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A Survey of Leprosy amongst the Lovale Tribe in the Upper Zambesi Basin, Northern Rhodesia*

BY

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PART I

An extensive health survey, with special reference to an epidemiological study of leprosy, amongst the Lovale tribe who live in the upper Zambesi basin has been carried out. A considerable part of their tribal area is in Angola, and that part which is in Northern Rhodesia comprises about half of what is known as the Balovale district. This district lies in the extreme north-west corner of Northern Rhodesia and is bounded on the north and west by Portuguese West Africa (Angola). Until 1941, Balovale was administratively the northern section of Barotseland. It is isolated from the main towns and separated from the railway by 450 miles of sparsely populated bush country. Balovale district lies between latitude 13° and $14^{\circ} 12'$ at an altitude of 3,200 to 3,500 feet and the temperature varies from 102° F. to 55° F. There is an average rainfall of 35 to 40 inches and a well-defined wet and dry season, the rainy season being from November to April and the dry season from May to October.

The Lovale tribal area comprises about 8,000 square miles (population density two per square mile), the whole of it low-lying on the west bank of the Zambesi and most of it covered with light bush. A considerable area of Lovaleland is inundated for two to three months of each year by the Zambesi flood which, at Chitokoloki, rises and falls about 30 feet annually. The relative humidity is not great except during the two months December and January. A large part of the country is sandy. In addition to the territory of the Lovale chieftainship, the district of Chavuma, disputed territory on the east bank of the Zambesi, has been included in this survey, as the majority of the people there are also Lovale. In Lovaleland practically all the villages lie along the banks of the Zambesi and

its tributaries and, owing to the low-lying nature of the country, are difficult of access. At the time of this survey there were no roads, nor were there any European traders nor stores in the area, and consequently the whole area has been extremely backward.

The social organisation of the Lovale people is most primitive, their unit of social life being the village, an average village containing 20 to 50 people. Their houses are small and dark, built of mud and wattle, and covered with grass and usually only six to eight feet high. There is no ventilation nor lighting. Some of the villages are clean and well laid out. All the houses have mud floors and the inmates sleep either on the floors on grass mats or on "beds" of small branches, bound together with bark rope and supported on stakes a few inches from the ground. Young children always sleep with the women, more often with aunts or grandmothers than with their mothers. The villages usually have no latrines nor arrangements for the disposal of refuse and, while the actual area of the village is kept cleared, beyond the village area the houses are closely surrounded by long grass or bush which serves for the disposal of rubbish of all kinds. Many of the houses are infested with ticks (*Ornithodoros moubata*) and tick relapsing fever is frequently encountered (Fig. 1).



Fig. 1—Typical village scene.

Each village has a headman, usually the senior male, and the whole discipline of the tribe is based on seniority or rule by elders. Women

* Based on a thesis accepted for the degree of M.D., University of St. Andrew's.

have only limited rights and are regarded as the property of the males. Before puberty the girls are the property of their father or maternal uncle, who "sells" them at puberty at the best price offering. After marriage they become the property of the husband, who may return a wife to her male parent or guardian and receive his money back should he find sufficient reason for so doing. Polygamy is common and the fear of witchcraft is universal. All this has an important bearing on public health. There is no family life as we understand it, and promiscuity is general. The vast majority of men of middle age or over have had a number of wives, perhaps only one or two at a time, but changing them at intervals of a few years; and, similarly, most of the women have had a number of husbands. The marriage bond is held very loosely and is broken, temporarily or permanently, on the most trivial pretext.

It is usual for each woman to have her own hut, and any child she may have will sleep with her *until weaned*, when it is customarily taken over by an aunt or grandmother or other female relative who will bring it up.

With these people no disease is attributed to infection or contagion, but invariably to witchcraft. There is no fear of leprosy and no question of isolating or ostracising its victims. In spite of this, it is extremely rare to find living in their villages a husband and wife who are both suffering from leprosy. In leprosy settlements there are many such couples, as unattached people coming to settlements tend to mate with others already there.



Fig. 2—Bringing home cassava after soaking it in the river.

DIET

The basic food is cassava meal. To have two meals a day is usual—a small meal at midday and a good meal in the evening. The women prepare all the food, but the sexes feed separately. Additional foods when available, and then usually in very small quantities, include rice, millet, beans, groundnuts, native potato, corn and fruits



Fig. 3—Food store for protection from white ants.

in season, bananas, mangoes, paw-paw, guavas and citrus. They eat also caterpillars and a variety of mushrooms. Poor quality fish is always available, but is practically never eaten fresh—it is dried on the roofs of their huts in the sun and is often full of maggots and worms. To the vast majority, meat of any kind is rarely available, but is in great demand when offering, as also is salt. They keep goats and hens, but rarely take milk or eggs, and the main use of the animals is for bartering. On the whole, their diet is never generous and there is considerable undernourishment, especially during the dry season. With practically all there is a protein deficiency in their diet (Figs. 2 and 3).

CLOTHING

Very little clothing is worn. All, of both sexes, wear at least a loin cloth. One occasionally still sees a person wearing nothing but an animal skin. Those who are more civilised may wear trousers or shorts and shirts, and the women dresses and some kind of headcloth (Fig. 4).

EMPLOYMENT

There is no employment available within the area, but many males travel 500 miles or more to work in the mines or towns. All adult males are taxed 6s. per year. This is done through the Native authority, which consists of a paramount chief and four or five sub-chiefs responsible to the European District Commissioner. European rule is thus indirect. The men in each village see to the building of the huts and fell bush for fields, while the women do the actual cultivating.



Fig. 4 --Village scene.

There are some 15 primitive, elementary mission out-schools in the area, which have a total of 1,509 pupils (1952).

THE DISEASE BACKGROUND

One of the commonest ailments amongst these people is anaemia of nutritional or parasitic origin. Malaria is endemic and carries off a good number of children, but adults do not suffer

greatly. Hookworm is common. Bilharzia is common in certain areas only. Syphilis and gonorrhoea are both very common, the latter being known in the areas surrounding Lovaleland as the "disease of the Lovale."

The less common conditions include thyroid adenomata, relapsing fever, tuberculosis (a recent introduction) and skin conditions, particularly scabies. Uterine fibroids are common and a variety of malignant tumours is seen. Any skin or nerve conditions likely to be confused with leprosy are very rare indeed.

THE SURVEY

The purpose of a health survey was explained to the chief and headmen and their co-operation enlisted. I have been a number of years in the district and am sufficiently well known to the Africans to command their confidence. The importance of seeing every person was stressed and any absentees were checked up as far as possible. I explained to each headman, "We want to find out what diseases the people have so that we can get the right medicines to cure them." No indication was given that I was looking for leprosy. As far as practicable the whole population was examined stripped or with loin cloth only. They make no effort to conceal leprosy and the disease is not regarded with any reproach. It seems to have been familiar to them for generations and they do not consider it a disease of recent introduction.

The survey occupied five months, full time, and meant travelling great distances on foot or by boat. I visited every village in the sparsely populated Lovale country, and each individual was recorded by name and with serial number. Since these people are illiterate and amoral, their individual answers to questions may not always be exactly true, but the collective impression of all the answers is certainly fair and accurate.

The figures of the survey report are modelled on the minimal epidemiological data recom-

Table I
AGE GROUPS

	A	B	C	D	E	F	G	H	I	
	0-4	5-9	10-14	15-19	20-29	30-39	40-49	50-59	Over 60	TOTAL
Males - -	618	972	814	388	1,086	1,655	1,247	1,600	1,282	9,662
Females -	605	718	479	537	1,651	1,897	2,085	1,460	1,054	10,486
TOTALS -	1,223	1,690	1,293	925	2,737	3,552	3,332	3,060	2,336	20,148

Table II
THE AGE PREVALENCE OF LEPROSY
AGE GROUPS

	A	B	C	D	E	F	G	H	I	TOTAL
	0—4	5—9	10—14	15—19	20—29	30—39	40—49	50—59	Over 60	
Males - -	—	2	3	3	6	11	14	30	38	107
Females -	—	—	1	1	3	21	37	37	33	133
TOTALS -	—	2	4	4	9	32	51	67	71	240

mended by the International Leprosy Congress at Cairo in 1938.

THE SURVEY FINDINGS

Census Figures.—In all, 20,148 people (9,662 males and 10,486 females) were examined. The age groups are summarised in Table I.

The number of people found with leprosy was 240, giving a general prevalence of 11.85 per 1,000.

The number of cases in the different age groups are shown in Table II.

It is observed in the first three age groups (A, B and C) the males considerably outnumber the females. In the next four age groups (D, E, F and G) the females greatly outnumber the males, while in the last two groups (H and I) the males outnumber the females. In the first four years of life the sexes are almost equal, while from the age of 5 to 15 the males take the lead. Possibly under local conditions the males withstand better the attacks of malaria and other acute conditions which carry off so many children and adolescents. Age group D (age 15—19) is unusually small and this is related to a plague of locusts in 1935, followed by famine in that and the following years, when many children died.

From age 15 to 50 the females greatly outnumber the males, and this is undoubtedly due to the males leaving the districts and going off in search of employment and adventure to South Africa, Southern Rhodesia and the Northern Rhodesia Copperbelt.

In the last two age groups, age 50 and upwards, the males again predominate. This may be due to the return home of older men who have been absent and the fact that elderly African women are unwanted and neglected and do not therefore survive as long as the men.

THE CONTACT RATE

Sixty-six per cent. of the cases of leprosy admitted have a near relative with the disease. If we accept the view, now generally held, that most leprosy is contracted in childhood, and as we know the social habits of the tribe, it is not surprising that 63 patients (26.25 per cent.) had an uncle or aunt with leprosy, whereas only 44 (18.33 per cent.) had a parent infected.

The significant finding was the low childhood rate and the steadily increasing prevalence with the advancing age groups. There was also a steadily rising number of lepromatous cases as the age groups advance, the proportion being approximately doubled with the advance in the total number of cases.

Table III
THE AGE PREVALENCE OF LEPROSY
MALES

	A	B	C	D	E	F	G	H	I	TOTAL
Tuberculoid	—	1	2	1	3	5	8	18	30	68
Lepromatous	—	—	—	—	1	2	3	11	5	22
Indeterminate	—	1	1	2	1	3	3	1	2	14
Borderline -	—	—	—	—	1	1	—	—	1	3
TOTAL - -	—	2	3	3	6	11	14	30	38	107

Table IV
FEMALES

	A	B	C	D	E	F	G	H	I	TOTAL
Tuberculoid	—	—	1	—	3	13	21	24	15	77
Lepromatous	—	—	—	—	—	3	7	9	16	35
Indeterminate	—	—	—	1	—	5	8	4	2	20
Borderline	—	—	—	—	—	—	1	—	—	1
TOTAL	—	—	1	1	3	21	37	37	33	133

These findings are shown in the Tables III and IV.

The figures for type prevalence in the last age groups (over 60) show a sharp rise in lepromatous cases in females (there are actually more lepromatous than tuberculoid cases in this group) and an equally sharp fall in the lepromatous cases in males. In regard to tuberculoid cases, the females show a decrease and the males an increase in this age group.

THE TYPE PREVALENCE OF LEPROSY
(Classification of Madrid Congress, 1953)

Out of 240 cases of leprosy—

146 (60.84 per cent.) were of the *tuberculoid* type.

57 (23.75 per cent.) were of the *lepromatous* type.

33 (13.75 per cent.) were of the *indeterminate* type.

4 (1.66 per cent.) were of the *borderline* type.

The table gives the details of the types met with in 240 cases.

TYPES:	No.	Per cent.	Total
LEPROMATOUS—			
Macular	10	4.16	
Diffuse	37	15.42	
Infiltrated	4	1.66	
Nodular	6	2.50	23.75%
TUBERCULOID—			
Minor	109	45.42	
Major	37	15.42	
Pure Neuritic	—	—	60.84%
GROUPS:			
INDETERMINATE—			
Macular	29	12.09	
Pure Neuritic	4	1.66	13.75%
BORDERLINE—	4	1.66	1.66%
	<u>240</u>	<u>100.00</u>	<u>100.00%</u>

From all types and groups, 111 showed polyneuritic signs = 46.3%.



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