10	11	5	2	–	117
1933	13	4	6	13	13	6	18	13	13	2	2	103
1934	15	11	2	8	10	13	18	18	7	4	2	108
1935	15	5	8	8	13	11	14	16	6	2	2	100

Causes of Deaths	No.
Premature birth	6
Malformation of heart	1
Valvular disease of heart	6
Myocarditis	2
Malaria	8
Blackwater fever	13
Tuberculosis—pulmonary	3
Gastro-enteritis	3
Dysentery—bacillary	1
Dysentery (type not stated)	1
Cancer (all forms)	5
Sprue	1
Pneumonia (all forms)	11
Aortic aneurysm	1
Influenza	1
Hydrocephalus and convulsions	1
Gastric ulcer	1
Typhoid fever	1
Puerperal peritonitis	1
Arterio-sclerosis	1
Senility	1
Meningitis—meningococcal	1
Cystitis and pyelonephritis	1
Acute nephritis	1
Intra-cranial haemorrhage	1
Marasmus	1
Bronchitis	1
Protracted labour	1
Accidents :	
Killed by buffalo	1
Mauled by lion	1
Wound in neck	1
Accidental	1
Drowning	1
Haemorrhage following severe crushing—injury of left thigh	1
Blasting accident	1
Mine accident	1
Gunshot wound	1
Motor accident	2
Concussion due to blow on head	1
Potassium cyanide poisoning	1
Various :	
Natural causes	1
Pulmonary haemorrhage	1
Heart failure	5
Acute dilatation of heart	1
Toxaemia	2
Senility	1
Total	100

Infantile Mortality.

There were fifteen deaths of infants under the age of one year, the causes being as follows :

Cerebral malaria	1
Premature birth	6
Broncho-pneumonia	2
Malformation of heart	1
Gastro-enteritis	1
Protracted labour	1
Marasmus	1
Influenza	1
Intra-cranial haemorrhage	1
Total	15

(3) **European Officials.**

	European						Native
	1930	1931	1932	1933	1934	1935	1935
Total number of officials resident ...	621	678	750	650	540	552	2,595
Average number of officials resident	558	554	598	525	452	466	2,409
Total number on sick list	232	343	352	239	238	246	2,252
Total number of days on sick list ...	1,964	3,334	3,661	2,204	1,991	2,547	15,143
Average daily number on sick list ...	5.66	9.13	10.03	6.03	5.45	6.97	41.48
Percentage of sick to average number resident	1.01	1.64	1.67	1.14	1.20	1.49	1.72
Average number of days on sick list for each patient	8.89	9.72	10.40	9.22	8.36	10.35	6.72
Average sick time to each resident ...	3.52	6.02	6.12	4.19	4.40	5.44	6.28
Total number invalided	—	2.	2.	2.	1.	1.	16.
Percentage of invalidings to total residents	—	.29	.26	.31	.18	.18	.62
Total deaths	1.	5.	5.	1.	—	2.	19.
Percentage of deaths to total residents	.16	.73	.66	.15	—	.36	.73
Percentage of deaths to average number of residents	.18	.92	.83	.19	—	.43	.78

SECTION III.

HYGIENE AND SANITATION.

General Review of Work Done and Progress Made.

(1) Preventive Measures.

Financial considerations have limited and almost eliminated active measures. The Department's resources for active anti-mosquito work were £975 for the Territory ! Other work not amounting, however, (except at Ndola) to more than maintenance of minimum standards was done by the two municipalities and various town management boards and district commissioners. At Ndola special drainage work in the Itawa dambo were undertaken by the Ndola Municipal Council at a cost of £240, half of which, along with supervision by a health inspector, was provided by Government.

Medical officers of stations act as medical officers of health of their areas but find little time for active work in the preventive sphere, nor have they at their disposal subordinate staff or funds to permit of their doing more than try to maintain the *status quo*. The absence of medical officers devoted to the health branch of the Service, the existence in the whole Territory of but three European sanitary inspectors employed by Government and three employed by local authorities, and the non-existence of Africans trained in sanitary work are together sufficient explanation of one's inability to claim much " work done " or " progress made " in hygiene and sanitation.

There is nothing to record regarding specific preventive measures against the various bacterial and helminthic diseases which occur in the Territory except 12,239 anti-smallpox vaccinations. It is astonishing to me to find so complete a disregard of inoculation as a preventive of the enteric fevers as is encountered in Northern Rhodesia. Few Europeans seek this protection for themselves and inoculation of native employees is not practised on the copper mines or at the Broken Hill mine. The incidence of the enteric group is, however, not heavy ; 10 European and 38 native cases occurred in 1935.

(2) General Measures of Sanitation.

In the new capital site sewage disposal is by a water-borne system with treatment in septic tanks and disposal of effluents in soakage pits locally known as " French drains." There have been some difficulties with the water-carriage system and the septic tanks among the African community in the Personal Servants' Compound and the Governor's Village. These have been mainly due to unfamiliarity with the arrangements and to persistence in the use of unsuitable materials, from stone to corn cobs, for purposes for which more enlightened folk use toilet paper. From 1st January, 1936, the new capital site will become part of the area under the Town Management Board of Lusaka which, as Local Authority, will have the duty of administering the Public Health Ordinance. With very restricted finances, practically no staff and a minimum of experience the Board will experience difficulties in discharging their health responsibilities. They will, however, receive every assistance which Government's Health Department, with its own restricted resources, can give.

Throughout European residential districts of the Territory, refuse-disposal, surface drainage, offensive trades, water supplies and the clearance of bush and undergrowth are fairly well cared for.

The Lusaka water supply from boreholes has continued to be adequate in quantity. Storage capacity is very limited but this is made up for by a large reserve of pumping and power units. The raw water shows evidence of sewage contamination but analysis after treatment by the new chlorinating

plant installed late in the year showed the complete efficacy of the plant in rendering the water safely potable. The softening plant proved to be too small and too costly in operation to be a satisfactory means of softening the very large quantity of water used and the water is now supplied with all its natural hardness. The bore-holes would probably supply ample water for the old Lusaka Township but financial considerations have (hitherto) prevented the provision of the additional storage capacity and piping which would be necessary to extend to old Lusaka the water supply enjoyed by the new capital area.

In general, the number of sanitary inspections made falls far below what is desirable but with only six inspectors in the Territory, this is not surprising.

(3) School Hygiene.

Government medical officers are supposed to inspect twice a year the European children of all schools controlled or supervised by Government. This duty seems to have been overlooked by several medical officers in 1935 but, in the inspections made, the effects of chronic malaria were noted, many cases of enlarged tonsils and some lack of cleanliness.

The arrangements for dental inspections of European school children are in advance of other branches of preventive medicine and the money spent thereon forms a disproportionately high part of the expenditure of the Department if one has regard to the small fraction of the population benefitted and the numerous things being left undone. It is therefore the more regrettable to have to record the pronounced neglect of European parents to have carried out the dental treatment recommended by the dental inspector. Government gives the inspection free and those able to pay for treatment are expected to do so, but poverty is no barrier to receiving the necessary treatment as a certificate of inability to pay given by the district officer will secure free attention according to the school dental practitioner's recommendation.

(4) Labour Conditions.

Organised recruiting of native labour for employment within or without Northern Rhodesia is practically in abeyance, the supply coming forward voluntarily both for industry and agriculture being greater than the demand. The housing of employees by the industrial concerns of Northern Rhodesia is good on the whole. I would like to record my agreement with the praise recently bestowed, by the Commission of Enquiry into the copper-belt troubles, upon the housing of certain of their native employees by the Roan Antelope Mine at Luanshya. By approximation to native village circumstances in general arrangement, and by divergence therefrom in hygienic conditions, the management have come within reasonable measure of the ideal. On the whole it is embarrassing to an inspecting Government officer to survey the conditions under which the native employees of the chief industries of Northern Rhodesia live ; they are so greatly superior to the conditions obtaining in Government and town locations. The difference between the two sets of conditions is due in great measure to financial considerations and also to the degree of absolutism which an industrial concern can exercise within its own domain.

Far too many quarters provided by Europeans for natives, and the corrugated iron shacks for servants on Government officers' stands at Livingstone are a bad example, are frankly degrading and definitely worse hygienically than the grass huts which natives build for themselves in the bush. There is welcome evidence, however, of a tendency to think of native housing in terms of African townships rather than in terms of " compounds " and " locations." Even when the latter terms are still employed there is a tendency to get away from the dreadful rows of barrack rooms, unfortunately still to be seen, and to strive for provision of individual dwellings in which the occupant can make something of a home. One " life " of Cecil Rhodes speaks of him as the originator of the " compound." If this is so it must be entered on the debit side of any catalogue of Rhodes's achievements for Africa.

The medical care of industrial employees reaches for the most part a high level. At the three large copper mines and at Broken Hill there are arrangements which are complete and excellent. I am less satisfied with the arrangements of the Zambesi Saw Mills in respect of the several thousand employees in their forest camps. The construction of a landing ground, however, has enabled more frequent visits to be made by the Company's part-time medical officer, and the General Manager seemed to take kindly to my proposal that he should station a trained nurse at the main camp.

I do not feel satisfied that agricultural employees get the medical care that they need. The European employers of agricultural labour have been going through hard times and, I think, scarcely fulfil the duty which the law places upon them of providing and paying for treatment of their native employees. Natives are never too willing to go to hospital when sick and it is perhaps not unnatural to take advantage of this unwillingness when their going to hospital would entail the paying of fees by the employer. I would like to see all agricultural employers of less than 100 labourers enjoy the privilege of having their employees treated free in Government hospitals.

There is no evidence that any mining at present carried on in Northern Rhodesia gives rise to silicosis. Health conditions on the mines are superior to those in native villages and the health of the employees improves during their employment.

(5) **Housing.**

The new capital was opened at Lusaka on 3rd June, 1935. The town-planning was by then complete and also the housing programme arranged for that date. The new houses for Government officers are of a type unusual in tropical countries. Individual houses are of two storeys and without verandahs, and there are two-storeyed blocks of flats, each flat consisting of bedroom, sitting-room, kitchen and bathroom. I know of no house in Northern Rhodesia which could be described as properly mosquito-proofed, though some houses built by Government have wire mesh at all windows. The new houses at Lusaka and the flats make no pretence at mosquito-proofing, a circumstance which, in my opinion, is contrary to the teachings of experience and of science and greatly to be regretted. In the newer houses one or two small windows in an odd room or two are supplied with wire gauze but since these gauzed windows alone provide quite inadequate ventilation, the gauze serves no useful purpose and only tends to confirm the mistaken view that mosquito-proofing keeps out air and lets in mosquitoes. Government House has no mosquito gauze at all. I feel that an explanation is necessary how, at this date, in a new capital, on a malarious site, real mosquito-proofing came to be omitted. I find that omission of mosquito-screening (which had apparently been decided on) was proposed by the Acting Governor in 1932. The Health Department advised that, given adequate money and staff for anti-malaria field work, mosquito-proofing might be omitted. If avoidance of unnecessary expenditure was the motive for proposing omission of mosquito-proofing as has been suggested, it is relevant to remark that the comparative costs of proofing and of adequate anti-malaria field work appear never to have been computed. On the abolition of its sanitation branch in 1933 the Health Department retracted the former advice and advised mosquito-proofing but later, on receiving from Government a promise of every assistance to control mosquito breeding "short of providing money", unfortunately agreed that "mosquito netting for the houses need not be insisted upon at present". The present screening of a window or two in a few rooms was quite frankly aimed less at mosquitoes than at larger but less dangerous flying pests.

(6) **Food in Relation to Health and Disease.**

In Livingstone, Lusaka, Broken Hill, Ndola and on the copper mines there is adequate inspection and control of food. Elsewhere there is little inspection but there is no reason to think that food, which is deficient in value or dangerous in quality, is at all commonly supplied to the public.

Milk supplies are nowhere to be regarded as safe without either boiling or pasteurisation. From time to time there is agitation for compulsion to be used to induce native milk vendors to place their milk in special, clean bottles. Sometimes this agitation arises from the too successful competition of natives in the milk trade; sometimes from genuine horror of the conditions under which natives hawk milk. Northern Rhodesia is still far from the time when raw milk from any source, native or European, can be regarded as safe and the placing of dirty milk in smart, clean bottles is not only of no advantage but positively dangerous because it conveys a false sense of safety. A commercial house in Lusaka retails pasteurised milk and cream, and the management of Mufulira mine is to be congratulated on an arrangement for central pasteurisation of all milk sold on the mine property.

So far as concerns competition between European and native producers of milk and milk prot ducts, one medical officer reports that the two European suppliers in his area cannot meet the demand. Another medical officer, reporting from one of the chief areas of white agricultural settlement, says: "Three years ago the Boma herd was dispersed in order to encourage milk production by settlers. A European made a half-hearted attempt to establish a milk round and then gave up. We are all dependent on milk produced by natives under native conditions and sold in whiskey bottles. Butter is made locally by two Europeans. One farmer makes it with sufficient care to be comparatively safe and appetising. The other produces a very inferior article which quickly becomes rancid. It is not safe at any rate for children".

There is, as is well known, a definite shortage of food from time to time in native areas. Nothing amounting to famine conditions appears to have occurred in 1935 but there was really serious shortage among those living east of Lake Mweru late in the year, and a definite shortage during the last quarter in the Balovale district of Barotseland. In 1935 the cause of shortage seems to have been insufficient planting rather than deficient rainfall or the depredations of locusts.

MEASURES TAKEN TO SPREAD THE KNOWLEDGE OF HYGIENE AND SANITATION.

In all schools, native and European, lessons in hygiene are given and the same subject is taught in the special curricula of those in training to be teachers.

In the Jeanes School, where promising individuals are trained with a view to their being centres of light and culture on return to their villages, a special feature is made of teaching practical village hygiene. From reports I have received of the activities of some of these Jeanes teachers I think that their work, at least as regards hygiene, is admirable and a credit to the Department of Native Education who have given the instruction.

TRAINING OF SANITARY PERSONNEL.

Hitherto there has been scarcely any training of sanitary personnel. A few boys have been enabled to pick up the elements of mosquito identification and mosquito control, but their aptitude suggests that success will follow systematic training, which I anticipate will be initiated in 1936.

Recommendations for Future Work.

Without appreciable increase of expenditure and increase of staff no great progress in hygiene and sanitation is possible but I think every effort should be made to establish as soon as possible, in the main centres of population on the railway line, a standard of sanitation more nearly approximating to accepted standards at home. Some improvement can be effected without much expense but this will entail realisation by local government authorities that they have not only certain powers but many duties conferred upon them by the laws under which they exist. Some amendments of the law relating to public health and local government are under consideration by the Committee set up by the Governor to consider such matters, and these, if enacted, will assist and ease actual working when funds permit expansion of activities.

The important recommendation which I wish to make in respect of hygiene and sanitation and in connection with every branch of medical work in the Territory is the provision, as a matter of real urgency, of a laboratory. Without a laboratory the whole work of the Department, whether concerning curative or preventive medicine, is conducted in the dark and the Department's officers operate under an impossible handicap ; a handicap, indeed, suffered by no other British dependency of any consequence.

SECTION IV.

PORT HEALTH WORK AND ADMINISTRATION.

The only port in the Territory is Mplungu on Lake Tanganyika, visited monthly by a lake steamer belonging to the Tanganyika Government. The Medical Officer, Abercorn, visits the ship and performs the ordinary duties of a port health officer. Nothing requiring record occurred in the course of this duty in 1935.

SECTION V.

MATERNITY AND CHILD WELFARE.

The welfare clinics established at Livingstone, Lusaka, Ndola and Luanshya have been maintained.

That at Livingstone is managed by the local District Nursing and Welfare Association and receives a grant of £200 per annum from Government and subsidies from the Beit Trustees, Rhodesia Railways and Livingstone Municipality. The Government Medical Officer stationed at Livingstone, in his capacity as medical officer of health of the Municipality, directs the clinic's operations. In addition to the strict functions of a maternity and child welfare clinic, the association provides treatment for minor ailments among natives at the Maramba dispensary.

	Cases	*Attendances*
Maramba Dispensary (Natives) ...	1,323	12,693
Native Welfare Clinic	310	1,001
European Welfare Clinic	89	421

The records show a gratifying increase in the use made of the services provided.

During the year the Lusaka Child Welfare Association was reorganised under the name of The Lusaka and District Welfare and Nursing Association. Up to 11th March, 1935, the post of welfrae nurse was filled by Mrs. F. A. Thomson, M.R.C.S., L.R.C.P., who had experience of this work in the Gold Coast and who put the work of both European and native clinics on an excellent footing. In September it was possible to appoint for this work a whole time nursing sister who is a member of the Territory's nursing service. The local association provides transport for the nurse, and Mr. Egerer, a contractor who had been engaged on the new capital works, most generously provided, free of cost, the labour required for the erection of a new building for the European clinic. The reorganisation of the local association took place under the presidency of Lady Young, whose energy and enthusiasm gave such impetus to the work that funds were contributed in generous measure. The new clinic was furnished and set agoing, a new vanette car was provided for the nurse and a new era of effort for child welfare work among the Europeans of the Lusaka district was begun and has been maintained. The district nursing side of the work has developed rapidly and in this the ability of the nurse to speak Afrikaans has assisted notably among the farming community. Several farmers in the districts round Lusaka have given facilities for holding periodical branch clinics at their farms, which are attended by both Europeans and natives from the neighbourhood.

It was a condition of the provision of a nurse paid by Government that both native and European work should be conducted. The European side developed so rapidly after the reorganisation that one nursing sister could not cope with the whole work. The situation has been met, however, by the Lusaka Town Management Board who, from Beer Hall Funds, have built and equipped a separate native clinic and have appointed a full time nursing sister to conduct it. This native clinic was opened

in June by His Excellency the Governor. Besides maternity and child welfare work, it does a thriving general medical practice, being visited daily by the medical officer, Lusaka. Further, every Friday there is held a women's clinic for veneral disease under Dr. F. A. Thomson, working as a part-time Government servant.

The European clinic at Ndola continues to flourish and is increasingly appreciated. Again thanks are due to Dr. E. S. Adderley who, in the midst of a busy private practice, finds time to act as honorary physician.

The native work conducted at the clinic in the town location has increased steadily. The confidence of the people has been gained and the only difficulty is to keep up with the needs and demands of the native community.

For the success of both the European and the native work in Ndola, particularly the latter, very great credit is due to Miss Hodnett, the Government nursing sister in charge. Her untiring work, her firmness combined with patience and her acquisition of colloquial Chiwemba speech have completely won the confidence of the native community who appreciate and make almost over-full use of her services.

Figures for the year are as below :

European Clinic.

Number of patients :		
Children over 1 year	105	
Infants	53	
Number of attendances	4,705	
Number of visits to families...	622	

Native Clinic.

Number of patients :		
Men	1,236	Total
Women	2,106	cases,
Children	3,330	6,672
Number of attendances	27,245	

In addition fifteen maternity cases were attended and frequent visits paid to various parts of the location.

SECTION VI.

HOSPITALS, DISPENSARIES AND VENEREAL CLINICS.

Government maintained 7 European and 12 native hospitals throughout the year. Figures of in-patients treated are given at the end of this section. The new European hospital at Lusaka was opened in July, 1935, and represents a standard of convenience and comfort in keeping with the new capital of the Territory. The European hospitals at Livingstone and Ndola were used to an extent which severely taxed the limited staff of doctors and nurses.

The old native hospital at Lusaka, which was semi-ruinous, was in part abandoned, use being made of the vacated European hospital. Even this, however, is far from satisfactory and a new native hospital is urgently required, more conveniently placed and far better built and equipped than the present one. It is the more desirable to have a really good native hospital in Lusaka since it will be the place of training for native medical orderlies when this is organised, as is hoped, in 1936.

The native hospital at Abercorn requires replacement. It was formerly the gaol but was condemned even as tnat.

The native hospital at Fort Jameson is semi-ruinous and requires replacement.

The Roan Antelope, Mufulira and Nkana copper mining companies continued to maintain admirable and fully staffed hospitals for European and native employees and they provide treatment of a high order for these and also, at Govrenment expense, for Government servants in the mining area and for many natives not employed by the mine.

During 1935 Government maintained 15 rural dispensaries staffed by native orderlies, a number of these taking a few in-patients. Theoretically these dispensaries are under the supervision of the medical officers of districts. In fact, many of them, owing to distance, inaccessibility and the difficulty of the medical officer in leaving his main station, are scarcely ever visited by him. For the success and popularity of these dispensaries the Medical Department owes a debt of gratitude to the officers of the provincial administration who value the services of the medical orderlies to the natives of their districts and who support and encourage them. Indeed, some of the district officers themselves display not only enthusiasm but ability and skill in diagnosis and treatment. There is need for extensive development of the dispensary service. Three major difficulties present themselves—finance, shortage of trained personnel and supervision. As to the first, there is a good case for seeking outside assistance for initial expenditure and ground for hope that increasing prosperity will enable provision to be made for gradually increasing recurrent costs. Shortage of trained personnel must be met by training well educated Africans. I foresee no difficulty in getting the candidates for training and proposals for an immediate temporary training school and for later permanent arrangements will be submitted in 1936.

Supervision of an increased number of dispensaries will not be easy. An increase of medical officers by two when that becomes possible will go a long way in the required direction and I hope that gradually there may be built up a group of tried and responsible senior native orderlies who will be able to undertake supervisory duties.

As in the past, the various missions throughout the Territory continued to do invaluable work amongst the natives in the outlying districts. There are 27 mission hospitals in the Territory, six of which are controlled by qualified medical practitioners and the rest by trained nurses and other partially trained staff. The native population and the community at large are greatly indebted to these missions for the active part they are taking in medical work in remote areas, as the financial resources of the Territory could not at present bear the burden of establishing new medical stations in the many districts where mission hospitals are to-day established.

Medical subsidies, amounting to £2,950, were paid to missionary societies doing medical work, the sums allocated varying from £495 per annum to £15 per annum according to the amount of medical work undertaken and trained staff employed. This is money well spent.

During the latter half of 1935 I was able to visit all stations where there is a Government medical officer except Fort Jameson; many mission stations where medical work is done; and many of the rural dispensaries. These visits and inspections were of the greatest value to myself and were welcomed by the medical officers, district officers, missionaries and medical orderlies concerned. They involved about fifty hours of travel by air, about 2,500 miles by road and about 1,000 miles by railway.

Except for the weekly women's venereal clinic in Lusaka referred to previously, there is no special venereal clinic in the Territory. Every dispensary and hospital out-patient department in the Territory, however, is a venereal diseases clinic. Special reference to venereal diseases is made in section II of this report.

European Hospitals.

Hospital	Year	Admissions	Deaths	Daily Average
Livingstone	1934	474	4	12.98
	1935	466	6	12.24
Lusaka	1934	290	6	7.05
	1935	372	3	8.96
Broken Hill	1934	293	4	5.67
	1935	265	3	6.02
Ndola	1934	307	9	9.94
	1935	435	13	16.93
Fort Jameson	1934	52	1	1.12
	1935	59	2	1.29
Kasama	1934	28	1	.76
	1935	18	1	.56
Mongu	1934	6	—	.21
	1935	5	—	.09

Native Hospitals.

	Year	Admissions	Deaths
Livingstone	1934	1,193	99
	1935	1,331	102
Choma	1934	238	10
	1935	264	6
Mazabuka	1934	558	18
	1935	635	8
Lusaka	1934	889	60
	1935	981	74
Broken Hill	1934	1,441	62
	1935	1,833	58
Ndola	1934	1,008	57
	1935	1,257	62
Kasama	1934	258	9
	1935	299	12
Fort Rosebery...	1934	363	11
	1935	416	6
Fort Jameson	1934	396	20
	1935	332	15
Abercorn	1934	—	—
	1935	146	1
Mongu	1934	1,036	34
	1935	1,061	39
Balovale	1934	1,192	18
	1935	1,536	14

Out-Patients—Native.

Hospital	Number Treated	Number of Attendances
Livingstone	2,070	8,076
Choma	650	3,680
Mazabuka	2,349	12,211
Lusaka	1,591	6,053
Broken Hill	3,902	7,787
Ndola	11,012	—
Kasama	2,460	8,623
Fort Rosebery...	3,310	7,478
Fort Jameson	2,494	15,391
Mongu	10,523	65,459
Balovale	2,280	8,479
Abercorn	2,488	11,449

Dispensaries.

Place	In-patients	Out-patients	Attendances
Maramba (Livingstone)	—	1,323	12,693
Lundazi	104	1,835	10,345
Petauke	36	228	2,610
Njobo	285	1,399	20,046
Nkanda	133	1,144	9,580
Maguya	218	2,604	11,482
Kawaza	111	1,673	12,617
Kapalala	—	1,574	5,746
Kafulwe	—	2,236	7,566
Luwingu	—	2,137	3,866
Chitimukulu	14	1,506	—
Chambezi	21	4,157	—
Muchinshi	—	1,175	2,519
Mpika	83	6,926	—
Nsombo	—	1,037	3,298
Malima (opened 23-10-35)	—	737	—

SECTION VII.

PRISONS AND ASYLUMS.

There are no asylums for the insane in the Territory. All European and certain special native cases are sent to Ingutsheni in Southern Rhodesia or other institutions outside this Territory at the expense of this Government; the cose in 1935 was £1,849 14*s*. 7*d*. Other insane natives are confined in the prisons. This arrangement is entirely unsatisfactory and the results sometimes deplorable. Arrangements for more suitable care of insane natives are under consideration by Government. The health of prisoners has been satisfactory and there have been no epidemics or outbreaks of institutional disease in the gaols.

Livingstone.

European males committed in 1935	10
Native males committed in 1935	469
Native females committed in 1935	23
TOTAL ...	502
Daily average in prison	106.8
Daily average sick in gaol...	2.3
Number of deaths	3

Lunatics:

11 Criminal lunatics were in prison on 1st January, 1935.
5 Certified lunatics were in prison on 1st January, 1935.
1 Criminal lunatic was admitted during 1935.
7 Certified lunatics were admitted during 1935.
3 Suspected lunatics were admitted during 1935.

27

The above lunatics were disposed of as follows :

2 Criminal lunatics were sent to Ingutsheni.
1 Criminal lunatic was liberated.
6 Certified lunatics were sent to Ingutsheni.
3 Certified lunatics were liberated.
3 Suspected lunatics were liberated.
12 Criminal lunatics remained at 31st December, 1935.

27

Lusaka.

Local Gaol.

Total number of prisoners committed in 1935	265
Total number of prisoners sick in 1935	42
Daily average in prison	15
Daily average sick	.75
Number admitted to hospital	24
Number of deaths	Nil

Central Prison.

Total number of prisoners committed in 1935	182
Daily average in prison	191.48
Total number of prisoners sick in 1935	560
Daily average sick	8.81
Number admitted to hospital	110
Number of deaths	8

Broken Hill.

Total number of prisoners committed in 1935	744
Daily average in prison	120.8
Daily average sick	7.043
Remaining in hospital from 1934	5
Admitted to hospital	92
Number of deaths	*3

*Two executions and one suicide on eve of execution.

Fort Jameson.

Number in prison at beginning of 1935	45
Number committed during 1935	156
Number in prison at end of 1935	73
Daily average in prison	39.156
Number of deaths	1
Daily average sick	.972
Criminal lunatics in prison at beginning of 1935	3
Criminal lunatics admitted during 1935	1
Criminal lunatics transferred during 1935	1
Criminal lunatics remaining at end of 1935	3

Fort Rosebery.

Total number of prisoners committed in 1935	45
Daily average in prison	10
Admitted to hospital	6
Daily average in hospital	.14

Kasama.

Number of prisoners committed in 1935	115
Daily average in prison in 1935	32
Daily average sick	1.4
Admitted to hospital	34
Number of deaths	*1

*Pneumonia.

Mongu.

Number of prisoners committed in 1935	214
Daily average in prison	73.6
Admitted to hospital	60
Daily average sick	4.3
Number of deaths	4
Number of executions	1

Balovale.

Number of prisoners committed in 1935	136
Daily average in prison	13.8
Number admitted to hospital	8
Daily average sick	.10
Number of deaths	*2

*Pneumonia.

SECTION VIII.

METEOROLOGY.

The following meteorological data have been supplied by the officer in charge:

Plateau Stations:

	Abercorn.			Kasama.		
	Mean. Max.	Mean. Max.	Mean. Max.	Mean. Max.	Mean. Max.	Mean. Max.
January ...	78.9	58.2	68.5	80.1	61.0	70.5
February ...	76.7	58.3	67.5	76.1	60.8	68.5
March ...	79.0	58.7	68.9	80.1	61.2	70.7
April	77.8	58.6	68.2	78.7	58.8	68.7
May	77.8	56.9	67.3	78.4	57.1	67.7
June	76.3	51.3	63.8	75.7	50.9	63.3
July	76.2	47.9	62.1	75.4	48.5	61.9
August ...	78.3	51.1	64.7	78.2	50.9	64.5
September ...	85.7	56.6	72.1	86.6	56.6	71.6
October ...	86.1	59.4	72.7	89.5	63.0	76.3
November ...	83.6	61.9	72.7	85.8	60.4	73.1
December ...	75.5	60.0	67.7	80.5	61.7	71.1

Plateau Stations:

	Mpika Aerodrome.			Serenje.		
	Mean. Max.	Mean. Min.	Mean. Temp.	Mean. Max.	Mean. Min.	Mean. Temp.
January ...	76.7	61.1	68.9	73.5	62.5	68.0
February ...	74.0	59.7	66.9	72.5	59.7	66.1
March ...	77.7	60.0	68.9	74.0	58.4	66.2
April	75.4	57.8	66.6	71.6	55.6	63.6
May	75.5	—	—	72.4	55.6	64.0
June	70.1	49.7	59.9	65.8	49.8	57.8
July	69.3	45.5	57.4	68.4	47.9	58.1
August ...	71.8	48.8	60.3	68.7	48.6	58.7
September ...	82.8	56.3	69.7	80.5	58.5	69.5
October ...	85.8	60.6	73.1	82.7	63.0	72.9
November ...	74.4	63.7	69.1	81.5	62.4	71.9
December ...	74.2	61.7	67.9	78.6	61.1	69.9

	Chinsali.			Mporokoso.		
	Mean. Max.	Mean. Min.	Mean. Temp.	Mean. Max.	Mean. Min.	Mean. Temp.
January ...	79.0	60.2	69.6	81.5	62.3	71.9
February ...	76.4	59.3	67.9	76.9	61.3	69.1
March ...	80.1	59.9	70.0	82.3	61.8	72.1
April	79.4	56.6	68.0	80.0	59.4	69.7
May	79.4	54.1	66.7	80.7	57.8	69.3
June	75.4	50.3	62.9	80.5	50.0	65.3
July	79.6	47.5	63,5	78.8	44.9	61.9
August ...	84.3	51.0	67.7	87.1	49.1	68.1
September ...	84.6	52.6	68.6	95.2	52.6	73.7
October ...	85.8	59.9	74.5	95.5	59.7	77.6
November ...	83.1	62.3	72.7	91.0	61.1	76.1
December ...	79.1	60.1	69.6	85.5	60.3	72.9

Zambesi Valley Stations.

	Balovale.			Mongu.		
	Mean. Max.	Mean. Min.	Mean. Temp.	Mean. Max.	Mean. Min.	Mean. Temp.
January ...	84.0	61.9	72.9	83.8	66.3	75.1
February ...	84.4	60.6	72.5	85.5	65.9	75.7
March ...	92.0	60.8	76.4	87.4	65.6	76.5
April	89.5	58.0	73.7	86.2	62.8	74.5
May	91.4	52.6	72.0	85.7	57.8	71.7
June	85.9	44.1	65.0	79.1	48.9	64.0
July	90.5	45.0	67.7	82.5	51.8	67.1
August ...	92.3	45.3	68.8	85.1	49.6	67.3
September ...	102.0	57.8	79.9	97.2	62.2	79.7
October ...	103.1	62.2	82.7	98.8	67.9	83.3
November ...	93.7	62.4	78.1	94.1	65.3	79.7
December ...	87.3	61.1	75.5	85.4	65.9	75.7

Zambesi Valley Stations.

	Mwinilunga.			Kalabo.		
	Mean. Max.	Mean. Min.	Mean. Temp.	Mean. Max.	Mean. Min.	Mean. Temp.
January ...	81.8	61.8	71.8	90.6	67.8	79.2
February ...	78.8	—	—	91.9	65.5	78.7
March ...	82.6	—	—	96.1	66.0	81.1
April	83.3	56.9	70.1	83.6	61.2	77.4
May	84.6	53.5	69.1	90.3	56.7	73.5
June	80.9	44.9	62.9	84.6	43.2	63.9
July	81.0	43.6	62.3	87.5	44.3	65.9
August ...	88.1	43.0	62.1	88.3	43.1	65.7
September ...	90.2	52.6	71.4	102.4	54.4	78.4
October ...	89.4	56.9	73.1	106.3	62.3	84.3
November ...	84.3	61.2	72.7	97.9	63.9	80.9
December ...	80.0	61.2	70.6	90.5	65.3	77.9

	Mankoya.			Sesheke.		
	Mean. Max.	Mean. Min.	Mean. Temp.	Mean. Max.	Mean. Min.	Mean. Temp.
January ...	82.9	64.8	73.9	85.9	64.0	74.9
February ...	83.5	63.0	73.3	87.1	60.5	73.8
March ...	88.3	62.7	75.5	88.0	60.7	74.3
April	83.6	57.7	70.7	85.6	54.8	70.2
May	86.7	50.7	68.7	83.3	46.0	64.7
June	78.6	42.2	60.4	75.1	33.2	54.1
July	81.6	43.7	62.7	81.4	37.5	59.5
August ...	83.0	41.3	62.1	82.5	37.3	59.9
September ...	93.5	57.1	76.2	95.1	52.7	73.9
October ...	97.9	61.0	78.9	100.3	57.1	78.7
November ...	93.0	64.5	77.7	93.6	62.6	78.1
December ...	88.2	64.6	76.4	90.4	62.7	76.5

LIVINGSTONE OBSERVATORY.

1935	Mean Max. Fah.	Mean Min. Fah.	Mean Range Fah.	Mean Temp. Fah.	Rainfall Inches	Humidity % 8 h	Humidity % 14 h	Wind Direction 8 h	Wind Direction 14 h	Wind Force m.p.h. 8 h	Wind Force m.p.h. 14 h
January	85.1	66.4	18.6	75.7	4.26	81	59	E	E	7	9
February	85.1	63.5	21.6	74.3	4.45	76	50	E	E	9	11
March	87.7	63.7	24.0	75.7	1.36	75	45	E	E	8	9
April	85.5	59.0	26.5	72.3	0.64	70	37	E	E	7	9
May	83.9	53.5	30.4	68.7	Nil	61	30	E	E	5	9
June	74.2	43.9	30.3	59.1	Nil	63	31	E	E	4	5
July	77.7	47.4	30.4	62.5	Nil	66	35	E	E	4	8
August	78.2	46.6	31.6	62.4	Nil	61	39	E	E	5	8
September ...	92.7	61.2	31.5	76.9	Nil	45	30	E	E	3	5
October	95.9	67.4	28.5	81.7	0.42	44	30	E	E	6	7
November... ...	92.5	67.3	25.2	79.9	2.82	51	32	E	N	6	7
December... ...	88.8	65.7	23.1	77.3	2.69	67	42	E	E	3	4

SECTION IX.

SCIENTIFIC.

Native microscopists are employed at the main hospital centres along the railway line and have proved themselves capable of doing useful work.

Routine examinations of blood, urine and stools in all patients revealed the following :

Livingstone :

Europeans.		Natives.	
Blood	313	Blood	1,394
Stool	63	Stool	1,184
Urine	392	Urine	980
Sputum	7	Sputum	64

Findings were :

Europeans :

	Cases.
P. falciparum in	74
Microfilariae in	3
S. haematobium in	1
S. mansoni in	1
N. americanus in	3
Entamoeba histolytica in	2
B. tuberculosis in	1

Natives :

P. falciparum in	245 or 17.6%
Microfilariae in	28 or 2%
T. duttoni in	3
Necator americanus in	597 or 50%
Entamoeba histolytica in	3
Schistosoma haematobium in	21
S. mansoni in	2
Taenia in	3
Hymenolepis nana in	3
B. tuberculosis in	4

Lusaka :

Trypanosoma rhodesiense	23
Malaria parasites (not classified)	250
Microfilariae	66
Hook-worm (not classified)	240
Bilharzia (not classified)	47
Entamoeba histolytica	9
Tape worm	5
B. tuberculosis	4
Gonococcus	17
Leprosy bacilli	4

Total number of slides, 4,134.

During the year a paper entitled " Human Anthrax in Barotseland, treated by Novarsenobenzene " by Dr. Gilbert was published in the *Lancet*.

JOHN F. C. HASLAM, M.D., F.R.C.P.E., D.P.H.,
Director of Medical Services.

RETURNS.

ADMINISTRATION.

TABLE I.

Staff as at 31st December, 1935.

European :

Director of Medical Services	1
Specialist Surgical Officer	1
Medical Officers	15
Pharmacist and Storekeeper	1
Pharmacist	1
Clerk Dispenser	1
Accountant	1
Clerks	3
Matrons	2
Nursing Sisters	29
Female Ward Attendants	4
Health Inspectors	3
Dispenser (part paid by the Broken Hill Development Company)	1

African :

Native Clerks	7
Orderlies	98
Other Servants	138
Native Porters	13
Office Boys	3
Sleeping Sickness Guard	1
Vaccinators	4
Labourers	26
Sanitary Overseers	3
Malaria Control Boys	28

TABLE V.

RETURN OF DISEASES AND DEATHS (IN-PATIENTS) FOR THE YEAR 1935.

EUROPEAN HOSPITALS.

Diseases	Remaining in Hospital at end of 1934	Yearly Admissions	Total Deaths	Total cases Treated	Remaining in Hospital at end of 1935
I. Epidemic, Endemic and Infectious Diseases.					
1. Enteric Group					
a. Typhoid Fever	1	11	1	12	...
b. Paratyphoid A	...	2	...	2	...
5c. Malaria Aestivo Autumnal	14	454	1	468	7
e. Blackwater	...	8	4	8	...
7. Measles	...	3	...	3	...
9. Whooping Cough...	...	2	...	2	...
10. Diptheria	...	1	...	1	...
11. Influenza	...	38	...	38	...
16a. Dysentry-Amoebic	...	10	...	10	...
b. Bacillary	...	8	...	8	...
c. Undefined	...	6	...	6	1
25a. Rubella	...	2	...	2	...
b. Varicella	...	1	...	1	...
31. Tuberculosis, Pulmonary	1	7	2	8	...
38. Syphilis	...	...	...	...	
a. Primary	...	1	...	1	...
e. Period not indicated	...	2	...	2	...
40a. Gonorrhoea and its complications ...	...	2	...	2	...
II. General Diseases not mentioned above.					
43. Cancer	1	3	2	4	1
47. Cancer of Breast	...	1	1	1	...
48. Cancer-Sarcoma of Lung	...	1	...	1	...
50. Tumours-non-malignant	...	2	...	2	...
51. Acute Rheumatism	...	10	...	10	...
52. Chronic Rheumatism	...	7	...	7	...
57. Diabetes	...	2	...	2	...
58b. Anaemia	...	3	...	3	...
60. Exopthalmic Goitre	...	1	...	1	...
64. Diseases of the Spleen	...	3	1	3	...
66. Alcoholism	...	4	...	4	1
69. Purpura Haemorrhagica	...	2	...	2	1
III. Affections of the Nervous System and Organs of the Senses.					
74c. Thrombosis	...	1	...	1	...
77. Other forms of Mental Alienation ...	...	2	...	2	...
82a. Hysteria	...	6	...	6	...
b. Neuritis	...	4	...	4	...
c. Neurasthenia	...	7	...	7	1
85b. Conjunctivitis	...	12	...	12	1
e. Other affections of the Eye	1	8		9	1
86. Affections of the Ear	...	8		8	...
IV. Affections of the Circulatory System.					
89. Agina Pectoris	...	4	...	4	...
90a. Valvular Disease of the Heart	...	2	1	2	
b. Myocarditis	1	5	2	6	...
91c. Hyperpiesis	...	1	1	1	...
93. Haemorrhoids	1	1	...	2	...
Varicose Veins	...	5	...	5	...
Phlebitis	...	1	...	1	...
94. Lymphadenits	...	1	...	1	...
95. Haemorrhage of undetermined cause ...	...	1	...	1	...
96. Other affections of the Heart	...	4	1	4	...
Carried forward	20	670	17	690	14

TABLE V.—*continued.*

RETURN OF DISEASES AND DEATHS (IN-PATIENTS) FOR THE YEAR 1935.
ALL EUROPEAN HOSPITALS.

	Diseases	Remaining in Hospital at end of 1934	Yearly Total		Total cases Treated	Remaining in Hospital at end of 1935
			Admissions	Deaths		
	Brought forward ...	20	670	17	690	14
V.	**Affections of the Respiratory System.**					
97.	Adenoids	...	6	...	6	...
98.	Laryngitis...	...	16	...	16	...
99a.	Bronchitis, Acute	...	8	...	8	...
b.	Bronchitis, Chronic	...	7	...	7	1
100.	Broncho Pneumonia, ...	...	2	...	2	...
101a.	Lobar Pneumonia, ...	...	14	2	14	1
b.	Unclassified Pneumonia, ...	...	1	...	1	...
102.	Pleurisy	...	7	...	7	2
	Bronchial Catarrh	...	1	...	1	...
	Empyema	1	...	1	1	...
105	Asthma	...	3	...	3	...
107.	Lung Abscess	...	4	1	4	...
VI.	**Diseases of the Digestive System.**					
108b.	Edentation	2	71	...	73	...
109.	Tonsillitis	1	58	...	59	...
	Quinsy	...	8	...	8	...
111a.	Ulcer of the Stomach	...	8	1	8	...
b.	Ulcer of the Duodenum	...	6	...	6	...
112.	Gastritis	...	13	...	13	...
113.	Enteritis under 2 years	1	14	...	15	...
114.	Enteritis over 2 years	1	23	...	24	...
	Colitis	...	4	...	4	1
116a.	Cestoda	...	1	...	1	...
	Taenia Solium	...	2	...	2	...
c.	Ascaris	...	2	...	2	...
117.	Appendicitis	2	86	...	88	4
118.	Hernia	...	15	...	15	...
119a.	Fistula	...	1	1	1	...
b.	Constipation	...	6	...	6	...
122.	Cirrhosis of the Liver	...	2	...	2	...
124.	Abscess of Liver	...	1	...	1	...
	Cholecystitis	...	16	1	16	1
	Juandice	...	2	...	2	...
123.	Cholelethiasis	...	1	...	1	...
127.	Prolapse of Rectum	...	3	...	3	...
	Intestinal Obstruction	...	9	1	9	...
VII.	**Diseases of the Genito-Urinary System.**					
128.	Acute Nephritis	1	...	...	1	...
129.	Chronic Nephritis	...	3	...	3	...
130b.	Schistomiasis		1	...	1	...
131.	Pyelitis	1	17	1	18	...
132.	Urinary Calculus...		2	...	2	...
133.	Cystitis	...	9	...	9	1
	Heamaturia	...	1	...	1	...
134a.	Stricture of Urethra	2	2	...	4	1
135.	Prostatitis	...	1	...	1	...
136.	Hydrocele	...	3	...	3	...
	Orchitis	...	2	...	2	...
	Varicocele...	1	...	...	1	...
	Carried forward	33	1,132	26	1,165	26

TABLE V.—*continued.*

RETURN OF DISEASES AND DEATHS (IN-PATIENTS) FOR THE YEAR 1935.

ALL EUROPEAN HOSPITALS.

Diseases	Remaining in Hospital at end of 1934	Yearly Total		Total cases Treated	Remaining in Hospital at end of 1935
		Admissions	Deaths		
Brought forward ...	33	1,132	26	1,165	26
VII. Disease of the Genito-Urinary (*continued*).—					
137. Ovarian Abecess...	...	3	...	3	...
138. Salpingitis	...	4	...	4	...
139. Uterine Tumours...	...	7	...	7	...
140. Uterine Haemorrhage	...	1	...	1	...
141. Endometritis	...	9	...	9	...
141a. Metritis	...	5	...	5	...
b. Menorrhagica	...	3	...	3	...
Dysmenorrhoea	...	15	...	15	...
Metorrhagica	...	4	...	4	...
Displacement of Uterus	...	4	...	4	...
142. Mastitis	...	2	...	2	...
Abscess of Breast	...	2	...	2	...
Retention of Urine	...	1	...	1	...
Uraemia	...	1	...	1	...
Enlarged Prostate	...	1	...	1	...
VIII. Puerperal State.					
143A. Normal Labour	2	132	...	134	2
B. a. Abortion	1	27	...	28	1
b. Ectopic Gestation	...	3	...	3	...
c. Other accidents of pregnancy	...	18	...	18	...
145. Other accidents of Parturition	...	2	...	2	...
IX. Affections of the Skin and Cellular Tissues.					
152. Boil	...	5	...	5	...
Carbuncle	...	2	...	2	...
153. Abscess	...	8	...	8	1
Whitlow	...	3	...	3	...
Cellulitis	2	30	...	32	1
154b. Scabies	...	1	...	1	...
155. Other diseases of the skin	...	25	1	25	...
Tropical Ulcers	...	1	...	1	...
X. Diseases of the Bones, and Organs of Locomotion (Other than Tuberculosis).					
156. Osteitis	...	2	...	2	...
Osteomyelitis	...	16	...	16	1
157. Arthritis	...	4	...	4	...
Bursitis	...	4	...	4	...
Synovitis	...	3	...	3	...
158. Osteosis	...	1	...	1	...
XII. Diseases of Infancy.					
160. Marasmus	...	1	...	1	...
162. Malnutrition	...	1	...	1	...
XIII. Affections of Old Age.					
164. Debility	...	4	...	4	...
Anaemia	...	1	...	1	1
Carried forward	38	1,488	27	1,526	33

TABLE V.—*continued.*

RETURN OF DISEASES AND DEATHS (IN-PATIENTS) FOR THE YEAR 1935.

EUROPEAN HOSPITALS.

Diseases	Remaining in Hospital at end of 1934	Yearly Total		Total cases Treated	Remaining in Hospital at end of 1935
		Admissions	Deaths		
Brought forward	38	1,488	26	1,526	33
XIV. Affections produced by External Causes.					
175. Food Poisoning	...	1	...	1	1
176. Snake Bite	...	1	...	1	...
177. Accidental Poisoning	...	2	...	2	...
178. Burns by Fire	...	2	...	2	...
179. Burns other than by Fire	...	2	...	2	...
183. Wounds by Firearms	1	2	...	3	...
185. Wounds by Fall	...	1	...	1	...
187. Wounds by Machinery	...	5	...	5	...
189. Injuries inflicted by Animals	...	4	1	4	1
194. Heatstroke	...	1	...	1	...
201A. Dislocations	...	7	...	7	1
b. Sprain	...	1	...	1	...
c. Fracture	2	29		31	1
202. Other External Injuries	1	38		39	2
XV. Ill-defined Diseases.					
205A. Asthenia	...	3	...	3	...
XVI. Diseases, the total of which have not caused ten Deaths.	1	27	...	28	...
Total	43	1,614	28	1,657	39

TABLE Va.

RETURN OF DISEASES AND DEATHS (IN-PATIENTS) FOR THE YEAR 1935.
ALL NATIVE HOSPITALS.

Diseases	Remaining in Hospital at end of 1934	Yearly Total		Total cases treated	Remaining in Hospital at end of 1934
		Admissions	Deaths		
I. Epidemic, Endemic and Infectious Diseases.					
1. Enteric Group	...	...	...	...	...
a. Typhoid Fever	...	5	3	5	...
b. Paratyphoid A.	...	1	1	1	...
3. Relapsing Fever	...	38	3	38	1
5c. Malaria Aestivo Autumnal	29	916	24	945	21
,, Cerebral	...	1	1	1	...
e. Blackwater	...	1	...	1	1
6. Alastrim	...	3	...	3	...
7. Measles	1	146	12	147	...
9. Whooping Cough	1	1	...	2	...
11. Influenza	9	270	7	279	13
13. Mumps	1	5	...	6	...
16a. Dysentery-Amoebic	2	25	2	27	...
b. ,, -Bacillary	2	11	4	13	...
c. ,, -Undefined	...	6	...	6	...
20. Leprosy	67	142	2	209	82
24. Cerebro-spinal Fever	...	4	4	4	...
25b. Varicella	2	103	...	105	5
g. Yaws	10	259	1	269	12
h. Trypanosomiasis	2	40	9	42	8
i. Infantile Jaundice	...	2	...	2	...
27. Anthrax	1	2	...	3	...
30. Mycosis	1	...	...	1	...
31. Tuberculosis-Pulmonary	4	34	20	38	5
33. Tuberculosis-Vertebral Column	...	2	1	2	...
34. Tuberculosis-Spinal	...	2	1	2	...
35. Tuberculosis of Bones and Joints	...	8	2	8	...
36c. Tuberculosis-Lymphatic System	2	9	1	11	2
37. Tuberculosis-Acute Disseminated	...	1	1	1	...
38. Syphilis	...	...	...	...	...
a. Primary	71	1,073	...	1,144	59
b. Secondary	16	185	...	201	4
c. Tertiary	1	21	...	22	5
d. Hereditary	3	41	12	44	3
e. Period not indicated	29	788	7	817	42
39. Soft Cancre	...	14	...	14	...
40a. Gonorrhoea and its complications	11	294	...	305	22
b. Gonorrhoeal Opthalmia	...	3	...	3	...
c. Gonorrhoeal Arthritis	1	4	...	5	1
d. Granuloma Venereum	...	2	...	2	...
41. Septicaemia	...	6	6	6	...
II. General Diseases not mentioned above.					
43. Cancer of Stomach	...	6	3	6	...
44. Cancer of Liver	...	3	3	3	...
46. Cancer of Female Genital Organs	...	2	...	2	...
47. Cancer of Breast	...	1	...	1	...
48. Cancer-Sarcoma	...	2	...	2	...
49. Malignant Tumours	1	10	...	11	1
50. Tumours-Non-malignant	2	34	...	36	...
51. Acute Rheumatism	...	32	...	32	1
52. Chronic Rheumatism	8	112	...	120	7
53. Scurvy	2	34	1	36	6
54. Pellagra	3	16	1	19	4
57. Diabetes	1	1	...	2	...
58b. Anaemia	...	4	...	4	...
60. Goitre-Barenchymatoris	...	7	1	7	...
64. Diseases of the Spleen	1	7	...	8	1
65a. Leukaemia	...	1	...	1	...
Carried forward	284	4,740	133	5,024	306

TABLE Va.—*continued.*

RETURN OF DISEASES AND DEATHS (IN-PATIENTS) FOR THE YEAR 1935.
ALL NATIVE HOSPITALS.

	Diseases	Remaining in Hospital at end of 1934	Yearly Total		Total Cases Treated	Remaining in Hospital at end of 1934
			Admissions	Deaths		
	Brought forward ...	284	4,740	133	5,024	306
b.	Hodgkin's Disease	...	2	1	2	...
	Cerebral Thrombosis	...	1	1	1	...
69.	Onyalai	...	10	7	10	1
III. Affections of the Nervous System and Organs of the Senses.						
70.	Oedema of Brain	...	2	2	2	...
71.	Meningitis...	...	5	3	5	...
73.	Spinal Concussion	...	2	...	2	...
74a.	Haemorrhage	...	9	8	9	...
c.	Thrombosis	...	1	...	1	...
75a.	Hemiplegia	1	1	...	2	1
b.	Paralysis	...	3	...	3	...
77.	Other forms of Mental Alienation ...	1	39	3	40	1
78.	Epilepsy	1	42	1	43	1
80.	Infantile Convulsions	...	1	...	1	...
82b.	Neuritis	1	3	...	4	...
	Sciatica	...	1	...	1	...
c.	Neurasthenia	...	6	...	6	...
85b.	Conjunctivitis	11	396	...	407	25
c.	Trachoma	...	1	...	1	...
e.	Other affections of Eye	1	23	...	24	...
86.	Affections of the Ear	6	54	...	60	4
IV. Affections of the Circulatory System.						
89.	Angina Pectoris	...	1	...	1	...
90b.	Myocarditis	1	4	2	5	1
93.	Haemorrhoids	...	2	...	2	...
	Varicose Veins	...	9	...	9	...
	Phlebitis	...	1	...	1	...
94.	Lymphangitis	...	6	...	6	...
	Lymphadenitis	1	31	...	32	2
	Filariasis	...	3	...	3	...
95.	Haemorrhage of undetermined Cause ...	...	3	...	3	...
96.	Other affections of the Heart	...	6	3	6	...
V. Affections of the Respiratory System.						
97.	Adenoids	...	1	...	1	...
	Sinusitis	1	...	...	1	...
	Coryza	...	9	...	9	...
	Epistaxis	...	2	...	2	...
98.	Laryngitis	...	7	...	7	...
	Oedema of Larynx	...	1	...	1	1
99a.	Bronchitis-Acute	7	108	4	115	6
b.	,, -Chronic	1	28	...	29	3
100.	Broncho-Pneumonia	1	70	19	71	4
101a.	Lobar Pneumonia	5	231	55	236	9
b.	Unclassified Pneumonia...	1	124	36	125	2
102.	Pleurisy	...	20	2	20	...
	Empyena	...	1	...	1	...
105.	Asthma	...	8	1	8	1
	Bronchiectasis	...	1	1	1	...
VI. Diseases of the Digestive System.						
108a.	Dental Caries	1	10	...	11	1
	Pyorrhoea...	1	...	...	1	...
b.	Edentation	...	1	...	1	...
b.	Stomatitis	1	8	...	9	...
	Cancrun Oris	...	1	...	1	...
109.	Tonsillitis	...	19	...	19	2
109.	Pharyngitis	...	1	...	1	...
111.	Ulcer of the Stomach	...	1	...	1	...
112.	Gastritis	1	26	...	27	3
	Carried forward	328	6,086	282	6,414	374

TABLE Va.—*continued.*

RETURN OF DISEASES AND DEATHS (IN-PATIENTS) FOR THE YEAR 1935.
ALL NATIVE HOSPITALS.

	Diseases	Remaining in Hospital at end of 1934	Yearly Total		Total Cases Treated	Remaining in Hospital at end of 1934
			Admissions	Deaths		
	Brought forward ...	328	6,086	282	6,414	374
VI.	**Diseases of the Digestive System.**—*Continued.*					
113.	Diarrhoea	...	9	...	9	...
	Enteritis under 2 years...	2	72	10	74	...
114.	Enteritis over 2 years	3	41	2	44	1
	Colic	...	15	...	15	...
	Diverticulitis	...	1	...	1	...
115.	Ankylostomiasis	1	95	2	96	1
116a.	Cestoda	...	1	...	1	1
	Taenia Solium	...	9	...	9	3
118.	Hernia	4	47	1	51	2
119a.	Fistula	2	3	...	5	...
b.	Constipation	...	37	...	37	2
122.	Cirrhosis of the Liver	...	4	4	4	...
	Hepatitis	...	5	2	5	...
	Jaundice	...	1	...	1	...
126.	Peritonitis	...	5	2	5	...
127.	Prolapse of Rectum	...	2	...	2	...
	Intestinal Obstruction	...	3	1	3	...
VII.	**Diseases of the Genito-Urinary System (Non-Venereal).**					
128.	Acute Nephritis	...	15	3	15	2
129.	Chronic Nephritis	3	10	4	13	2
130b.	Schistosomiasis	5	81	2	86	7
c.	Bilharzia	...	21	...	21	...
131.	Pyelitis	1	4	4	5	...
133.	Cystitis	...	10	1	10	...
	Haematuria	...	1	...	1	...
134a.	Stricture of Urethra	...	2	1	2	...
b.	Urethral Fistula, ...	...	1	...	1	...
136.	Hydrocele	1	14	...	15	...
	Orchitis	2	9	...	11	...
	Paraphimosis	1	2	...	3	...
	Ruptured Uterus	...	1	1	1	...
137.	Ovarian Cyst	...	2	...	2	1
138.	Salpingitis	...	2	...	2	...
	Pelvic Cellulitis	...	1	...	1	...
139.	Uterine Tumours	1	5	...	6	...
140.	Uterine Haemorrhage	...	5	...	5	...
141a.	Metritis	...	1	...	1	...
b.	Amenorrhoea	...	1	...	1	...
	Displacement of Uterus...	...	1	...	1	...
	Vaginitis	...	1	...	1	...
142.	Mastitis	...	4	...	4	...
	Abscess of Breast	...	4	...	4	...
VIII.	**Puerperal State.**					
143A.	Normal Labour	...	65	5	65	...
B.	(*a*) Abortion	1	8	...	9	...
	(*c*) Other accidents of Pregnancy ...	...	7	...	7	...
145.	Other accidents of Parturition... ...	...	7	2	7	...
146.	Puerperal Peritonitis	...	3	1	3	...
149.	Sequelae of Labour	...	1	...	1	...
IX.	**Affections of the Skin and Cellular Tissues.**					
151.	Gangrene	...	5	2	5	1
152.	Boil	1	20	...	21	...
	Carbuncle...	...	8	...	8	...
153.	Abscess	15	362	3	377	19
	Whitlow	1	41	...	42	1
	Cellulitis	12	230	5	242	26
154a.	Tinea	...	43	...	43	1
	Carried forward	384	7,434	340	7,818	444

TABLE Va.—*continued.*

RETURN OF DISEASES AND DEATHS (IN-PATIENTS) FOR THE YEAR 1935
ALL NATIVE HOSPITALS.

Diseases	Remaining in Hospital at end of 1934	Yearly Total		Total Cases Treated	Remaining in Hospital at end of 1934
		Admissions	Deaths		
Brought forward ...	384	7,434	340	7,818	444
IX. Affections of the Skin and Cellular Tissues.—*Continued.*					
b. Scabies	4	240	...	244	...
155. Other Diseases of the Skin	19	77	...	96	3
Tropical Ulcer	20	202	...	222	32
Ulcer	...	101	...	101	4
Elephantiasis	...	4	...	4	...
Herpes	...	1	...	1	...
Chigoes	...	30	...	30	3
X. Diseases of the Bones, etc.					
156. Osteitis	1	10	1	11	3
Osteomyelitis	1	7	2	8	1
157. Arthritis	4	30	1	34	4
Acute Supurative Arthritis	...	2	1	2	...
Bussitis	...	1	...	1	...
Synovitis	...	17	...	17	2
Myositis	1	2	...	3	...
Ganglion...	...	4	...	4	...
158. Other diseases of the Bone	...	17	...	17	1
159. Hydrocephalus	...	1	...	1	...
XII. Diseases of Infancy.					
160. Congenital Debility	...	7	3	7	1
161. Premature Birth	...	6	4	6	...
162. Malnutrition	...	1	...	1	...
Marasmus...	...	7	2	7	1
Hydrocephalus	...	1	...	1	...
XIII. Affections of Old Age.					
164. Debility	1	12	1	13	...
Senility	...	3	1	3	1
XIV. Affections produced by External Causes.					...
165. Suicide by Poisoning (attempted) ...	...	1	...	1	...
171. Attempted suicide by cut throat ...	...	1	...	1	...
175. Food Poisoning	...	4	...	4	...
176. Snake Bite	1	27	...	28	...
Insect Bite	1	1	...	2	...
177. Accidental Poisoning	...	5	1	5	...
178. Burns by Fire	24	181	19	205	21
179. Burns other than by Fire	...	11	1	11	...
183. Wounds by Firearms	1	8	2	9	...
184. Wounds (by cutting or stabbing instruments)	13	319	...	332	22
185. Wounds by Fall	6	2	...	8	...
186. Wounds (in Mines)	5	...	...	5	...
189. Injuries inflicted by Animals	9	43	1	52	2
195. Lightning Stroke...	...	1	...	1	...
201a. Dislocation	...	9	...	9	...
b. Sprain	...	15	...	15	...
c. Fracture	8	89	7	97	13
202. Other External Injuries	37	808	5	845	27
XV. Ill-defined Diseases.					
204. Sudden Death	...	2	2	2	...
205a. Ascites	...	7	1	7	3
Starvation	...	1	...1	1	...
Asthenia	...	7	1	7	...
Ainhum	...	1	...	1	...
Coma	...	1	...	1	...
b. Malingering	...	31	...	31	...
XVI. Diseases, the total of which have not caused 10 deaths	11	299	...	310	11 8
Total	551	10,091	397	10,642	596

APPENDIX I.

MEDICAL DEPARTMENT,
LUSAKA,
28th December, 1935.

THE HONOURABLE
THE DIRECTOR OF MEDICAL SERVICES,
LUSAKA.

SIR,

SLEEPING SICKNESS IN THE MUMBWA DISTRICT.

With reference to the above, I have the honour to submit the following report on a tour of investigation in December, 1935.

After a preliminary visit on December 3rd to 5th a tour of the whole sleeping sickness area in the Mumbwa District was begun on December 9th with the object of settling the following points which had been raised by the District Commissioner, Mr. K. G. Bradley :

(1) The endemicity or epidemicity of the disease.
(2) The liability of travellers (European and native) to and from Barotseland to contract the disease, and if necessary, the control of the various routes by which Barotse and Balovale natives now come to the railway to seek work.
(3) The desirability of opening the game reserve in the hook of the Kafue as a tourist attraction.
(4) The question of moving the natives from native reserve XVII if sleeping sickness were to be severe there.
(5) The consideration of the best areas to which the natives now in the game reserve should be moved.
(6) The best position for a native dispensary in the native reserve when money becomes available for this.
(7) The bearing of sleeping sickness on the native cotton industry which is being started in the reserve.
(8) The advisability of building through the area the contemplated west road which would link Lusaka with Mankoya and Mongu.
(9) The question of building an amergency landing ground in this area and its best situation from the point of view of sleepng sickness.

Geography.

A diagramatic map is attached showing the broad geography of the Mumbwa area, the distribution of the cases which have occurred in 1935 and the proximity of an area known as Kinghorn's area on the Luswishi-Kafue junction where sleeping sickness has been known to be endemic for many years. The whole of the hook of the Kafue in the Mumbwa district is heavily infested with tsetse fly which continues north-east without a break through the forest country towards the Lunga River and eventually to Kinghorn's area.

The Mumbwa area which was under investigation lies in the hook and can be divided into two parts :

(*a*) *The Game Reserve* lying to the north of a line drawn between Mumbwa and Mankoya. This line will approximately indicate the course of the proposed road. The map shows more accurately the southern boundary of this game reserve which runs up the west bank of the Kafue from a point opposite the old Mwengwa Boma northwards to the point where the Nangoma River flows into the Kafue—then eastwards approximately along the north bank of the Nangoma to the headwaters of the Kachereko River, the north bank of which it follows to a point near the village of Lukendo, where it turns north-east.

(*b*) *Native Reserve XVII* lying to the south of the imaginary line between Mumbwa and Mankoya. It occupies the central part of the hook, between the game reserve to the north and the Namwala District to the south.

There are also certain areas on the map which I have called Areas I, II, etc., and which will be referred to in detail later but which require mention at this point.

Area I is a group of villages in the eastern part of the game reserve which I regard as a definite focus of infection. It will be seen later that it is proposed to move these villages to Area I.A.

Area II is a scattered group of villages in the north-western part of the game reserve, most of them on the far side of the Kafue. These villages are on the move already into the native reserve. Their inhabitants are living in temporary, crudely built huts while they travel continually between their old and new homes and attend to their old gardens. They are repeatedly exposed to fly, and they move through a district which is full of game. I consider this Area II to have been another probable focus of infection. They are moving to Area II.A.

It will be noted that the villages of both Area I and Area II are to be moved to new sites during 1936. This will leave the whole of the Mumbwa part of the game reserve free of villages. Also by July, 1936, there will be no villages in the Mumbwa District west of the Kafue River. I consider this evacuation of the game reserve, which the Administration has already begun, to be of great importance from the medical point of view.

History of Sleeping Sickness in the Mumbwa District.

Reports of suspected isolated cases have been received for more than ten years but it was supposed that these natives had contracted the disease on the Luswishi and Lukanga Rivers. It is probable that cases have occurred unrecognised in the Mumbwa area, since it is unlikely that in a part of the country where game and fly are so numerous sleeping sickness has been confined to the oval on the map which represents Kinghorn's area. In 1929 suspicious but undiagnosed cases were seen on the Mumbwa area and in 1934 five suspects were reported one of which was medically diagnosed in Choma hospital.

Present Position in Mumbwa District.

The year 1935 has seen a great increase in cases. It is difficult to separate the true from the false cases, since natives and unqualified Europeans have been reporting reputed cases and deaths wholesale throughout the year. Sleeping sickness in its early stages resembles malaria and in its late stages may be confused by unqualified people with almost any disease showing symptoms of coma or wasting. The presence of glands in the neck is moreover in the Northern Rhodesian type of sleeping sickness no true criterion. These enlarged glands are also present in Filaria, a very common disease in the Mumbwa District, and in the various septic conditions of the head and neck. They are very commonly absent in early acute sleeping sickness cases.

It is true that natives in sleeping sickness areas acquire facility in recognising cases but the number of cases they report is always greatly in excess of the accurate figure. The only reliable guide to the number of cases is the microscope. Therefore, with the exception of Area I, in which 25 suspected deaths have occurred since last January in a small group of villages, this report is based on cases definitely diagnosed by means of slides made from blood or gland fluid.

During 1935 there have been 29 definitely diagnosed cases from the Mumbwa District. It is not profitable to guess at the number of unrecognised cases and it is useless to give figures other than this.

The tour of investigation was undertaken to find out exact figures of the cases existing in the area in the month of December. Nine of these cases were found and this figure is included in the total of 29. It probably represents quite fairly the average number of cases in the district at any given time. It is a reasonable figure for an endemic area of this size for it accords with the experience of the last ten years in the Luangwa Valley. It is usual to find odd scattered cases where sleeping sickness is of the Northern Rhodesian type and due to *Glossina morsitans*. Epidemics are extremely rare, the only one of recent years being that which occurred near the Vubwi Valley in the Fort Jameson District in 1927. The usual experience is that the disease is endemic and occurs persistently in isolated cases in certain districts.

Details of the Tour.

Starting from Mumbwa Boma the course of the journey followed roughly the dotted line shown on the map, with deviations daily around this main route so as to include other villages. All the villages, except 14, of the sleeping sickness area in the Mumbwa District were examined and a list of villages with the numbers of persons is attached. There was no reason to suppose that sleeping sickness existed in the 14 villages not examined, since no cases had been reported and enquiries by messengers threw no suspicion on them. A total of 81 villages was investigated with a total population of 2,411, which consisted chiefly of women and young children since the young men were away working at the mines or in the towns on the railway line. The country covered was the greater part of native reserve XVII (through the districts of Chiefs Kashinka, Mulendema, Kampengele and Kabulwebulwe) the eastern bank of the Kafue at its furthest point, and the villages in the game reserve, those along the Mumbwa—Kasempa road as far north-west as the pontoon crossing over the Kafue at Lubungu.

Natives.

There is a wide variety of tribes collected into this rather sparsely populated area. They range from offshoots of the Baila whose scanty clothing renders them especially susceptible to the bites of tsetse fly, to the Bakaonde under Chief Kampengele who inhabit the middle of the district and Area I where so many suspects have been reported. The Ambwera, under Chief Kabulwebulwe and speaking a dialect reminiscent of Sikololo are on the move from Area II into the native reserves. Basala, Baluba, Balenje and Walamba are all represented and a number of Marotse and Balovale travellers were encountered at various villages. These are passing through continually on their way to become industrialised. They wear little clothing and a number of this year's cases have occurred amongst them. They are often employed on their way through by the local natives to build their huts and thatch their roofs for them. The presence of so many tribes in this area makes removal of villages

and clearance of areas more of a problem than in other districts. At the conclusion of the tour the blood of all the carriers and of Chief Kampengele and his staff was examined. All slides were negative.

Vegetation.

A large part of the high ground in the hook of the Kafue is covered by Ntondo forest separated by broad wide damboes clear of trees. These large grass spaces in December are almost dry, they lead by gentle slopes down to the thickets near the river beds which flow into the Kafue. At the extreme western part of the hook the Ntondo forest changes to smaller trees described by Captain Pitman in his game report as "Orchard bush."

Game.

The association of sleeping sickness caused by *Glossina morsitans* with herds of buffalo is well known, and it is borne out again by the large herds in this game reserve.

Tsetse Fly.

An average of five tsetse fly per day was caught regularly at various places and times. Only *Glossina morsitans* were found throughout the tour. The whole of the hook of the Kafue is infested by them, the limit of the fly eastward being a salient in the shape of a semi-circle round Mumbwa Boma at a distance of about 20 miles from it. The whole of this tsetse fly area must be regarded as a potential sleeping sickness area even though cases have not yet occurred in all of it. There is, however, no doubt that there is a great deal more fly in the game reserve. In December the rains have already come, the bush and grass have begun to grow and the tsetse fly are more widely dispersed throughout the country than they are in the hot dry months. It was noticeable that on sunny days the fly were using the broad open damboes as feeding grounds.

Distribution of Cases during 1935.

In the following section the nine cases found during the tour have been added to the 20 definite microscopically diagnosed cases previously found and it is considered that this gives the most accurate view of the situation.

Twenty-nine cases in all have been definitely proved as follows :

A. From Matala Mine :

(*a*) Travellers from Mankoya and Barotseland...	5
(*b*) Native from Mkushi	1
B. From Mumbwa Boma.	
(*a*) Travellers from Mankoya and Barotseland...	3
(*b*) Native reserve	11
(*c*) Area II, Western Game Reserve	3
(*d*) Area I, Eastern Game Reserve	6
	29

It will be profitable to consider these in detail.

A. Matala Mine.

Approximately 12 suspect patients have been sent to Lusaka from this Mine. The Compound Manager, Mr. Dudley, has had experience with the other form of sleeping sickness (that due to *Glossina palpalis*) in the Congo and he has had six of these suspects confirmed by blood examination in Lusaka hospital. The remaining six cases were due to other diseases. One of his proved cases was a Mkushi native who could have been infected before arrival either in the Luangwa Valley area which he visited or in the small Lunsenfwa area which he passed through.

The other five of the proved cases from Matala Mine were travelling natives. It is in connection with these that the mine manager has been anxious.

A visit was paid to the Mine and the Manager stated that there is no fly on or near the Mine and that his only wish has been to point out that these Mankoya and Barotse travellers were repeatedly becoming infected by some focus on their route. He is not anxious about the Mine, which is fly free. With the exception of the Mkushi native referred to above, all the cases reported from Matala Mine have been travelling natives taken into the small mine hospital, generally in extremis.

There are four routes followed by these natives—

(1) Balovale—Kasempa—Lubungu pontoon over the Kafue—Mumbwa. This is the Mumbwa —Kasempa motor road. It passes through thick fly and suspected cases have occurred in the villages along it. These villages are in the game reserve and are being moved. Travellers to Matala Mine might become infected at any point. The route runs close to Area I.

(2) Mankoya—Shikomo—Area I—Mumbwa. This runs through the highly suspect Area I and is the route most often used. The villages along it are being moved.

(3) Mankoya—Shikomo—then south to Kampengele and through the villages in the north of the native reserve. Three or four of these villages have had proved cases of sleeping sickness in them notable Mumpa (two cases), Nsonga (three cases), Lukendo (three cases).
(4) Mankoya—Shegumo—Shigariotombwe—Kampengele and through the villages in the north part of the native reserve. The same remarks apply to these as to those in (3) above.

B. From Mumbwa Boma.

(*a*) Travellers from Mankoya and Barotseland. These natives followed one or other of the four routes referred to above. There are undoubtedly many places where the Kafue can be crossed but these four are the recognised routes and the vast majority of natives used these roads. They could rely on employment as hut makers and thatchers on the way and they travelled along a road with villages at convenient stopping places.

Since the whole of the game reserve is to be depopulated of villages, routes 1 and 2 will drop out of popularity and the traffic will be diverted either to new routes skirting the north and east sides of the game reserve or more probably to routes 3 and 4 which run through the native reserve at its northern end. This will occur automatically since travellers will always choose a line of villages which may employ them as they pass, rather than brave the desolation and increasing game of an evacuated area.

(*b*) *The Native Reserve.* From the map it appears at first sight that the northern villages of this reserve are a bad focus of infection. Eleven cases have been medically diagnosed here during the year. There is no doubt that sleeping sickness is now endemic here but I am of the opinion that it spread downwards from the game reserve and that measures which will be suggested later will be adequate to keep it in check. It will be noticed that the cases have occurred in the northern villages bordering on the game reserve. A close enquiry into the movements of these cases before they fell sick showed that they had comparatively recently visited friends and relations in the game reserve villages. The majority of them had been to Area I. It was not possible to question all because some have died and some were not available. They were reluctant to confess that they have been north for fear that trouble would arise over illicit shooting in the game reserve with their muzzle loader rifles, and this reluctance may account for the difficulty experienced in tracing their movements.

The three cases from Lukendo had visited friends and relations in other villages under the same chief, Kashinka. These villages have since been moved, they were in the game reserve south of Area I.

The three cases at Nsonga and the two cases at Mumpa had all visited Area I, which belongs to the same Chief Kampengele and in which they had friends. The two cases at Kampengele and the Shamabobo case could not be traced though the latter was a Boma messenger and presumably travelled all through the sleeping sickness district. The examination of these cases therefore throws a definite pointer towards the game reserve as being the original source of infection. Other suspects were reported, but enquiry showed how unreliable native reports of this disease can be.

(*c*) *Area II.* The western part of the game reserve. Three cases have been found here and there is no doubt that other cases have occurred. The area is very remote. It lies beyond the Kafue in the extreme north-west corner of the Mumbwa District. There is a great deal of game including large herds of buffalo and the villages are already in the process of moving into the native reserve to the south. The villagers are waiting to reap their crops and are living in small collections of bad houses in uncleared parts of the bush. There is moreover frequent travelling between the old and the new areas. Conditions are ideal for catching sleeping sickness for the fly is heavy. These conditions are temporary and as soon as they are settled in their new site there is no reason to suppose that they will be infected. Three cases were found here on the present tour and there have probably been other cases not reported.

(*d*) *Area I.* A group of 10 villages close together in the eastern part of the game reserve. This I regard as the chief focus of infection in the district. The natives of this group are definitely anxious about the disease. There have been 25 suspected deaths in the year and two cases were found in this small group on the present tour. The villages are badly cleared and the fly is severe. The natives, probably from their experience of many deaths, appeared more reliable in their knowledge of past cases. It is probable that a majority of these 25 deaths have been actually due to sleeping sickness, though by no means all. This group of villages together with others in the game reserve to the north of it is under orders to move out of the game reserve. The question of their new sites will be dealt with below. Six medically diagnosed cases have occurred here during the year (this includes the two cases found on the present tour).

Evacuation of the Game Reserve.

(*a*) *Western. Area II.*

This is already in progress. The villages from across the Kafue in the north-west have started to move into their new area along the banks of the Nangoma in native reserve XVII. The strip to which they are moving is badly infested with fly and they are on the extreme southern border of the game reserve. The area to which they are moving is marked Area II.A. on the map. It is not an ideal new site for a group of villages which has had several known cases of sleeping sickness. From the medical point of view they should move to a fly free area but this is not possible in the Mumbwa

district. The administrative difficulties are great and the incidence of a few cases of endemic sleeping sickness is not sufficient to justify any wholesale upheaval of the population. I consider that settlement along the banks of the Nangoma River will be suitable provided that villages and their gardens are grouped together so as to form continuous cleared areas as has been done successfully on the Luangwa River and in other countries.

(*b*) *Eastern. Area I.*

These villages, which formed a bad focus of infection are to be moved in 1936 into an empty area south of the game reserve. This is marked on the map as Area I.A. The same scheme of grouping them on their new site so as to form cleared areas and collections of villages, should be adopted as in the case of Area II.A.

Their new Area I.A. is an empty fertile tract of country east of the native reserve and situated in a triangular area which indents the boundary of the game reserve. There is fly in this area but not in great amount, and large areas are fly free. The Kanchindu hills will act as a buffer between this new settlement and Mumbwa Boma, which is about 25 miles away. These hills are rocky, barren, uninhabited and almost free of fly.

In an area so thick with fly as the Mumbwa district in the hook of the Kafue, it is not possible to find fly free places for these villages from the game reserve. The essential points from the medical point of view are :—

(*a*) the grouping of villages on their new sites so that gardens are contiguous and so that each village is surrounded eventually by at least a mile of cleared ground on all sides ;

(*b*) the removal of any new cases of sleeping sickness as soon as they occur. These cases are highly dangerous until they are treated. The present arrangements for evacuation of the game reserve can only be satisfactory if infection is removed to Mumbwa Hospital as soon as it occurs. The identification of cases should not depend on native report but on the examination of blood slides. This would necessitate the appointment of one sleeping sickness orderly who could tour Area I.A. and Area II.A., taking slides which could be sent to Lusaka for examination. The situation can never be adequately dealt with until it is possible to provide more medical officers. At present there are only two in the whole of North-West Rhodesia.

Under the present arrangements the empty game reserve will be a barrier against any further spread of infection from the north.

The question raised by the District Administration can now be answered.

1.—*The endemicity or epidemicity of the disease.*

The disease is endemic. It is carried by *Glossina moristans* and comparable to the conditions in the Luangwa Valley. Nine cases existed in the Mumbwa District in December, 1935.

2.—*The liability of travellers to infection and possibility of control of the routes.*

This will always be possible, both to Europeans and natives. The worst routes for natives lay through the game reserve and these will be automatically closed by the removal of all the villages. It is not considered necessary to close the area with a cordon since the disease is not an epidemic. The Bomas at Kasempa and Mankoya should warn natives of the disease and tell them that routes 1 and 2 have no villages on them.

3.—*The desirability of opening the game reserve as a tourist attraction.*

This would be wrong for at least ten years.

4.—*The question of evacuting the native reserve also.*

This is unnecessary. The cases found in the native reserve were probably infected in the game reserve. Sleeping sickness is endemic in the northern villages of the native reserve, but the measures suggested should keep it in check, and it is hoped eventually to reduce it to a very occasional case.

5.—*Consideration of the best areas to which the natives now in the game reserve should be moved.*

This has been discussed with Mr. Bradley, and Areas I.A. and II.A. have been decided upon as most suitable from both medical and administrative points of view.

6.—*The best position for a native dispensary in the native reserve when money becomes available.*

It has been decided that the new village of Kabulwebulwe is most suitable for this. It is central for the villages and could be reached by a short branch road from the main west road.

7.—*The native cotton industry.*

Mr. Bradley has already made considerable progress with this and, provided that the road to Mankoya is allowed to go through, this industry will not suffer.

8.—*The advisibility of building the contemplated road to Mankoya.*

There is no reason why a road should not be built, provided that fly posts are added for the protection of the Boma at Mumbwa. It should run along the exact southern border of the game reserve, *i.e.*, from Mumbwa to the headwaters of the Kachereko and then along the north bank of the Nangoma. A site for the pontoon can be found at Shikomo village, which would be the only village allowed to remain in this part of the game reserve. It is a well cleared, clean village on the banks of the Kafue, and no cases have been found or suspected near it. This would be the only village on the road, and the latter would be reasonably safe, even if new cases continue to occur in the native reserve to the south of it. Roads have been built through sleeping sickness areas in the Luangwa Valley the Luapula Valley in this country, and in Uganda, Kenya and Tanganyika Territory. A further question will be asked : " Is there any danger to the Europeans and natives who build it ?". The answer to this must be " Yes," but the European can be protected by a prophylactic dose of Bayer 205, and the labour could possibly be recruited locally. Local natives would run no more danger than in their normal journeys from village to village. The danger, in any case, is slight, since the road will not run through the bad areas and will not pass through any villages. It would be immensely valuable to Mumbwa District and to the development of North-Western Rhodesia.

9.—*The question of building an emergency landing ground and its best situation from the sleeping sickness point of view.*

It is suggested that this landing ground should be near the proposed Shikomo pontoon. The site to be along the road which would be widened to 100 yards for 1,000 yards in the form of a strip.

Summary of Recommendations.

1. The present arrangements for new sites for the infected villages moving from the game reserve into the native reserve are, from the medical point of view, the most suitable that can be made in this fly infested area.

2. The new areas I.A. and II.A. should have a sleeping sickness orderly attached for at least two years after movement has taken place. This orderly should take slides of suspicious cases, and the infectious cases should be removed to Mumbwa hospital at the earliest possible moment.

3. The villages must be grouped together so as to form contiguous wide cleared spaces. This has been done with success in the Luangwa Valley.

4. The small hospital built for £10 by Mr. Bradley's enterprise to meet this emergency needs a second orderly and money for enlargement. At present all new cases are being brought there and treatment there has been very successful.

5. The road to Mankoya can be built with reasonable safety. It should run on the extreme southern border of the game reserve and thus avoid the bad areas and any villages likely to have cases in them.

The Europeans in charge of the work should receive prophylactic injections of Bayer 205, and should be warned that poaching in the game reserve, camping in proximity of villages, short sleeves, thin clothing and shorts, all add to the danger of contracting sleeping sickness. The experience of the Great East Road in the Luangwa Valley showed that this new west road can be built safely if those in charge are careful. No medical opinion can, however, guarantee complete and certain safety through an area so fly infested as this.

6. The Bomas of Kasempa and Mankoya should warn travellers of this area and try and divert them if possible.

7. It is important that there should be a fly post on the new road at a distance of about 20 miles west of Mumbwa.

I should like to end this report by expressing my thanks to Mr. K. G. Bradley, the District Commissioner, Mumbwa, who accompanied me on the whole tour. His detailed knowledge and his organising powers made a great deal possible in a small space of time.

I have the honour to be,

Sir,

Your obedient Servant,

H. A. Gilkes,

Medical Officer.

SLEEPING SICKNESS CASES DISCOVERED DURING THE TOUR, DECEMBER, 1935.

	Village	Male	Female	Children	Village	Male	Female	Children
1.	Mwanachendi ...	6	12	12	Mwanachiwaya-waya.	8	18	31
2.	Mulungushi ...	6	18	15	Mutobola	5	8	8
3.	Mulimbika ...	8	10	8	Chiwautu	10	14	14
4.	Shiompa	7	12	9	Chilemba ...	13	16	18
5.	Kapepe	6	5	8	Shikomo	6	5	10
6.	Mulombanyama ...	5	6	5	Kapeshi	14	15	20
7.	Kafweba	3	6	7	*Tanyela*, *1 ...	15	17	15
8.	Chioshya	2	9	9	Mulungu	12	14	5
9.	Lukendo	18	18	14	Musakabantu ...	8	9	3
10.	Kashila	5	7	8	Kangombe ...	6	10	12
11.	Shamutindi ...	2	7	8	Mutumbi	7	14	33
12.	Shamubanga ...	14	12	18	Mwendani ...	5	8	6
13.	Mulandabantu ...	7	6	11	Nzabanzaba ...	5	14	20
14.	Shimutandabala ...	17	15	14	Mushima	8	8	10
15.	Mumena	8	3	9	*Mukandabantu*, *1, †1	7	19	10
16.	Lutwamaoma ...	5	7	6	Mwanabeki ...	5	10	8
17.	Lupumpaula ...	5	3	6	Lushimbika ...	12	18	18
18.	Mulendema ...	10	20	8	Lushima	18	18	26
19.	*Nsongo*, †2 ...	5	5	8	Musompo	4	15	16
20.	Mutinginyi ...	10	5	7	*Ngambela*, *1 ...	7	9	15
21.	Kampengele ...	14	18	20	Chikwana ...	11	10	12
22.	Kasongo	15	10	9	Mwambula ...	8	5	10
23.	Shibomba ...	10	5	8	Kasonso	3	10	9
24.	Nyumba	20	10	11	Kadilo	4	6	8
25.	*Mumpa*, *1, †1 ...	10	12	20	Mwila	3	8	9
26.	Chilwabubi ...	10	14	16	Shumbwa ...	5	7	10
27.	Shigariotombwe ...	14	10	8	Shimwese	5	7	9
28.	Munyani	6	8	6	*Mponda*, *1 ...	4	6	10
29.	Muchebwe ...	7	10	7	Mukoloboshi ...	1	4	2
30.	Chipunsa	5	7	6	Mbayama ...	2	9	10
31.	Machigi	5	13	8	Shamapanga ...	2	5	8
32.	Mubambo ...	7	9	7	Mbelama ...	8	10	12
33.	Shamachila ...	6	9	7	Funzi	19	16	14
34.	Shamabobo ...	10	14	14	Mwepamumpa ...	4	5	5
35.	Mwanachyanda ...	8	12	10	Kabesha	12	13	14
36.	Mutanti	7	13	21	Lubungu	3	9	6
37.	Tapula	9	16	20	Tenge	6	9	12
38.	Shieguma	12	13	16	Ingwe	5	14	10
39.	Shamatanda ...	4	9	8	Kasanzali ...	6	9	10
40.	Mukaka	8	10	14	Kanema	2	6	9

Cases found on the tour : *Male ; †Female.

9.—Slides examined (including 6 gland puncture smears).
11.—111 Sleeping Sickness cases.
14.—5 male, 4 female, total 9.
17.—Total villagers examined, 81.
19.—Total population examined :

Men ...	629
Women ...	845
Children ...	937
	2,411

MUMBWA DISTRICT.

Details of Sleeping Sickness Cases Microscopically Diagnosed During the Year 1935.

A.—*Natives travelling* from Mankoya and Barotseland ...	9
(3 of these sent in from Mumbwa to Lusaka hospital and 6 from Matala Mine.) ...	
B.—*Area I on map* :	
Kasonso village	1
Kadilo village	1
Kanema village (adjacent to Area I)	1
Mwambula Village	1
Mponda Village	1
Ngambela Village	1
C.—*Area II on map* :	
Tanyela village	1
Mukandabantu village	2
D.—*Native Reserve XVII* :	
Lukendo village	3
Kampengele village	2
Nsonga village	3
Mumpa village	2
Shamabobo village	1
Total	29

APPENDIX II.

SUMMARY OF MEDICAL ACTIVITIES AT VARIOUS MISSIONS DURING THE YEAR, 1935.

Name of Mission	In-Patients		Out-Patients		Number of Treatments		Number of Confinements	No. of Births	Infantile Deaths	Lepers	Remarks.
	European	*Native*	*European*	*Native*	*European*	*Native*					
Kalene Hill (Mwinilunga)...	14	736	31	2,905	509	15,555	50	44	8	5	—
London Missionary Society (Mporokoso)	—	21	—	972	—	5,722	—	—	—	—	—
Seventh Day Adventist Mwami Mission, Fort Jameson	2	205	19	3,614	338	52,847	7	7	—	68	—
Paris Mission, Sesheke ...	—	160	5	2,078	13	9,495	9	7	2	5	—
S.A. General Mission, Mukinge Hill, Kasempa	—	1,439	—	5,732	—	11,450	7	7	2	—	—
S.A. General Mission, Luampa, Mankoya	—	123	—	7,682	—	19,125	21	22	4	9	—
Jesuit Fathers, Chikuni ...	9	250	13	2,700	142	10,376	—	—	—	—	—
Livingstonia, Church of Scotland, Lubwa Chinsali	12	421	4	1,520	53	37,137	25	81*	6	—	*Total births recorded in district.
Kabanga Mission, Kalomo	—	1,623	—	1,440	—	4,832	—	—	—	11	—
Livingstonia, Church of Scotland, Mwenzi, Isoka	7	925	—	—	42	28,249	52	53	4	1	—
U.M.C.A., Msoro, Fort Jameson	5	104	6	3,435	28	36,457	11	29	8*	—	*Total births recorded
Livingstonia Mission, Chitambo, Serenje	—	106	2	6,390	—	16,080	24	24	6	—	—

SUMMARY OF MEDICAL ACTIVITIES AT VARIOUS MISSIONS DURING THE YEAR, 1935.—*Continued.*

Name of Mission	In-Patients		Out-Patients		Number of Treatments		Number of Confinements	No. of Births	Infantile Deaths	Lepers	
	European	*Native*	*European*	*Native*	*European*	*Native*					
Livingstonia Mission, Church of Scotland, Lundazi	—	43	—	5,031	—	14,345	—	—	—	—	—
Kanchindu Mission, Choma	—	96	—	2,479	—	8,469	1	1	1	—	—
Sinde Mission, Livingstone	—	95	—	270	—	2,481	—	—	—	—	—
White Fathers, Minga Petauke	—	71	7	6,300	47	19,258	—	—	—	12	—
U.M.C.A. Fiwila, Mkushi ...	—	60	—	1,826	—	16,485	—	—	—	23	—
Methodist Mission, Namantombwa, Mumbwa	—	24	—	278	—	2,006	—	—	—	1	Figures for six months only.
Macha Mission, Choma ...	12	168	1	—	25	17,378	4	4	4	—	—
White Fathers, Bangweulu	2	9	1	14,866	35	74,320	—	410*	57*	—	*Totol births and deaths for villages in district.
Methodist Mission, Chipembi, Chisamba	1	64	7	1,148	42	4,664	—	—	—	—	—
Johnston Falls Mission ...	—	76	—	568	—	13,510	—	—	—	—	Figures for six months only.
Dutch Reform Church Mission, Fort Jameson	57	2,856	248	6,152	—	90,337	51	51	48	28	Great difficulty experienced in persuading lepers to remain in colony until cured.
Namwianga Mission, Kalomo	3	181	48	1,165	84	1,809	21	22	—	3	
Rusangu, Mission Siding...	—	3	—	514	—	7,981	9	10	1	—	Weekly welfare clinic.
Katondwe, Luangwa Bridge (Jesuit Fathers	1	36	—	180	—	1,711	—	—	—	1	Average attendance of infants 20.
Jesuit Fathers (various Missions)	5	192	—	1,746	30	10,356	—	—	—	2	—

APPENDIX III.

RHODESIA BROKEN HILL DEVELOPMENT COMPANY, LTD.

DAILY AVERAGE NATIVES EMPLOYED THROUGHOUT THE YEAR: 1922 (including Contractors' Labour).

	Cases treated	Deaths	Remarks
Malaria	271	1	*Malaria*: Sickness incidence per mille employed, 135.5; Mortality incidence per mille employed, .5.
Varicella	2	–	
Relapsing fever	3	–	
Measles	2	–	
Bronchitis	5	–	
Diarrhoea	1	–	
Ankylostomiasis	1	–	
Tuberculosis	3	3	
Broncho-pneumonia—surface ...	15	7	*Pneumonia* (all types): Sickness incidence per mille employed, 9.0; Mortality incidence per mille employed 4.0.
Lobar-pneumonia—surface ...	3	1	
Influenza	72	2	
Pleurisy	4	–	
Diseases of heart and blood vessels	1	–	
Syphilis	16	–	
Gonorrhoea	3	–	
Tropical ulcers	6	–	
Accidents:			
(*a*) Arising out of employment ...	565	–	*Mine Accidents*: Disability rate per mille employed, 282.5; Mortality rate per mille employed, Nil.
(*b*) Not arising out of employment	2	–	
Abscesses	78	–	
Minor ailments	2	–	
Arthritis	3	–	
Phlebitis	1	–	
Hepatitis	1	1	
Pharyngitis	1	–	
Internal haemorrhage	1	1	
Epilepsy	2	–	
Cystitis	1	1	
Enteritis	1	–	
Conjunctivitis	4	–	
Quinzy	1	–	
Total	1,071	17	

RHOKANA CORPORATION—NKANA MINE.

DAILY AVERAGE NATIVES EMPLOYED THROUGHOUT THE YEAR : 6,614 (including Contractors' Labour).

	Cases treated	Deaths	Remarks
Malaria	55	–	*Malaria* : Sickness incidence per mille employed, 8.32.
Typhoid fever	26	9	*Typhoid* : Sickness incidence per mille employed, 3.92 ; Mortality incidence per mille employed, 1.36.
Cerebro-spinal meningitis	4	3	
Varicella	8	–	
Ankylostomiasis	150	–	
Amoebiasis	29	–	
Dysentery (bacillary)	3	–	
Diseases of chest	67	–	
Tuberculosis (pulmonary)	14	1	
Broncho-pneumonia—surface ...	3	–	*Pneumonia* (all types) surface and underground : Sickness incidence per mille employed, 45.26 ; Mortality incidence per mille employed, 5.45.
underground	2	–	
Lobar-pneumonia—surface ...	90	7	
underground ...	204	29	
Tuberculosis (miliary)	2	–	
Influenza	97	–	
Pleurisy	2	–	
Diarrhoea	6	–	
Diseases of heart and blood vessels	2	2	
Trypanosomiasis	2	–	
Syphilis	27	–	
Gonorrhoea	23	–	
Accidents :			*Mine Accidents* : Disability rate per mille employed, 173.93 ; Mortality rate per mille employed, 2.42.
(*a*) Arising out of employment ...	1,149	16	
(*b*) Not arising out of employment	406	2	
Suicide	1	1	
Conjunctivitis	54	–	
Minor ailments	401	–	
Yaws	3	–	
Tropical ulcers	1	–	
Meningitis (streptococcal) ...	1	1	
(encephelitis)	1	1	
(pneumococcal) ...	1	1	
Pyaemia	1	–	
Toxaemia	1	1	
Portal septicaemia	1	1	
Amoebic carriers	12	–	
Enteritis	1	–	
Intestinal obstruction	1	1	
Cancer of liver	1	1	
Abscess of liver	1	–	
Abscess of lung	1	1	
Anaemia	1	–	
Acute infective jaundice	1	1	
Carbon tetrachlor poisoning ...	1	1	
Trachoma	2	–	
Glandular fever	1	–	
Epidemic oedema	1	1	
Total	2,861	81	

MUFULIRA MINE.

DAILY AVERAGE NATIVES EMPLOYED THROUGHOUT THE YEAR : 2,914 (including Contractors' Labour).

	Cases treated	Deaths	Remarks
Malaria	85	–	*Malaria* : Sickness incidence per mille employed, 29.16.
Blackwater fever	9	–	
Cerebro-spinal fever	1	1	
Typhoid fever	2	1	
Varicella	43	–	
Diarrhoea	7	–	
Ankylostosomiasis	44	–	
Amoebiasis	8	–	
Dysentery (bacillary)	8	–	
Broncho-pneumonia—surface ...	32	4	*Pneumonia* (all types) surface and underground : Sickness incidence per mille employed, 31,91 ; Mortality incidence per mille employed, 4.46.
underground	24	1	
Lobar-pneumonia—surface ...	17	5	
underground ...	16	3	
Influenzal-pneumonia—surface ...	2	–	
underground	2	–	
Phthisis	4	1	
Influenza	186	–	
Pleurisy	2	–	
Syphilis	8	–	
Gonorrhoea	8	–	
Accidents :			*Mine Accidents* : Disability rate per mille employed, 149.62 ; Mortality rate per mille employed, 3.77.
(*a*) Arising out of employment ...	436	11	
(*b*) Not arising out of employment	175	–	
Conjunctivitis	37	–	
ffiarotitis	20	–	
Minor ailments	224	–	
Measles	2	–	
Phlebitis	1	–	
Angina Pectoris	1	1	
Hernia	2	–	
Hydrocele	4	–	
Yaws	1	–	
Filariasis	2	–	
Scabies	17	–	
Tonsilitis	1	–	
Undiagnosed	1	–	
Bronchitis	7	–	
Gastro-enteritis	2	1	
Tropical ulcers	3	–	
Total	1,444	29	

ROAN ANTELOPE COPPER MINES, LTD.

DAILY AVERAGE NATIVES EMPLOYED THROUGHOUT THE YEAR : 4,515 (including Contractors' Labour).

	Cases treated	Deaths	Remarks
Malaria	50	–	*Malaria* : Sickness incidence per mille employed, 11.07.
Cerebro-spinal meningitis ...	1	1	
Typhoid	7	4	
Pneumococcal meningitis	1	1	
Relapsing fever	4	–	
Varicella	7	–	
Dysentery (bacillary)	13	2	
Diarrhoea	16	–	
Tuberculosis (pulmonary)	2	2	
Other forms of tuberculosis ...	4	3	
Diseases of the chest	6	–	
Broncho-pneumonia—surface ...	8	2	*Pneumonia* (all types) surface and underground : Sickness incidence per mille employed, 19.25 ; Mortality rate per mille employed, 1.77.
underground	40	3	
Lobar-pneumonia—surface ...	9	1	
underground ...	30	2	
Influenza	107	–	*Influenza* : Sickness incidence per mille employed, 23.69.
Pleurisy	9	–	
Diseases of blood vessels	1	1	
Yaws	1	–	
Syphilis	55	–	
Gonorrhoea	8	–	
Accidents :			*Mine Accidents* : Disability per mille employed, 117.82 ; Mortality per mille employed, 1.107.
(*a*) Arising out of employment ...	532	5	
(*b*) Not arising out of employment	246	–	
Homicide	4	4	
Motor accident	1	1	
Diseases of eye	81	–	
Minor ailments	535	–	
Abscesses	44	–	
Causes unknown	1	1	
Diseases of the chest	8	–	*All Causes* : Sickness incidence per mille employed, 409.3 ; Mortality incidence per mille employed, 7.53.
Peritonitis	1	–	
Septic wounds	5	–	
Cirrhosis of liver	1	1	
Morbilli	11	–	
Total	1,849	34	