Abstracts

1. **Effect of X-Irradiation and Thymectomy on the Development of *Mycobacterium Leprae*, Infection in Mice,** by J. M. GAUGAS. *Brit. J. Exp. Path.*, 1967, **48**, 4, 417-22.

Using the mouse hind foot pad technique first described by Shepard, inocula in the order of 5.0×10^3 *M. leprae* bacteria showed a limited type of multiplication. General immunosuppressive treatment by thymectomy, potential lethal irradiation (900r. in mice then protected by marrow transplantation) or repeated sublethal doses of x-rays (420r.) produced only a slight increase in susceptibility to infection. However, thymectomy combined with 900r. did provide much higher yields of bacteria. This combination led to a maximum 16,800-fold increase of the total initial inoculum number of bacteria from its inception in contrast to a 560-fold increase in untreated controls. The nature of the host's defensive mechanism which then halts multiplication is uncertain. Macroscopic lesions were not found and there was no spread of infection from the site of inoculation.

From the author's summary.

The following 6 abstracts are reprinted, with permission, from *Trop. Dis. Bull.*, 1967, **64**, 7:

2. **Leprosy survey and control pilot project HMG-Nepal,** by I. B. MALI. *J. Nepal Med. Ass.*, 1966, **4**, 4, 330-38.

This work has been carried out in Nepal, where little work has been done on leprosy, and Dr. Mali of Kathmandu reports on his activity in a leprosy survey and the setting up of a control pilot project in Nepal sponsored by Emmaus Suisse. A WHO short-term consultant reported a prevalence of leprosy of 10 per 1,000 but Dr. Mali found a prevalence of 5.7 per 1,000 in a village survey and 1.5 per 1,000 in a school survey. (In spite of these diverse figures it is probable, in the abstracter's opinion, that the final figure will be in the neighbourhood of 10 per 1,000 based on experience in other parts of the world where surveys have been done.) The number of patients attending for treatment has already increased greatly.

This pilot study is laying a good foundation for a controlled scheme and the success of the project ultimately depends on the interest developed by the national staff.

J. R. Innes.

Acid-fast bacilli in the bone marrow of leprosy patients, by A. B. A. KARAT. *Int. J. Lepr.*, 1966, **34**, 4, 415-19.

At the Schieffelin Leprosy Research Sanatorium in South India 413 'consecutive admissions' (apparently not all were untreated patients) were subjected to sternal puncture, 235 of the patients having lepromatous leprosy, 33 borderline, 82 tuberculoid, 10 purely neural and 53 indeterminate leprosy. Classification was based on clinical and histological features. (A more detailed classification such as that of RIDLEY and JOPLING, this *Bulletin*, 1962, v. 59, 790, might be expected in such a research sanatorium.) In 47% of the patients with lepromatous, 15% of those with borderline and 4% of those with indeterminate leprosy acid-fast bacilli (AFB) were found in the bone marrow aspirate, but none were found in patients with tuberculoid leprosy. (The density of the bacilli is not mentioned.) There was no apparent relationship between AFB in the marrow and age, or duration of the disease. It is stated that the higher the Bacterial Index (BI) the more frequently were AFB found in the marrow (but the histogram shows that AFB were found in the marrow of 76% of patients with a BI of between 2.0 and 4.0, but in 68% of patients with a BI greater than 4.0; the number of patients in each group is not reported. There is no statistical analysis of the differences between the groups). Of 8 patients with 'dimorphous' leprosy (presumably the borderline patients referred to elsewhere in the paper) who had negative skin smears, 1 patient had AFB in the bone marrow; of 53 patients with indeterminate leprosy who had negative skin smears, 2 had AFB in the marrow; and of 38 with lepromatous leprosy who had negative skin smears, 4 had AFB in the marrow.

It is suggested that bacilli in the viscera may take much longer to be eliminated than bacilli in the skin, and the presence of bacilli in the reticuloendothelial system in patients with negative skin smears may be the explanation of reactivation of the disease. The morphology of the AFB in the marrow was noted, patients with a high BI having a 'preponderance of intracellular rod forms' in the marrow. and the significance of this finding in relation to the fact that the temperature of the bone marrow is usually 2-3°F above the skin temperature is noted (the percentage of evenly stained bacilli in the marrow and skin is not reported). Exacerbation of leprosy was not accompanied by a rise in the incidence of AFB in the bone marrow. 27% of the patients with lepromatous leprosy had a megaloblastic bone marrow.

(This interesting study merits more detailed reporting and analysis, which the author intimates will be forthcoming.)

C. S. Goodwin.

Histoid (high-resistance) lepromatous leprosy, by E. W. PRICE and M. FITZHERBERT. *Int. J. Lepr.*, 1966, **34**, 4, 367-74.

In Ethiopia the histoid variety of lepromatous leprosy (WADE, this *Bulletin*, 1964, v. 61, 673) is not uncommon. Ten patients are described, 3 in detail with photographs and histological reports. The presenting symptom was in each patient facial nodules, resistant to sulphone therapy, with the general condition of the patient being 'good'. Photographs illustrate the usual distribution of the nodules in clusters in the middle of the forehead, on the cheeks, at the tip of the nose and on the chin. The ears were infrequently involved, the eyebrows persisted and the nasal mucosa was less affected than would be

expected from the degree of nasal nodulation. Flattened lesions on the limbs and buttocks are described. The skin adjacent to the nodules was remarkably uninvolved. The characteristic histopathological features of the lesions are listed. The granuloma was composed almost entirely of densely packed macrophages, some with foamy change, and a few lymphocytes were seen. Connective tissue septa occurred in large nodules, the peripheral cells of a nodule lying tangentially, while in pedunculated nodules a capsule of collagen fibres was found. The skin appendages appeared 'resistant' to the granulomatous tissue, although intraneural acid-fast bacilli were seen. The nodules were unaffected by therapy with sulphones, thiambutosine, sulphamethoxypyridazine and ditophal but they responded clinically and bacteriologically to sulphormethoxine (Fanasil, sulphorthomidine). The initial dosage was 125 mgm. weekly rising to 1 to 1.2 gm. weekly after 2 months. Treatment frequently resulted at first in oedema and ulcertaion of one or more nodules. No patients were found to have albuminuria or jaundice. Of 10 patients treated with sulphormethoxine 7 showed notable diminution of the nodules, 1 showed only slight improvement, 1 developed severe ulceration, and 1 who developed severe joint paints showed bacteriological but not clinical improvement. A table summarizes the details of each patient. The pronounced collagen reaction in the nodules is compared with the situation in nodular subepidermal fibrosis. It is suggested that this type of leprosy be termed 'high-resistance' lepromatous (but the appellation histoid has priority and is less restrictive. This report is a significant contribution to the literature of a little-known form of leprosy; but fuller details of the condition are desirable, including the morphology of the leprosy bacilli in the nodules, a more detailed bacteriological index, the lepromin reaction and a longer follow-up).

C. S. Goodwin.

5. **Calcification of peripheral nerve trunk in leprosy. Report of a patient,** by K. RAMANUJAM and G. RAMU. *Lepr. India*, 1966, **38**, 4, 185-90.

Although nerve abscesses in leprosy are 'frequent' in India, apparently no previous report has been made of nerve calcification in an Indian patient with leprosy. After a review of the literature on nerve calcification in leprosy a description is given of an Indian woman who 20 years ago had an erythematous patch over the dorsum of her right foot which subsided without treatment. The right lateral popliteal nerve in the popliteal fossa, and the musculocutaneous nerve in the lower third of the leg anteriorly were thickened and felt bony hard over a distance of 2 inches, and were not tender. There was no motor deficit in the leg or foot. Skin smears revealed *Mycobacterium leprae*, and the lepromin reaction was strongly positive. Histological examination of the musculocutaneous nerve revealed a hyaline homogeneous mass with only a few nerve fibres in one small area. No acid-fast bacilli were seen. Four radiographs demonstrate the calcified nerves. The mechanism involved is suggested to be dystrophic calcification in the wake of abscess formation.

C. S. Goodwin.

6. **Les thérapeutiques spécifiques actuelles de la lèpre** (The specific treatment of leprosy), by J. LANGUILLION. *Med. Trop.*, 1966, **26**, Spec. No., 131-56, 24 figs. on 6 pls.

After a brief but useful historical introduction to the modern treatment of leprosy, this long review summarizes existing knowledge concerning the principal drugs now used against the disease (excluding those employed in reactional states).

Pride of place is accorded to dapsone, and the mono- and di-substituted sulphone derivatives. The mode of action, dosage and toxicity of members of this series of drugs are reviewed, together with practical advice on methods of administration of the oral and injectable forms of dapsone. The results of treatment are briefly catalogued. The section on thiambutosine provides unexceptionable data arranged along similar lines. The author's interest in the long-acting or depot sulphonamides is reflected in the length and authoritative nature of this section, which gives the best (if somewhat over-enthusiastic) résumé available of the use of this series of drugs. An excellent selection of paired photographs—'before and after'—follows the letterpress.

As a work of reference, this article is of value in providing a reasonably comprehensive survey of the drugs at present available for the treatment of leprosy. It is of less use as a guide to treatment, and provides neither criteria for critical comparison nor indications for choosing one drug rather than another.

(The author's conclusion that lepromatous leprosy is never cured—a conclusion based on the persistence of acid-fast bacilli in the deep organs—will sound unduly pessimistic to many, while his assertion that the sole test for true cure is the 'negativation' (*sic*) of the Mitsuda reaction is either a misprint (for 'positivation') or an impossible ideal—or both.)

S. G. Browne.

7. **Dapsone assay based on Schiff base formation,** by L. LEVY and L. J. HIGGINS. *Int. J. Lepr.*, 1966, **34**, 4, 411-14.

Dapsone is used in the treatment of leprosy and malaria in doses that result in extremely small tissue and blood concentrations and there is need for a more sensitive method of assay. A method is described, based on the phenomenon of Schiff base formation between 4-dimethylamino-benzaldehyde and dapsone, which is more than twice as sensitive as the commonly used Bratton-Marshal method. A comparison of the 2 methods is made with the use of standards and blood from one patient under treatment with dapsone. The method is admittedly relatively complex, and measures 'free' dapsone only. However, conjugated dapsone is present in only minute amounts and is probably biologically inactive.

S. M. Parrack.

The following 3 abstracts are reprinted, with permission, from *Trop. Dis. Bull.*, 1967, **64**, 8:

8. **Genetic influence in leprosy,** by P. MOHAMED ALI. *Indian J. Publ. Hlth.*, 1966, **10**, 4, 145-55.

This paper shows from studies conducted from the

Central Leprosy Teaching and Research Institute, Chingleput, S. India, that the incidence of leprosy is in part genetically determined. During the past 4 years a census survey in a heavily infected district of Madras State in a population of 200,000 showed that factors like sanitation, housing conditions, economic status, literacy, nutrition, had no significant influence on the incidence of leprosy; there was no correlation between the patients and the size of the family; and there is no basis for the theories of adult insusceptibility and the necessity of prolonged contact for contracting the disease.

The following facts are cited in support of the genetic theory: 1. The significant difference in the sex ratio vis-à-vis lepromatous leprosy particularly. 2. The 2 decisive periods when infection was found to occur. 3. The greater concordance among the monozygotic twins in the incidence of the disease. 4. The tendency of the disease to cling to families. It is concluded that there is a dual aetiology for leprosy—infection with *Mycobacterium leprae* and an inherited individual susceptibility. Certain suggestions with regard to anti-leprosy campaigns in the light of a genetic basis for the disease are also given.

J. R. Innes.

9. **Incubation period of leprosy,** by K. V. N. Prasad and P. Mohamed Ali. *Indian J. Med. Res.*, 1967, **55**, 1, 29-42.

'1. The data collected on the multiple-patient families during the course of a general leprosy survey in the Chingleput District of Madras State are utilized in the estimation of the incubation period of leprosy.

'2. The changes in the incubation period are studied in relation to the sex and type of leprosy of the Index patients and age and sex of the secondary patients.

'3. The incubation period is the same whether the index patient is male or female.

'4. Although no clear-cut significant results are obtained in all patients, a consistent difference is observed in the incubation periods between the 2 sexes, always being less in females.

'5. There is an association between the age and the age at onset of disease in an individual and the incubation period is more in adults when compared to children.

'6. In all the categories considered, the incubation period is longer with lepromatous type index patient when compared to the non-lepromatous index patient.

'7. Though there is no significant difference between the estimates of the incubation periods among the corresponding categories of the secondary patients in 2 types of index patients, we observe a notable difference between the estimates in the 2 types. Since the significance is not clear, it is difficult to explain the observed difference on the basis of the available data.

'8. The incubation period is the longest in the case of adults having lepromatous type of leprosy as index patient, its value being 85.3 months.

'9. The incubation period is shortest in the case of female children having non-lepromatous type of leprosy as index patient, its value being 29.6 months.'

10. **Leprosy prophylaxis,** by P. Fasal, E. Fasal and L. Levy. *J. Am. Med. Ass.*, 1967, **199**, 12, 905-8.

At the Leprosy Clinic of the U.S.P.H.S. Hospital in San Francisco during the last 7 years 198 family contacts of patients with lepromatous leprosy have been examined, and 16 have developed leprosy, an attack rate of 8.08%. The previous policy of 'watchful waiting' has now been changed to a programme of BCG vaccination of all contacts, except those with 'large' tuberculin reactions or pulmonary lesions found by chest radiography. Repeated tuberculin testing with revaccination of non-converters will not be carried out. The reasons for this new policy are delineated. The relative value of prophylaxis with dapsone or BCG is discussed. The reduction of the risk of infection by 51.2% with the use of prophylactic dapsone in bacilliferous leprosy contacts (Dharmendra *et. al.*, *Lepr. India*, 1965, v. 37, 447) is compared with the reduction of the risk of infection by 79.9% when BCG was given to contacts of all forms of leprosy (this *Bulletin*, 1966, v. 63, 413). An analysis is also made of 3 other, admittedly incomplete, studies of BCG prophylaxis when the reduction in risk of infection ranged from 88%-95.5%. The suppression of multiplication of *Mycobacterium leprae* in mouse footpads by BCG (this *Bulletin*, 1965, v. 62, 880) is cited in support of the BCG policy. (No other reports on dapsone prophylaxis are mentioned.)

C. S. Goodwin.

The following 3 abstracts are reprinted, with permission, from *Trop. Dis. Bull.*, 1967, **64**, 9:

The etiology of erythema nodosum leprosum, by J. H. S. Pettit and M. F. R. Waters. *Int. J. Lepr.*, 1967, **35**, 1, 1-10.

'An appeal is made for recognition of patients of erythema nodosum leprosum and designation as such. A study of 60 patients of ENL has confirmed earlier suggestions that the reaction appears only when the great majority of leprosy bacilli in the patient's tissues are no longer viable. This, in conjunction with other findings, emphasizes the fact that incrimination of the sulfone drugs as the causative agent of the reaction is untenable. Therefore the cessation of sulfone treatment during the course of ENL is not only illogical but is potentially dangerous to the patient's progress in that it allows any residual viable bacilli to propagate and extend a previously controlled infection.'

(There is a full reviewed discussion of the literature, with 45 references.)

12. **Erythema nodosum leprosum in borderline leprosy. Report of a patient,** by A. B. A. Karat, C. K. Job and S. Karat. *Int. J. Lepr.*, 1967, **35**, 1, 17-24.

The authors describe a patient with borderline leprosy who developed erythema nodosum leprosum (ENL) during a phase of exacerbation of the disease. Previously it was thought that ENL does not occur in this form of leprosy and this is the first report of the association of ENL with borderline leprosy. The paper is well illustrated with photographs and photomicrographs.

J. R. Innes.

13. **The treatment of eythema nodosum leprosum with B663. A controlled study,** by J. H. S. Pettit. *Int. J. Lepr.*, 1967, **35**, 1, 11-16.

The author has tried to establish a method whereby controlled investigations may be used to assess the value of a treatment in erythema nodosum leprosum (ENL). He studied severe cases which needed a high dosage of anti-inflammatory hormones and found evidence that the riminophenazine derivative B663, in a dosage of 100 mgm. daily for 6 days a week over a period of 14 months, had no dramatic effect on the alleviation of ENL, and that the cessation of sulphone therapy does not demonstrably speed the diminution of the reaction. The results are compared with those by Browne (this *Bulletin*, 1965, v. 62, 421; 1966, v. 63, 1344) in Nigeria who was using 3 times the dosage given by the present author.

J. R. Innes.

The following 4 abstracts are reprinted, with permission, from *Trop. Dis. Bull.*, 1967, **64**, 10:

14. **Über filamentös-myzeliale Globi des** *Mycobacterium leprae* (Filamentous-mycelial globi in *Mycobacterium leprae*), by V. Aplas. *Zentbl. Bakt. I. Orig.*, 1967, **202**, 4, 497-502.

The author has examined a cutaneous lepromatous lesion in frozen sections stained by his modification of prolonged staining with Giemsa. By this method extracellular globi of filamentous and mycelial forms, resembling actinomyces were demonstrated. These forms were shown to be non-acid-fast, were chromophobic and did not stain by the usual histological methods. They were demonstrable by prolonged Giemsa stain, by Sudan black, and in unstained sections could be shown as doubly refractive by polarized light.

(This observation was made on a single patient. It would be interesting if it could be confirmed on a series of patients.)

R. L. Vollum.

15. **Blood groups and leprosy,** by F. M. Salzano *J. Med. Genet.*, 1967, **4**, 2, 102-6.

This is an analysis of published work, with some 50 references. The author concludes that there is no indication 'of any differential susceptibility to leprosy or its form among the carriers of different ABO and Rh phenotypes. In relation to the ABO system the data are sufficiently numerous to rule out any important contribution of genes in this system to the variance in this attribute. Information concerning other systems is still too scarce and need not be considered here.'

16. **Leprosy and ABO blood groups,** by G. Singh and D. Ojha. *J. Med. Genet.*, 1967, **4**, 2, 107-8.

'ABO blood groups were studied in 633 leprosy patients and compared with 2,583 controls. No relation between blood groups and susceptibility to disease was observed. Lepromatous and non-lepromatous groups of patients did not differ significantly as regards pattern of ABO blood groups.'

17. **[Histological study of the derma in patients with leprosy during treatment,]** by K. P. Popov and Gia-Kulen Nguen. *Vest. Derm. Vener.*, 1967, **41**, 5, 27-30. (In Russian.)

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

'The authors examined 205 patients with leprosy, of whom 62 were over 7 years from the onset. Histologic changes in the derma after treatment with DDS, rimiphone, streptomycin, novocaine and penicillin are described. As a result of treatment sclerosis of the derma is formed and leprous infiltrates are resolved, indeterminate leprosy yielding to treatment readily while lepromatous leprosy is more difficult to treat.'