# LEPROSY REVIEW

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# LEPROSY REVIEW.

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# BLOOD TRANSFUSIONS IN THE TREATMENT OF LEPROSY

A. R. DAVISON.

In response to a petition from all the European patients at the Pretoria Leper Institution seven cases of varying types were selected for treatment by blood transfusions. It was decided that six transfusions at intervals of one month would be given—the amounts at each transfusion were to be from 350 to 400 c.c.s. The final effects were to be noted three months after the last transfusion.

No specific effects on leprosy were anticipated as a result of the transfusion of strange blood, but it was hoped that it would either build up the patients' resistance or perhaps even stimulate their reticulo-endothelial system. It was not possible to obtain arrested cases of leprosy as donors, though it was decided to attempt this if the first experiment showed any promise.

The Rand Blood Transfusion Service undertook to donate, free of charge, not only the blood but also the services of their operators. This gift is acknowledged with gratitude not only by us but also by the patients.

The cases were found to belong to the following blood groups:—

Case 1 — A later corrected to O.
,, 2 — O
,, 3 — A
,, 4 — A
,, 5 — O
,, 6 — O
,, 7 — O

During the period of the investigation records were made of:—

(1) Sedimentation index.
(2) Red and white cell count.
(3) Haemoglobin percentage.
(4) Clinical appearance.
(5) Condition of B. Leprae.

The cases selected included six cutaneous cases of the following stages of severity:

(1) Early cutaneous.
(2) Diffuse infiltration.
(3) Discrete nodules.

(4) Heavy infiltration with rugae.
(5) Heavy infiltration with ulcers.
(6) Infiltration with laryngeal stenosis and recurrent attacks of erythema nodosum leproticum.

Case 7 was a neural of the tuberculoid type.

Under routine antileprotic treatment the prognosis in the tuberculoid case would be very good but would be bad in the other cases.

## UNTOWARD EFFECTS.

*Case 1* had been reported to us as belonging to blood group "A." Before the transfusion a direct compatibility test was done at which three observers agreed that the bloods were compatible. The transfusion was started and when approximately 100 c.c.s. of blood was transfused the patient complained of severe pain in the small of the back with a constricting feeling in the chest. The transfusion was stopped. Pulse and respiration were normal and the patient appeared so normal that we suspected the complaints were neurotic in origin. A few minutes later she developed a rigor which quickly passed off. In 20 minutes she was fit enough to walk back to her quarters.

During the night she began to vomit and became pyrexial. The urine showed no blood, albumen or bile. There was no jaundice. Vomiting continued for 5 days and then ceased. An examination of the blood now showed an Icteric index of 6 and the ven den Bergh reaction was negative. A blood count showed no appreciable diminution of red cells.

Blood grouping was again performed and this patient was reported as belonging to group "O."

*Conclusion.* The reaction in this instance without a doubt was due to the transfusion of group "A" blood to a patient in group "O." The reaction seems to have been of a mild type in that there was no obvious jaundice. As a result of this it was decided to send specimens of all the patients' blood before each transfusion to the South African Institute for Medical Research for compatibility tests to be done there.

*Case 4,* after his fifth transfusion of 300 c.c.s, complained immediately of a blinding headache and nausea. For the following three days he stated he had haemoptysis but this was so slight he could produce no evidence to show us. He was found to have a frontal sinusitis. As his blood count was 5,000,000 red cells and his percentage of haemoglobin was 120 it was obvious that he was

not in need of additional blood. Therefore immediately prior to his next transfusion we withdrew 300 c.c.s. On this occasion there was no complaint.

## CASE HISTORIES.

*Case 1*: (L.1 N.1). Duration 5 years, has never advanced beyond the stage of early diffuse infiltration of face—so slight as to be hardly perceptible though bacilli are always demonstrable. Diffuse erythema on thighs and back with erythymatous lesions on abdomen. Transfusions given:—

| | | | | |
|---|---|---|---|---|
| 14th July, 1939 ... | 100 c.c's | — | group | A. |
| 24th August, 1939 ... | 250 ,, | — | ,, | O. |
| 5th October, 1939 ... | 250 ,, | — | ,, | O. |
| 5th November, 1939... | 300 ,, | — | ,, | O. |
| 8th December, 1939... | 300 ,, | — | ,, | O. |
| 12th January, 1940 ... | 300 ,, | — | ,, | O. |

*Results*: Sedimentation index before treatment 25, dropped to 1 at conclusion of treatment. Haemoglobin percentage practically unaltered. Red cells remained stationary around 5,000,000. White cell count dropped from 16,000 to 12,000.

Clinically the lesions on the face are less evident but the trunk lesions are very much more erythematous. Bacilli are just as numerous.

Conclusion—not benefited.

*Case 2*: (L.2). Duration 8 years. Diffuse erythematous infiltration on face with infiltrated plaques on arm and buttocks. Transfusions given:—

| | | | | |
|---|---|---|---|---|
| July, 1939 ... ... | 250 c.c's | — | group | O. |
| August, 1939 ... | 250 ,, | — | ,, | O. |
| October, 1939 ... | 250 ,, | — | ,, | O. |
| November, 1939 ... | 257 ,, | — | ,, | O. |
| December, 1939 ... | 300 ,, | — | ,, | O. |
| January, 1940 ... | 300 ,, | — | ,, | O. |

*Results*: Sedimentation index was 1 now 30. Red cells dropped from 5 to 3½ million. White cell count risen from 12,000 to 14,000. Haemoglobin percentage was 125 now 110.

Clinically the lesions on the face appear more active while there is no change in the condition on the trunk. Unchanged bacilli remain plentiful.

Conclusion—worse.

*Case 3*: (L.3). Duration 5 years. Discrete nodules over firm infiltration of face. Erythematous infiltration of forearms and

back with occasional nodules. Transfusions given:—

| | | | | |
|---|---|---|---|---|
| July, 1939 ... ... | 250 c.c's | — | group | A. |
| August, 1939 ... | 250 ,, | — | ,, | O. |
| October, 1939 ... | 500 ,, | — | ,, | A. |
| November, 1939 ... | 400 ,, | — | ,, | A. |
| December, 1939 ... | 500 ,, | — | ,, | O. |
| January, 1940 ... | 300 ,, | — | ,, | A. |

*Results*: Sedimentation index remains high. Red cells dropped from 3 to 2,000,000. White cell count dropped from 30,000 to 12,000. Haemoglobin percentage was 70%—now 100%. L. Bacilli always present.

Clinically no change.

Conclusion—not benefited.

*Case 4*: (L.3). Duration 3 years. Heavy infiltration of face which is very erythematous. Face shows rugae. Slight diffuse infiltration chest and back. Transfusions given:—

| | | | | |
|---|---|---|---|---|
| July, 1939 ... ... | 250 c.c's | — | group | A. |
| August, 1939 ... | 250 ,, | — | ,, | A. |
| October, 1939 ... | 250 ,, | — | ,, | A. |
| November, 1939 ... | 350 ,, | — | ,, | A. |
| December, 1939 ... | 300 ,, | — | ,, | A. |
| January, 1940 ... | 300 ,, | — | ,, | A. |

(Comment—patient had cholicystitis in September and frontal sinusitis in January.)

*Results*: Sedimentation index has remained at all times below 10. Red cells around 5,000,000. White cell count has fluctuated with his infections—started at 7,500 and is now 11,000. Haemoglobin percentage has remained high, i.e. 120%. Leprosy bacilli unaltered.

Clinically no change.

Conclusion—not benefited.

*Case 5*: (L.3). Duration 15 years. An advanced cutaneous case with heavy infiltration of face, trunk and limbs, which has broken down into multiple leprotic ulcers, especially on the buttocks and thighs. Transfusions given:

| | | | | |
|---|---|---|---|---|
| July, 1939 ... ... | 250 c.c's | — | group | O. |
| August, 1939 ... | 250 ,, | — | ,, | O. |
| October, 1939 ... | 400 ,, | — | ,, | O. |
| November, 1939 ... | 300 ,, | — | ,, | O. |
| December, 1939 ... | 300 ,, | — | ,, | O. |
| January, 1940 ... | 300 ,, | — | ,, | O. |

*Results*: Sedimentation index has remained in neighbourhood of 60 to 65. Red cells (in spite of adjuvant iron therapy) have

risen only to 3,000,000. White cell count has dropped from 20,000 to 12,500. Haemoglobin percentage has risen from 55% to 75%. Leprosy bacilli remain plentiful and unchanged.

Comment. The response of this case to a blood transfusion was extraordinarily promising. Within a week of each transfusion the ulcers would change from grey sloughs to healthy granulations. In a fortnight the majority would be healed or healing. But, before the month was up and the next transfusion was due new ulcers would appear. He also gained greatly in health and strength. It is perhaps feasible that the transfusions were spaced at too long intervals and that he would be greatly benefited by weekly or even daily transfusions.

Clinically no change.

Conclusion—fleeting benefits only.

*Case 6*: (L.3). Duration 7 years. Diffuse infiltration of face, trunk and limbs with laryngeal ulceration. Patient also frequently has outcrops of fleeting nodules (erythema nodosum leproticum). Transfusions given:—

| | | | | |
|---|---|---|---|---|
| July, 1939 ... | ... | 250 c.c's | — group | O. |
| August, 1939 | ... | 250 ,, | — ,, | O. |
| October, 1939 | ... | 250 ,, | — ,, | O. |
| November, 1939 | ... | 325 ,, | — ,, | O. |
| December, 1939 | ... | 300 ,, | — ,, | O. |
| January, 1940 | ... | 300 ,, | — ,, | O. |

*Results*: Sedimentation index remained bad ranging between 60 and 70 until April, 1940. At this stage even though we did not wish to complicate our findings by additional treatments it was obvious that the transfusions had had no beneficial effect. A course of Fouadin—15 injections totalling 52.5 c.c.s brought the sedimentation index down to 28. Red cell improved slightly from 2,800,000 to 3,000,000. White cells remained in the neighbourhood of 16,000. Haemoglobin percentage improved from 55 to 100%. Bacilli remained plentiful but have become more beaded. Outcrops of erythema nodosum leproticum continue to occur. Voice has become less husky but the laryngeal stenosis persists. No change in leprotic infiltration.

Conclusion—not benefited.

*Case 7*: (N.2). Duration 11 years. Large tuberculoid minor macule over buttocks. This macule is erythematous and slightly elevated throughout its whole extent. No bacilli can be found. A faintly erythematous macule is present below left eye. Repeated skin and nasal smears showed no bacilli before the transfusions.

No transfusion given in December owing to blood of donor coagulating.

In December patient had acute pyelitis followed by outcrops of evanescent macules. In March new permanent macules appeared on face and shoulders. The nasal smear became positive once only in January. Transfusions given:—

| | | |
|---|---|---|
| July, 1939 ... ... | 250 c.c's — | group O. |
| August, 1939 ... | 250 ,, — | ,, O. |
| October, 1939 ... | 300 ,, — | ,, O. |
| November, 1939 ... | 275 ,, — | ,, O. |
| December, 1939 ... | none given. | |
| January, 1940 ... | 300 c.c's — | ,, O. |

*Results*: Sedimentation index has remained good. Red cells started at 5,000,000 and have dropped to 3,000,000 (due to menorrhagia). White cells have dropped from 10,000 to 7,500. Haemoglobin percentage remains above 100.

Clinically the lesions on the buttocks are improved but the new lesions show that the patient's general condition has deteriorated.

Conclusion—worse.

THE RECORDS OF THE SEDIMENTATION INDEX SHOW

A study of the illustrative graphs reveals:—

(1) There has been improvement in only one case of the sedimentation indices during the period of the blood transfusions or for the following three months.

(2) Sedimentation indices taken before and after transfusions were not altered.

(3) Only cases 1, 4 and 7 show satisfactory sedimentation indices, but in each case the clinical lesions are more obvious.

(4) The sedimentation index has become worse in case 2.

THE RECORDS OF THE RED CELL COUNT SHOW

The graphs of the red cell counts reveal:—

(1) Anaemia was not benefited by the transfusion.

(2) Anaemia was a marked feature of cases 3, 5 and 6.

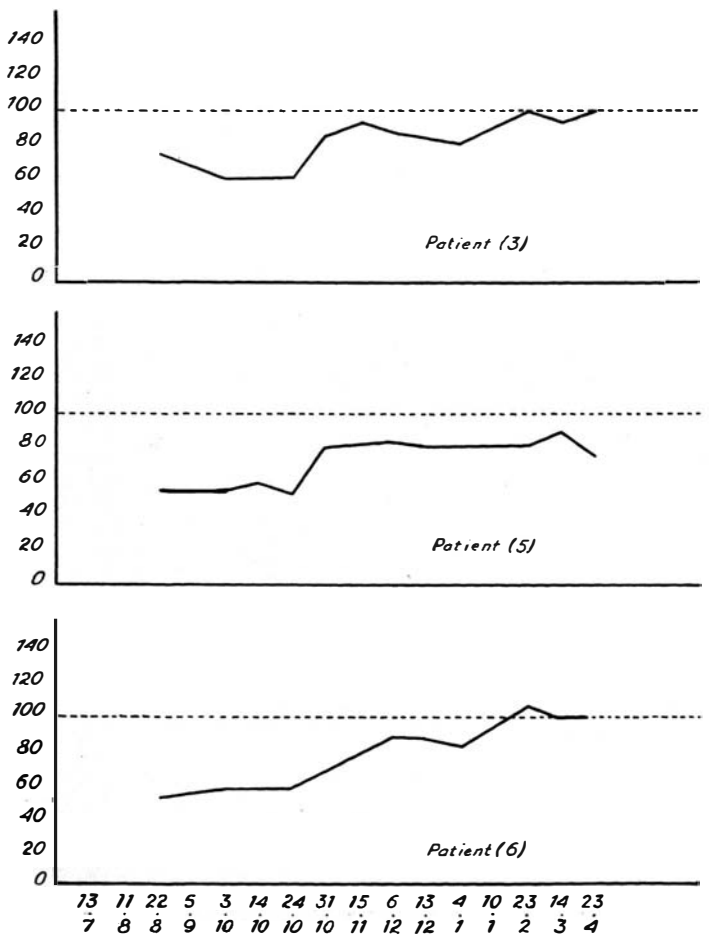
(3) Progressive anaemia occurred in cases 2 and 7. In case 7 there was menorrhagia during January and February.

GRAPHS ILLUSTRATING THE WHITE CELL COUNT.

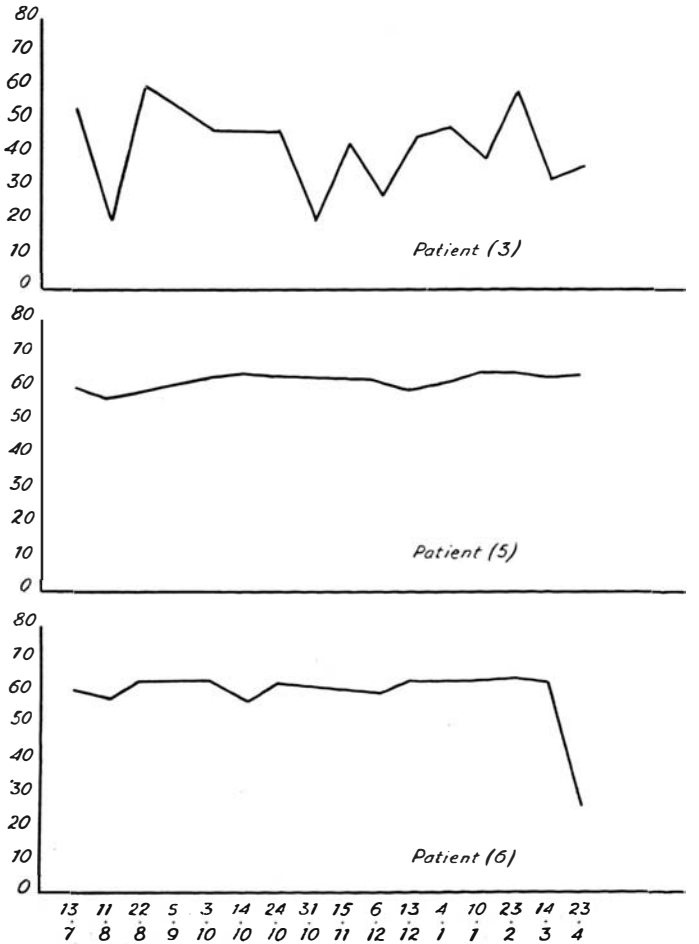
(1) All the cases showed a leucocytosis at some period or other during the course of the transfusions, though only case 5 had obvious septic lesions.

(2) The white cell count showed no correlation with the transfusions or with the clinical appearances.

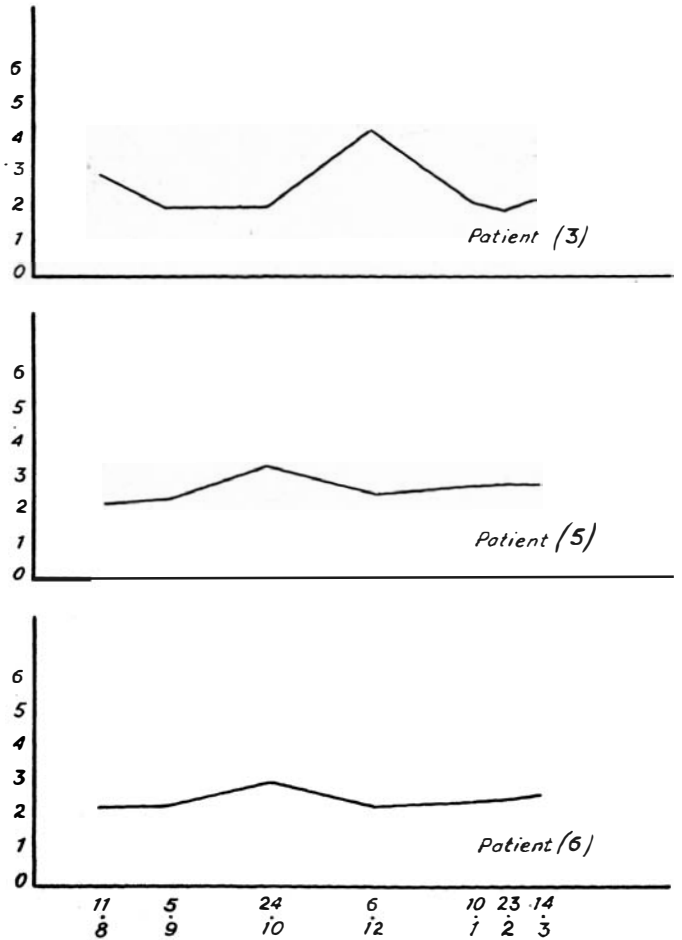
GRAPHS ILLUSTRATING THE PERCENTAGE HAEMOGLOBIN.



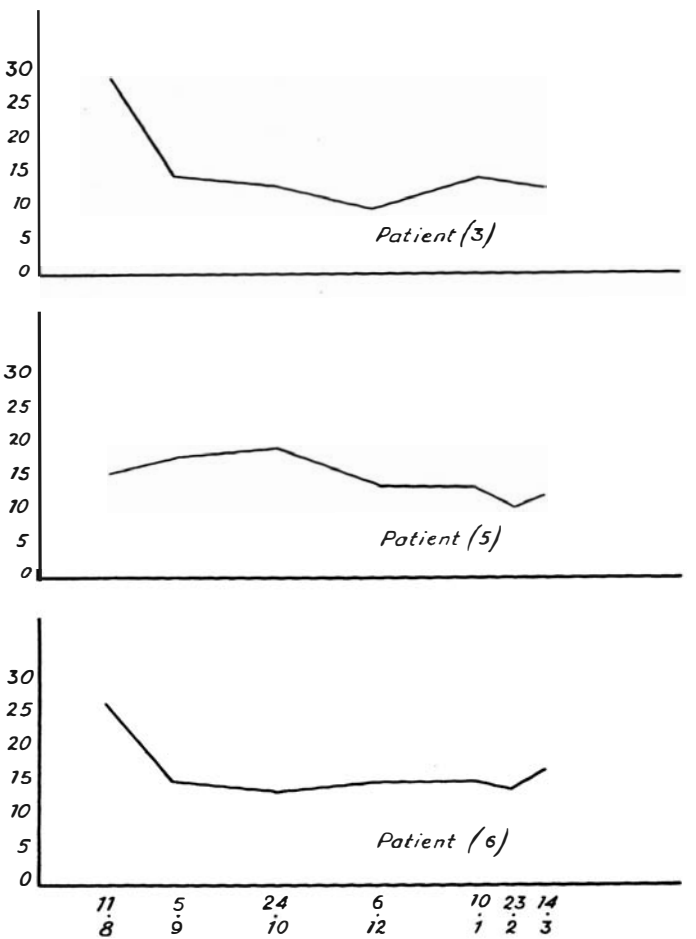

GRAPHS ILLUSTRATING THE SEDIMENTATION INDICES.



GRAPHS ILLUSTRATING THE RED CELL COUNTS (IN MILLIONS)
Per cub. m.m.




GRAPHS ILLUSTRATING THE WHITE CELL COUNTS (IN THOUSANDS)
Per cub. m.m.



THE RESULT OF THE PERCENTAGE OF HAEMOGLOBIN SHOW

(The Haemoglobin percentages were read on a " Haemometer Sicca " in which the normal range is from 100 to 120.)

(1) A definite improvement is revealed in cases 3, 5 and 6 as a result of the transfusions.

Illustrative graph of cases 3, 5 and 6 are shown.

SUMMARY.

Six monthly transfusions were given to seven leprosy patients. Nine months after starting the treatment no improvement could be found.

# A NOTE ON THE TREATMENT OF LEPROMATOUS ULCERS

E. MUIR.

Ulcers in leprosy are of two kinds: lepromatous and trophic. My experience in India showed that trophic ulcers were by far the more common of these two. An investigation of all ulcers in the large leprosarium at Purulia showed only between one and two per cent to be bacteriologically positive, the rest being of a trophic nature resulting from affection of the nerve supply. On coming to the Trinidad leprosarium at Chacachacare I was astonished to find that the great majority of ulcers are of a lepromatous nature, that is, due to the breaking down of nodules and diffuse leproma. These are full of masses of bacilli which are constantly shed off from the surface. The treatment of these ulcers was a problem. The sisters who dress the wounds spent a large part of their time in dressing these constantly discharging wounds. The patients, loaded with dressings and bandages become immobilised and bed-ridden and their limbs, and especially their fingers, become stiff and atrophied.

Reading an article by Ross and Hulbert on the treatment of air battle burns with silver nitrate, tannic acid and gentian violet* I tried this method with these ulcers. The results obtained were

*Treatment of burns by silver nitrate, tannic acid and gentian violet, by J. H. Ross and K. F. Hulbert. Brit. Med. Jl. No. 4168, Nov. 23, 1940, p. 702.

highly satisfactory. After a few applications the discharge was controlled, and in many cases it was found possible to do without dressings or to apply only a loose cloth covering. Septic absorption ceased. The patients felt much more comfortable. They were able to move their limbs and especially their fingers and thus avoid one of the chief causes of atrophy and deformity. A considerable amount of the valuable time of the staff was saved and the danger of spreading infection was considerably lessened.

The treatment, as slightly modified, consists in painting first with a one per cent solution of gentian or methyl violet in alcohol, then with a ten per cent solution of silver nitrate in distilled water, and, lastly, with a fifteen per cent solution of tannic acid in water. On the first day this is repeated three or four times, but in most cases after the first day one painting, either with tannic acid alone, or with the dye solution followed by tannic acid, is sufficient. The patients particularly appreciate the treatment of the lips and the face in this way, parts to which it is difficult to apply cloth dressings. Many ulcers which had remained discharging for weeks at once began to heal up, and the improvement in the general health and the comfort and cheerfulness of the patients was remarkable. I can strongly recommend this very simple and effective form of treatment.

# REPORT OF LEPROSY SURVEY IN THE AMADI DISTRICT, EQUATORIA PROVINCE, S. SUDAN

A. J. SOWDEN.

The inhabitants of this area are an agricultural people; during the dry season they are rather widely scattered, being engaged in hunting, work for their Chiefs, and Government road work; with the onset of the rains they return to their villages to undertake their farming for the year.

Having these facts in mind I decided to embark upon my work of surveying the Moru people within the Lui-Amadi area at the coming of the present rainy season.

The survey of the people of three Chiefs, Jambo, Luka and Aganwa has been completed, and that of the people of Wajo and Ngeri is in hand. In each case, prior to commencing the survey I have visited the Chief and requested a meeting with him and his Sub-Chiefs. At this meeting the need for the survey

was stated and the fact stressed that without the full co-operation of the Chiefs it would be useless. I asked the Chiefs to appoint meeting places where their people could foregather for inspection; on no account were these to involve the people in more than two hours walking.

The object of this condition was to avoid taking the people away from their work on the farms for any undue length of time. That this has been worth while is evident from the large percentage of people seen, though it has involved long journeys into the forest and eight to ten hours walking per day for a week at a time. This was particularly necessary when working in the area in the vicinity of Lui—Chief Luka's people. Here the younger generation have left the roads in the search for virgin soil to farm, and on two occasions I was "out in the blue" for a week. These people would not have come in unless force had been used—the offer of a policeman from Amadi was refused on the grounds that his presence would tend to create a fear of segregation in the minds of both known and new cases of leprosy. Undoubtedly the method used gave confidence; it is believed that there were very few attempts made to conceal the disease, and several crippled cases were so eager to be seen that they had their relatives carry them either to the roadside or the meeting place.

The attitude to leprosy in the Sudan favours the spread of the disease. It is in marked contrast to that which prevails in Nigeria where in every community there is a very obvious fear of leprosy. There, once discovered to be a leper, the victim is obliged in the majority of cases to leave his village and live in the bush, and various settlements were begun through cast-out lepers combining and building villages for their own protection. Very little evidence of such fear has been discovered during the present survey. The most infectious lepers are permitted to mix freely with their fellows. A case in point is that of a female child of a leper who married when clean, but later when the disease developed was divorced by her husband who, within a year, himself became a leper; recently whilst in another area I came upon the woman who, having once more been divorced, was again married. The husband told the writer that prior to his marriage two years ago he had no known contact with a leper, yet he also now had the disease, moreover two children of these three marriages are also lepers.

Leprosy control in the densely populated areas of Southern Nigeria presents a problem of tremendous magnitude to workers in that country, even though they are aided by the fear of the

clean and the desire of the lepers for treatment and their willingness to enter settlements. Here in the S. Sudan, though these factors are missing, leprosy control should not present anything like the same problems.

The Morus are much less clanish than the Ibos of Nigeria. They live in small hamlets with rarely more than 50 people in each, more often than not less than 12. Consequently they have ample land for farming, the housing is much better and, whilst there is little or no attempt at sanitation, one does not meet with the vile conditions which are often seen in Nigeria. A scheme for the segregation of infectious lepers such as that operating in the Uzuakoli district, S. Nigeria, ought under these conditions to prove most successful in the matter of leprosy control.

During the surveys I was accompanied by one assistant who was able to take smears; the actual examination was made by the writer. The names of all persons having lesions which could possibly be produced by leprosy were noted and, when all the people present had been seen, these were re-examined and slides taken. The 1939 census was used and every effort made to trace and note names of any absentees; the Chiefs co-operated very willingly and in the majority of cases the only absentees were men engaged in working in other parts of the province. Any living under another Chief are brought in when that area is visited. A census of the people was made and the age group, reckoned in decades, of each person was recorded at the time of examination. On one or two occasions names were put on the list for observation.

*Numbers seen and Leprosy incidence.*

*Chief Jambo's people.*

| | |
|---|---|
| Total seen (including those of sub-chieftains) ... ... | 1,715 |
| Total lepers seen ... ... ... ... ... ... | 30 |
| Incidence ... ... ... ... ... ... ... | 1.7% |

(Of the above 30 lepers, only 12 showed a positive slide)

*Chief Juka's people.*

| | |
|---|---|
| Total seen ... ... ... ... ... ... ... | 5,320 |
| Total lepers seen ... ... ... ... ... ... | 135 |
| Incidence ... ... ... ... ... ... ... | 2.5% |

(Of the above, 50 lepers only gave a positive slide)

*Chief Aganwa's people.*

| | |
|---|---|
| Total seen ... ... ... ... ... ... ... | 2,350 |
| Total lepers seen ... ... ... ... ... ... | 50 |
| Incidence ... ... ... ... ... ... ... | 2.1% |

(The examination of the slides of this survey is not yet completed)

The work of survey will be continued until the end of the rains. With the coming of the dry season the people will scatter and become more difficult to get hold of for examination. If circumstances permit I propose to visit one or other of the two districts of Maridi and Yei early in 1941, proceed with the survey of that district, and return to complete the Moru area in the next rainy season.

With regard to the lepers in the area so far covered, I suggest that a small settlement be established at each of the three places surveyed (certainly two, one at Luka's and the other at Aganwa's), large enough to house the infectious lepers in each case, the Chief providing the labour for the building of the houses. Some arrangement would need to be made whereby the lepers would be assured of a regular weekly supply of grain; the relatives could be made responsible for the supply of other items of food, failure to do so being punishable by the Chief's court. Some assistance with the farming for the following year might be needed; this too could be done with the co-operation of the Chief.

Treatment could be given by the dispenser at the Chief's dispensary, within the vicinity of which the settlement would be erected. If funds were available a well would be an asset. I could return periodically from whichever district I was working in and I feel sure that the Lui doctor would also be willing to visit on the occasions when he paid a visit to his dispensaries.

# REVIEWS

**Leprosy in India, Vol. XII, No. 4, Oct. 1940.** & Dharmendra.

*Studies on the Lepromin Test,* by John Lowe. This paper consists mainly of a review of the literature on the subject since K. Mitsuda first reported in 1916 the local reactions following the intra-cutaneous injections of a boiled emulsion of lepra bacilli obtained from leprosy nodules, now usually known as the Lepromin test. The strength in bacilli is roughly standardised by counting the bacilli in a smear. An early erythematous reaction, regarding the value of which opinions differ, is followed after seven or more days by a local infiltration which may go on to ulceration. Positive reactions are a measure of the resisting powers of the patient and the mildness and curability of the case. Negative

results are met with in the severe lepromatous cases with little resistance to the spread of the bacilli over the body. Repeated lepromin injections lead to an increase in the reaction as shown by papers by Lara already summarised in this journal. The reaction appears to be of most value in prognosis, but Lara found no prophylactic value in the injections, but this is a point the Calcutta workers propose to investigate further. This paper affords valuable information on the work already done on this reaction for the guidance of future workers on the subject.

*Report on the Leprosy Survey of Jodhpur State, 1937 to 1939,* by E. W. Hayward. This is the largest of the Rajputana States and has a comparatively low rainfall for India. Leprosy decreased after the famine of 1899 as usual. The 1931 census returned only 117 cases and the numbers attending hospitals is also low. Among 6,444 schoolboys only two, together with one teacher, were found to be infected. The Propaganda, Treatment and Survey method was used for the purpose of attracting as many cases as possible. The examination of a population of 960,874 persons in 1,029 villages revealed 888 cases, a rate of 0.08%, with 48.81% of lepromatous cases; an unusually high rate for India in spite of the total incidence being low. The age distribution showed only 5.4% up to the age of 14 years, 36.5% from 15 to 29, and 57.8% from 40 upwards; unusually high ages. The proportion of males to females was 4.7 to 1, due mainly to the purdah system limiting the number of women who could be examined. The author concludes that leprosy is not decreasing in the Jodhpur State, and that the true incidence is probably about 1 per mille, with a total of between 2,000 and 4,000 whom it is beyond the financial resources to isolate. He advises a central leper asylum for selected cases for treatment, and small colonies in villages with out-patient treatment at the existing hospitals and dispensaries.

**International Journal of Leprosy, Vol. 8, No. 4, Oct.-Dec. 1940.**

*Epidemiological Survey in the Nepoko, Kibali-Ituri District, Belgian Congo,* by J. Degotte, with an introduction by A. Dubois. The system in the Belgian Congo of examining the whole population for sleeping sickness has been extended to a search for leprosy cases in certain areas by a whole-time epidemiologist, who does not have to deal with medical treatment. He is assisted by a European sanitary agent, three native microscopists and native dressers. About 400 persons are examined in one day and their general state of health and the presence of signs of leprosy, yaws (which is now not very common), venereal affections, sleeping

sickness and splenomegaly in children noted. The leprosy cases and suspects are classified according to the Cairo Congress system. The climate is tropical with a high rainfall and small variations in temperature at different seasons. The great majority of the people seen were Mabudu of the Bantu race, together with a few hundred Pygmies. Their diet is mainly carbohydrate and their standard of living very low. Only a few of the patients had been isolated in formerly established leper villages. Among 38,120 persons examined the leprosy rate was at the high figure of 5.29 per cent, and among the Pygmies it was 7.07 per cent. The lepromatous cases constituted 8.61 per cent of the total, Nt cases with combinations 14.95 per cent, and Na and Ns cases 76.44 per cent. In the case of the Bantus males and females were nearly equally affected, but male Pygmies were as 8 to 4 females. The age incidence showed only 10.35 per cent from 0 to 19 years, 73.41 per cent from 20 to 49 and 16.24 over the latter age. In 43 per cent of the foci the appearance of highly infectious lepromatous cases had soon been followed by an extension of the disease. For the detection of the diffuse lepromatous cases microscopical examinations are necessary. Where village segregation had been relatively well carried out the cases were about one-third as numerous as where this measure was relatively defective. Segregation of such cases is therefore considered to be the best method of combating leprosy in this area.

*Development of the Lesions of Leprosy, with Particular Reference to Tuberculoid Leprosy and the Significance of the Lepromin Test,* by R. G. Cochrane. This paper is mainly of a theoretical nature which cannot well be summarised. A complicated diagram illustrates the author's views regarding the development and transformations of his three types of incipient lesions of childhood, simple macular lesions and tuberculoid macular lesions, which are described in detail and points of differentiation pointed out. Tissue sensitiveness is considered. An intermediate class between tuberculoid and lepromatous cases is also described, which are exceptional in giving negative lepromin reactions, and yet almost invariably recover. His studies are being continued on these lines. Illustrations of cases and histology are included.

*Injections Intra-Arterielles d'Huile de Chaulmoogra dans le Traitement de la Lepre,* by J. Tisseuil. This brief paper records favourable results, both general and locally on perforating ulcers, in two cases following the injection into the femoral artery of a chaulmoogra oil marked " Uclaf " in doses of 2 to 4 cm. twice

weekly up to eleven injections. Some temperature reaction may result, but the local oedema rapidly became reduced and the ulcers became healthy and filled up, with extrusion of a piece of bone in one case. The technique of the intra-arterial injections is not described, although they must require care and skill.

*Morphological Changes in the Cutaneous Nerves in Leprosy,* by N. A. Torssujew. This is a highly technical paper with histological illustrations which will doubtless be read in the original by the research workers interested in it.

*Attempted Cultivation of Mycobacterium Leprae,* by Florence L. Evans. As the results reported were negative it will suffice to mention that the culture media used included those prepared with legumes, milk, egg, or egg yolk, M. phlei, or various combinations of these ingredients.

*Importance of the Preventorium in the Rehabilitation of the Child of the Leper,* by Eunice Weaver. This paper deals with institutions for looking after the children of leprosy patients with a view to saving them from infection through their leper parents. Such institutions include three in Hawaii and India, and more recent ones in Brazil from 1915 onwards now number eight with more than 1,000 children in them. No child removed from its parents at birth has developed leprosy. All admitted children are carefully examined, and those who have died from other conditions up to the age of four years have shown no lesion or lepra bacilli in any of their organs. They are examined every month or oftener for the first symptoms. Among 500 children in one preventorium in the course of ten years, 62 became leprous, two-thirds during their first two years residence, and most of the rest during their third year, and only four during the fourth year. Good diet, with abundant vitamins, is provided. Many of the children have been refused care by relatives for fear of the disease and also by schools and orphanages, so special institutions are essential for their protection. Agricultural work and training for other vocations and education are provided. Brazil is once more in the forefront in caring for the children of the leprous.

*Observations of Patients with Atypical Mitsuda Reactions, after an Interval of Ten Years,* by Masa Igarashi and Fumio Hayashi. This paper is best summarised in the following conclusions of the authors:—

"Of a total of 35 improved lepromatous cases the lesions of which had been resolved long before the tests were made and which gave positive reactions, 28, or 80 per cent, have remained well, without relapse. The other 7 cases of this original group (20 per cent) have

relapsed, the Mitsuda reaction of course becoming negative. This observation answers the hitherto unsettled question of whether or not improved lepromatous cases that give positive reactions may undergo relapse.

"Of a total of 11 similarly improved lepromatous cases that gave only weakly positive (±) Mitsuda reactions, only 5 have relapsed. The other 6 have, unexpectedly, remained without further symptoms, indicating an about even chance of favourable outcome in such cases. Most of the lepromatous cases with resolved lesions that gave negative Mitsuda reactions have relapsed. Such cases are regularly of poor prognosis.

"Three neural cases whose reactions were repeatedly negative have all relapsed. It is noteworthy that this significant result of this test precedes by a considerable time the unfavourable turn of the clinical course. One neural case with a typical positive reaction that has, nevertheless, become lepromatous is mentioned.

"The element of sex appears to have influenced the outcome of these cases. (a) Among the resolved lepromatous cases with positive reactions that have not relapsed are 12 males and 16 females, a ratio of 1:1.3, which is in contrast with the usual ratio of 2:1 to 3:1 among leprosy cases in general. (b) On the other hand the 7 cases of this category that have relapsed are all males. (c) The six resolved cases with weak reactions that have not relapsed are all females, but all cases with that grade of reaction were of that sex. (d) The three neural cases that had negative reactions and that relapsed were all males. Even as males predominate numerically among leprosy cases in general, and among female cases the neural type is relatively predominant, so in the cases the subject of this study there is evidence that the prognosis is more favourable and the disease process more stable among females than among men."

## CORRESPONDENCE

19th November, 1940.

The Editor,
"Leprosy Review,"
115, Baker Street, London, W.1.

Dear Sir,

May I correct an erroneous impression given by the British Medical Journal, May, 18th, 1940 and quoted in the *Leprosy Review* of October, 1940 (page 180).

My treatment is not for ascites due to leprotic cirrhosis of the liver but for the type connected with simple cirrhosis of non malignant origin. Out of many hundreds of post mortems on lepers, I have never seen macroscopic changes in the liver caused directly by leprosy although I have not infrequently found microscopic changes and acid fast bacilli. Clinically I have never seen a case of ascites which could be diagnosed as leprotic.

I am,
Yours sincerely,

Sungei Buloh Settlement,
Selangor, F.M.S.

G. A. RYRIE.
Medical Superintendent.