Abstracts

1. Leprosy in Kenya, by M. Ziedses des Plantes, A. R. H. B. Verhagen, D. Leiker and J. W. Koten. *East African Medical Journal*, **45**, 6, June, 1968.

The absence of reliable vital statistics is nowhere more obvious and more serious than in the assessment of the prevalence of leprosy and the planning of measures for successful control. This report indicates that in Kenya leprosy is more common than was formerly believed, and is present in hitherto unsuspected foci. Suggestive pointers were first noted during an analysis of the tribal and geographical origins of leprosy patients in an urban clinic. These suspicions were confirmed by sample and pilot surveys, by 'whole-population' surveys, admittedly incomplete, and by more thorough investigation of supposedly hyperendemic foci.

The obvious lessons to be learned from this study are that there are always more patients suffering from leprosy than early reports suggest; that the provision of inadequate facilities for in-patient treatment of a proportion of patients with multibacillary disease has little or no effect on the prevalence of leprosy; that control measures beset with such shortcomings as incomplete coverage with treatment centres, delay in reporting for treatment, high defaulter rate, and absen follow-up of defaulters—are scarcely able to contain the leprosy endemic. Movements of people from country to town, and within the rural areas, coupled with a natural increase in the numbers exposed to leprosy, also increase the possibility of leprosy infection.

S. G. Browne.

The following 7 abstracts are reprinted, with permission from *Trop. Dis. Bull.*, 1968, **65**, 5:

2. **Leprosy in New Brunswick: the end of an era,** by F. L. Whitehead *Can. Med. Ass. J.*, 1967, **97**, 21, 1299-300.

Leprosy entered New Brunswick in 1815, attacked about 320 people, and quietly disappeared in 1965. Apparently, the 3 first victims were sisters, of French extraction, but their 16 sibs and half-sibs were unaffected. Where they contracted the disease is a mystery, never to be solved. This account of a small and limited outbreak of leprosy traces briefly the history of the earliest lazaretto on Sheldrake Island, with its 18 inmates in 1844, and the lazaretto in Tracadie, which was a 'cheerless prison, surrounded by a wall 12 feet high, with a row of long spikes on the top to prevent escape'. In those days, 'lepers' (*sic*) 'were hunted like wild beasts, dragged from their lairs by an iron hook attached to a long pole, handcuffed'. A better day dawned with a new attitude to leprosy sufferers, and new hope came 20 years ago with the sulphones. The last 2 patients from New Brunswick itself were admitted in 1937, though a few patients from other provinces came to Tracadie during the next 15 years. The last patient was discharged in 1965.

In an accompanying editorial (p. 1298) Aequanimitas pays tribute to the succession of dedicated workers whose efforts have brought the era of leprosy in New Brunswick to an end.

(No valid epidemiological conclusions can be drawn from this interesting conspectus concerning the value of segregation as a means of controlling a limited outbreak of leprosy in a developed country.)

S. G. Browne.

3. **Leprosy. II. IgA and IgM immunoproteins in leprosy sera,** by S. D. Lim and R. M. Fusaro *Int. J. Lepr.*, 1967, **35**, 3, 355-60. **III. A comparison of IgA and IgM immunoproteins of patients with pulmonary tuberculosis and leprosy,** by S. D. Lim and R. M. Fusaro. *Ibid.*, 361-5.

II. Reports on immunoelectrophoretic changes in IgA and IgM immunoglobulin in 15 leprosy patients were previously recorded (*Trop. Dis. Bull.*, 1964, **61**, 574). This report summarises the serum protein changes in 232 leprosy patients studied by the same methods. Serum electrophoresis was carried out in agar gel on slides and anti-human serum was prepared in horses. Control sera from normal subjects were examined at the same times as those from leprosy patients. Results indicated that IgA globulins were most active in tuberculoid leprosy (91%) and least active in the lepromatous type (51%). IgM globulins occurred in 99% of patients with lepromatous leprosy, in 62% with the tuberculoid type and in 49% of indeterminate type.

III. The authors have now compared their findings in tuberculous and leprosy patients. In 50 patients the diagnosis of tuberculosis was established by clinical and laboratory studies. 25 sera from normal patients were compared. The results obtained by electrophoresis in these 2 groups of patients are tabulated. In the tuberculous patients the changes in IgA were more numerous than in the IgM fraction of serum. The findings were closely comparable to those occurring in the sera of patients with tuberculoid leprosy but differed from those with lepromatous leprosy.

J. D. Fulton.

4. **A logarithmic index of bacilli in biopsies. 1. Method,** by D. S. Ridley and G. R. F. Hilson. *Int. J. Lepr.*, 1967, **35**, 2, Pt. 1, 184-6. **2. Evaluation,** by D. S. Ridley. *Ibid.*, 187-93.

1. The usual method of assessing the state of the disease in patients with leprosy, both before and during treatment, is based on the number of bacilli present in smears, i.e., the bacterial index. However, Ridley (*Trop. Dis. Bull.*, 1956, **53**, 200) suggested that this method ignores the extent of the granuloma and its diminution during treatment. He therefore suggested that the biopsy index (IB) is more informative because it is based on the extent of the granuloma as seen in

sections and the number of bacilli in smears. However, in the first of these papers, the authors now suggest that the IB is also unsatisfactory because its calculation involves an arithmetical component and a logarithmic component; they therefore suggest the adoption of a logarithmic scale for both components.

In order to express the density of bacilli on a logarithmic basis, they recommend that the bacilli present in sections of 5 μ thickness be assessed on a 6 + scale as is done in the IB (section) or the BI (smear) indices. With a × 100 objective, 6+ signifies 1,000 bacilli or more per field, 5+ equals 100 or more bacilli per field, and so on, to 1+ equalling 1 or more bacilli per 100 fields. Half units are introduced when the count is in the upper range of a '+ number', which on a logarithmic scale is 0.7. The fraction of the dermis occupied by the granuloma is estimated with a low power (× 4 objective), to within 1/10; e.g., the granuloma may occupy 3/10 or 4/10, and the logarithm, to the base 10, of this fraction is added to the bacterial density figure to give the logarithmic index of biopsies (LIB). The logarithms required for the area of the granuloma have negative values, since they refer to fractions of 1; thus log. 0.6 is conventionally expressed as 1.8 which is in fact —0.2. For simplicity the logarithms are expressed as log. 1.0 = 0, log. 0.9 = —0.05, log. 0.8 = —0.1, log. 0.7 = —0.15, log. 0.6 = —0.2, log. 0.5 = —0.3, log. 0.4 = —0.4, log. 0.3 = —0.5, log. 0.2 = —0.7 and log. 0.1 = —1.

Whereas IB and BI can be no more than indices, the LIB forms a basis for crude counts and, if the size of the fields is known, the number of bacilli per cmm. can be calculated. With a field size of 0.17 mm., if the granuloma is assumed to be evenly distributed, it can be calculated that with an LIB 1.0 there are 80-250 bacilli/cmm. of dermis and with an LIB 6.0 there are 8,000,000 or more/cmm.; thus the bacillary content represented by these indices would usually be of the order 10^5 and 10^{10} per ml. respectively.

By a similar procedure the index could be modified to express a number of viable (solid-staining) bacilli present. If the percentage of solid organisms was 20, the proportion would be 0.2, the log. of which is —0.7. If the LIB was 4.3, the LIB (viable) would be 4.3 minus 0.7 or 3.6.

2. In the second paper, the author assessed the use and limitations of the indices IB, BI and LIB by comparing the results of the values calculated from observations made on patients before treatment and during the course of sulphone therapy. He shows that the random errors of biopsy indices are relatively small and that the rate of fall of the LIB during treatment is about twice that of the smear BI. The independent assumption of alterations in bacterial density of size and granuloma, which is made possible by the LIB shows some significant differences on the mode of responses to treatment by lepromatous and borderline leprosy patients, and the value previously placed on the IB index for assessing response to treatment as an aid to defining the TT-LL groups is fully confirmed.

S. R. M. Bushby.

5. **Cutaneous sarcoidosis and tuberculoid leprosy. A comparative histopathologic and histochemical study,** by T. Ramasoota, W. C. Johnson and J. H. Graham. *Arch. Derm.*, 1967, **96**, 3, 259-68.

A comprehensive histological and histochemical study of cutaneous sarcoidosis and tuberculoid leprosy was made to evaulate their differential diagnosis. Biopsies were made from 47 patients with sarcoidosis and from 45 with leprosy, and the results are described in detail and illustrated.

It was confirmed that the 2 conditions can be distinguished if cellular invasion of nerve bundles or the presence of acid-fast bacilli can be demonstrated, either of which is pathognomonic of leprosy. Other features, though not diagnostic one way or the other, were useful indicators. Invasion of the arrector pilorum muscles was frequent in leprosy and probably resulted from infiltration of the nerve supply. Fibrinoid degeneration, found at the centre of the tubercle in 58% of sarcoid specimens, was not present in leprosy. Elongated or cord-shaped tubercles are said to be characteristic of tuberculoid leprosy. A number of other features showed quantitative differences between the two conditions hich were of limited diagnostic value.

(In such a thorough study silver impregnation of nerves should have been included; but it is nevertheless a useful account of the histological differentiation of the two diseases.)

D. S. Ridley.

6 **The 'Lucio phenomenon' in diffuse leprosy,** by R. S. Donner and J. A. Shively. *Ann. Intern. Med.*, 1967, **67**, 4, 831-6.

The authors describe the case of a Mexican woman who had spent the previous 7 years in Texas and who developed a soft-tissue sarcoma of one leg. After amputation and a mild local infection she developed fever, severe anaemia, and skin lesions typical of those seen in Lucio's phenomenon (*Trop. Dis. Bull.*, 1949, **46**, 1053). It was then noticed that her eyebrows and eyelashes were absent, and her skin was diffusely thickened; skin smears showed large numbers of acid-fast bacilli. The authors emphasise the difficulty of diagnosing diffuse lepromatous leprosy and also the similarity of Lucio's phenomenon to the form of haemorrhagic cutaneous anaphylaxis due to autosensitisation to deoxyribonucleic acid. The reacting lesions are well shown in a photograph of the patient's face.

W. H. Jopling.

7. **Clinical evaluation studies in lepromatous leprosy. Sixth series: Effect (on lepra reaction) of supplementing DDS with dexamethasone, methandrostenolone, or mefenamic acid,** by J. A. Doull *et al. Int. J. Lepr.*, 1967, **35**, 2, Pt. 1, 128-39.

This study is a continuation of the carefully planned and carefully controlled drug trials that have been made in two Philippine leprosaria, Cebu and Central Luzon. The object was to determine the value, if any,

of 3 drugs in the prevention and treatment of lepra reaction when added to standard dapsone treatment. These drugs were: dexamethasone; mefenamic acid, a non-steroid drug with an anti-inflammatory action 5 times that of acetylsalicylic acid; and methandrostenolone, an anabolic steroid possessing little if any anti-inflammatory or cortisone-like property. The well-known standards of case admission, clinical and bacteriological assessment, and accurate recording we have come to expect of the trials were followed.

The double-blind trial began with 400 patients suffering from lepromatous leprosy, most of whom had received no previous treatment; of these, 346 remained for statistical analysis at the end of the 24 weeks' trial. The patients in the matched groups all received dapsone in a daily dose of approximately 2.5 mgm. per kgm. body weight (or 15 mgm. per kgm. per week), this maximum being reached after 8 weeks of treatment.

The trial drugs were given in daily doses (except Sundays) of 1.5 mgm. (dexamethasone), or 10 mgm. (methandrostenolone), or 750 mgm. (mefenamic acid). Between 80 and 94% of the prescribed doses were actually taken.

At the end of the trial period, 35% of the patients were considered to have improved, with an overall reduction of 14.5% in the bacteriological index (as calculated from 6 skin sites, and 2 from the nasal mucosa). No prophylactic or curative value could be attributed to any of the drugs used at the stated doses to supplement standard dapsone therapy; in fact, patients taking dexamethasone had more severe attacks of erythema nodosum leprosum (ENL) than those on dapsone alone. The latter had fewer and shorter attacks of ENL than those taking a supplementary drug.

Recurrences of ENL were noted in more than 90% of patients who had ENL at the beginning of the trial, but in only 52% of those in whom ENL was initially absent. Patients who seemed likely to undergo ENL were those suffering from more advanced lepromatous disease, with slighter tendency to borderline features, and they tended to have had longer sulphone therapy previously. It seemed that some patients were inherently more prone to develop ENL than others.

Patients who received methandrostenolone experienced a moderate increase in body weight.

No instance of drug intolerance occurred or side-effects attributable either to dapsone or to one of the supplementary drugs employed, except for one patient ad transient moon-face.

S. G. Browne.

8. **Inhibition of haemaggregation by lepromin and other mycobacterial substances,** by C. S. Goodwin, D. A. Tyrrell, B. Head and R. J. W. Rees (Correspondence.) *Nature*, London, 1967, Dec. 9, **216**, 1019-20.

Human erythrocytes in glucose buffer solution at *p*H 5.0-5.8 autoagglutinate and this is prevented by the addition of a variety of agents including tuberculin. In this study the authors show that preparations of *Mycobacterium leprae*, *Myco. lepraemurium* and other mycobacteria inhibit haemaggregation.

The preparations were dialysed to remove sodium chloride and each was titrated by the double-dilution, chess-board technique against fresh Group A human red cells in the buffer at *p*H values ranging from 5.0 to 5.7; in some experiments the red cells were treated overnight with 0.1% trypsin and, although 4-fold differences in inhibition titre were observed between these treated and untreated cells, the mean results were similar.

The titres of inhibition observed were 1 : 1280 and 1 : 3200 with lepromin from whole *Myco. leprae* or with cytoplasmic fractions from them; 1 : 80 with *Myco. lepraemurium* from rats, either as washed bacilli or cell walls and 1 : 160 with cytoplasmic fractions from them; 1 : 80 with H37Ra as whole bacilli, 1 : 20 with cell walls but 1 : 1024 when their cytoplasmic fraction was used.

An extract of normal skin was itself strongly inhibitory to haemaggregation so it could not be used to help in deciding whether the activity of lepromin is due to a component of the bacilli or to a product of the skin but the authors consider that it is most likely due to the former.

S. R. M. Bushby.

The following 8 abstracts are reprinted, with permission, from *Trop. Dis. Bull.*, 1968, **65**, 6:

9. **Détermination de la viabilité des mycobactéries de la lèpre à l'aide du procédé cytochimique** (Staining method for viability of *Mycobacterium leprae*), by S. V. Biryukova. *Problemy Tuberk.*, 1967, **45**, 12, 64-7. (In Russian.)

A staining method for *Mycobacterium leprae* is described, which enables a differentiation to be made between viable and non-viable organisms.

Films from examined material are prepared in the usual way and fixed over a flame (short exposure to the heat does not affect the staining properties of viable bacteria). Then the film is stained with 1% malachite green warmed to 70°C. The stain is kept on the film for 5-10 minutes at room temperature. Afterwards it is washed in water and stained with fuchsin (aqueous solution) for 2-5 minutes. Next the stained film is decolorised with 8% nitric acid, washed in water and dried. Viable bacteria appear as green, non-viable as red, bacilli. The structural changes in DWA in non-viable bacteria are related to the loss of ability to retain the first stain.

The author carried out experiments on white mice infected with *Myco. leprae* and found by this method a significant increase of non-viable organisms in animals treated with antimycobacterial drugs (solusulphol (? solasulfone = solapsone) and ethionamide).

Owing to difficulties in the cultivation of *Myco. leprae* this staining method could be used in the evaluation of the effects of chemotherapy in leprosy.

W. Odrzywolski.

10. **Studies of immune mechanisms in leprosy. I. Depression of delayed allergic response to skin test antigens,** by W. E. Bullock *New Engl. J. Med.*, 1968, **278**, 6, 298-304.

It is not certain to what extent the anergy to lepromin

of patients with lepromatous leprosy is specific. Although the evidence regarding a possible anergy to other antigens is somewhat conflicting, there have been reports of diminished sensitivity to tuberculin and to *Candida albicans* extract in lepromatous leprosy, and also to a lesser degree in tuberculoid leprosy. In this paper the sensitivity to lepromin (Mitsuda and Dharmendra types), purified protein derivative (PPD) trichophytin and *C. albicans* extract at various strengths was tested in both forms of leprosy with reference to the length of treatment and other factors. The induction of contact type delayed hypersensitivity to picryl chloride was studied similarly. 107 patients and 30 control subjects were used in the tests.

The percentage of positive reactions to each antigen was lower in the patients with leprosy than in the control subjects, and the depression of sensitivity was observed in both tuberculoid and lepromatous types of infections, though it was greater in lepromatous leprosy. The only exception to this result was the 48-hour lepromin reaction in tuberculoid patients, who produced the normal percentage of positives. With all antigens the depression of sensitivity was greater in patients who had received less than 18 months' treatment than in those who had had over 18 months', especially among lepromatous patients; i.e., the incidence of positives tended to revert to normal after prolonged treatment. (The increased incidence of lepromin reactions after treatment might be explained by borderline reactions among the borderline lepromatous patients who were included in the lepromatous group.) But there were no distinctive differences among the patients who suffered from erythema nodosum leprosum, nor among those who underwent tuberculoid reactions.

These interesting results indicate that in leprosy there is a generalised depression of the delayed allergic inflammatory response.

D. S. Ridley.

11. **DDS prophylaxis against leprosy,** by R. V. Wardekar. *Lepr. India*, 1967, **39**, 4, 155-9.

This paper describes a trial in which the prophylactic value of dapsone (DDS) is compared with that of a placebo in 54 villages in the Bobbili region of Andhra Pradesh. The trial included all healthy persons aged less than 25, and the villages were divided into 27 test (dapsone) villages and 27 control (placebo) villages. The numbers of persons involved were roughly 11-12,000 in each group, and all those who developed leprosy during the period of the trial were transferred to treatment clinics. No survey was made during the first 9 months, but it was noted that during this time 84 persons in the dapsone group and 80 in the control group reported with leprosy lesions.

In the first survey, covering the 10th to 21st months of the trial, there were 2.53/1,000 cases of leprosy in the dapsone group (1 lepromatous and 28 non-lepromatous), and 4.79/1,000 in the control group (3 lepromatous and 51 non-lepromatous). In the second survey, covering the 23rd to 32nd months, there were 1.17/1,000 cases of leprosy in the dapsone group (1 lepromatous and 13 non-lepromatous), and 5.36/1,000 in the control group (4 lepromatous and 61 non-lepromatous)—a statistically significant result.

W. H. Jopling.

12. i. **A preliminary review of the experimental evaluation of drugs for the treatment of leprosy,** by R. J. W. Rees. *Trans. R. Soc. Trop. Med. Hyg.*, 1967, **61**, 4, 581-95.

ii. **The evaluation of drugs for leprosy: bacteriological considerations,** by D. S. Ridley. *Ibid.*, 596-600.

iii. **The clinical evaluation of drugs for leprosy,** by S. G. Browne. *Ibid.*, 601-7.

i. It was shown by Shepard (*Trop. Dis. Bull.*, 1961, **58**, 214) that human *Mycobacterium leprae* will multiply to a limited extent in the footpads of mice, until the number of about 10^6 is reached. Then multiplication ceases, presumably owing to immunological causes. Rees has found that if mice are thymectomised and irradiated, so as to suppress their immunological reactions, the bacilli can continue to multiply up to 10^9. This multiplication in the footpad can be used to test the activity of drugs against *Myco. leprae in vivo*. By this test dapsone, sulphadimethoxine, sulphormethoxine, diphenylthioureas (e.g., thiambutosine), thiacetazone, Riminophenazine (B663), streptomycin, isoniazid, *p*-aminosalicylic acid and capreomycin have been shown to be active, but ethambutol, ditophal, and pyrazinamide were inactive; cycloserine was weakly active. Human leprosy bacilli in the footpad of mice are extremely sensitive to dapsone, a daily dose of 0.02 mgm./kgm. being enough to prevent growth. This technique has also been used to prove that 8 strains of human bacilli, taken from 8 patients in Malaya who failed to respond to sulphone treatment, had definitely become resistant to dapsone. Such cases are, however, rare.

ii. Ridley describes tests for the response of patients to treatment based upon (i) the percentage of solid-staining bacilli (i.e., viable bacilli) in lepromatous lesions (the Morphological Index) and (ii) the bacilli in smears, expressed in a logarithmic scale (the Bacteriological Index). The former is more important for short term trials, the latter for long term trials.

iii. Browne describes the numerous difficulties of clinical trials, owing to the protean nature of leprosy, the variability of patients and many other causes. He considers that there is need for: (*a*) a long-acting chemical prophylactic; (*b*) a rapidly-acting mycobactericidal drug; (*c*) an agent to accelerate the removal of mycobacterial debris from the tissue; and (*d*) a drug to minimise tissue sensitisation and sensitivity reactions.

(This valuable symposium should be studied in the original by all interested in leprosy.)

F. Hawking.

Transmisión de la lepra humana a la alantoides del embrión de pollo (Transmission of human leprosy in the chick embryo), by J. G. Prieto. *Anais Inst. Med. Trop.*, 1965, **22**, 1/4, 179-83, 12 figs. on 11 pls.

The English summary appended to the paper is as follows:—

'We achieved the appearance of macroscopically visible nodular lesions in allantois of chicken inculated with different types of human leprosy. Histologically, these lesions were constituted by a leprotic granuloma with vacuolated cells inside which were found amorphous masses and acid-resistant particles.

'Via the electronic microscope we demonstrated the existence of some bacilli and observed the structure of the amorphous masses and acid-resistant particles that suggest a cyclic development of *M. leprae*, which, in some circumstances, may originate large L forms, spheroblasts and probably filtrable particles.'

6. **Las formas sub-microscópicas del** *M. leprae* (Sub-microscopic forms of *Mycobacterium leprae*), by J. G. Prieto, G. Gonzalez and M. L. Alonso Puertas. *Medna Cutánea*, 1967, **2**, 1, 51-68.

The English summary appended to the paper is as follows:—

'Description of the transmission of different types of human leprosy, lepromatous, tuberculoid and indeterminate, into the chorio-allantoic membrane of chicken embryos.

'Inoculation of this material provokes yellowish nodules umbilicated in the centre, in the allantoids of the chicken. These may be transmitted in serial form, in one case up to the 14th passage. Histologically these nodules are initially composed of a dense accumulation of vacuolated, histiocytic cells, similar to those of human leprosy. After the 6th or 7th passage, this structure changes into an accumulation of histiocytic leprosy of Wade.

'Only by inoculating bacillary material can one observe any acid-fast bacilli in the first passage and after the 3rd or 4th passage, only acid-fast granules and some partially acid-fast material in spherical forms that are larger and irregular. Strangely enough, with the electron-microscope the following 3 types of formations can be observed:

'Ovoid bodies, wrapped in membranes, similar to those described by Imaeda in experimental hamster leprosy and which are, perhaps, as this author maintains, degenerated bacilli; formations wrapped in a clearly visible membrane, containing very dark spherical or ovoid forms which could conceivably be large L forms; rounded particles, dark-centred and surrounded by a light marginal zone, virus-like and possibly small L forms.

'In bacteriologically positive human leprosy one observes, above all, changes in the mitochondria which lose their cristae and myelin formations, particularly intense in lepromatous leprosy.

'Description, with numerous electron photomicrographs, of the ultrastructure of *M. leprae* and of the globi, as well as some epidermal features not hitherto described.

'Some of the electron photomicrographs show a particularly noticeable presence of the same formations to be found in experimental leprosy of the allantoid.

'In biopsies of incipient tuberculoid or indeterminate lesions in which no acid-fast bacilli appear but only acid-fast dust, the ultra-structure of these forms is described. Membrane-wrapped forms are to be found, containing tiny, very dark spherical bodies. At numerous points of the cytoplasm, these forms are loose-floating and almost identical to the virus-like particules observed in profusion in experimental leprosy of the allantoid.

'The above findings are fully discussed and the hypothesis advanced is that in addition to the typical acid-fast bacillary forms of *M. leprae*, infra-microscopic filterable forms also exist, thus explaining the enormous percentage of leprous lesions devoid of bacilli.

'The allantoid of the chicken embryo would prove to be an exceptionally appropriate form of culture for the development of these forms. The brief time lapse, maximum 5 days, in which observation of the evolution of these lesions can be made, does not allow observation of the transformation of this phase of the cycle of evolution of *M. leprae* in acid-fast and bacillary forms. In order to achieve this, it would become necessary to be able to inoculate this material into longer-living biological systems.

'Possibly this observation coincides with the findings of Shepard who, after inoculating *M. leprae* into the footpads of rats, observed some months later the temporary disappearance of the acid-fast bacillary forms which later reappeared again.'

The following 6 abstracts are reprinted, with permission, from *Trop. Dis. Bull.*, 1968, **65**, 7:

17. **Lepromin and tuberculin reactivity in adults not exposed to leprosy,** by C. C. Shepard and E. W. Saitz. *J. Immunol.*, 1967, **99**, 4, 637-42.

A group of 73 inmates of a penitentiary, all males and all 'whites', aged 25-45 years, was skin-tested with Mitsuda-Hayashi type lepromin (biologically standardised, and containing 2.5×10^7 acid-fast bacilli per ml.), and also with tuberculin and mumps antigen.

Although none of the men had been exposed to leprosy, all showed positive reactions to lepromin, of various degrees of intensity from 4 mm. upwards. There was some correlation between the Fernandez and the Mitsuda reactions, but none between the tuberculin and the lepromin reactions apart from a tendency for the degree of positivity of the lepromin reaction to increase with the size of the tuberculin reaction.

The assumption that the lepromin reaction is determined by prior exposure to leprosy bacilli or by sensitivity to tuberculin is not supported by these findings, and the origin of the lepromin sensitivity in group is left unexplained.

S. G. Browne.

The isopathic phenomenon in infiltrated tuberculoid and macular tuberculoid leprosy. A comparative histologic study of the tissue response produced by cotton pellet implantation and lepromin injection, by A. H. Klokke, A. Bhaktaviziam and B. Subramaniam *Int. J. Lepr.*, 1967, **35**, 4, Pt. 1, 477-87.

'Forty-five patients with tuberculoid leprosy were examined. These were distributed in 4 groups: I,

infiltrated tuberculoid, 12; II, macular tuberculoid with a single macule, 9; III, maculoanesthetic, 10; and IV, low-resistant tuberculoid, 14. In 38 patients bacteriolcgic and histologic examination was carried out of skin lesions and reactive granulomas produced by cotton pellet implantation and lepromin injection. In 7 patients (included in group I) a suspension of normal tissue was injected.

'This study demonstrated the existence of an isopathic phenomenon in tuberculoid leprosy. In the majority of patients a tuberculoid tissue response was obtained. Both cotton pellets and normal tissue provoked granulomas reflecting the same pattern of immunologic response, which was of lower grade compared to that produced by lepromin. The outcome supports the hypothesis that the Mitsuda reaction produced by lepromin is a kind of foreign body reaction.

'A sliding scale of decreasing tuberculoid response was seen in patients ranging from group I, the highest mean grade, to group IV, the lowest mean grade. Macular tuberculoid leprosy (groups II-IV) proved to be a distinct variety of leprosy of tuberculoid immunologic status.

'Ths histology of lepromin-provoked granulomas in patients with disseminated macules (groups III and IV) gave evidence more clearly of the host's exact tissue response than mere histologic examination of skin lesions.'

19. **A study of the conduction velocity of sensory fibres of the ulnar nerve in leprosy,** by M. S. Dash. *Int. J. Lepr.*, 1967, **35**, No. 4, Pt. 1, 460-69.

'The conduction velocity of the sensory fibres of the ulnar nerve has been studied in leprosy patients.

'Sensory potentials have been recorded from the afferent nerves supplying anesthetic areas, and therefore a loss of sensation in leprosy does not necessarily mean destruction of all nerve fibres. This conforms with the histologic observations of Weddell, Jamison and Palmer and of many other workers, who noted the presence of healthy nerve fibres in leprosy lesions.

'It has been shown that a significant reduction of the conduction velocity occurs in all forms of leprosy. The cutaneous afferent fibres are affected more than the muscle afferents.

'A prolongation of the refractory period of the nerve fibres probably precedes the reduction of velocity. The significance of this finding is discussed.

'It appears that the cutaneous receptors are deranged, but not totally destroyed, over all anesthetic areas in leprosy, and sensations can be induced to reappear.'

20. **Observações preliminares com sulfamida de eliminação ultra lenta no tratamento da lepra** (Preliminary studies on a long-acting sulphonamide in the treatment of leprosy), by A. C. Pereira, Jr.. *Anais Bras. Derm.*, 1967, **42**, 1, 35-45.

The English summary appended to the paper is as follows:—

'The author reports the treatment on 23 leprosy patients with Ro 4-4393 sulpha for about one year. Nine cases of lepromatous, 2 of borderline and 12 of tuberculoid leprosy.

'Satisfactory results were obtained, comparable to the results obtained with DDS.

'The author also shows the remarkable tolerance of the patients to this drug and its simple administration, and in view of its ultra-slow elimination it can be used in weekly doses.

'The author, nevertheless, remarks the brief period of time of this observation in order to draw definite

Talidomida nas reações lepróticas (Thalidomide in lepra reaction) by L. S. Netto. *Revta Bras. Med.*, 1967, **24**, 9, 760-63.

The author laments the severity of the leprotic reactions he has seen in patients under sulphone treatment which often necessitate its suspension. In an effort to find drugs which will suppress this, he has tried, among others, steroids and antimonials which have proved the best so far, but in view of the report of favourable results after the use of thalidomide he tested this drug on 10 patients aged from 20 to 50 years. The dosage varied, but in most of the patients it was 100 mgm. daily. This enabled the sulphone treatment to be resumed and he states that the improvement seen in the leprotic reactions was quite remarkable. He considers that the optimum dose of thalidomide is 100 mgm. daily and that this drug should now be included in the list of first line drugs in leprosy. However he advises caution in its use in female patients.

(See also *Top. Dis. Bull.*, 1966, **63**, 285, 1200, 1344; 1967, **64**, 380.)

W. K. Dunscombe.

22. **Prophylactic value of DDS against leprosy—a further report,** by Dharmendra, S. K. Noordeen and K. Ramanujam. *Lepr. India*, 1967, **39**, 3, 100-106.

'An interim report on the investigations regarding the prophylactic value of DDS amongst intra-familial child contacts of infectious patients of leprosy had been published earlier, covering a period of 30 months of the study proper, up to the end of October, 1965. Full particulars about the investigations and the detailed methods of work were included in that report. (*Trop. Dis. Bull.*, 1967, **64**, 1332.)

'The investigations have been continued and the present report includes findings made up to October, 1966, i.e., over a period of $3\frac{1}{2}$ years of the actual observations.

'During the entire period of $3\frac{1}{2}$ years, 60 leprosy patients, 57 of the non-lepromatous and 3 of the indeterminate type, have been detected in the 632 contacts studied up to October, 1966. Of these 60 patients, 41 (including the 3 indeterminates) arose amongst the 316 contacts in the 'Control' group, and 19 amongst the same number of contacts in 'Prophylaxis' group. This gives an incidence of 13% in the control group, and 6% in the prophylaxis group. The difference in the incidence of the disease in the 2 groups (6% against 13%) is statistically highly significant ($t=3.0$, $p<0.01$).

'The difference seen in the incidence of the disease in the 2 groups has been due entirely to the difference seen in this respect in the contacts up to 10 years of age. No difference was observed in the contacts of the age-group 11-15; however, the number of contacts in this age-group was too small (about 50 in each group) to permit any definite conclusion.

'The effect of the prophylactic treatment was not evident till 9 months after starting the treatment. It then became evident, and has been maintained throughout the period of observation. Of the 13 cases amongst the contacts up to 10 years of age, all but 4 occurred in the first year of observation; on the other hand, amongst contacts of the same age-group in the control group, the 33 patients were distributed throughout the period of observation.

'Thus, the further results obtained since the last interim report have confirmed the earlier finding regarding (i) the protective value of DDS against leprosy, and (ii) the need for starting the prophylactic treatment at a very early age in case of intra-familial contacts.

'The study was not designed to specially find out if the prophylactic DDS had any toxic effects on the treated children. However, during the frequent follow up of the contacts, no obvious signs of the toxicity were observed, in particular it may be stated that no drug dermatitis was observed.

'In 137 of the 316 contacts in the prophylaxis group, DDS treatment has been stopped as they have completed 3 years of prophylactic treatment, and their "source" have all along been bacteriologically negative. They will now be followed up and periodically examined to see the long-range effect of the prophylactic treatment.'