Reviews

Leprosy in India, VOL. VII, October, 1935.

Dr. Rodriguez writes on *Lazarine Leprosy:*—

"The distinguishing features of this variety of leprosy are the following:—A rapid, sometimes sudden, development often in the *early* stages of the disease. In some cases, there may be 'no lepromas or macular lesions or any other dystrophic manifestations of leprosy' Formation of blisters and blebs. These usually start from an erythematous patch, a solitary nodule, or on a pachydermic edema of an extremity. Sometimes, they may appear on normal-looking skin. Rupture of the bullæ producing rapidly growing ulcers or areas of skin necrosis, which may 'disorganise cutaneous tissues, muscles, tendons and bones, opening up joints, and ending in tremendous deformities'. Presence of *M. lepræ* in the fluid of the bullæ and particularly in the secretion from the ulcers, usually in large numbers. Histologically, the picture is typically 'tuberculoid', but in contrast with the usual scantiness of the organisms in 'tuberculoid leprosy' numerous *M. lepræ* are found in the tissues."

A case described, the peculiarity of which is the "extremely rapid development of the ulcers, without any manifestations of acute *lepra reaction.* The temperature was absolutely normal and the patient did not feel weak or ill at all. There was no thickening of the cutaneous nerves and no enlargement of the superficial lymph glands.

"The picture presented is that of the existence, in a fairly early stage of the disease, of allergy and extreme irritability of the tissues towards the invading organism, resulting in violent efforts to limit the invasion and to eliminate the organisms. Except for some anesthesia around the larger ulcers, the ordinary signs of nerve involvement were conspicuous by their absence in this case.

"As in malignant syphilis, the presence of early allergy may explain the rapid course of the infection in lazarine leprosy. On the other hand, the rapid and destructive development may be due also to utter lack of resistance on the part of the host, to extreme invasive powers of a particular strain of the bacillus, or to the co-existence of another infection. Also it must be stated that the prevailing opinion is that the blebs are due to trophic disturbances or to inflammatory reaction in the nerve-trunk supplying the part. If this were the principal cause, however, we would expect to find much less bacilli in the fluid contents of the bullæ, if any. We have at present very few good reports on the subsequent development of the disease among those who survive the initial attack; such information would doubtless throw some light on the subject."

In a later note on this case Rodriguez mentions:

"During the months of January and February, he was afebrile, in fair condition, and the ulcers about the knees were improving very gradually. On the 19th of March, however, he suddenly developed several irregular erythematous patches on both legs and feet which rapidly sloughed off, forming acute ulcers. By the fourth day, the

larger coalescing ulcers measured several inches across. At the same time there was severe prostration and considerable fever. The patient lost about 4 pounds in one week.

" Scrapings from the base and sides of all the new ulcers showed numerous acid-fast bacilli. The total leucocyte count taken on March 25, was 11,100; the polymorphonuclears were 85%; small lymphocytes, 3%; and transitional forms, 1%. The urine was negative for albumin, sugar, and casts on repeated examination. During the last 3 days of March, the fever became continuous, reaching up to 103° F.

" As to treatment, mercurochrome, fluorescein and neosalvarsan have been injected intravenously without the least effect. Among the numerous local applications tried, Dakins solution was found to be the most useful.

" The writer believes that at the present time, the patient presents the picture of typical lazarine leprosy."

Dr. Dow contributes an article on *Massage, Electricity and Diathermy in the Treatment of Contracture.* He states:

" The selection of cases which will derive benefit from electricity, etc. requires care and discrimination, and such specialised treatment demands the supervision of someone trained in this type of work. In this hospital, neural cases with deformities are referred to our Physio-electro-therapeutic Department which is in the charge of a specially trained Sister, and there, before a patient is accepted for treatment, his electrical reactions are tested, as patients showing reaction of degeneration are not regarded as suitable, though even some of these have shown a degree of improvement under prolonged treatment."

The next article is *A Study of the Transmission of Leprosy in Families,* by Dr. Christian. His summary is as follows:—

" A detailed investigation is made of 57 families in which one or both the parents were suffering from leprosy, in order to study the factors influencing the transmission of the disease in such families. The following conclusions are drawn:—

Cases of leprosy which do not show *M. lepræ* on clinical examination (i.e. ' neural ' cases), do not transmit the disease.

Cases of leprosy showing *M. lepræ* on clinical examination transmit the disease, more than 90% of the children of such parents showing signs of leprosy.

Susceptibility to leprosy appears to be inversely proportional to age, young children exposed to infection showing a very high incidence, older children not so high an incidence, and adults a low incidence, conjugal infections being rare.

The incidence of leprosy in children exposed to infection is about the same in males and females.

The disease tends to take a severer form in male children than in female children.

The children of infectious fathers show almost as high an incidence of leprosy as the children of infectious mothers.

The joint family system greatly aids the transmission of leprosy in families.

The employment of infectious leper servants is sometimes the cause of leprosy in children whose parents are healthy."

Indian Medical Gazette, Vol. LXVIII, No. 9, Sept., 1933.

Dr. John Lowe contributes an article on *Bacillæmia in Leprosy.* This article is of considerable value, and should be read in full. His conclusions are as follows :—

" The finding of bacilli in the circulating blood of cases of neural leprosy is very rare. The finding of bacilli in the circulating blood of cases of cutaneous leprosy is commoner. The thick film method of detecting bacillæmia in the blood is extremely unreliable, nearly all the positive results reported being false positives due to the prick being made in leprotic skin.

" Examination of the venous blood by a concentration method as described is much more reliable, showing bacilli very occasionally in neural cases, and commonly in cutaneous cases, particularly in marked cutaneous cases, but it is probable that some of these findings are false positives.

" Examination of venous blood for lepra bacilli is a complicated and difficult procedure and quite unnecessary for diagnosis.

" Other methods of bacteriological examination particularly skin examination by the ' slit ' and ' clip ' methods are far easier and far more reliable than blood examination.

" One very interesting point to which we have previously referred but which the present investigations have demonstrated very clearly, is the very frequent finding in definite cases of leprosy of acid-fast bacilli in apparently unaffected areas of skin. In cases of cutaneous leprosy the involvement of the skin is very much more extensive than the clinical lesions would indicate. In practice we find that in marked cases of cutaneous leprosy, although the visible lesions are confined to certain areas of the skin, yet practically all the skin of the body may be involved ; hence it is difficult or impossible to puncture a vein through unaffected skin."

International Journal of Leprosy, Vol. 3, No. 1, January—March, 1935.

Dr. H. P. Lie writes an original article on *The Curability of Leprosy.* He refutes the commonly held idea of " Once a leper, always a leper." He gives the following general view of leprosy :—

" When we attempt to obtain a general view of the nature of leprosy and its course, we find that the causative agent, the leprosy bacillus, may encounter very different conditions in different individuals, and may thus have quite different effects. Many observations and theoretical considerations lead to the assumption that many people, perhaps most, possess an absolutely unfavourable soil for this microbe,

and that in such persons it loses its pathogenic power. In other words, the number of those infected with the leprosy bacillus is greater than the number who actually suffer from leprosy.

"Among those who acquire the actual disease the bacillus in certain cases finds good soil for life and multiplication, meeting with little or no resistance; in such cases the duration of the disease may be short, though acute leprosy with a fatal outcome is rare. The more common occurrence is the well-known chronic form of the disease, for in most cases the human organism resists the invader. Unfortunately, this attempt is often too late and is ineffective, whereupon we see the common picture of nodular leprosy, with its unfortunate outcome after many years. However, even in this form of the disease the human organism may ultimately be the victor, and this more frequently than we have been inclined to believe, though in these cases victory is paid for very dearly.

"In other instances the organism resists the bacillus at an early stage and hinders its multiplication to a very considerable degree. In some cases this may result in the disease being completely cured in a relatively short time. Such cases, quite surely, occur more often than we have been inclined to suppose. Many of them never come up for clinical observation, and may not even be noticed by the patients themselves. For this reason proof of this assumption may be difficult to obtain, but in my opinion careful clinical and pathological observations during the course of leprosy make it perfectly justified. However, in most cases when the invading bacillus meets resistance the disease assumes a more or less chronic course, presenting the clinical picture of the maculo-anaesthetic type (in which is included pure nerve leprosy), which possesses a distinct tendency to cure."

Dr. Lie says that "tuberculoid leprosy" must be very rare in Norway, for despite research only one single case has been found. His remarks regarding age at onset and duration are of special interest:—

"Of all those who were cured, 11 per cent. were 10 years old or younger when leprosy broke out, while of those not cured only 4.6 per cent. were as young at the onset. Similar proportions existed in patients who were from 10 to 20 and 25 years old at the outbreak, 49 per cent. and 75 per cent., respectively, for those cured, 30 per cent. and 54 per cent. for those not cured. The chances of a cure are not great when the disease appears after the age of 25. The oldest patient cured was 47 at the outbreak of the disease."

Perhaps this is due to the greater natural resistance of adults as compared with children; for should an adult after the age of 25 acquire the disease in a country of comparatively low endemicity like Norway, it would be a sign that his general health was reduced to a very considerable extent to make the naturally resistant soil of the adult body suitable for the growth of leprosy infection. With such reduced health the prognosis would be particularly bad. A number of photographs are given of patients presumably cured for 20 to 50 years.

Prof. Hoffmann writes on *Allergic Erythematous Eruptions in Leprosy.* He discusses the possibility of an " ultra-organism," a granular or filtrable form of M. leprae in its causation, and suggests the analogy of a similar filtrable form in tuberculosis.

Drs. Wade and le Roux write on *A Leprosy Case Progress Chart* :—

" The essential part of the chart is the form for the progress graph; in the example which accompanies this article that form, plus space for recording the bacteriological findings, occupies one-half of the total enclosed space, but this can, of course, be varied to suit particular needs or preferences. The other part, susceptible to much more variation, is provided for the periodical summarization of data such as weight, treatment, and clinical events, which presumably will include the occurrence of lepra reaction and important complicating conditions. Where tests such as the sedimentation index or the Wassermann reaction are made periodically, separate spaces for them would be provided.

" The progress form itself has two parts, one for the C (' cutaneous ') and one for the N (' neural ') phase of the disease; and each of these type-areas is divided into three spaces in accordance with the subtypes of the Memorial Conference classification (C1, C2 and C3; N1, N2 and N3). Each of these spaces is further sub-divided, the reason for this being that during the intervals between examinations there may be changes in the case sufficient to be indicated in the graph as a trend, but not sufficient to change the actual classification from, for example, C2 to C1. The first, least advanced of the sub-type spaces (i.e. C1 and N1) are both nearest a central blank space, which may be called the ' negative ' or ' neutral ' zone, so that with increasing severity of the case the graph line goes farther from that zone, and in an advancing ' mixed ' case the two lines diverge. The negative zone is intended to indicate absence of—or rather, disappearance of—evidence of the disease.

" With respect to the vertical rulings, the chart may be divided for as many years as desired, but the narrower these divisions are made the fewer notes can be inserted in them. Each of the year spaces is subdivided as if for quarterly recording, not because it is expected that many will attempt to reclassify their cases that frequently, but in order to permit rough correlation of records and dates, as shown in the illustrative cases.

"The sample chart herewith is designed for a sheet form measuring 8 x 10.5 inches, the left-hand margin being wider to provide for binding, but it can easily be modified for other sizes of records. A modification, based on suggestions received, is printed on an ordinary 8 x 5 inches filing card, one-half of the whole form on each side. Better in certain respects would be to use a double card of tough, durable stock, 8 x 10 inches when opened, folding transversely and then measuring 8 x 5 inches, to be filed, of course, with the folded edge uppermost. The entire chart could be printed on the inside; the outside, back and front, would be available for other records, including personal data."

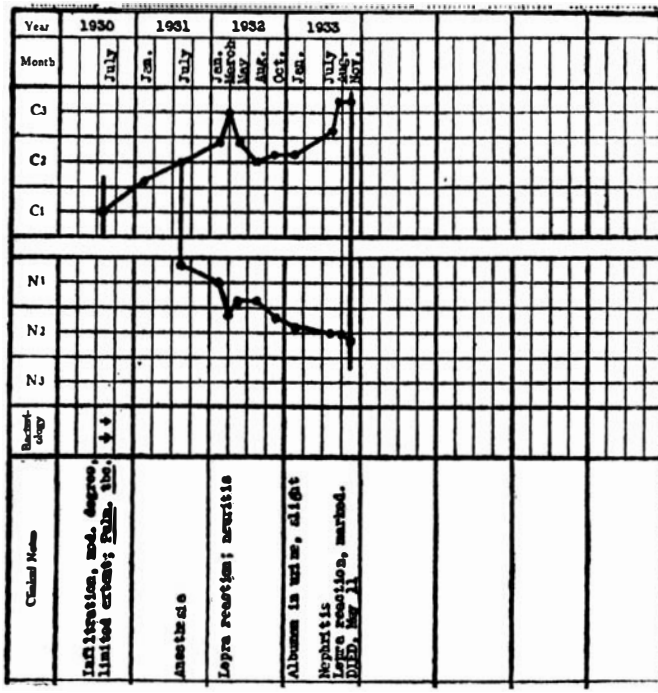

FIG. 1. Representing an untreatable cutaneous-type case of unfavourable course, dying of protracted lepra reaction.

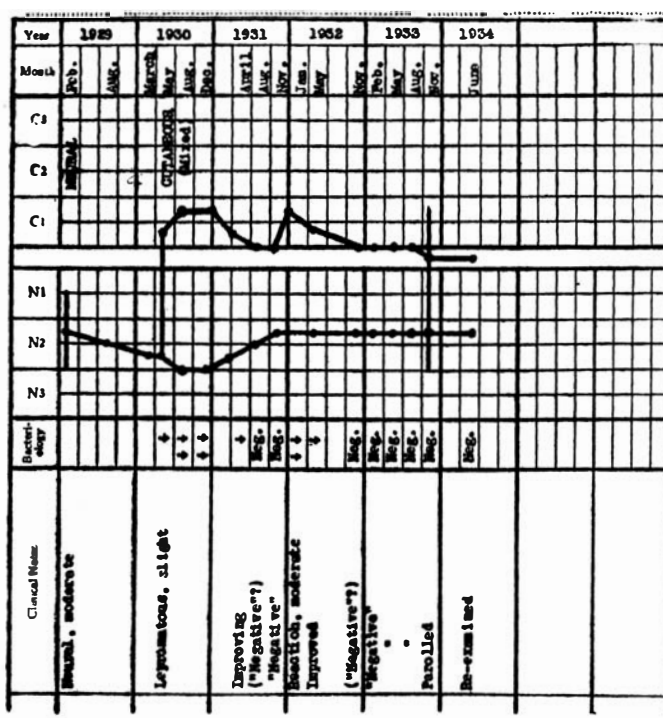

FIG. 2. Representing a neural case that became "mixed" but recovered, though with permanent stigmata.

The following is an index to primary divisions of case progress chart.

CUTANEOUS type (C): All cases showing "leprotic" lesions in the skin, *with or without neural symptoms.*

- **N1** — *Advanced*: Numerous or very marked leprotic lesions in various stages of development or retrogression, usually with lesions of the mucosa.
- **N2** — *Moderate*: Numerous leprotic macules, or fairly numerous or marked areas of infiltration or nodules, frequently with lesions of the mucosa.
- **N3** — *Slight*: One to a few leprotic macules, or a few small areas of infiltration, or nodules.

Details of further division of each subtype not specified by any convention; may vary more or less under different circumstances.

(Negative or neutral zone.) NEURAL type (N):

- (a) *Preneutral*: For cases under special observation; i.e., quiescent cases previously with leprotic lesions.
- (b) *Neutral*: Symptom-free cases with neither active leprotic lesions nor neural sequelae.

All cases showing evidence of actual or previous nerve involvment (i.e., alterations of sensation, trophic disturbances or paralyses and their consequences), *without "leprotic" skin changes."*

- **C3** — *Slight*: One or a few small areas of disturbed sensation, with or without alterations of circulation or pigmentation, or minor degrees of paralysis or trophic changes.
- **C2** — *Moderate*: Extensive or numerous, disseminated, areas of disturbed sensation, with paralyses or/and visible trophic changes (marked depigmentation, moderate atrophy, keratosis, bullae, etc.).
- **C1** — *Advanced*: More or less extensive anaethesia and marked motor and trophic disturbances; marked paralyses, atrophies, contractures, trophic ulcers and mutilations.

(As above)

Prof. E. Loewenstein claims to have cultivated the leprosy bacillus. His conclusions are as follows:—

"Cultivation of the leprosy bacillus has been successfully accomplished by means of my sulphuric-acid method on an egg medium to which fish-broth has been added. The statements of Lie and others that leprosy bacilli are found in the blood have been verified both by direct smear and by culture. In two out of five cases a pure culture was obtained from the blood. In two cases tubercle bacilli were also found in the blood, along with the leprosy bacilli.

"The growth of this leprosy bacillus is very slow, taking up to six months to form macroscopic colonies on my fish-egg medium. These leprosy strains have not shown evidence of pathogenicity in guinea pigs observed for six months. They are characterised by a strong capacity of acid production, both on the egg medium and in the fish-asparagin solution."

These claims would have to be confirmed before they could be generally accepted. Judging from the text alone it is difficult to award this organism any higher marks than its preceding rivals.

Dr. H. de Souza-Araujo writes on the Brazilian Chaulmoogra (*Carpotroche Braziliensis*). Sapucainha oil obtained from the seeds of this tree has the qualities of other chaulmoogra oils, viz. the power to rotate polarised light to the right (51.5 to 58.9) and high iodine saturation index (up to 112.8). Carpotrochinic acid derived from this oil is said to have a lower melting point than chaulmoogric and hydnocarpic acids. The pulp of ripe fruits is used as a beverage when mixed with water and honey. There seems to be an abundance of this tree and its products in Brazil; the following is a list given of the principal products on the market:—

Hansenyl, ethyl esters of carpotroche oil with ethyl morrhuate. Recommended for leprosy and tuberculosis (Granado & Co., Rio de Janeiro.)

Carpotrenol (L.C.L.), ethyl esters of carpotroche oil. For intramuscular use in leprosy.

Carpoidil, tabloids of magnesium iodocarpotrochate, for internal use. (The last two products from Laboratorio Leopoldineuse, Minas Geraes, Prof. A. Machado & Co.)

Karpotran, "a physiohydrosol of cupric carpotrochate, sterile, with an absolute titre of 1:1,000, isotonic," marketed in ampules. (Instituto Therapeutico Orlando Rangel, Rio de Janeiro.)

Aurocarpol, of two kinds: "A," iodine carpotrochate of gold and sodium 0.064, water q.s. 2 c.c.; "B," iodo-carpotrochate of gold and sodium 0.096, water q.s. 3 c.c. For intravenous and intramuscular injections.

Protocarpol, a sodium carpotrochate, iodized, 0.06; iodo-protein (carpotroche oil) 0.20. In ampules of 2 c.c. for intramuscular use with aurocarpol.

Carpol, in tabloids: sodium carpotrochate iodized, 0.40; calcium phospho-caseinate, 0.20. For internal use.

Carpol in gelatin capsules (perles): iodized ethyl esters of carpotroche oil, 0.50; ethyl esters of cod liver oil 0.20. (The last four products by Dr. Raul Leite & Co., Rio de Janeiro.)

Beautiful illustrations of the tree, flowers, fruit and seeds are given. It might be well to cultivate this tree in other parts of the world.

Dr. Macleod and Dr. Cochrane write notes on *Leprosy in Great Britain*:—

"A century or two ago it still prevailed in the outer islands of Scotland—the Shetlands, the Orkneys and the Hebrides. In the seventeenth century it was common in the Shetland Islands, where the lepers were segregated on the island of Papa Stour, which is situated to the west of the Shetland group and is separated from the mainland of Shetland by a stormy sound that effectively isolates it in all but fine weather. The last person with leprosy in Papa Stour died about a century ago and the present people, many of whom are descended from lepers, are a hardy race of healthy crofters.

"It is not possible to estimate the exact number of cases at present in the country, and such numbers as fifty to a hundred, sometimes quoted, are mere guess-work. This want of precise knowledge is largely due to the fact that the disease is not notifiable in Great Britain, and in consequence patients are liable to be hidden away and their existence carefully concealed. Cases also are apt to go unrecognised, as the disease is so rare that only the few medical men who have practised abroad are capable of diagnosing it."

Mention is made of the St. Giles Homes for British Lepers in this country, to provide "a home for such patients as were homeless and uncared for."

A special article describes *Leprosy Control in the Southern Soudan.* The following is the summary and conclusions:—

"In the area north of the sixth parallel it is considered that leprosy can be best dealt with by: (1) propaganda among tribal sheikhs or chiefs as to the infectivity of the disease and the necessity for relative isolation, i.e. the patient to be prohibited from eating, smoking or sharing a hut with an uninfected person; (2) wherever possible moving the leper to the near vicinity of a hospital or dispensary so as to insure treatment; and (3) in certain cases making special provision for the accommodation and treatment of lepers near a hospital.

"South of the sixth parallel the leprosy problem is more serious; in certain districts as much as 4.3 per cent. of the population is infected. In order to deal with the immediate situation large settlements have been formed, and some 70 per cent. of the total leper population have been admitted to these camps. By this means the lepers have been brought under close observation and regular treatment. The problem of the infectivity of the disease has been studied under conditions closely resembling those of normal village life, and observations have been made on the degree of improvement which can be expected from regular treatment and from satisfactory conditions of life. In addition, the lepers and the relations are being taught the simple precautions that are necessary to take to avoid infection. It has been found possible to repatriate to their villages some 40 per cent. of these lepers.

"A large percentage of early cutaneous cases remain stationary and do not require treatment or segregation. If adverse conditions obtain, such cases may rapidly acquire active signs. It is not only unnecessary, but unwise, to bring such cases into a leprosy settlement unless they become 'open' cases. Strict segregation of highly infective

cases is a very beneficial measure in prophylaxis and should be extended.

"Treatment by the present methods, though not spectacularly curative, certainly tends to keep the disease from advancing. Measures intended to improve the living conditions, and especially the quality of the food, are more important than actual drug treatment. The salt ration must be maintained.

"Bush dispensaries manned by trained native staffs should be developed to deal with the leprosy problem on the spot. Lepers could be housed near such dispensaries and while leading their normal lives still be under frequent supervision. Highly infective cases only need be removed to the central camp. It will take at least two years to train a sufficient staff for this. With the staff and resources available only routine work can be done, but we are gradually accumulating data of epidemiological value, which should in time point the way to a sounder prophylaxis.

"With regard to permitting relatives to live with the lepers, it must be remembered that, though there is a fresh infection of three to four per cent. in the settlement, in Li Rangu practically all, and in Yubo 50 per cent. of the relatives living there have for an average period of five years been in close contact with their leper relatives outside before entering the settlement, and fresh infections were to be expected from them in any case."

Dr. Cole describes a syrupy yellow oily fraction in which resides the greater part of the irritant character of anti-leprotic oils and their derivatives:—

"Not only is the yellow syrupy acid mixture to be obtained from the mixed fatty acids of the original chaulmoogra oil, but it also appears after a time in highly purified, separated hydnocarpic and chaulmoogric acids, due to a gradual decomposition. The decomposition is more rapid in the presence of air and light than otherwise, and, of course, more rapid if the acid is allowed to remain in small crystals than when it is melted into a solid cake. If a small amount of a pure acid is sealed in a relatively large container (such as a quart mason jar) and opened after a period of months, air rushes into the jar indicating that oxidation has actually taken place."

Dr. S. N. Chatterji describes two cases to show that the type of leprosy (neural or cutaneous) which will develop depends approximately upon the general health of the one infected, and also on the number of bacilli which entered the body.

The International Journal of Leprosy, VOL. III, No. 2, April—June, 1935.

Dr. Wade gives his fourth paper on *Tuberculoid Leprosy* and deals with the classification of this type. Dr. Wade assigns it to the neural rather than to the skin type for the

following four reasons:—

"*Clinical.* Outstanding is the fact that its course and prognosis are those of neural rather than cutaneous leprosy; it is relatively benign, indefinitely prolonged, and often self-healing. Typical tuberculoid leprides may develop in an ordinary neural case without a change anything like that which follows the appearance of lepromata in such cases. Without going into details regarding the lesions it may be pointed out that the tuberculoid leprides, like the simple ones, are more sharply limited, less diffused, than lepromatous infiltrations often are. The question of sensory changes is interesting in that they apparently are often less marked than in simple neural leprides. A tuberculoid lepride without anaethesia is particularly liable to be mistaken for a leproma.

Bacteriological. It is of the greatest significance that typically the tuberculoid lepride gives negative smears in the standard examination. When an untreated infiltrated lesion proves negative it is open to more than a mere suspicion of being tuberculoid, provided the examination is properly made. For the present at least it seems that a clinician working without the benefit of histological diagnosis is quite justified, if not compelled, to accept this as the principal diagnostic criterion. The relatively few tuberculoid cases which in the writer's experience have proved positive showed very few bacilli in lesions which, had they been lepromata, should have had very many.

Histological. The principal evidence which the histopathology affords in the present connection is negative, namely, that the condition is not lepromatous. But it does give an indication of the degree of reaction to the infecting organism, much greater than in typical lepromata, and it may prove to be more directly indicative of the case type if it turns out that the tuberculoid change, in slight degree, is common in simple, flat leprides. It is significant that the tuberculoid change is rarely if ever seen in the nerves of unmixed cutaneous leprosy, but is the rule in at least the skin nerves in the tuberculoid variety, and in India, peculiarly, often goes on to necrosis and liquefaction.

Immunological. Hyashi states that the leprolin test will differentiate between tuberculoid and cutaneous-type infiltrations, and Muir says that cases with tuberculoid lesions give even stronger reactions than ordinary neural cases. Certainly the frank, florid tuberculoid case suggests that there has been some change which has greatly exaggerated, and perhaps even basically modified, the reaction to the infecting agent that is shown in the ordinary neural case. This increased sensitivitiy presumably involves some change of resistance to that agent, but whether it is an increase or decrease has not been shown. The familiar question of sensitization (allergy) versus true immunity is involved here, for it is not seen to what factor other than allergy the tuberculoid tissue-reaction can be ascribed. However, if there is a decrease of resistance it clearly does not approach the breakdown that is seen when lepromata develop in a neural case."

Later, referring to the definition of "leprotic" in the Leonard Wood Memorial Conference Report, he says:—

"Examining first the definitions that have been quoted, it is

evident that ' leprotic ' is used there in a special sense, actually synonymously with ' lepromatous,' which of course refers to the condition universally accepted as characteristic of the cutaneous type of the disease. Recognizing that this lesion (defined by the Conference, with the greatest conservatism, as a granulomatous change in which bacilli can ' usually ' be demonstrated by ordinary methods), is the bacillus-rich lesion composed chiefly of the lepra cells of Virchow, it would be a misconstruction to confuse or include with it the tuberculoid granuloma, which is typically negative for bacilli and essentially epithelioid in nature."

We fail to see the logic of this statement. Undoubtedly the tuberculoid lesion shows " changes which present clinical or microscopic evidence of inflammatory processes, typically of granulomatous nature, which are apparently caused by mycobacterium leprae in them " (the L.W. Conf. definition of *leprotic*). Even though the organism cannot be " usually demonstrated by the ordinary methods of examination " (as added in the L.W. Conf. report), it can frequently be demonstrated by special methods, and its presence in the skin is undoubtedly the cause of the inflammatory granuloma present.

In some countries, as for example N. India, this form of lesion is among the commonest, and has long been considered by workers in Calcutta the primary (A1 in the old classification) type of neural lesion.

We agree with Wade that this form of leprosy should be classified under the neural type, but we disagree with his suggestion that these cases should be classified " by simply recognising them as a variety or sub-type of the neural (N) type."

Dr. A. A. Stein of Leningrad contributes an article on *Lepra Reaction and Meteorotropism.* His conclusions are as follows:—

" The occurrence of exacerbation of leprous processes depends upon changes in the atmospheric conditions. There is no relation between exacerbation and the annual or monthly temperatures, the barometric pressure, rainfall or winds. Exacerbations occur in a region with the passage of ' variable layers ' of different systems (cyclones, anit-cyclones etc.). The greatest number of exacerbations (73 per cent. of my cases) occurred during the passage of cyclones and occluded cyclones. The greatest number of exacerbations were observed during the passage of the warm front of cyclones (44 per cent.), and next the cold front (29 per cent.). In cold seasons exacerbations prevail when the warm front sets in, and to the contrary in the warm season when the cold front passes. Multiple cases of exacerbation are more numerous and appear more frequently in winter. In stable weather only a small number of cases of exacerbation was

observed (7 per cent.); they appeared only as isolated cases. The exacerbations of leprous processes appear not only on the day the variable layer passes, but also on the previous day."

Many leprologists must have noticed results similar to those of Dr. Stein. In India lepra reaction is particularly common in the long hot weather and exacerbations are common in the case of hillmen coming to the plains, such as Gurkha soldiers serving with the British Army or police.

Dr. Ota and other Japanese doctors have prepared an emulsion of the ethyl esters of hydnocarpus anthelmintica which can be given intravenously. We quote as follows:—

"This emulsion contains particles of the ethyl esters which are about 1 micron in diameter and nearly uniform, and its colloidal condition is so stable that it can be preserved for a long time, whether it contains 10 per cent. or 50 per cent. of the esters. We have used one containing 40 per cent. as the standard, though what we call 'Esperol' is a 10 per cent. emulsion.

"Experiments with rabbits have shown that the dose of the 40 per cent. emulsion given at one time should be less than 2 c.c. per kgm. If the dose is 0.5 c.c. per kgm. no unpleasant symptoms are caused. In patients we injected single doses of 2.5 and 3.0 c.c., of the 40 per cent. emulsion (1 c.c. of the esters), and with some patients 5 c.c. at times. Intravenous injections of such large amounts of ethyl esters have never been made before, and not only did this large amount cause noticeable secondary reactions, but also flushing of the face, feeling of oppression in the chest etc. These reactions, which were occasionally met with at the first stage of our investigation, have nearly been gotten rid of through improvements in the preparation. It is much safer to use the emulsion diluted about 5 to 10 times with distilled water, physiologic saline or 4.5 per cent. glucose solution. The largest number of injections given to any of the patients treated was 50, and the total amount of emulsion injected reached 148 c.c., this figure being calculated as of the standard 40 per cent. preparation.

"What is the effect of the intravenous injections? Is this method superior to the usual intramuscular or subcutaneous injections? These questions are difficult to solve, and our experience is as yet too limited to decide upon them. They must be reserved for the investigation of specialists, but we are convinced that the method of injection we use is not inferior to those used up to this time."

French workers, working in S. India, have found that after neutralising pure hydnocarpus oil by frequent washings with alkali, it was possible to inject up to 1.5 c.c. intravenously without unpleasant symptoms. In Calcutta we were able to confirm their results. Most workers, however, now consider that intramuscular, subcutaneous, and above all, intradermal injections are more effective.

Dr. Hayashi describes his interesting world tour as a fellow of the League of Nations.

Dr. Soule writes on *The Wassermann Reaction and the Kahn Test in Leprosy*:—

"The sera of 615 patients with more or less advanced cutaneous leprosy, and 54 other cases with severe lepra reaction, were tested by both the Kolmer-Wassermann and the Kahn procedures for syphilis. The group had been carefully selected, and comprised only individuals whose clinical examinations and case histories failed to reveal evidence of syphilis or yaws. Of the 615 sera from cases without lepra reaction the Wassermann test gave 109 strongly positive and five positive, a total of 18.5 per cent., as compared with 121 strongly positive and 70 positive, a total of 31 per cent. reactors with the method of Kahn. Of the 54 sera of patients undergoing severe lepra reaction 18 were strongly positive and one positive with the Wassermann test, and 18 strongly positive with the Kahn, 35.2 per cent. and 33.4 per cent., respectively. This study adduces considerable evidence that leprosy *per se* is responsible for the positive reactions.

"The true answer as to whether the positive serological reactions are due to undiagnosed syphilis or yaws in the presence of leprosy, or to an influence of leprosy itself, will be found only as a result of the testing at frequent intervals, over a protracted period of time, of such individuals as are found positive. A number of workers are now engaged in this project. The outcome of the survey under consideration by the United States Public Health Service will be awaited with interest by leprologists. In that study approximately 1,000 specimens of blood will be submitted to a representative group of participating serologists. The object is to appraise separately the various serodiagnostic tests for syphilis. Included among the donors selected will be individuals with leprosy."

Dr. Ribeiro reports that leprosy is capable of producing complete alterations of the finger prints:—

"In a number of patients whose fingers appeared absolutely normal there were alterations of the papillary designs so marked that it was impossible to classify them and effect identification by dactyloscopy. In many cases previous finger-prints were available, and comparison showed that before the illness they were normal. Biopsy showed that this change is not due to secondary atrophic changes, but to an active lepromatous infiltration with distortion of the bodies of the papillae. Numerous leprosy bacilli were found."

Dr. Montanés writes on *Leprosy in Spain*. He estimates that there are not less than 2,000 cases, or 0.04 per thousand.

Dr. Wilson, of the Biederwolf Leper Colony in Korea, describes how certain selected inmates of his colony:—

". . . in whom the disease had been arrested have been allowed to choose mates. After they had built, with some assistance, houses for themselves on plots of land assigned to them, and after the males had been sterilized, they were married. Each couple was required to select from among the children of the colony one to adopt and

bring up as their own. Those who entered this relationship did so voluntarily, and the experiment so far has been eminently successful. It has had a good effect upon all of the inmates of the colony, and has reduced to one fourth the per capita cost of maintaining those concerned."

Belgian Congo—Leprosy Control.

The following extract from a letter of H. Wakelin Coxhill will be of interest to some of our readers :—

"On Dr. Helser's return here we together saw the Governor General and the Médecin en Chef; both were most cordial and were obviously interested in hearing what Dr. Helser had to say about his tour. Seeing that the Governor General was leaving Leopoldville for his own extensive tour in the Colony two days after our interview with him, and was exceedingly busy, we appreciated the more the time he granted us.

"We asked Dr. Van Hoof what he thought of the following suggestions as to the aid the Government might give to Protestant missions willing to enter into the fight against leprosy :—

To grant concessions of land for leper colonies and for agriculture.

To furnish medicines.

To pay for a superintendent for each lazaret.

To furnish 0.50 centimes daily,

1 bed cover,
1 mosquito net,
2 cotton drawers (for females).

To grant subsidies for the construction of provisional huts.

"The Médecin en Chef was so heartily in accord with these suggestions that he asked me to present them officially to the Governor-General without any delay, so that provision might be made in his 1936 budget, which he was then preparing. It was realised that there must not be any hold-up in the granting of required concessions for leper work, and that though the 0.50 cms. per day might be sufficient in some areas, it would be far from sufficient in others, such as in and around Elisabethville, and that adjustments would be made according to local conditions.

"Our appointment to see the Governor followed immediately after our interview with Dr. Van Hoof. Monsieur Ryckmans' perfect command of English made it easy for him to converse freely with Helser. We soon found that the Governor was genuinely sympathetic, and was at once in full accord with the suggestions we placed on the table. He told me there was no need for me to go to the trouble of writing further on the matter, as he would do all that was necessary right away that day, promising us that where land is required for leper work he would arrange that the local authorities grant it without long drawn out formalities. It is naturally understood that the concessions and Government assistance herein envisaged will only be granted to those able and willing to do leper work."

"Some Experience of the Aniline Dyes in the Treatment of Leprosy," Reviota de Leprologia de Sao Paulo, September, 1935.

Drs. Fernandez and Schujman give full details of a thorough trial of various dyes. Their conclusions are as follows:—

1. We have employed bonney blue, fluorescein, eosin and methylene blue in the treatment of distinct forms of leprosy and their complications, but we have not obtained the favourable results obtained by some other authors. We have proved, on the contrary, that in the majority of the cases treated there has been a distinctly prejudicial effect on the evolution of the disease.
2. According to our experience the therapeutic action of these anilines is inferior to that of chaulmoogra and its derivatives.

Journal of Medical Association of South Africa, July, 1935.

Dr. Mostert discusses the contagion theory. "Of 426 children born of lepers prior to their admission to this institution, there is a history of 230 (54 per cent.) of these children contracting the disease: 78 per cent. of infections occurred before the age of 20 years; 59 per cent. of the parents suffered from leprosy of the nodular type. In contrast, only 33 (or 8.6 per cent.) of 385 married lepers now in the institution (of whom 43 per cent. are nodular) give a history of the healthy mate contracting the disease after marriage from the leprous partner."

Regarding methylene blue, brilliant green and trypan blue, he says: "It is rather too early to predict the future of the various dyestuffs in leprosy. The ideal preparation would be one of high leprocidal action and low toxicity, capable of prolonged administration. None of the drugs used by us so far attain this ideal. Trypan blue appears to be the most effective, but our results with this dye and brilliant green cannot compare, however, with results obtained by Ryrie in Malaya, or by Ryles in India."

Regarding mercurochrome, he states: "Although it does not in the long run appear to benefit the leprotic process itself, it is a drug of absorbing interest in leprosy, and has received a thorough trial at West Fort. It relieves nerve pains and clears up septic conditions and lepra reactions. Its action on nerve pains has so far been its most striking feature, and patients have flocked for treatment. Of a series of 71 patients, 87 per cent. were completely relieved of pain

after five injections, and with one exception, all the others benefited by treatment. Six months later 80 per cent. were still free of pain. Some gave a history of nerve pains of over ten years' duration. All manner of superimposed septic states tend to resolve. Acute inflammatory conditions of the skin subside rapidly, but chronic septic states (e.g., foul leprotic ulcers) require prolonged treatment. A cellulitis, secondary to some septic wound, is frequently seen, and is characterised by a hot, red, swollen, brawny area, exceedingly painful, with ill-defined outline and a tendency to spread and abscess formation. Mercurochrome exerts a most beneficial influence on this condition. The patient has early relief from pain, and the temperature and redness subside rapidly. Small injections of the dye may also be beneficial in clearing up pyorrhœa, but excessive doses tend to loosen the teeth and cause painful gums. Muir states that mercurochrome appears to be much more powerful than potassium antimony tartrate in stopping lepra reactions, and we have found it most useful, even the worst cases usually showing improvement after the initial injection. It is contra-indicated in tuberculosis, but appears to be of benefit in certain cases of albuminuria, those probably of septic origin.

"The drug is not very toxic and reactions following administration have so far been negligible. In some bad nodulars there is a transient tightness of the throat soon after injection, presumably due to a temporary congestion of an already affected larynx. During the initial injections there may be an exacerbation of symptoms at the seat of the trouble.

"Best results are obtained by employing small doses initially, 3 c.c. of a one per cent. solution in distilled water intravenously, and working up gradually to a maximum of 10 c.c. twice weekly."

British Medical Journal, November 2nd, 1935.

Dr. Norman Burgess describes the use of phenyl ethyl hydnocarpate injected intradermally in lupus vulgaris. This method was first used by Sir L. Rogers in 1933, who used creosoted moogrol, as did also Dr. Muende. Burgess found the phenyl ethyl preparations less painful and better tolerated by patients. He describes six cases and illustrates three of them, before and after treatment, by means of excellent photographs. The most striking results are in a case

of facial lupus extending into the mouth. Even in the mucus membranes the injections were effective. [This form of treatment might be tried in other infective granulomata—Editor.]

Transactions of The Royal Society of Tropical Medicine & Hygiene, Vol. XXVIII, No. 6, April, 1935.

Dr. J. M. Lindsay, in his paper on Medical Services in the Chaco War, states:—

"Leprosy is very prevalent in South America, and the number of lepers in Paraguay is very large considering the small population of the country. For certain political reasons and in connection with their immigration policy, the numbers are not allowed to be published. For some time efforts had been made by various missionary bodies, including the Salvation Army, to found and support a leper colony on mission lines, far away from the capital; and a few years ago I ventured to make some propaganda in the matter and my views were quoted at the Strasburg Tropical Medicine Congress and later ventilated at the League of Nations in Geneva.

"In 1929 Dr. Etienne Burnet, of the League of Nations Leprosy Commission, visited Paraguay; and in May of last year I travelled with him from San Paulo in Brazil: speaking of Paraguay, he said that the leprosy problem there was very difficult and the outlook rather hopeless.

"It has not proved to be so, however. One of the Fellows of this Society of Tropical Medicine, Dr. J. Nairn Hay, a graduate of Edinburgh, and, as a native born citizen of Paraguay, a Member of the Faculty of Medicine of Asuncion, has been working most energetically with the good-will of the President and his ministers and with the hearty co-operation of the local Faculty of Medicine and the Department of Hygiene, for the founding of a Leper Colony. Dr. Nairn Hay, as a Paraguayan citizen, had been mobilised for the war and had served in one of the military hospitals. In the beginning of this year, however, he was demobilised and commissioned to carry on the work of the Leper Colony. The American Leprosy Association has taken a great interest in this work, and a few months ago Dr. Webster Browning of that Association visited Paraguay in connection with the matter. Now in the latest Paraguayan newspapers I read that the first buildings of the Leper Colony have been completed, and all the lepers have already been removed from the hospital in the capital to their new home far out in the country. All this has been accomplished through the initiative and energy of our colleague, Dr. J. Nairn Hay, aided and backed in every way by a most patriotic zeal on the part of the higher authorities of the nation during the course of this terrible war which, it might have been supposed, would have sapped the nation of all its resources."