Lepr. Rev. (1977) **48**, 57–76

Abstracts

1. PAUL, R. C., STANFORD, I. J. L. & CARSWELL, J. W. **Multiple skin testing in leprosy**. *J. Hyg. (Lond),* 1975, v. 75, 57-68.

Ten reagents prepared by ultrasonic disintegration from *M. tuberculosis, M. duvalii, M. chelonei* and 7 other species of mycobacteria were skin tested in groups of patients and hospital staff from 6 leprosaria in E. Africa together with non-contact groups. It was found that the specific defect to *M. leprae* of lepromatous patients also applied to a variable extent to 6 other species tested, but most noticeably to *M. nonchromogenicum* and *M. vaccae,* suggesting that these species are more closely related to *M. leprae* than others tested.

T. F. Davey

2. BARTON, R. P. E. **Clinical manifestations of leprous rhinitis.** *Ann. Otol. Rhinol. & Laryngol.,* 1976, v. 85, 74-82.

This detailed study of the clinical appearances in the nose especially in early lepromatous leprosy is of great value and should be essential reading for all concerned with the diagnosis and care of those with early leprosy, coming as it does from an author with unique experience in this field.

T. F. Davey

3. BARTON, R. P. E. **Importance of nasal lesions in early lepromatous leprosy.** *Ann. Roy. Coll. Surg. Engl.,* 1975, v. 57, 309-312.

The pathological changes which occur in the nose of early lepromatous leprosy are outlined and attention drawn to the heavily bacillated nasal discharge as the most important source of viable leprosy bacilli discharged from the body. The necessity for early diagnosis and treatment is emphasized.

T. F. Davey

4. JAMANS, A. G. **A dermatological survey of the Ghurka Brigade.** *J. roy. Army med. Cps.,* 1976, v. 122, 135-142.

A thorough dermatological survey of 4500 serving officers and soldiers of the Brigade of Ghurkas revealed a prevalence of 11.3 cases of leprosy per thousand in this highly selected group, and almost doubled the previously known prevalence, suggesting that indeterminate lesions overlooked on recruitment later underwent development. Only 1 of the 25 new cases discovered had lepromatous leprosy. Some previous estimates of the prevalence of leprosy in the general population of the Himalayan foothills may have underestimated the problem.

T. F. Davey

The following Abstracts from the August, September, October and November 1976 Issues of *Tropical Diseases Bulletin* are reproduced here by courtesy of the Director, Bureau of Hygiene and Tropical Diseases. They are listed according to subject.

1. MICROBIOLOGY

5. SAXENA, H., AJWANI, K. D., PRADHAN, S., CHANDRA, J. & KUMAR, A. **A preliminary study on bacteremia in leprosy**. *Lepr. India,* 1975, v. 47, No. 2, 79-84.

Leprosy bacilli were found in the peripheral blood in 2 cases of lepromatous leprosy (classified on clinical and histopathological grounds) but not in 29 cases of tuberculoid leprosy. One to 5 bacilli were present, mainly within mononuclear cells, 1 cell in about 500 being affected. The authors conclude that patients suffering from tuberculoid leprosy are completely non-infective and need not be segregated, whereas those suffering from lepromatous leprosy—"a very infective disease"—should be segregated.

S. G. Browne

6. PRABHAKARAN, K. **Specificity of *o*-diphenoloxidase in *Mycobacterium leprae*: An identification test**. *Lepr. India,* 1976, v. 48, No. 1, 19-23.

Mycobacterium leprae from human skin, spleen, and testes, from mouse foot-pad, and from armadillo skin, spleen, and liver gave positive reactions in the dopa spot test [*Trop. Dis. Bull.,* 1974, v. 71, abstr. 513] but all other *Mycobacterium* spp. tested, including *M. lepraemurium* and *M. tuberculosis,* gave negative reactions. In a modification of the test, filter paper discs, dipped in the dopa solution and dried, gave the same colour change as the solution. Bacilli from biopsy specimens gave the best results. The specimens may be stored at -20°C for up to 4 weeks without appreciable loss of enzyme activity in the bacilli. The author stresses the importance of using a sufficient quantity of bacilli, at least 5×10^7.

F. I. C. Apted

7. DESIKAN, K. V. & VENKATARAMANIAH, H. N. **A modified method of harvesting *M. leprae* from foot-pads of mice**. *Lepr. India,* 1976, v. 48, No. 2, 157-162.

"A modified technique of harvesting *M. leprae* from the foot-pads of mice is described. The method is simple and takes less time for its performance than the conventional techniques. The yield of bacilli is also better. No difficulties have been encountered in its application in these laboratories."

8. LEVY, L. **Bactericidal action of dapsone against *Mycobacterium leprae* in mice**. *Antimicrob. Agents Chemother.,* 1976, v. 9, No. 4, 614-617.

"Dapsone (4,4′-diaminodiphenylsulfone), incorporated into the mouse chow in a concentration of 0.1 g/100 g of diet, was administered for 1 week to mice in which *Mycobacterium leprae* had multiplied to the level of 10^6 organisms/foot-pad. *M. leprae* were harvested from these and also from control mice, diluted serially, and inoculated into additional mice. The organisms recovered from untreated mice multiplied in passage with a mean doubling time of 12.2 days, and 35% or more of the inoculated organisms were viable, i.e. capable of infecting mice. Growth curves of *M. leprae* recovered from dapsone-treated animals lagged behind those of organisms from control animals by an average of 78 days, equivalent to 98.8% killing. Foot-by-foot harvests showed that only 0.2% of the *M. leprae* recovered from treated mice were

viable, suggesting that treatment of mice with dapsone had been accompanied by killing of 99.4% of the viable *M. leprae*."

9. ULRICH, M., CONVIT, J., CENTENO, M. & RAPETTI, M. **Immunological characteristics of the armadillo. *Dasypus sabanicola*.** *Clin. Exp. Immunol.,* 1976, v. 25, No. 1, 170-176.

"The immunological responses of the armadillo are of interest because of its susceptibility to generalized lepromatoid infection with *Mycobacterium leprae*. In this study, specimens of *Dasypus sabanicola* were found to have a typical mammalian distribution of lymphoid cells in thymus, spleen, lymph nodes and blood. Their complement was active in bactericidal, protozoan immobilization and haemolytic systems. Blood lymphocytes responded to phytohaemagglutinin and to pokeweed mitogen. Sensitization with ovalbumin in CFA resulted in the production of circulating precipitins; strong Arthus reactions were detectable in the sensitized animals. Responses of cell-mediated immunity to DNCB and to *M. tuberculosis* were very discrete. Heat-killed *M. leprae* elicited granulomatous reactions characterized by microscopic necrosis, but without abundant lymphocytic infiltration; skin tests and lymphocytic transformation were generally negative in the animals injected with *M. leprae*."

10. HOLMES, I. B., BANERJEE, D. K. & HILSON, G. R. F. **Effect of rifampin, clofazimine, and B1912 on the viability of *Mycobacterium leprae* in established mouse foot-pad infection.** *Proc. Soc. Exp. Biol. Med.,* 1976, v. 151, No. 4, 637-641.

Rifampicin (Rifampin) and clofazimine (B663) were administered continually or intermittently (1 day in 30, over 5 months). Doses were: rifampicin, 0.03% in the diet (75 mg/kg/day); clofazimine and B1912, 0.01% continually (25 mg/kg/day) or 0.03% intermittently. The strains of *M. leprae* were sensitive to dapsone (DDS) and would not grow in mice receiving 0.0001% dapsone in the diet. The effect of rifampicin in the absence of host immune response was also studied in mice inoculated with 10^6 *M. leprae* and immediately immunosuppressed with anti-mouse-thymocyte globulin (0.2 ml, subcutaneously, twice weekly) and hydrocortisone acetate (4.0 mg/kg/day). In infected mice treated continuously with rifampicin the bacillary solid ratio was reduced with a survival half-life of 5-6 days, this being 12-13 days in rifampicin-treated immunosuppressed animals in the absence of host immunity. Both clofazimine and B1912 produced a significant effect only after a lag period of 100 days, the rate of action being considerably slower than rifampicin. Intermittent or continuous administration of both clofazimine and B1912 produced comparable results.

W. Houston

11. SKINSNES, O. K., CHANG, P. H. C. & MATSUO, E. **Acid-fast properties and pyridine extraction of *M. leprae*.** *Int. J. Lepr.,* 1975, v. 43, No. 4, 339-347.

"The reportedly unique pyridine extractability of acid-fastness as an identifying characteristic for *M. leprae* was examined in the leprosy bacilli and in eight other strains of mycobacteria. The initial findings were, in general, in accord with previous reports except that *M. smegmatis* and *M. phlei* likewise demonstrated 2 h pyridine extractability of acid-fastness. Perhaps, more significantly, it was found that this characteristic in *M. leprae* is related to aged, probably nonviable bacilli. Some other strains of mycobacteria when tested in aged cultures showed the same phenomenon while *M. leprae* cultivated *in vitro* in a recently developed medium resisted pyridine extraction up to 3 weeks of growth, but thereafter as the culture aged pyridine extractability became characteristic. It is concluded that this pyridine extractability of acid-fastness is a characteristic of ageing or nonviable bacilli. As such it is not definitive in the determination of whether or not *in vitro* cultivation of *M. leprae* has been achieved."

12. COLSTON, M. J. & HILSON, G. R. F. **Growth of *Mycobacterium leprae* and *M. marinum* in congenitally athymic (nude) mice.** [Correspondence.] *Nature.* London, 1976, July 29, v. 262, 399-401.

Congenitally athymic (nude) mice were tested for susceptibility to infection with *Mycobacterium leprae* in the hope that they would provide a more convenient model for experimental infections of the lepromatous type. A previous attempt to infect nude mice (Prabhakaran *et al., Experientia,* 1975, v. 31, 784) had only been maintained for 6 months, which was regarded as insufficient. Thirty homozygous nude mice were inoculated in the foot-pads with *M. leprae,* together with a group of heterozygous phenotypically normal littermates which were used as controls.

Survival of the nude mice was poor, but enhancement of growth in the two longest surviving mice at 266 and 322 days, by comparison with controls, was highly significant. In addition to the foot-pad, significant numbers of bacilli were found in the liver ($10^{5.3}$) and spleen ($10^{5.3}$) and scanty bacilli were found in testes, nose, tail and forepaw. In another experiment, enhancement of growth of *M. marinum,* which does not curtail survival of nude mice, was even more convincing.

If the problem of survival could be overcome, nude mice might provide a very useful model for leprosy.

D. S. Ridley

13. KAWAGUCHI, Y., MATSUOKA, M., KAWATSU, K. HOMMA, J. Y. & ABE, C. **Susceptibility to murine leprosy bacilli of nude mice.** *Jap. J. Exp. Med.,* 1976, v. 46, No. 3, 167-180.

"Comparative observations were made on the development of experimental murine leprosy in various inbred strains of mice, including nude mice of congenital thymic aplasia. The susceptibility of these strains of mice to murine leprosy bacilli was evaluated by the development of leproma at the subcutaneous infection site and also by the involvement of visceral organs.

"Nude mice developed a much more severe disease than C3H mice which is the representative of the malignant type. Their high sensitivity was also demonstrated in the case of intraperitoneal infection.

"The observations in nude mice and other mouse strains confirmed our concept that experimental mouse leprosy can be classified into 3 clinical types, benign, intermediate and malignant, and suggested that such mouse strain differences are related with their cell-mediated immunity."

2. IMMUNOLOGY, PATHOLOGY

14. SAINT-ANDRE, P. La stimulation de l'immunité à médiation cellulaire dans la lèpre lépromateuse: état actuel du problème. [**A survey of the stimulation of cell-mediated immunity in lepromatous leprosy**.] *Méd. Trop.,* 1976, v. 36, No. 1, 80-85.

The English summary appended to the paper is as follows:

"Lepromatous leprosy is caused by a deficiency in cell-mediated immunity (C.M.I.) and recent advances about C.M.I. are reviewed by the author. He, then, considers the test tactical approach for anti-leprosy action and he favours the stimulation of C.M.I. associated with chemotherapy: injections of leucocytes, the use of transfer factor, unspecific stimulations by B.C.G., various bacterial lysates and Levamisole (original experiments).

"The author emphasizes a new anti-leprosy procedure beginning with Rifampicin (900 mg a week for the first 2 months) then C.M.I. stimulation associated with chemotherapy."

15. HARDAS, U. D. & SAOJI, R. G. **17-Ketosteroids in leprosy**. *Int. J. Lepr.,* 1975, v. 43, No. 3, 249-251.

"Urinary 17-ketosteroids were estimated in 29 lepromatous leprosy cases. Correlation between 17-ketosteroid values, histopathologic findings, and serum S.G.P.T. values is discussed. Low values of 17-ketosteroids were associated with definite leproma in liver indicating the value of liver damage to 17-ketosteroids. This was more marked in males than in females."

16. MEYERS, W. M., KVERNES, S. & BINFORD, C. H. **Comparison of reactions to human and armadillo lepromins in leprosy**. *Int. J. Lepr.,* 1975, v. 43, No. 3, 218-225.

Skin reactions to lepromins prepared from human and armadillo sources were compared in 115 leprosy patients. Lepromin derived from the armadillo provoked a pattern of response identical with that derived from human lepromatous tissue, and gave consistently more intense reactions. The armadillo is thus a promising source for a standardized lepromin.

T. F. Davey

17. MILLAR, J. W., GANNON, C. & CHAN, C. S. P. **Comparison in leprosy patients of Fernandez and Mitsuda reactions using human and armadillo antigens. A double-blind study.** *Int. J. Lepr.,* 1975, v. 43, No. 3, 226-233.

A careful study of Mitsuda and Fernandez reactions to lepromins derived from armadillo and human sources led to the conclusion that lepromin prepared from *Mycobacterium leprae* obtained from infected armadillos is as effective as that prepared from bacilli obtained from human lepromatous tissue.

T. F. Davey

18. BARNETSON, R. ST C., BJUNE, G. & DUNCAN, M. E. **Evidence for a soluble lymphocyte factor in the transplacental transmission of T-lymphocyte responses to *Mycobacterium leprae*.** [Correspondence.] *Nature.* London, 1976, Mar. 11, v. 260, 150-151.

The *in vitro* lymphocytic blastogenic response to whole washed *Mycobacterium leprae* was used to demonstrate specific cell mediated hypersensitivity in normal mothers and their babies at birth. Cord blood lymphocytes from babies of 5 sensitive mothers were consistently shown to be sensitized; those from babies of insensitive mothers were shown not to be sensitized. This condition was statistically highly significant. There was correlation in BCG responsiveness between the 2 maternal groups and between the 2 neonatal groups. Mothers unresponsive to *M. leprae* were also unresponsive to PPD, but this correlation was not found between the 2 neonatal groups.

It was concluded that the strict correlation between maternal and neonatal lymphocyte responsiveness to *M. leprae* implied the transplacental passage of either antigen, lymphocytes or a soluble factor released from lymphocytes. Antigen seemed unlikely as no mother showed signs of leprosy or other mycobacterial disease. The question of transplacental passage of maternal lymphocytes is still debated, but recruitment of foetal lymphocytes would seem necessary to produce the demonstrated response. A soluble lymphocyte product, such as the small molecular weight molecule known as transfer factor, might cross the placenta relatively easily and could be expected to sensitize foetal lymphocytes.

A. D. M. Bryceson

19. BJUNE, G., BARNETSON, R. ST C., RIDLEY, D. S. & KRONVALL, G. **Lymphocyte transformation test in leprosy; correlation of the response with inflammation of lesions.** *Clin. Exp. Immunol.,* 1976, v. 25, No. 1, 85-94.

"Lymphocyte transformation tests (LTT) using 'whole washed' and 'sonicated' preparations of *Mycobacterium leprae (M. leprae)* as antigen were studied in 81 patients with borderline leprosy. The results were correlated with the histological and the clinical pictures.

"There was a good correlation with the histological spectrum, LTT responses generally being higher in the borderline tuberculoid leprosy patients and lower in the borderline lepromatous. However, considerable variation was noted in each group of the borderline leprosy spectrum, and it was found that this was due in part to the degree of inflammation in the skin. Thus those with 'inflamed' skin lesions had higher responses than those with 'silent' lesions, and even those with borderline lepromatous leprosy with inflamed lesions had higher responses than those with borderline tuberculoid leprosy whose lesions were silent. Those who had reversal reactions, where inflammation is very marked, had very high LTT responses which fell with treatment of the reaction with steroids.

"It thus appears that the LTT in leprosy is influenced by the occurrence of hypersensitivity reactions as well as by the patient's ability to resist bacillary multiplication."

20. SCHEVING, L. E., ENNA, C. D., HALBERG, F., JACOBSON, R. R., MATHER, A. & PAULY, J. E. **Mean circadian cosinors of viral signs, performance of blood and urinary constituents in patients with leprosy.** *Int. J. Lepr.,* 1975, v. 43, No. 4, 364-377.

"We have herewith examined the characteristics of circadian rhythms in patients with lepromatous leprosy, active or inactive, allowing a comparison with corresponding properties of rhythms in healthy subjects mapped earlier. Group results were illustrated by cosinor plots, produced directly on microfilm by computer. Eventually such reference standards in the form of cosinors, among other displays, notably of waveform, may be individualized and carried on a person's health record. Such a quantitative assessment of an individual's rhythms in health may serve for rigorous comparison with any changes accompanying increased susceptibility or occult or overt disease."

21. CARAYON, A., LANGUILLON, J., GIRAUDEAU, P., CAMAIN, R. & MAYDAT, L. Névrites micro-angiopathiques d'origine auto-immune probable après migrations inverses dans la zone borderline du spectre de la lèpre. [**Micro-angiopathic neuritides, probably of auto-immune origin and following immunological changes in the borderline zone of the leprosy spectrum.**] *Méd. Trop.,* 1976, v. 36, No. 1, 16-33. English summary.

The authors break important new ground in these studies of the multifactorial aetiology of nerve damage in leprosy. Clinical observations, histopathological examination of tissue removed at biopsy, direct inspection of nerves exposed at operation, and evaluation of medical and surgical decompression of constricted nerves lead them to suggest that an important factor in nerve damage in leprosy lies in the occurrence of multiple minute vascular lesions. These are attributed essentially to changes in the immunological status of the patient and, particularly, to a down-grading following a reversal reaction. The resulting vaso-constriction leads to localized oedema in the nerve. The breakdown of the myelin in the nerve sheaths releases products that provoke auto-immune reactions on the one hand and a Guillain-Barré type of allergic neuritis on the other.

Anti-inflammatory treatment by systemic corticosteroids associated with specific leprostatics (like clofazimine) is advocated, with surgical decompression where indicated.

[It is to be hoped that the authors will supplement these studies with the demonstration of the immune complexes, antigens and antibodies that their elegant suggestions require.]

S. G. Browne

22. PRICE, M. A., ANDERS, E. M., ANDERS, R. F., RUSSELL, D. A. & DENNIS, E. S. **Cell-mediated immunologic status of healthy members of families with a history of leprosy.** *Int. J. Lepr.,* 1975, v. 43, No. 4, 307-313.

"The cell-mediated immune status of 20 apparently healthy children from families with a history of leprosy has been studied. They have been compared with 20 age- and sex-matched controls from families with no history of leprosy. Lymphocyte transformation tests using PHA, PPD and lepromin and skin tests to lepromin, PPD and candida were carried out. No evidence of a depression of cell-mediated immunity in the children from families with leprosy was obtained.

"The only 2 children giving a negative Mitsuda lepromin skin test both subsequently developed leprosy in the succeeding 16 months. One was classified histologically as indefinite lepromatous and the other as borderline lepromatous. This emphasizes the practical significance of a negative lepromin skins test in an endemic leprosy area as a prognosis of clinical lepromatous leprosy."

23. KRISHNAMURTHY, S., VERGHESE, R. & JOB, C. K. **The Kveim test in leprosy.** *Int. J. Lepr.,* 1975, v. 43, No. 4, 333-338.

"The response to lepromin and Kveim antigens was compared and studied in 15 leprosy patients who were tuberculin negative. Of the 11 lepromin positive tuberculoid patients, 4 were Kveim positive, 1 was equivocal, and the rest were negative. Of the 4 lepromin negative lepromatous patients, 1 gave a positive Kveim test while the other 3 were negative. It has been shown that false-positive Kveim reactions are found in a higher percentage of South Indian leprosy patients than in those of other backgrounds, such as Japanese and Malaysian Chinese patients. It is also suggested that no definite relationship exists between the reaction of leprosy patients to lepromin and Kveim antigens. We further suggest that the anergy exhibited by lepromatous patients to the antigen of *M. leprae* is specific, as evidenced by the positive Kveim response in one lepromatous patient."

24. REA, T. H. *et al.* **Immunologic responses in patients with lepromatous leprosy.** *Arch. Derm.,* 1976, v. 112, No. 6, 791-800.

"Immunologic responses were measured in 46 patients with lepromatous leprosy. These patients were not distinguishable from controls on the basis of responses to soluble intradermal antigens, sensitization to contactants, peripheral blood T- and B-cell percentages, *in vitro* lymphocyte responses to a mitogen, or the prevalence of autoantibodies. Generalized immunologic abnormalities in patients with lepromatous leprosy are neither predisposing causes nor necessary accompaniments of lepromatous leprosy, but are probably remote sequelae of the illness. By implication, the generalized immunologic abnormalities reported in other diseases are likely to be remote sequelae of the particular illness."

25. GUPTA, M., BHARGAVA, M., KUMAR, S. & MITTAL, M. M. **Platelet function in leprosy.** *Int. J. Lepr.,* 1975, v. 43, No. 4, 327-332.

"In a group of 50 leprosy patients, platelet function tests were found to be abnormal in 44. More than half the patients showed significant impairment in platelet adhesiveness and aggregation to collagen which correlated best with increase in serum IgM levels. ADP-induced aggregation of platelets was not a major defect and Pf-3 availability was reduced only in a fourth of the patients. *In vitro* incubation of collagen with plasma from leprosy patients significantly reduced its ability to clump normal platelets. This appears to be the first report of

defective platelet function in leprosy, and it is thought that such changes may in part be due to increased IgM globulins in the blood and/or to alterations in the collagen brought about thereby."

26. SAHA, K., DUTTA, R. N. & DASGUPTA, A. **Immunologic aspects of leprosy with special reference to the study of immunoglobulin E.** *Int. J. Lepr.,* 1975, v. 43, No. 4, 314-319.

"The serum levels of IgG, IgM, IgD and IgE have been determined in normal subjects, individuals suffering from ascariasis and filariasis, and in leprosy patients. Allergic and parasitic diseases were excluded in these normal subjects and in leprosy patients before they were taken for the study of their serum levels of IgE. The circulating IgG was significantly raised in both tuberculoid and lepromatous forms of leprosy and also in filariasis; IgM was significantly elevated in only the lepromatous form of leprosy, ascariasis as well as in filariasis; while IgA was exclusively raised in both forms of leprosy. IgD was detected in the sera of more subjects with ascariasis and filariasis than in normal individuals and leprosy patients. The mean level of serum IgE in 35 normal Indian subjects was 1025 iu per ml, 9 of them (25%) having serum IgE concentrations above 700 iu per ml. The highest mean level of serum IgE was found in ascariasis (7328 iu per ml), followed by leprosy (5180 iu per ml), and filariasis (4244 iu per ml). Furthermore, no significant difference between the mean serum IgE levels of tuberculoid and lepromatous leprosy patients was observed. Although the rise of serum IgE level in these parasitic diseases, as well as in leprosy, was spectacular, the augmented synthesis of this unique class of immunoglobulins was not invariably present in all patients. The results have been discussed on the basis of recent ideas on immunoglobulin synthesis."

27. ESTRADA-PARRA, S., PEREZ-MOSQUEIRA, N., GOMEZ-VIDAL, M. & ROJAS-ESPINOSA, O. **A serological profile in leprosy.** *Revta Lat.-am. Microbiol.,* 1975, v. 17, No. 4., 211-212.

"Serological profiles were studied in 54 patients with different types of leprosy and the data compared with those obtained from 30 healthy individuals. The results indicate that the patients' group have increased levels of total proteins, alpha 2 and gamma globulins. All, IgG, IgA and IgM immunoglobulins were elevated. The higher values for these serum components were found in the group of patients with nodular lepromatous leprosy. However, C_4 seemed to be in lower concentration within the patients group. Patients with erythema nodosum leprosum showed higher incidence of soluble immune complexes. Twenty per cent of the patients were positive for the C-reactive protein test. Most of the patients (80%) were under treatment at the moment of the study."

28. BROCHARD, C., LANGUILLON, J., SAIMOT, G., GENITEAU, M., COULAUD, J. P. & PAYET, M. Intérêt de la recherche des cryoglobulines dans la lèpre. [**Value of the detection of cryoglobulins in leprosy.**] *Méd. Trop.,* 1976, v. 36, No. 1, 69-79. English summary (7 lines).

The authors investigated the presence of cryoglobulins in a series of 274 patients in Senegal. The proportion of patients with cryoglobulins in their sera varied from 65% in those with lepromatous leprosy to 15% in those with the tuberculoid form. In 3 patients out of 7 with borderline lepromatous leprosy, cryoglobulins were present, but in none out of 7 with borderline tuberculoid leprosy. In patients with multibacillary forms of leprosy passing through an episode of erythema nodosum leprosum, the percentage of cryoglobulinaemia reached 84.

A useful indication of the potential polarity of indeterminate forms of leprosy was provided by the investigation of the presence of cryoglobulin. In the majority of patients in whom the globulin was found, the eventual evolution towards a multibacillary form of leprosy was in accord with the initial finding.

The authors also investigated the titres of complement present in the sera, utilizing macrophage receptors and ^{125}I tagged Clq: the results will be published shortly.

S. G. Browne

29. KRONVALL, G., BJUNE, G., STANFORD, J., MENZEL, S. & SAMUEL, D. **Mycobacterial antigens in antibody responses of leprosy patients.** *Int. J. Lepr.*, 1975, v. 43, No. 4, 299-306.

"A reference system for *M. smegmatis* antigens in crossed immunoelectrophoresis was used to study antibody activities in serum samples of 91 leprosy patients. All polar and borderline lepromatous patients were positive. Mean numbers out of 14 *M. smegmatis* antigens involved were 4.3 and 3.5, respectively. Precipitins against antigen no. 1 were seen in all lepromatous cases. Antibodies against this antigen were detected in 50% of tuberculoid (polar, subpolar and borderline) cases. Antibody activity against *M. avium* and *M. duvalii* antigens was also detected usina staphylococcal radioimmuno-assay. Borderline and polar lepromatous cases showed elevated levels. Antigenic comparisons were made between 4 slow growing mycobacteria, 14 fast growing mycobacteria and the leprosy bacillus using lepromatous serum pools as antibody reagents. Four of the antigens detected in *M. leprae* were also found in slow growing as well as fast growing species indicating a common occurrence among mycobacteria. Antigen no. 1 of *M. duvalii,* with an apparent molecular weight of 290,000, showed nonprotein characteristics. Further analysis of antigen no. 21, using lepromatous serum pools as antibody reagents, indicated the existence of at least 2 groups of antigenic determinants. In addition to determinants shared by all mycobacteria, there were antigenic structures apparently unique to *M. leprae*."

30. WILHELM, G. & SELLIER, J. L. **Presence of antibodies reacting with a ribonucleoprotein from *Mycobacterium tuberculosis* in sera from leprous patients.** *Zentbl. Bakt. I. Orig., Ser. A,* 1976, v. 234, No. 1, 68-71.

Ribonucleoprotein (RNP) with a molecular weight of between 12,000 and 13,000 was isolated from *Mycobacterium tuberculosis.* It was tested by an agar-gel double diffusion method against sera from 10 subjects with lepromatous leprosy, 201 subjects with tuberculosis and 114 healthy blood donors. All the sera from the leprous subjects reacted with the RNP, 4 of the sera from the tuberculous subjects gave weak reactions and none of the sera from the blood donors reacted. When tested in a radioimmuno-assay system, the sera from the leprous subjects had significantly higher titres than the sera from tuberculous subjects. It is concluded that the antigenic determinants in RNP isolated from *M. tuberculosis* must be similar to those in *M. leprae.*

RNP is capable of protecting guinea pigs and mice against infection with *M. tuberculosis.* In view of the cross-reactivity with *M. leprae* it may also protect against infection with this organism.

P. A. Jenkins

31. SAINT-ANDRE, P. LOUVET, M. & SCHLECH, B. Stimulation de l'immunité à médiation cellulaire par le B.C.G. dans la lèpre lépromateuse et intermédiaire. **[Stimulation of cell-mediated immunity by BCG in lepromatous and borderline leprosy.]** *Méd. Trop.,* 1976, v. 36, No. 2, 133-136. English summary.

This interim report continues the previous work of the authors. Their original posology is now modified, and they give progressively increasing doses of BCG, intradermally, beginning with 0.1 ml of 1 in 100 dilution. This dose is increased every fortnight, until a maximum of 0.1 ml

of a 1 in 10 dilution is attained. The injections were well tolerated, except that necrotic nodules developed at some injection sites in all the patients.

The authors concluded that acceptable degrees of stimulation of cell-mediated immunity had been demonstrated in all patients. In 7 suffering from polar lepromatous leprosy, the Mitsuda reaction became positive clinically, but histopathological examination revealed a predominantly borderline response. In 6 patients with borderline leprosy, there was rapid clinical and bacteriological improvement, even of signs of nerve damage in 4 out of 5 patients. In 2 patients with lepromatous leprosy out of a total of 10 treated with BCG, erythema nodosum of moderate severity occurred.

It is concluded that the clinical improvement noted was more rapid than that observed when dapsone alone is given, and that further investigations are indicated.

[See *Trop. Dis. Bull.*, 1976, v. 73, abstr. 1815.]

S. G. Browne

32. SAINT-ANDRE, P., LOUVET, M., GIRAUDEAU, P. & SCHLECH, B. Effets de la stimulation de l'immunité cellulaire par les lysats et extraits bactériens dans la lèpre lépromateuse. **[Results of the stimulation of cell-mediated immunity in lepromatous leprosy by bacterial lysates and extracts.]** *Méd. Trop.*, 1976, v. 36, No. 2, 137-145. English summary.

The authors attempted to stimulate cell-mediated immunity in leprosy patients by giving them a series of injections (every other day) of a glycocolic lysate of *Neisseria perflava* (Ducton), an agent that non-specifically accelerates phagocytosis of carbon particles in the experimental animal.

In 3 of the 7 patients with lepromatous leprosy, treatment was abandoned after 7 to 12 months, in the absence of improvement. In 2 others, however, rapid improvement was noted for 18 months, but relapse followed. In the 6th patient, rapid and sustained improvement occurred and the Mitsuda test became positive. The variable and unpredictable results are attributed to differences in the potential for cell-mediated immunity. In 3 patients with borderline leprosy, improvement in the clinical state and in signs of nerve damage was thought to be due to the treatment given. Moreover, the improvement was maintained for 21 months.

A mixture of bacterial lysates intended to stimulate local rhinopharyngeal defence mechanisms against infection (Stimugène) was given to 9 patients suffering from lepromatous leprosy. Sublingual and injectable preparations were used. The results as demonstrated by improvement in lesions in the nasopharynx (rhinitis and epistaxis) and the skin were "astonishing", and the authors consider that they were at least as good as those achieved by standard chemotherapy. The histopathological and bacteriological results were thought to be equally satisfactory. The injectable form of the product had a more rapid action than that administered sublingually.

[This novel form of attack deserves further critical evaluation in larger series of patients, and its long-term effects on the disease and lymphocyte activity should be more precisely determined.]

S. G. Browne

33. SAHA, K. MITTAL, M. M. & MAHESWARI, H. B. **Passive transfer of immunity in leprosy patients by transfusion of lymphocytes from lepromin positive healthy donors.** *J. Indian Med. Ass.*, 1976, v. 66, No. 5, 93-101.

Four-hundred-million viable lymphocytes from the peripheral blood of healthy tuberculin and lepromin positive individuals were transfused into 5 patients with leprosy [3 lepromatous (LL), 1 borderline lepromatous (BL) and 1 borderline tuberculoid (BT)], all in a reactive condition and all negative to lepromin and normal lymphocyte transfer tests. Three transfusions were given at monthly intervals. Reactive episodes followed each transfusion in all cases, but definite

bacteriological and histological improvement was observed in 4 of the 5 patients; clinical improvement was also witnessed, most marked in the BT and BL patients. In repeat immunological assessment in 3 patients 5 months later, the only change observed was that the BL patient developed a positive Fernandez reaction.

T. F. Davey

34. CARAYON, A. Gamme lésionnele des névrites hanséniennes. (État actuel des acquisitions récentes et des orientations thérapeutiques.) **[The pathological range of neuritis in leprosy. (A survey of recent advances and of trends in treatment.)]** *Méd. Trop.,* 1976, v. 36, No. 1, 41-61. English summary.

The author reviews the recent contributions made by clinicians, histopathologists and immunologists to the elucidations of the various patterns of nerve damage in leprosy, and attempts to correlate the different findings with the pathological features of the various types of leprosy. He asserts that biopsy specimens taken from mixed nerve trunks, especially at sites of maximal damage, would show changes in structure (and hence, in function) much more obviously related to the type of leprosy, its stage of advancement and its state of clinical activity, than a biopsy taken from a small superficial sensory nerve.

The concordance in the cases of tuberculoid and borderline leprosy is now generally accepted, but further investigation is needed in the case of multibacillary forms of leprosy, and the neuritides occurring in erythema nodosum leprosum and secondary auto-immune phenomena. He makes the point that, in the acute forms of neuritis, intrafascicular oedema and multiple small vascular lesions may predominate and these are frequently reversible with anti-inflammatory treatment or surgical decompression.

His studies emphasize the role of mechanical constriction of nerves in fibrotendinous or fibro-osseous canals and the damage that results from unrelieved constriction and traumatic elongation of the nerve trunks in this situation. In conclusion, he pleads for further unprejudiced observation of early and reversible impairment of peripheral nerve function, so that the incubus of permanent nerve damage may be relieved.

S. G. Browne

35. COUTELIER, L., FLESHMAN, K. & NOEL, H. Observations sur les remaniements osseux dans un cas de lépre. **[Observations on bone changes in a case of leprosy.]** *Ann. Soc. Belg. Méd. Trop.,* 1975, v. 55, No. 4, 359-371. English summary (8 lines).

Using the special techniques of microradiography and fluorescent microscopy developed by one of the authors, the team record their investigation of the changes observed in the 5th metatarsal of a patient who had suffered from tuberculoid leprosy, whose foot had to be amputated because of gangrene.

Illustrated with excellent photographs, the article emphasizes the different kinds of bony change that follow peripheral damage—destruction alone, new bone formation without preceding destruction, and bone destruction and new bone formation proceeding concurrently. The authors emphasize the rapidity with which the new bone is formed, and the extent of the subperiosteal erosion. They suggest a kind of compensation between peripheral bone destruction and central bone formation and deposition, and suspect that the vascular component plays a decisive role in the process.

S. G. Browne

36. GUPTA, J. C., JESUPADAM, T., GUPTA, M. C. & GUPTA, D. K. **A histopathologic study of striated muscle biopsies in leprosy.** *Int. J. Lepr.,* 1975, v. 43, No. 4, 348-355.

"Histopathologic changes in striated muscle biopsies in 50 cases of leprosy were studied; 40 being the lepromatous type and 10 the non-lepromatous type. All the biopsies were obtained

from midportions of normal looking bicep muscles and paraffin embedded. Sections cut in transverse and longitudinal planes were stained by hematoxylin and eosin, Masson's trichrome, Mallory's PTAH, Gomori's silver impregnation, and Ziehl-Neelsen's technic. Lepromas, focal or confluent, in the endomysium, perimysium, muscle fibers and perineurally, constituted the most common pathologic lesion, being observed in 34% of all cases with a higher frequency in the lepromatous type. Acid-fast bacilli could be demonstrated in some of these lepromas. These nodules were observed even in younger patients and increased in frequency as the age of patient advanced. Three cases of non-lepromatous leprosy showed granulomas. Other changes noted in varying proportions were loss of striations, hyaline change, fatty change, sarcolemmal changes, along with endomysial thickening, muscle necrosis and fibrosis. Bacillemia in leprosy and the possible route of muscle invasion resulting in subsequent production of leprous nodules with associated degenerative changes, independent of nerve involvement, have been postulated."

37. DISCAMPS, G., LANGUILLON, J. & SAINT-ANDRE, P. La biopsie ganglionnaire dans le diagnostic de la forme de lepre. **[The biopsy of lymph nodes in the diagnosis of the various types of leprosy.]** *Méd. Trop.*, 1976, v. 36, No. 1, 62-68. English summary (5 lines).

This biopsy study of supratrochlear and other lymph nodes (numbers unspecified) in relation to the immunological spectrum of leprosy follows closely the study of Turk and Waters [*Trop. Dis. Bull.*, 1971, v. 68, abstr. 2270]. The immunological spectrum is reflected in the histology of the lymph nodes, which in turn parallels to a considerable extent the histology of the skin lesions. The examination of lymph nodes is recommended as a useful adjunct for the diagnosis and classification of leprosy.

Lymph nodes from patients of the lepromatous type who had received a non-specific immunological stimulus (*Neisseria perflava* or BCG) showed hyperplasia of the follicular centres and, apparently, a dissolution of the acid-fast bacilli in some cases. In others there were signs of a tuberculoid transformation, with well differentiated epitheloid cells and an occasional Langhans giant cell. [This original observation ought to be substantiated in a more detailed and factual account.]

D. S. Ridley

38. ANTIA, N. H. & PANDYA, N. J. **Qualitative histology and quantitative bacteriology in various tissues of 50 leprosy patients.** *Lepr. Rev.*, 1976, v. 47, No. 3, 175-183.

"Fifty patients, 45 males, and 5 females, from different parts of the leprosy spectrum and at various stages of the disease and its treatment, were examined both by multiple skin smears, nasal scrapings and also by qualitative histology and quantitative bacteriology of skin, dartos, lymph node, nasal mucosa, muscle and nerve. A total of 797 tissues were studied by histology as well as homogenization.

"Our study revealed that the qualitative involvement and quantitative bacillary load in the nerves was highest of all the tissues examined. A high incidence of *M. leprae* in the nerves of tuberculoid patients (40%) as opposed to other tissues–skin (7%), dartos (8%), nasal mucosa (7%), lymph node (7%), voluntary muscle (0%) was also observed. The nerve was also found to be a major and the most important reservoir of *M. leprae.* Scrotal skin biopsy was shown to be a suitable and practical site for diagnosis of leprosy. A smear obtained from the homogenate of the scrotal skin can be a useful investigation when histological facilities are not available. The findings of histology and homogenization correlate fairly well except in the skin where homogenization (24%) was better than histology (18%) for detection of bacilli. Nasal mucosa had a similar bacillary load while the lymph node showed a higher load. The importance of voluntary or involuntary muscle (dartos) as a reservoir of *M. leprae* was not borne out in our study."

3. CLINICAL ASPECTS

39. DONGRE, V. V., GANAPATI, R. & CHULAWALA, R. G. **A study of mononeuritic lesions in a leprosy clinic.** *Lepr. India,* 1976, v. 48, No. 2, 132-137.

"An analysis of 11,581 leprosy patients registered at the Acworth Leprosy Hospital clinic showed that 494 cases (4.3%) had primary polyneuritic leprosy and 143 (1.2%) localized cutaneous anaesthetic lesions (or non-visible anaesthetic lesions), accounting for 5.5% who had no evidence of obvious skin lesions."

40. CHATTERJEE, B. R., TAYLOR, C. E., THOMAS, J. & NAIDU, G. N. **Acid-fast bacillary positivity in asymptomatic individuals in leprosy endemic villages around Jhalda in West Bengal.** *Lepr. India,* 1976, v. 48, No. 2, 119-131.

This interesting study follows up the findings of Figueredo and Desai [*Trop. Dis. Bull.,* 1949, v. 46, 1052] of high rates of acid-fast bacillary positivity in clinically normal family contacts of leprosy patients. The entire population of 9 villages in a highly endemic area of West Bengal was examined for leprosy, clinically and bacteriologically, using for bacteriological assessment a snip from one ear lobe, collected with a sclerocorneal punch. Of apparently healthy subjects 5.8% gave positive findings for acid-fast bacilli in such tests, the prevalence rising with age to early adult life and then levelling off. In this area the entire population was regarded as being at risk of contact with *Mycobacterium leprae.* Among nuclear family contacts of leprosy cases marginally higher rates of positivity (5.9%) were found than in the general population, with no striking contrasts between the contacts of lepromatous cases and the contacts of tuberculoid and indeterminate cases. All persons with positive findings were kept under constant surveillance, and the whole population was re-examined after 2 years. During this period 13.6% of asymptomatic persons with positive ear lobes developed early clinical leprosy. When at the end of 2 years the entire population was re-examined, 2.3% of those with negative ear lobes had developed overt leprosy. Among nuclear family contacts the rate was 4.8%.

[The large-scale bacteriological study of whole populations gives this paper unusual interest. Some aspects of methodology and interpretation are controversial, but the positive findings are important and should provoke similar studies elsewhere.]

T. F. Davey

41. JOSHI, P. B. **Pilocarpine test in assessment of therapeutic efficacy in maculoanaesthetic leprosy.** *Lepr. India,* 1976, v. 48, No. 1, 55-60.

The sweat response in maculoanaesthetic lesions of 132 leprosy patients was tested every 2 months over a period of 12 months. 0.2 ml of a 1 in 1000 solution of pilocarpine nitrate was injected intradermally, the injection site was painted with tincture of iodine, and starch powder was dusted over the site. Sweating caused a blue discolouration of the starch granules. The results are shown in a series of tables. 111 patients showed improvement in the sweating mechanism, improvement being maximal in most cases by the end of the trial period.

W. H. Jopling.

42. SEHGAL, V. N. **The significance of the local sweat response in assessing the progress of leprosy.** *Br. J. Derm.,* 1976, v. 94, No. 6, 615-618.

Twenty-nine patients with tuberculoid leprosy and 5 with borderline leprosy were selected for a study of sensation and sweat response in hypopigmented skin lesions while on dapsone

treatment over a trial period of 2 years. Significant improvement was recorded in both these tests, and the author stresses the importance of early diagnosis and treatment if optimal results are to be obtained.

W. H. Jopling

43. SEBILLE, A., SAINT-ANDRE, P., GIRAUDEAU, P. & ROUGEMONT, A. Manifestations cliniques de la multinévrite lépreuse chez l'African de l'Ouest. A propos de 90 observations. **[Clinical manifestations of leprous polyneuritis in West Africans. Report of 90 cases.]** *Bull. Soc. Path. Exot.,* 1975, v. 68, No. 4, 335-344. English summary (5 lines).

The authors report the results of the clinical examinations of 10 main peripheral nerve trunks, together with the corresponding sensory and motor deficits, in each of 90 West African leprosy patients in the Institut Marchoux in Bamako, Mali. They emphasize the importance of enlargement of the nerve trunk at sites of predilection as the most frequent and earliest sign of nerve damage, and refer to the probable importance of compression of the trunk in fibro-muscular canals. Obvious atrophy and weakness of the muscles supplied, and sensory deficit (as demonstrated by testing with a wisp of cotton wool, and pinpoint) were less useful signs, though sensory impairment usually preceded motor weakness.

The ulnar nerve was most commonly affected, and the facial least. In the latter no enlargement was detected in the nerves of the superficial cervical plexus. [The small nerves passing over the malar bone are not mentioned.]

The authors claim that the immunological classification of the disease had no bearing on the peripheral nerve damage [a statement at variance with the findings of most authors], and that erythema nodosum leprosum had a transitory effect only on the appearance of the signs of neuropathy.

[A greater precision of the clinical findings would be welcome, together with a correlation of the enlargement and hardness of the nerve trunks with the stage of the disease and the immunological classification of the form of leprosy concerned. Other sensory modalities (such as temperature sense) might well have been included in the examination.]

S. G. Browne

44. MAHAPATRA, S. B. & RAMU, G. **Transformation from lepromatous to borderline leprosy under clofazimine therapy. A case report.** *Lepr. India,* 1976, v. 48, No. 2, 172-176.

This is a report of a patient suffering from subpolar lepromatous leprosy (lepromatous leprosy which has been preceded by a borderline phase) upgrading to borderline during combined therapy with clofazimine and dapsone as shown by the appearance of new erythematous plaques with borderline histology.

4. THERAPY

45. MARTINEZ, D. & ZAIAS, N. **Levamisole as adjunct to dapsone in leprosy.** [Correspondence.] *Lancet,* 1976, July 24, 209-210.

Patients with modular lepromatous or nodular dimorphic leprosy took part in this trial. Lesions were graded from 4 (nodule) to 0 (totally flat macule). All 12 patients who completed the trial were clinical grade 4+ at the start. All were receiving dapsone or acedapsone. Six of the 12 received, in addition, levamisole 150 mg every 2 weeks, and 6 received a placebo pill. After 6 months, the 6 patients who had been on levamisole had lesions graded 1+ or 0. Of the 6 who were taking the placebo, 4 had 3+ lesions, and 2 had 0, similar to the results to be expected

from dapsone alone. The prevalence of reactions was studied in 6 patients, all with 4+ reactions before the trial. In 3 on levamisole plus dapsone there was a gradual decrease of intensity to 0 or ± over the 6 months, whereas the 3 on placebo + dapsone continued to have reactions (3+ or 4+). When levamisole was withdrawn at the end of 6 months one patient's reactions increased again.

F. I. C. Apted

46. EKAMBARAM, V. & VENKATACHARI, S. **A trial of long-acting sulphonamide R.O. 4-4393 (Fanasil) in treatment of cases of lepromatous leprosy with repeated E.N.L.** *Lepr. India,* 1976, v. 48, No. 1, 24-30.

Long-acting sulphonamides, including the drug sulfadoxine (Fanasil), have had a limited vogue in the treatment of leprosy. A small trial is reported here of the use of this drug in relation to recurrent erythema nodosum leprosum (ENL). After 2 years on sulfadoxine in a dose of 1 g weekly, 5 out of 6 patients subject to severe recurrent ENL experienced marked relief and were able to continue on standard dapsone treatment (300 mg weekly). Two out of 3 patients given sulfadoxine before ENL became recurrent gave the same result. While clinical and bacteriological improvement during the trial was not regarded as satisfactory, the authors nevertheless consider a larger trial worth while.

T. F. Davey

47. LANGUILLON, J. La clofazimine dans la lèpre (son action sur les formes réactionnelles et les formes resistantes). **[Clofazimine in leprosy (its effect on the reactive and resistant types).]** *Méd. Trop.,* 1976, v. 36, No. 2, 127-130. English summary (7 lines).

The author summarizes his experience with clofazimine [Lamprene (Geigy), B 663] in Bamako (Mali) and Dakar (Senegal). In his first series of 15 patients suffering from lepromatous leprosy, untreated, and given clofazimine at a daily dose of 100 mg, he obtained good clinical and bacteriological results, the Morphological Index falling to zero in 24 weeks and the Bacterial Index falling by one-half in 12 months. No patient showed signs of reaction during the period of treatment.

His second trial was designed to evaluate the practicability of using clorazimine in a mass treatment scheme, and to compare the results of treatment of patients with lepromatous leprosy given either a weekly dose of 600 mg of clofazimine or a weekly dose of 600 mg of dapsone. No difference was noted in the speed of clinical or bacteriological improvement between the groups, but among the 13 patients treated (and followed up) with clofazimine, there were only 2 instances of erythema nodosum leprosum: both were considered to be of slight degree and were easily controllable; whereas there were 8 cases of severe reaction among the 13 patients treated (and followed up) with dapsone. The author quotes the experience of Menke, who gave a loading dose of 600 mg of clofazimine daily for 7 days, followed by a monthly dose of 1 g to 23 patients suffering from lepromatous leprosy in Papua New Guinea.

A group of 34 patients suffering from erythema nodosum leprosum was treated with clofazimine at doses varying from 200-600 mg a day, 19 of them being given 300 mg daily. Improvement in the systemic and skin manifestations of the reactive state was noted in about 20 days for the majority, the limits being from 15-60 days. The author stopped all other leprostatic treatment when he gave clofazimine in these cases.

Another group of 26 patients treated at Bamako for "reaction" in lepromatous leprosy was given, in addition to clofazimine, either thalidomide (for males) at a dose of 400 mg daily for 7-10 days, or aspirin or a corticosteroid (for females) at a dose of 10-15 mg daily for 10 days. Excellent results were obtained in this regimen.

To 15 patients with lepromatous leprosy, suspected on clinical grounds of harbouring sulphone-resistant bacilli, clofazimine was given as follows: 300 mg daily for 6 months, then 200 mg daily for 3 months, followed by 100 mg daily. The clinical and bacteriological results

were good, and pigmentation was no problem in the dark-hued African. [It may be that some of the patients in this group were slow responders, and did not harbour dapsone-resistant bacilli.]

The author concludes that clofazimine is the antileprotic of choice in the treatment of patients with lepromatous leprosy, especially those prone to reaction, and could with obvious advantage be used in mass treatment programmes in Africa, where the lepromatous/tuberculoid ratio is low. For patients in the throes of the severe reaction of lepromatous leprosy, and those harbouring dapsone-resistant bacilli, clofazimine is the drug of choice.

[A word of warning should be uttered regarding the toxic effects of prolonged high-dose clofazimine therapy.]

S. G. Browne

48. U.S. LEPROSY PANEL (U.S.-JAPAN COOPERATIVE MEDICAL SCIENCE PROGRAM); LEONARD WOOD MEMORIAL. **Spaced clofazimine therapy of lepromatous leprosy.** *Am. J. Trop. Med. Hyg.,* 1976, v. 25, No. 3, 437-444.

Reports of the delayed effect of clofazimine (Lamprene; B663) in killing *Mycobacterium leprae,* its slow elimination, and its capacity to accumulate in the tissues, prompted this trial comparing the effect of spaced administration of the drug with that of smaller doses given more frequently. In this trial, carried out in the Philippines, 46 patients suffering from borderline-lepromatous and lepromatous leprosy were assigned randomly to 5 treatment regimens: (1) 200 mg daily for 6 days per week; (2) 100 mg three times weekly; (3) 300 mg weekly; (4) 600 mg every other week; and (5) 600 mg on 2 consecutive days every 4 weeks. Although skin smears and biopsies were taken regularly throughout the trial, this report deals with the findings on mouse foot-pad inoculations. By the end of 24 weeks it was confirmed that all 5 regimens were effective but the best results came from regimens 1 and 2. Erythema nodosum leprosum (ENL) was of equal frequency and severity in all 5 regimens and occurred in nearly a quarter of all patients; skin pigmentation was universal and was proportional to dosage of clofazimine, and there were no toxic effects.

After 24 weeks of treatment the patients were randomly allocated to treatment either with 200 mg daily for 6 days per week or with dapsone. ENL was more frequent in the latter group. The authors conclude that, for a constant average dose, the longer the interval between doses of clofazimine the less efficacious is the regimen, and the drug which has accumulated in the tissues is not readily available to exert an antibacterial effect.

W. H. Jopling

49. CARAYON, A. Limites actuelles de la chimiothérapie antihansénienne sur la névrite et danger de ses effets secondaires immunologiques. [**Limits of the chemotherapy of leprous neuritis. Its dangers and its immunological side-effects.**] *Méd. Trop.,*1976, v. 36, No. 1, 86-96.

The English summary appended to the paper is as follows: "Anti-leprous drugs have a poor effect on leprous neuritis. In this prospect a review of all available medical treatments is made.

"The advantages and inconveniences are considered for the four major antibacterial drugs, for the anti-inflammatory ones and for those raising or lowering the immunity."

[There are 67 references.]

50. LEGRAND, A. Essai de traitement par auto-hémothérapie de la réaction lépreuse. A propos de 27 cas suivis à l'Institut Marchoux Bamako (Mali). [**An attempt to treat leprosy reaction (ENL) by autohaemotherapy.**] *Méd. Trop.,* 1974, v. 34, No. 4, 495-507. English summary.

An uncontrolled trial of whole blood as the sole treatment for erythema nodosum leprosum in 27 patients with lepromatous leprosy is reported. In 15 the reaction, as judged by the clinical

state, was considered to be severe, and in the others, moderately severe. The treatment was thought to be effective in all cases of moderately severe reaction, and in 10 out of the 15 cases of severe reaction.

The initial dose of whole blood given was 2 ml; daily doses, with a 2 ml increment, were given until a maximum dose of 10 ml was attained. Thereafter 3 fortnightly booster injections of 10 ml were given, followed by monthly injections of a similar volume.

In the case of relapse, in patients whose initial reaction was successfully controlled by autohaemotherapy, a further series of daily injections of 10 ml of whole blood, given for 2 or 3 days, sufficed to control the reaction.

S. G. Browne

51. SHUKLA, R. K., CHATURVEDI, S. N., SRIVASTAVA, R. K. & GUPTA, A. K. **Modified Zancolli's operation in claw hand in leprosy.** *Lepr. India,* 1976, v. 48, No. 1, 48-54.

The technique is briefly described. In operations on 25 hands, results were assessed as good in 15, fair in 8, and poor in 2. There were few complications.

F. I. C. Apted

52. CARAYON, A., COURBIL, J. L. & GIRAUDEAU, P. Evolution actuelle de certains procédés de chirurgie palliative de la main lépreuse paralytique. [**A study on some surgical procedures in the treatment of the paralytic leprous hand. Present trends.**] *Méd. Trop.,* 1976, v. 36, No. 2, 181-191.

The English summary appended to the paper is as follows: "A review of surgical procedures used in the treatment of the leprous paralytic hand. Four points are emphasized:

1. The proximal attachment of the activating transplant.
2. A new pattern for the passage through the carpal canal.
3. A peculiar treatment of the contracture of the interosseous muscles (resection).
4. The pattern to activate the thumb, with use of 2 transplants."

[The surgical procedures are illustrated in a series of line drawings.]

53. CARAYON, A. & GIRAUDEAU, P. Valeur de la résection de l'épitrochlée dans la décompression et le déroutement de 87 névrites cubitales hanséniennes. [**Value of the resection of the epitrochlea for decompression and diversion of a leprous cubital nerve.**] *Méd. Trop.,* 1976, v. 36, No. 2, 163-173.

The English summary appended to the paper is as follows: "The translocation of a leprous cubital nerve has good physio-pathological bases and has proved to be a reliable technic.

"The rerouting may be carried out by a limited anterolateral diversion, by an anterior one. The resection of the epitrochlea which prevents the elongation of the nerve without vascular risk is today preferred. A study of 87 cases is reported."

5. EPIDEMIOLOGY, PREVENTION, CONTROL

54. ESCOBEDO VALDES, E. Evaluación del programa de vigilancia epidemiologica de la lepra en la frontera norte de Mexico. [**Evaluation of the programme for epidemiological surveillance of leprosy along the northern border of Mexico.**] *Bol. Of. Sanit. Panam.,* 1976, v. 80, No. 1, 23-31. English summary.

Of the 273 municipalities in northern Mexico, along the border with the United States, 102 have a leprosy problem and cases have been notified in 22 of 36 municipalities on the boundary

line. In 1973 and 1974, 277 cases were discovered in these areas (whereas 1498 new cases had been found in the country as a whole). Eighty-six of these cases occurred along the border, 84 of them in subjects aged over 15 years; 47 were in men. Sixty-eight cases were lepromatous, 12 tuberculoid and 6 undetermined. In 39 cases the illness was in its first 5 years. Eight cases were discovered by examination of contacts. Twenty-one cases were in settled frontier inhabitants; the others had emigrated there from other Mexican states where leprosy was known to be prevalent. Sixty-nine lived in towns. Twenty-one cases in California were notified to Mexico as being Mexican in origin (9 were in subjects who had left more than 5 years previously). Eight appeared to have been suffering from leprosy when they had entered the United States.

Up to the end of 1974 there was a total of 14,882 cases in Mexico, of which 1224 were along the northern border. There were 541 cases in Sonora, 46 of them from the six municipalities bordering Arizona. Principal foci were in San Luis Río Colorado (23 cases) and in Nogales (16). In Baja California Noerte there were 166 cases, with principal foci in Tijuana and in Mexicali (60 cases each). There were 215 cases at Tamaulipas, bordering Texas, with principal foci at Matamoros (40) and at Reynosa (28). Another focus was at Ciudad Juárez (22).

The leprosy frontier problem exists but it is not of great magnitude. The endemic is active and the disease is diagnosed late, when patients are already infectious. Where specific control services exist, these are satisfactory. The Health and Welfare Ministry is considering the creation of mobile services devoted to the promotion, supervision and evaluation of antileprosy activities in northern Baja California, and in the states of Chihuahua and Coahuila. Systematic early and correct notification, as well as early diagnosis and hygiene education, and also the control of contacts, must be encouraged.

E. Agius

55. CAP, J. A. & MULATU, B. La lépre en Ethiopie: situation actuelle, **[Leprosy in Ethiopia.]** *Méd. Trop.,* 1976, v. 36, No. 1, 11-15. English Summary (7 lines).

The estimated number of leprosy sufferers in Ethiopia is between 128,000 and 135,000, of whom about 59,000 are registered. In a population of 24 million, the prevalence rate varies from 0.1–7.0 per thousand, or an overall rate of 2.5 per thousand. Most of the registered patients live in the central, hilly areas, but the higher prevalence rate in these districts may be a reflection of such factors as population density, activity of case-finding teams and the provision of more adequate facilities for treatment. Where the prevalence is low, treatment is given at general dispensaries (1 for 28,000 persons in some areas; 1 for 220,000 persons in others); a special leprosy service is organized in areas where the prevalence is high, each trained medical auxiliary being responsible for the treatment of leprosy patients in from 3–5 centres.

S. G. Browne

56. LOUVET, M., SAINT-ANDRE, P. & BERNARD, L. Epidémiologie de la lèpre en Afrique de l'Ouest. **[Epidemiology of leprosy in West Africa.]** *Méd. Trop.,* 1976, v. 36, No. 2, 121-125. English summary.

According to official statistics in the French-speaking countries of West Africa, there has been little reduction recently in the total numbers of leprosy patients under treatment. Either, then, the excellent and costly leprosy service (inaugurated in 1957) is not as successful as it was thought to be, or the figures are suspect. Basing their conclusions on detailed investigations in mali, and opining that a similar state of affairs would be disclosed in the Ivory Coast, Dahomey, Upper Volta, Niger, Senegal and Togo, the authors suggest that the anti-leprosy campaign has indeed been much more successful than the official figures indicate. Many patients have had treatment for up to 18 years for tuberculoid leprosy; the medical auxiliaries show a reluctance to discharge such patients from treatment, or to place them "on observation without

treatment"; they also have a lackadaisical attitude towards the compilation of reports and the furnishing of statistics; they are, in a sense, "too competent" in their assiduity in giving treatment and too conscientious in continuing treatment. Thus, the total figure of patients under treatment for leprosy in these countries, now officially 437,041 (representing a prevalence rate of 14 per 1000), should be reduced considerably. As a consequence, the medical auxiliaries attached to the leprosy control service could be redeployed and absorbed in the general medical service for the control of endemic diseases, including such activities as treatment of tuberculosis and onchocerciasis and examination of schoolchildren in their daily round, as well as continuing their important case-finding of patients suffering from early leprosy.

S. G. Browne

57. NEBOUT, M. Le traitement ambulatoire des lépreux par la méthode de l'autotraitement. Bilan d'une étude réalisée en République du Tchad de 1966 à 1973. [**The ambulatory treatment of leprosy patients by the "self-treatment" method. A study conducted in the Chad Republic from 1966 to 1973.**] *Méd. Trop.,* 1976, v. 36, No. 2, 147-152. English summary (8 lines).

This enthusiastic and reasoned report provides an excellent summary of the author's programme of "self-treatment". The accepted methods of control of leprosy in the West African countries that were formerly colonies of France consisted mainly of circuits maintained by motor vehicles and/or cyclists. Because of the small number of doctors (1 to 65,000 inhabitants), the inaccessibility of many of the villages, the lack of credits, and the relatively poor results of the leprosy programme then in operation, a district in the Republic of Chad containing about 700,000 inhabitants was selected for the "self-treatment" trial.

A total of 18,412 leprosy patients in this population was placed under treatment. Clinical examinations were performed every 6 months by a competent team of medical auxiliaries headed by a doctor; the bacteriological status was determined (skin smears being obtained from all patients suffering from infectious or potentially infectious forms of leprosy); adequate records were kept; the opportunity was taken for health education talks. The team visited the centres every 3 or 6 months to check the patients gathered by convocation and to distribute packets containing sufficient tablets for a daily dose of dapsone: the dose was 100, 50 or 25 mg, according to body weight. Each team was on the road for 20 days a month, covering an average of 500 km. About 60 leprosy patients a day were seen.

At the end of 7 years of effort along these lines, the prevalence of leprosy had fallen from 32 to 8 per 1000, and the incidence from 0.8 to 0.1 per 1000. A total of 24,418 patients have been discharged, disease arrested, and in 50% of the remainder the disease is no longer considered to be active. Useful comparative tables are included.

[These impressive results in an area of high prevalence and a high proportion of tuberculoid and spontaneously resolving forms of leprosy, may not be automatically reproducible in other situations, but the principles of "self-treatment" merit further application and evaluation.]

S. G. Browne

58. LOUVET, M., SAINT-ANDRE, P. & GIRAUDEAU, P. Place de la chimioprophylaxie dans la prévention de la lèpre. [**Role of chemoprophylaxis in the prevention of leprosy.**] *Méd. Trop.,* 1976, v. 36, No. 2, 153-156. English summary.

In view of the disturbing observation that leprosy appears to be increasing in many countries as their population increases, the possibility of prevention of the spread of the disease should be re-examined. The authors review the role of temporary and voluntary segregation, the use of rifampicin as a mycobactericidal drug in selected situations, the efficacy of dapsone in mass treatment schemes in slowly reducing the size of the reservoir of infection, the need to improve standards of environmental and personal hygiene, the value of BCG vaccination in the control

of tuberculosis and the possibility that it might concurrently and non-specifically enhance resistance to leprosy infection. In a group of 57 children studied in the Bamako Leprosy Institution (Mali Republic) for a period of from 1-10 years (average 2½ years), prophylactic dapsone was considered to be a factor in their remaining entirely free from all signs of leprosy, despite the fact that all were exposed for a long time to a person suffering from lepromatous leprosy in the household—a parent or sib. The dose of dapsone varied from 25-100 mg, weekly. Mention is made of the other factors that undoubtedly played a role in this highly satisfactory accompaniment of sulphone prophylaxis, for example, the drug treatment of the index case, health education, improvement in domestic hygiene. In this group of 57 children, the tuberculin reaction was positive in 28, and the Mitsuda positive in 34; of the remaining 23 children, some were considered to be too young to show their immunological polarity, but in the unknown number in this group who would be persistently Mitsuda-negative, prophylactic dapsone might prevent the development of clinical signs of multibacillary leprosy.

[This study illustrates the difficulty of isolating and evaluating the role of chemoprophylaxis in the prevention of leprosy in an exposed child population.]

S. G. Browne

6. REHABILITATION AND SOCIAL ASPECTS

59. DE SINCAY, B. Attitudes envers la lèpre et son traitement dans une communauté ethiopienne. [**Attitudes towards leprosy and its treatment in an Ethiopian community.**] *Ann. Soc. Belg. Méd. Trop.*, 1975, v. 55, No. 4, 313-320. English summary (5 lines).

The author analyses the responses obtained by oral interrogation (through an interpreter) of a group of 100 patients who presented themselves for diagnosis of leprosy at the Princess Zenebe Work Hospital in Addis Ababa in the months of March and April, 1974.

No fewer than 29 had been divorced by the healthy partner because of their disease, either because of inability to provide the necessities of life (10), or because of fear or shame (10), or because the sick partner wanted to leave the conjugal home in order to seek treatment in Addis Ababa. In general, leprosy entailed a lowering of economic and social standards, and rejection by relatives and friends.

Six patients had been discharged from work. The real motives of 17 patients who declared that they came to Addis to seek treatment may have been a desire to hide their sickness or to leave their homes. Apparently, 25 patients who were married when they came to Addis experienced no rejection on the part of their partners.

The author is uncertain concerning the awareness of the patients of the true nature of their disease, and cites the criteria for diagnosis popularly held, such as obvious deformity of hands and feet. A majority of those interviewed (58) had had no previous contact with Western medicine: traditional healers and Coptic priests or other religious leaders had fulfilled the role of diagnostician and therapist, the prescriptions consisting of natural "remedies", that is burning, the application of leaves, the drinking of infusions, and the like.

Other factors that caused people to postpone seeking medical advice were the demands of their job (usually farming), poverty, and fear of travelling alone.

Women (numbering 31) seemed so tied to their domestic duties that they neglected their personal health.

Town-dwellers were less reluctant than country folk to come to hospital, and those with obvious tuberculoid lesions were more ready to present themselves than those with the potentially more serious forms of leprosy.

S. G. Browne