

## ANALYSIS OF 722 CASES OF LEPROSY AND THEIR TREATMENT

BY B. MOISER, M.D.

*Medical Superintendent, Ngomahuru Leprosy Hospital  
Fort Victoria, Southern Rhodesia*

At the Ngomahuru Leprosy Hospital, which is the isolation hospital for the southern portion of Southern Rhodesia, located in sparsely-settled country several miles from Fort Victoria, there are no out-patients. All of the patients live within the hospital fence, in huts built of native materials in local native style, grouped in six villages. The inmates are assigned to these villages according to the type of the case, one village being reserved for early closed cases and those nearing discharge.

On January 1, 1934, the number of patients was 399, of whom 259 were males and 138 females, a proportion of 1.9 to 1. Seven of them were people who had been discharged but who had returned for further treatment. All but one European patient are Negroes. During 1933 there were admitted 129 new cases, considerably fewer than 155 and 183, respectively, in 1931 and 1932. During the same year 30 (about 7.5 per cent) died, and in the six months preceding the departure of the medical officer on leave 24 patients (6 per cent) were discharged on parole as apparently cured, after repeatedly negative bacteriological examinations.

### ANALYSIS OF CASE DATA

The total number of patients treated at the hospital since the records began, in 1913, is 909. A considerable number of the case records are too incomplete to be of use in the present connection, but in 722 cases sufficient data were recorded to make them available for analysis.

Considering them first with regard to age, the proportions in the different age groups are as follows:

0-10 years of age,	2.6 per cent
11-20 years of age,	11.9 per cent
21-30 years of age,	34.1 per cent
31-40 years of age,	26.8 per cent
41-50 years of age,	15.5 per cent
51-60 years of age,	6.2 per cent
61-70 years of age,	2.9 per cent

The peak is reached in the 20 to 30 decade, which is too old. There should be more in the 10 to 20 group, for this is the one in which the first signs of the disease most commonly appear. These figures are an indication of the desirability of systematic examination of contacts.

Of the 80 patients that were classified as children, 37 had been born in the hospital and 43 had been brought in by their mothers. Eight of them died, and 48 were sent home. Only one child is recorded as having become infected in the institution.

The matter of family relationships among the patients has been investigated, and the findings are tabulated as follows:

<i>Relationship</i>	<i>Number of Instances</i>
Father and one child .....	4
Father and two children .....	3
Father and three children .....	1
Total instances, father and children .....	8
Mother and one child .....	17
Mother and two children .....	1
Mother and three children .....	1
Total instances, mother and children .....	19
Sisters, two .....	1
Sisters, three .....	1
Total instances, sisters .....	2
Brothers .....	4
Brother and sister .....	10
Husband and wife .....	24
Uncle and nephew or niece .....	7
Stepfather and son .....	1
Stepmother and son .....	6
Brother and sister-in-law .....	1

Among the features of these data that are of interest is the greater frequency of mother-child than father-child relationship; the proportion is 2.3 to 1, increased to 3.6 to 1 when step-parent rela-

tionships are included. The sister-sister relation seems, curiously, to be less frequent than the brother-brother, while the brother-sister relationship is by far the most common of these. The frequency of husband-wife relationship, 24 instances involving 48 individuals out of 722 (6.6 per cent), is exceptionally high.

TABLE 1.—Results of treatment of 722 cases of leprosy.

Type of case	Cases treated	Discharged		Improved		Stationary	Worse	Died	Negative <sup>a</sup>	
		No.	Per cent	No.	Per cent				No.	Per cent
<b>NEURAL</b>										
N1	98	55	56.2	38	38.8	2	0	3	b	b
N2	203	126	62.2	52	25.6	2	0	23	b	b
N3	22	12	54.5	7	31.8	1	0	2	b	b
Total	323	193	59.8	97	30.0	5	0	28	b	b
<b>MIXED</b>										
N1-C1	106	8	7.5	87	82.0	3	2	6	49	46.2
N1-C2	47	1	2.1	28	59.6	8	2	8	11	23.4
N1-C3	4	0	0.0	2	50.0	1	0	1	0	0.0
N2-C1	135	13	9.6	88	65.2	5	1	28	47	34.8
N2-C2	54	0	0.0	22	40.7	22	0	10	5	9.3
N2-C3	15	0	0.0	3	20.0	5	2	5	0	0.0
N3-C1	14	0	0.0	6	42.9	5	0	3	8	57.2
N3-C2	8	0	0.0	3	37.5	1	0	4	0	0.0
N3-C3	2	0	0.0	0	0.0	1	0	1	0	0.0
Total	385	22	5.7	239	62.1	51	7	66	120	31.2
<b>CUTANEOUS</b>										
C1	5	1	20.0	4	80.0	0	0	0	2	40.0
C2	4	0	0.0	1	25.0	0	0	3	0	0.0
C3	5	0	0.0	1	20.0	1	1	2	1	20.0
Total	14	1	7.1	6	42.8	1	1	5	3	21.4
<b>TOTAL</b>	<b>722</b>	<b>216</b>	<b>30.0</b>	<b>342</b>	<b>47.3</b>	<b>57<sup>c</sup></b>	<b>8<sup>c</sup></b>	<b>99<sup>c</sup></b>	<b>123</b>	<b>30.8</b>

<sup>a</sup> Cases originally bacteriologically positive that have become negative.  
<sup>b</sup> Neural cases, never bacteriologically positive.  
<sup>c</sup> The percentages of all stationary, worse and died are 7.9, 1.1, and 13.7, respectively, totalling 22.7.

The class distribution of these cases with respect to type and severity of the disease is shown in Table 1. The classification used is that recommended by the Leonard Wood Memorial Conference, the symbols N, C, and NC representing neural, cutaneous and mixed, respectively, and each class being subdivided with numerals indicating the degree of severity. The distribution of cases in the latter respect will doubtless vary with different observers, for which reason our figures are probably not strictly comparable with the records of others,

but the differences are probably not great. As the classification has been applied by us the cases analyzed were 45 per cent neural, 53 per cent mixed, and 2 per cent cutaneous. Mixed cases predominate, and purely cutaneous cases are rare. With regard to the neural type it will be noticed that the N2 cases form the largest single group. It must be explained that the great majority of these come under the heading of "secondary neural;" that is, they have not been N1 cases that have become N2 through extension of the disease, but have been mixed cases that have lost all signs of cutaneous involvement.

#### TREATMENT

Before taking up what I prefer to call the specific treatment of the disease, it is desirable to consider the general regimen under which our patients live. Housing may be said to be satisfactory from the native viewpoint. Clothing has been inadequate in the past, but this has recently been remedied.

As an important part of the general regimen, regular occupation and exercise is insisted on for everybody, the patients being kept busy out of doors from 6 to 11 a.m., four days in a week. They keep the place clean, construct and repair roads and drains, make and tend plantations, nurseries and vegetable gardens, tend cattle, etc. It would not be practicable or economical for them to grow the cereal food of the hospital, for the seasons are too uncertain and mealie (i.e., corn) meal can be purchased more cheaply than it can be grown at Ngomahuru. In the afternoons the patients have to fetch their own wood and water, cook their food, and till their own small farms. They are taken to bathe and wash their clothes once a week. Complicating diseases are, of course, sought out and remedied. Malaria is countered by mass administration of quinine during the rainy season; intestinal parasites—which are not common—are got rid of; syphilis is controlled when necessary, though such cases are very few.

During the past five years various antileprosy remedies have been tried out, mainly alepol and the plain and iodized ethyl esters of *Hydnocarpus wightiana* oil. The ethyl esters have been found to give by far the best results and are now being used exclusively, the iodized variety being much preferred. It can be given in large doses and causes little local irritation. Another important point is that our experience of its keeping qualities is in direct contradiction of the belief that once a bottle is opened it cannot be used again

later—six-ounce bottles are opened as required, kept corked until finished, and the drug has been found to keep well for two weeks or more.

As for the dosage, we use up to 10 cc. twice a week, given intramuscularly with or without portion, or intradermally, without any ill effect whatever. It causes little pain or induration and does not tend to abscess formation. In contrast, the maximum dose of the non-iodized esters has proved to be about 5 cc. twice weekly, but such doses cause a good deal of pain and induration, occasionally an abscess, and sometimes general reaction. The dose for a given patient is not determined by weight but by the condition of the site of the last injection. If it is indurated and painful the dose is lessened or withheld. Most patients become saturated at the end of six or seven weeks, after which no injections are given for a week or even a fortnight. Trichloroacetic acid is applied to nodules and raised edges of macules, and is much desired by the patients.

The results obtained with the properly recorded cases that have been hospitalized here since the records were started, under all the conditions of life and treatment that have prevailed during that time, are shown in Table 1. Especially to be noted is the fact that of the 98 cases classified as N1—all early—55 have been discharged as arrested, while 38 more showing improvement are still here but will probably all be discharged. Thus 95 per cent of this group have been or will be discharged. Only two remain stationary and three have died, not from leprosy.<sup>1</sup> The N1-C1 cases are also early, though not so amenable to treatment as the N1 cases. We have had 106 of this group, of whom only 8 have been discharged, but 87 have improved and a total of 49 (46 per cent) have become bacteriologically negative and most of them will probably be discharged in time. So it can be said that over 90 per cent of our early cases can be arrested—and called cured if we do not quibble about the word.

As has been noted, the purely cutaneous case is rare in this institution. Only 14 are shown by our data, one of whom has been discharged, while six others have improved. These cases are treated intradermally and generally improve. The four C1 improved cases will probably all be discharged later.

<sup>1</sup>The causes of death at this hospital are not always definitely known. Autopsies are never performed for reasons of policy, and sudden deaths are not uncommon.



It is interesting to note the influence of the cutaneous element in the mixed cases. This is seen in the discharged and improved columns of Table 1 and rather strikingly in the bacteriological findings. Whereas 60 per cent of all the purely nerve cases have been discharged, only 8 per cent of the total of 255 cases with even the first (C1) degree of the cutaneous element have been discharged, though it is to be said that 40 per cent of them have become bacteriologically negative and many of these will doubtless be released.

Improvement in some degree has been shown by all types except N3-C3. These are really hopeless cases, but fortunately they are few. It is not evident from the figures that we do any good at all by giving these people treatment, but it does not seem justifiable to withhold it, for it produces a feeling of well-being and comfort in their wretchedness and it is not a great expense when the smallness of their numbers is considered.

#### DISCUSSION

It can be stated definitely that results with modern treatment, in this case the iodized esters, are far better than I have seen before in an experience of 25 years of active work. Every new patient is given treatment, with changes of drug if no improvement is noted. Even the apparently hopeless cases are treated, for it is impossible to state beforehand which are likely to improve and which are not, and some of the very worst ones have shown remarkable improvement.

It is true that here and there one comes across a case, generally not of the worst type, who exhibits no improvement no matter what drug is employed. But it is very seldom that such a patient desires to discontinue the injections, for even when the drug fails to control the disease it seems to give the patient a feeling of well-being. This applies especially to the worst nodular type. We have less than half a dozen cases of active disease not receiving treatment, though there are a few completely inactive old cases, settled here for purely economic reasons, who receive none.

In our work much stress is laid on the microscopic examination of smears, which normally is done for every patient four times a year. Specimens are taken from the earlobe (snip method), nodules, raised edges of macules and skin ulcers (scraped incision), nose and palate (scrape) and enlarged lymph nodes (aspiration). If bacilli are present in a smear in any numbers it takes only a very short time to ascertain the fact, but a fifteen-minute examination is necessary

before a case can be declared negative. This work occupies a great deal of time, but I consider it to be of the greatest importance. It gives the best indication of the progress of the patients who are bacteriologically positive. The appearance, degree of staining, size and arrangement of the bacilli are, I believe, reliable indications of the state of the disease. Severe cases show many large, closely packed clumps of deeply-stained bacilli, but as the patient improves the clumps become smaller, less compact, and the bacilli become less deeply stained, scattered and dotted.

Far too great a number of the cases that are discharged are never seen again; in this respect we fail rather lamentably. A second failure that might be mentioned is that of not examining contacts of known cases. The medical officer should tour his district in the dry season and examine all discharged cases—it is feared that a number of relapses would be brought to light—and examine the contacts of new admissions. In this way, undoubtedly, many early (N1) cases would be discovered, and since such cases are easily curable it is especially important that we should get hold of them. The simplest way to do so is to examine contacts at the homes of infectious cases, and with the help of the Native Department of the Government this is quite practicable.

I believe that this is a much better way of getting early cases under treatment than a general survey. Surveys produce interesting information and show up advanced cases, but they do not produce the early ones. These are often difficult to diagnose and require time and detailed examination which cannot possibly be given during a survey. They are certain to be found at the kraals of infectious cases, so it seems that the most practicable thing to do is to go to them and examine each individual carefully. The experience of two surveys in this country leads me to advise this examination of contacts in preference to surveys.