## Age Groups of Leper Patients at Nauru T. M. CLOUSTON.

In response to a request by Dr. Robert Cochrane during 1935 for more detailed information about the course of leprosy at Nauru than was given by Bray<sup>(1)</sup> and Grant<sup>(2)</sup>, it is proposed in this brief paper to set out the various age groups affected since the first cases were definitely diagnosed in 1920. In addition, some further facts will be given, in the light of some comments made in an Editorial in the "International Journal of Leprosy".<sup>(3)</sup>

As Grant pointed out, cases of leprosy are here divided into infectious and non-infectious according as to whether acid-fast bacilli are found in skin section smears and nasal smears, or not. This classification is still used for convenience in administration, but for record purposes, the standards and classifications of the Manila Conference<sup>(4)</sup> are employed. The infectious cases are segregated; the noninfectious are treated at an outpatient clinic until fit for parole and subsequent discharge.

Unfortunately, whilst more or less complete information about all patients placed in segregation since 1921 is available, many histories of those admitted for treatment at the clinic only have been lost. The course of the disease in two hundred and eighty-four cases (excluding three Chinese

LEPROSY REVIEW

labourers who had contracted the disease in China long before arrival) can be fairly accurately traced. This was the total number admitted to segregation from 1920 to 30th June, 1936. The number of histories of patients treated at the clinic only is one hundred and ninety-three, whereas more than this number are known to have been admitted to the Clinic.

The following tables show all those admitted to segregation, and all those that could be traced as attending the clinics only, in age and sex groups.

TABLE I.—Patients admitted to segregation.

Age Grou	ıp 0—5	6-10	11-15	16—20	21-30	31-40	41-50	Over 50	Total
Year	MF	MF	MF	MF	MF	MF	MF	MF	
1921	01	54	93	24	11	31	10	10	36
1922	34	1611	128	75	108	72	02	11	97
1923	01	33	02	00	32	22	11	00	20
1924	43	75	31	61	<b>9</b> 6 <sup>.</sup>	38	13	13	65
1925	10	00	00	00	01	01	01	10	5
<b>19</b> 26	00	01	01	10	14	01	21	03	15
1927	01	00	00	11	11	22	10	10	11
1928	00	00	10	20	30	00	00	02	8
1929	00	01	00	00	10	00	11	10	5
1930	01	00	01	00	01	10	00	00	4
1931	00	10	00	00	00	10	00	00	2
1932	00	02	20	00	11	00	00	00	6
1933	00	01	10	00	00	10	10	00	4
1934	20	00	01	00	00	00	00	00	3
1935	00	00	00	00	00	01	01	01	3
Total	1011	3228	2817	1911	3025	2018	810	89	284
Percent.	(7.4)	(21.1)	(15.8)	(10.5)	(19.4)	(13.4)	(6.3)	(6.0)	

Note.— The figures for admissions for the years 1931 and 1932 differ from those given by Grant (4 and 16 respectively) because in 1931 two cases admitted as new cases have been since found to have been relapses; and in 1932, as noted by Grant, a number were admitted without bacteriological examination by a relieving medical officer and of these ten were found to be bacteriologically negative and were shortly discharged. Accordingly these have not been included amongst the infectious cases.

TABLE II.—Patients admitted to Outpatient Clinic only.

					-		-		
Age Group Year	p 0—5 MF	6—10 MF	11—15 MF	16—20 MF	21—30 M…F	31—40 M…F	41—50 MF	Over 50 MF	Total
1924	32	42	67	35	810	24	02	01	59
1925	06	15	03	21	53	33	03	00	35
1926	00	02	00	10	12	12	01	02	12
1927	00	00	00	00	01	01	00	00	2
1928	01	00	00	00	11	00	00	00	3
1929	01	23	10	10	32	10	11	13	20
1930	11	12	10	21	10	21	00	00	13
1931	01	10	10	01	00	00	00	00	4
1932	00	10	11	20	01	21	10	01	11
1933	10	12	00	00	00	11	00	10	.7
1934	11	18	12	00	00	01	02	00	17
1935	00	32	01	00	00	00	00	00	6
1936(June) 00		11	00	01	00	00	00	10	4
Total	<b>613</b>	1627	1114	119	1920	1214	29	37	193
Percent.	(9.8)	(22.3)	(12.9)	(10.4)	(20.2)	(13.0)	(5.7)	(5.2)	

NOTE—Here again the figures for admissions for the years 1929 to 1933 inclusive differ from those given by Grant, in this case very markedly. This is due to the fact that in compiling this table, only those cases were included for which histories could be found, so that an accurate check on sex and age could be made. Grant's figures were compiled from total returns and are accurate as to totals. Several tendencies are disclosed by a study of these tables. It will be noticed that in the latter years, the number of bacteriologically positive new cases is low compared with the earlier years, whilst the figures for admission to the clinic of bacteriologically negative cases has not shown a similar decrease. (This is emphasised the more by a study of Grant's figures for admissions of new cases to the clinic. These are: 1929—29 new cases; 1930—60; 1931—31; 1932—43; 1933—8.).

Two reasons may be advanced for this. Firstly, the system of frequent examination of all natives for (inter alia) suspicious signs of leprosy has resulted in earlier detection of both infectious and non-infectious cases. This results in the early treatment of both types, and also in the segregation of the infectious case at the earliest possible moment, thus removing a source of infection to others, especially children. Secondly, the general resistance may be increasing, partly through repeated subliminal infections and partly as a result of persistent pressure from the administrative authorities to secure better hygienic conditions of housing and living. The result is that fewer cases now reach the infectious stage, pointing strongly to the advisability of early and continued treatment.

It will also be noticed that approximately fifty-five per cent. of the admissions to segregation could have been infected before reaching the age of 15 years, and that about forty-five per cent. were definitely infected before reaching the age of 15. Almost the same figures apply to those receiving treatment at the clinic. On the other hand, twentyfive per cent. at least were over the age of twenty-five years when they showed the first signs of infection and fifteen per cent. of the total cases must have been over the age of twenty-five when they received their first chance of infection. This is assuming that the first generalised opportunity of infection was about 1917, three or four years earlier than the generally accepted date of the outbreak. As noted by Bray, the evidence points to there having been definite neural cases before 1916. It seems probable that there were more than this number if reliable data were only available. It seems fairly definite that there were no cases before 1911 or 1912.

It thus appears that the possibility of initial infection in adult life is strongly supported by the figures quoted.

A small number of "non-infectious" (i.e. probably neural) cases have gone on to nodule formation in spite of early and continued treatment. Four such cases have been traced and all are still nodular. The period from first diagnosis to the appearance of nodules varied from two to four years. At least five cases in the last six years have developed from non-infectious to infectious (i.e. cutaneous cases but not nodular) despite treatment, the period of appearance of bacilli in the skin smears being from three to eleven years after the appearance of the original signs. Seventeen cases admitted to segregation as mildly infectious cases and receiving continuous treatment advanced to the nodular form. This is six per cent. of the total admissions to segregation. Of these seventeen cases, ten have been males and seven females. Two of the females have now improved and do not show any nodules, exhibiting fairly active macules with anaesthesia and analgesia.

More encouraging is the fact that thirty-two cases (fifteen male and seventeen female) who have been at some time nodular have been released from segregation since 1929, which was the first year in which a previously nodular case was found to be bacteriologically negative. This number is approximately 11 per cent. of the total admissions to segregation. In addition, twelve cases previously nodular have lost their nodules but are still in segregation. Of these, seven are males and five females. (One of the females has died since the figures for this paper were collected. Cause of death was senility). Thus the total number of persons who showed definite improvement from the nodular state and have maintained this improvement unless interrupted by death, is forty-four, or approximately 15.5 per cent. of the total admissions.

From all the figures so far quoted, it will be seen that there is no great disproportion in the sex incidence. For the cases admitted to segregation, the totals are one hundred and fifty-five males and one hundred and twenty-nine females, a ratio of 1.2 : 1.0. For cases treated in the clinic the totals available are eighty males and one hundred and thirteen females, a ratio of females to males of 1.41 : 1.0. The total cases of which records are available, including both infectious and non-infectious types, comprise two hundred and thirty-five males and two hundred and forty-two females.

If any conclusions can be drawn from such a comparatively small group of cases, it would seem that the males when once infected exhibit a slightly greater tendency to develop the infectious type of the disease, whereas the females appear to exhibit a slightly higher resistance to the development of infectious lesions.

The "relapse rate" to the infectious type of the disease appears to be somewhat lower than the published figures for other parts. Such a relapse here may be defined as one who has had the infectious form of the disease and has been in segregation, has been discharged to receive treatment at the clinic and is either still receiving treatment or has been finally discharged as arrested, and who then exhibits infectious types of skin or nasal lesions again. Such a case is of course returned to segregation. Twenty-five such cases have had to be readmitted since 1925. These readmissions have not been included in the total admissions given previously. Thus the relapse rate is 8.8 per cent. of the total admissions to segregation. Of these twenty-five, six have developed nodules since readmission in spite of continuous treatment over an average period of twelve years, both in segregation and at the clinic.

There have been nine relapses in the last eighteen months (to June 30th, 1936). Eight of these gave negative reactions to the Leprolin Test, using Muir's technique, thus indicating a lowered resistance. The ninth case was not tested.

It has not been possible to ascertain the relapse rate in the purely neural cases treated at the clinic only, but it appears to be very low.

Possibly the most important reason for this low relapse rate is the fact that the small area of the Island, the small population of just over sixteen hundred natives and the small number of persons receiving treatment make it easy to keep an accurate check on attendance for treatment, together with the fact that a prolonged period of treatment is insisted upon (at least five years except in certain special cases treated as suspects only, and two years treatment after the last sign of activity). The patient is not allowed to cease treatment until the medical officer is satisfied that such action is justified. It must be noted in justice to the majority of patients that they do not desire to cease treatment until they are considered by the medical officer to be safe from further manifestations. In fact, several have recently requested to be allowed to continue with somewhat less frequent injections, although pronounced fit for parole. It will thus be seen that the average Nauruan does not regard treatment with disfavour, but rather looks on it as a safeguard.

Dr. Cochrane also asked whether we have any evidence of natural arrest of the disease in the early neural stage of the disease amongst adults. It is not possible to throw any light on this question from our experience here, as all cases in which a definite clinical diagnosis can be reached are placed on treatment as soon as possible. Similarly, any strongly suspicious cases are treated to be on the safe side.

The publication of articles on Tuberculoid Leprosy by Wade<sup>(5)</sup> and Moisier<sup>(6)</sup> led to a careful search for any cases showing the clinical features of this form of the disease, but none have been found in the last eighteen months, nor can any reference to findings suggesting Tuberculoid Leprosy be found in the records. Nerve abscess, described as a tuberculoid manifestation, is conspicuous by its absence.

In conclusion, it may be of interest to quote the present situation as regards the types of cases on the Island. There are fifty-seven cases in segregation, of whom twenty-two are nodular, seventeen being males and five females; the remaining thirty-five are milder though infectious cutaneous cases, sixteen being males and nineteen females. There are one hundred and two attending the clinic, of whom forty-five are male and fifty-seven female. Thus the total number of persons actually receiving treatment for leprosy is one hundred and fifty-nine, or approximately ten per cent. of the native population. This is a high percentage, but contrasts very favourably with the figure of almost thirty per cent. in 1924 and fourteen per cent. at the end of 1933. As Grant pointed out, the high figure for persons attending the clinic is indicative of the severity of the standard of " apparent cure ". Our object is to be over-cautious and to take no risks whatever. The goal of the Administration is the total conquest of the disease.

## Summary.

(1) Å summary of the result of a survey of all the available records of leprosy at Nauru up to June 30th, 1936 is given.

(2) A high incidence of infection in childhood and adolescence is noted, together with a definite incidence of infection in adults.

(3) A small but definite tendency for adequately treated cases to progress to the nodular type is noted. Against this is the fact that a proportion of previously nodular cases has shown very definite improvement as a result of treatment.

(4) The relapse rate is shown to compare favourably with experience elsewhere.

(5) A definite improvement in the incidence of the disease in the last twelve years is noted.

(6) The tuberculoid form of the disease appears to be absent.

(7) No reference has been made to methods of diagnosis and treatment employed, as these have already been fully discussed by others<sup>(1)</sup><sup>(2)</sup>.

## REFERENCES.

- (1) BRAY, G.W., The Story of Leprosy at Nauru. Proc. Roy. Soc. Med., Sect. on Trop. Dis. and Parasitol. 23 (1930), 1370.
- (2) GRANT, A. M. B., Leprosy at Nauru since 1928, Int. Jour. Lep., II, 3, Aug.-Oct., 1934, pp. 305-310.
- (3) The Nauru Epidemic: Ibid., II, 3, Aug.-Oct., 1934, pp. 359-362.
- (4) Leonard Wood Memorial Conference on Leprosy, Manila, 1931.
- (5) WADE, H. W., Tuberculoid Changes in Leprosy, Manila, 1931.
  (5) WADE, H. W., Tuberculoid Changes in Leprosy. Int. Jour. Lep., II, 1, Jan.-Mar., 1934, pp. 7-38.; Ibid., II, 3, Aug-Oct., 1934, pp. 293-9. Ibid., III, 2, April-June, 1935, pp. 121-136.
  (6) MOISIER, B., Tuberculoid Leprosy in Southern Rhodesia. Int. Jour. Lep., III, 3, July South 2020, 66, 270-262.
- III, 3, July-Sept., 1935, pp. 279-282.