CURRENT LITERATURE

This department carries selected abstracts of articles published in current medical journals, dealing with leprosy and other mycobacterial diseases. Abstracts are supplied by members of the Editorial Board and Contributing Editors, or are reproduced, with permission, from other abstracting journals.

Clinical Science

Bergel, M. Consideraciones sobre el estado actual de las investigaciones leprológicas. [The present status of leprosy investigations.] Dermatología (Mexico) **13** (1969) 88-92.

The author draws the following conclusions from his experiences of the last 25 years: (1) Leprosy is a disease caused by *M. leprae* acting within an abnormal background of biochemical nature. (2) General and nonspecific processes which depress immunologic responses to bacterial infections, interfere with positive inoculations of *M. leprae* in animals. (3) Leprosy is more a metabolic or nutritional disease than a common infectious disease. (4) Chemotherapy against leprosy seems to provoke a general and nonspecific modification of the "leprosy background." Sulfones act not on *M. leprae* but on this "leprosy background." (5) Every compound with a biological antioxidant activity must have an antileprous action. Vitamin E and sulfones are good example of this. Leprosy could be prevented by giving biologic antioxidant compounds to a large population. Every experimental study in leprosy will fail if alterations of the biochemical leprosy background, which are the basis of all cases of the disease, are not taken into account.—A. SAÚL

Chaudhuri, S. K. and Ghosh, S. Thorn test in leprosy. Bull. Calcutta Sch. Trop. Med. **16** (1968) 121-122.

The Thorn test is a convenient screening laboratory procedure to assess the functional activity of the suprarenal cortex. In this study 55 cases of different types of leprosy, none receiving steroid therapy were subjected to the Thorn test, and eosinophilic depression suggestive of functional impairment of suprarenal cortex was observed in 14 cases, 5 of 20 tuberculoid reactive, 8 of 20 lepromatous, and 1 of stable tuberculoid leprosy. The authors do not think these results permit a valid conclusion about suprarenal involvement, suggesting further study before a precise assessment can be made.—G. L. FITE

Delgado Camacho, J. R. *et al.* Lepra tuberculoide. [Tuberculoid leprosy.] Rev. Cubana Med. **7** (1968) 323-333.

The authors classify tuberculoid leprosy as (1) macular, (2) minor tuberculoid, (3) major tuberculoid, or (4) a purely neural variety. Histologically, a type characterized by early formation of tuberculids, 1 of a follicular type (with nodules consisting of an accumulation of epithelioid cells amongst which giant cells surrounded by lymphocytes are seen) and 1 sarcoidal in character are met with. This last is so-called because of its resemblance to the Schaumann-Boeck sarcoid being formed almost solely of epithelioid cells. In tuberculoid leprosy no bacilli are seen with normal methods, but are being found in increasing numbers of patients using the Khanolkar technic, which adopt fluorescent staining methods.—(*From* abstract by E. Agius. *Trop. Dis. Bull.* **67** (1970) 175)

Sabin, T. D. Preservation of sensation in a cutaneous vascular malformation in lepromatous leprosy. New England J. Med. **282** (1970) 1084-1085.

A case of leprosy is reported in which a palmar congenital vascular malformation was spared neurologic involvement, although sensation to pinprick was lost over much of the body surface. The temperature in this area as measured by thermography was 7°C warmer than in adjacent parts. The author suggests that the increased vas-

cularity with the increased skin warmth created a relatively unfavorable site for growth of bacilli.—G. L. Fite

Toma, J., Kuninaka, K., Kakihana, Y., Takasu, N., Katuren, S. and Harada, N. The incipient signs of leprosy patients in Miyako Nanseien Leprosarium. La Lepro **38** (1969) 153-161. (In Japanese, English summary).

The results are shown in 4 tables. Notable findings were (1) Fewer lepromatous cases proportionately were found than in the interior of Japan, as well as an average younger age. (2) Most cases began during adolescence, many appearing before 10 years of age. (3) Flat hypesthetic and hypopigmented patches were the most prominent early lesion. Only a few cases began as frank lepromatous. (4) Early lesions appeared on the face, lower limb, upper limb, buttocks, and trunk, in this descending order.—Authors' summary.

Carayon, A., Maydat, L., Bobin, P. and Blin, F. Investigations de sept gynécomasties chez le lépreux africain. [A study of 7 cases of gynecomastia in African patients with leprosy.] Bull. Soc. Med. Afrique Noire Lang. Franc. **14** (1969) 498-506.

By means of the lymphographic technic that they have developed, the authors visualized the testiculo-funicular lymphatic vessels in 7 patients who had gynecomastia and long-standing lepromatous leprosy. They were able to demonstrate some degree of lymphatic stasis in these vessels in all the patients. The associated noninflammatory edema of the Leydig cells, accompanied by the specific leprosy lesions in the testis itself, is held to provide an adequate pathologic explanation of the hormonal imbalance that results in gynecomastia in leprosy.—*Abstract by* S. G. Browne. *Trop. Dist. Bull.* **67** (1970) 419)

Modi, T. H. and Lele, R. D. Acute joint manifestations in leprosy. J. Assoc. Phys. India **17** (1969) 247-154.

This paper opens with a description of the ways in which acute joint involvement may occur in leprosy, then the literature on the subject is reviewed, and finally, the authors describe the types of joint disorder encountered in a study of 2,500 patients with leprosy of all types examined between March and December 1965. The incidence of joint manifestations was 1.08%. The paper is illustrated by 10 photographs.—(*Abstract by* W. H. Jopling. *Trop. Dis. Bull.* **67** (1970) 419)

Locke, S. Dimorphous leprosy. Case 21-1970. Case records of the Massachusetts General Hospital. New England J. Med. **282** (1970) 1144-1152

Although the case reported (of dimorphous leprosy) would hold no unusual interest to the leprologist, it was complicated by neurologic changes suggesting a little understood motor neuron disease prevalent in Guam. Still more interesting in this report are the discussions of Dr. Simeon Locke on the role of the Schwann cell alterations in relation to the clinical signs of sensory and motor neural damage.—G. L. Fite.

Chemotherapy

Saul, A. and Barcelata, R. Ethambutol en el tratamiento de la lepra. Resultados del tratamiento de 20 pacientes durante 12 meses. [Ethambutol in the treatment of leprosy. A twelve-month trial in 20 patients.] Dermatología (Mexico) **13** (1969) 152-159.

This preliminary trial of ethambutol involved the treatment of 20 leprosy patients: 16 lepromatous, 3 tuberculoid and 1 borderline. A single daily dose of 800 mgm. was given to all patients for 6 months in tuberculoid cases and for 12 months in the lepromatous. Complete regression of tuberculoid lesions was observed after 6 months of treatment. In lepromatous cases improvement began after the first 15 days followed by flattening and atrophy of nodules, and healings of ulcers. At 12 months

clinical cure was evident in 4 cases, improvement in 3 and relapse in 5. Although bacteriologic changes were observed in all patients, smears remained positive in 9 cases after 12 months. Histologic modifications were also noted. Neither lepra reaction nor side-effects were observed. Ethambutol seems to work more quickly than other drugs, but the evidence of bacillary resistance suggests need for further trials.—A. SAÚL

Rodríguez, E., Ramírez, J. and Yambay, J. Talidomida en reacción leprosa. [Thalidomide in lepra reaction.] Dermatología (Mexico) **13** (1969) 147-151.

In the first experiences in Paraguay in the management of lepra reaction with thalidomide, surprising results were obtained with doses of 100 mgm. daily for the first two days, followed by a dose of 25 mgm. per day. When the drug is withdrawn mild recurrences of the reaction become manifest within 10 days. Specific treatment can be continued while the patient receives thalidomide. —A. SAÚL

Gomez-Calvillo, J. J. N-Ftaliliglutarimide en el tratamiento do la reacción leprosa. [Thalidomide in the treatment of the lepra reaction.] Thesis, University of Mexico, 1968.

Thalidomide in an initial dose of 200 mgm. per day in 18 patients proved to be the preferred drug in the treatment of the lepra reaction.—A. SAÚL

Barba-Rubio, J. Derivado de la Fenazina (G 30320) en el tratamiento de la reacción leprosa. Informe preliminar. [A derivative of phenazine (G 30320) in the treatment of lepra reaction. Preliminary port.] Dermatología (Mexico) **131** (1969) 270-280.

This drug in daily doses from 100 to 300 mgm. was administered to 10 patients with lepra reaction who did not tolerate specific treatment. The drug had to be discontinued in 1 patient because of gastric intolerance and in another because of exacerbation of the reaction. Seven patients continued the treatment with satisfactory results; in 3 the reaction subsided and specific therapy was resumed in 4. The results were classified as "good." Hyperpigmentation caused by the drug limited its use but could be avoided by smaller dosage. The author concludes that new drugs for the control of the lepra reaction need to be investigated carefully, because the problem is not easily resolved.—A. SAÚL

Guilaine, J., Sterin, D., Despres, E. and Lesobre, R. Lèpre tuberculoide traitée par Rifampicine. [Tuberculoid leprosy treated by Rifampicin.] Bull. Soc. franc. Dermat. et Syphilig. **76** (1969) 749-750.

An African suffering from minor monomacular tuberculoid leprosy and primary pulmonary tuberculosis was treated with a daily dosage of 300 mgm. of Rifampicin orally. After two and a half months the leprous lesion was improved. Corticosteroid treatment was associated with the therapy for 3 weeks. A discussion follows in which it is noted that Kanamycin and Novobiocin are equally effective in leprosy.—P. HARTER

Warren, A. G. The use of B.633 (clofazimine) in the treatment of Chinese leprosy patients with chronic reaction. Leprosy Rev. **41** (1970) 74-82.

Over a period of 2 years B.663 has successfully controlled chronic lepra reaction in its various forms in Chinese patients. At the same time it has obviously acted therapeutically, assisting in the elimination of the disease. The trial concerned 30 patients, and the optimum dose varied with the type of leprosy and the severity of the reaction. It must be adjusted for each individual, and can be adjusted so that neuritis does not occur, even in patients who were previously neuritis prone.—AUTHOR'S SUMMARY

Karuru, E. R. Clinical evaluation of Lamprene (Geigy). A preliminary report. Leprosy Rev. **41** (1970) 83-88.

The trial confirms that Lamprene (clofazimine) is the most valuable new drug to be introduced into the treatment of leprosy since dapsone. Of 18 patients suffering from all types of leprosy who

were treated with Lamprene for 12 months, 6 had received no previous treatment, while the remaining 12 had proven intolerant or resistant to other forms of therapy. One patient responded poorly, but all the others improved during therapy, the response having been dramatic in several cases. Clofazimine is not a miracle drug, as shown by the fact that no patient's disease was arrested after 12 months of continuous therapy, and is undoubtedly an excellent substitute in patients with erythema nodosum or in those unable to tolerate dapsone. —AUTHOR'S SUMMARY

Shepard, C. C. Minimal effective doses in mice of clofazimine (B.663) and of ethionmide against *Mycobacterium leprae*. Proc. Soc. Exper. Biol. & Med. **132** (1969) 120-124.

This article presents important data to justify treating leprosy patients with "spaced ingestion" (*e.g.*, monthly doses) of clofazimine (B. 663, Lamprene), or with much smaller doses than are currently used, which may avoid the distressing skin pigmentation accompanying clofazimine therapy in light-skinned people. The experiments were carried out in mice inoculated in the foot pad with 5,000 *M. leprae*, then fed diets containing the drugs. Ethionamide evidently exhibited a bacteriostatic action only. In mice receiving 0.01% clofazimine the characteristic pigment could still be found in the foot pad tissues 219 days after the drug was discontinued.— (*From* abstract by C. S. Goodwin. *Trop. Dis. Bull.* **67** (1970) 522-523)

Rees, R. J. W., Pearson, J. M. H. and Waters, M. F. R. Experimental and clinical studies on Rifampicin in treatment of leprosy. British Med. J. **1** (1970) 89-92.

Rifampicin showed high activity against experimental leprosy, inhibiting the multiplication of dapsone-sensitive and dapsone-resistant strains, of *M. leprae* in mice fed 5 mgm./kgm. body weight. In a formal pilot-type trial on 6 previously untreated patients with active lepromatous leprosy, Rifampicin (600 mgm. daily by mouth) was as effective as standard treatment with dapsone. *M. leprae*, however, appeared to be killed more rapidly by Rifampicin than by dapsone or other antileprosy drugs so far studied. This was confirmed on another 10 patients, including 2 with dapsone resistance, and from the infectivity in mice of bacilli recovered from patients during treatment with Rifampicin or dapsone. These results are consistent with the bactericidal activity of Rifampicin against other microorganisms, which could be important to the chemotherapy of leprosy, since all antileprosy drugs in current use are bacteriostatic. The final place of Rifampicin alone or in combination with other antileprosy drugs must await more knowledge gained from larger and long-term studies.— AUTHORS' SUMMARY

Kunigoshi, U. A preliminary report of 2-mercapto-3-hydrazinoquinoxaline (MH-Q) in the treatment of leprosy in Cambodia. La Lepro **38** (1969) 186-190. (In English)

This compound, synthesized by Asano in 1957, was used topically in an ointment base in 10 cases. Although only a small number of patients were treated, the disappearance of infiltration, redness, pigmented spots and swellings could be observed in a relatively short time. Smaller nodules became flat in 1 to 2 months. No accompanying dermatitis was observed during the 6-month trials.— (*From* author's summary)

Gatti, J. C., Cardama, J. E., Baliña, L. M., Crespi, H. G., Bianchi, O., Santabaya, E., and Farina, M. H. Treatment of leprosy with a phenazine derivative (B.663 or G 30 320)-clofazimine. Leprosy Rev. **41** (1970) 89-92.

Thirty-five patients with various clinical forms of leprosy were treated with B.663 (clofazimine) for 4 to 13 months. An excellent clinical results was obtained together with both histologic and bacteriologic improvement, on a dosage of 100 mgm. a day. Reactions were absent at this dosage and the drug was tolerated perfectly. Brief reactive episodes occurred in patients given 300 mgm. daily, which subsided with thalidomide administration. The reactions

did not reappear when treatment with 100 mgm. daily was resumed. —AUTHORS' SUMMARY

Kneedler, W. H. Griseofulvin in leprosy. Leprosy Rev. 41 (1970) 105-106.

A double-blind trial of griseofulvin as an adjunct to the standard treatment of 43 patients with lepromatous leprosy (compared with 50 similar patients receiving a placebo) provided no evidence that the addition of griseofulvin accelerated bacillary clearance, or resulted in more rapid clinical improvement than was to be expected.—AUTHOR'S SUMMARY

Surgical Treatment and Surgical Specialties

Matsuda, H. Charcot-like changes in leprosy. La Lepro 38 (1969) 167-180. (In Japanese, English summary)

Joint changes similar to those of the "Charcot's joint" are seen in leprosy mostly in the foot and ankle, rarely in other joints, and were observed in 38 cases. Three showed total destruction of tarsal bones, 19 involved the ankle joint, 4 affected the subtalar joints, 8 involved Chopart's and 4 Lisfranc's joint. Proliferative bone changes are rarely observed, and the articular surface of the tibia is not damaged, perhaps helping to maintain the stability of the foot, even though roentgenograms show destruction of the navicular bone and the calcaneus. Destruction of the cuboid bone in Lisfranc's joint may result only in pes valgus and planus deformity, with retention of good stability of the foot.—(*From* author's summary).

[The editor of this department wishes to remind students of leprosy that "Charcot-like" is a phrase devoutly to be avoided, retained here only because it occurred in the English title. Jean Martin Charcot never resembled a joint, and no joint resembles him. Charcot's joint (tabetic osteoarthropathy) continues to be eponymically a convenience, but that is all.—G.L.F]

Warren, A. G. A foot drop spring. Leprosy Rev. 41 (1970) 101-102.

A simple coil spring runs from the dorsum of the shoe to a suspension upper leg cuff, acting as a functional support to allow normal walking in the presence of foot drop.—AUTHOR'S SUMMARY

Pathology

Saúl, A.; Rodríguez, O.; Novales, J. and Navarro, E. Histopatología de la leprominorreacción a las 4 horas. Correlacion entre la presencia o ausencia de bacilos y la clasificacion de los casos. [A histopathologic study 4 hours after injection of lepromin. Correlation between presence or absence of bacilli and the classification of cases.] Dermatología (Mexico) 13 (1969) 301-308.

A group of 42 patients with leprosy and 10 with dermatoses other than leprosy were subjected to intradermal injections of 0.1 cc. of integral lepromin. Four hours later biopsy of the site of injection was made to determine the presence of *M. leprae*, and to correlate this with clinical, histologic and immunologic data. This study seems to prove our previous hypothesis. In tuberculoid cases with high tissue immunity toward *M. leprae*, bacilli were absent within four hours after injection. In lepromatous patients intact bacilli were present, which had not been phagocytized. The peculiar impairment of delayed hypersensitivity of these cases could explain this observation, and it is probable that prolonged treatment modifies in some way the immunologic status. The presence of bacilli in indeterminate cases is in accordance with their lepromatous status. The authors think that this simple and practical procedure should help to classify difficult cases, and adds another

approach to understanding the complicated immunology of leprosy.—AUTHORS' ABSTRACT

Vaidya, M. C., Palmer, E., Weddell, G. and Rees, R. J. W. A note on the presence of *Mycobacterium leprae* in the central nervous system of a mouse with lepromatous leprosy. Med. Microbiol. **3** (1970) 194-196.

Results of a histopathologic study of the tissue of a mouse experimentally infected with *M. leprae* indicate that leprosy bacilli can cross the blood-brain barrier and multiply in the brain and that they gain access to ganglion cells by a hematogenous route. The findings are discussed with reference to lepromatous leprosy in man and the use of the thymectomized-irradiated mouse as a model for the study of the disease.—AUTHORS' SUMMARY

Coudert, J., Lu Huynh Thanh, Perrot, R., Souvanthavong, R. and Desessard, D. Lésions anatomiques obtenues chez les animaux de laboratoire avec deux souches de "mycobacterium" isolées des lèpromes. [Anatomic lesions induced in laboratory animals with two strains of mycobacterium isolated from lepromas.] Bull. Soc. franc. Dermat. et Syphilig. **76** (1969) 897-898.

Two strains of bacillus A.A.R. isolated from leprous patients and adapted to solid medium culture were inoculated in rodents. Lesions similar to those of human leprosy became evident. The antigenic capacity of these strains toward the serum of leprous patients appears important.—P. HARTER

Rupec, M., Korb, G. and Behrend, H. Feinwebliche Untersuchungen zur Entwicklung des positiven Kveim-Tests. [Histologic investigation of the positive Kveim test.] Archiv. klin. exper. Dermat. **237** (1970) 811-818.

The different phases of development (on the 3rd, 10th, 20th, 40th and 60th days) of the positive Kveim test have been investigated using the light microscope. The authors found marked correlation between the pregranulomatous and granulomatous stages of the Kveim test and the same stages of spontaneously developed epithelioid cell granulomata in sarcoidosis. The applicability of this test in the study of the development of the sarcoidosis granuloma is emphasized.—AUTHORS' SUMMARY

Panikarovsky, V. V., Grigoriyan, A. S. and Busygina, M. V. Histochemical characteristics of leprous lesions of the buccal mucosa. Vest. Dermat. i Venerol. **44** (1970) No 4 32-38.

When the buccal mucosa is affected in the lepromatous process, elements of the connective tissue undergo destruction, particularly fibrillar structures. At the peak of the process fragmentation and lysis of collagen fibers are observed. The remaining fibers are irregularly oriented, and acquire argentophilia. Proliferation of lymphohistiocytic elements is noted. Leprous cells representing derivatives of the histiocytic series possess all the characteristics of macrophages which have the structure and histochemically detectable properties specific for leprous formations. Involvements of the walls of blood vessels is considerable, even though this process in specific granulomas is frequently overlapped by intensive formation of new vessels of the capillary type. In those cases where lepromatous foci occur in the immediate proximity to the epithelial lining or involve it in the process, destruction of the basal membrane is observed. Epithelial cells often undergo necrosis, with ulceration.—(*From* authors' abstract)

Khalimanchuk, I. M. Fermentative splitting of antileprous preparation solusulphone by the homogenate of albino rats liver. Voprosy dermato-venerol. (Kharkov) (1969) 36-37.

In the liver of intact and experimental albino rats there is a ferment system which catalyzes the splitting of Solusulphone with deblocking of the amino group which is substituted in this preparation by an aromatic radicle. It was also found that with long use of Solusulphone the activity of this ferment system increases significantly, and pH optimum moves to the acid side.—N. TORSUEV

Bacteriology and Immunology

Potier, J. C. Étude sur la transformation lymphoblastique des lymphocytes de lépreux provoquée par broyat de lèprome murin. [Study of lymphoblastic transformation of lymphocytes of leprosy patients by minced murine leproma.] Bull. Soc. Path. exot. **62** (1969) 987-992.

The author's study is based on the capacity for blastic transformation of the lymphocyte when exposed to an antigen to which the patient is sensitized. The author placed different leprosy sera in contact with a mince of murine lepromas. The reaction proved negative in tuberculoid leprosy, and when patients were under treatment with chloroquine or prednisolone. In lepromatous leprosy the reaction was positive, with blastic transformation values ranging from 4.5% to 10%.—P. HARTER

Merklen, E. P. and Cottenot, F. Présence d'anticorps dans les sérums de lépreux. [Presence of antibodies in the sera of leprosy patients.] Bull. Soc. Path. exot. **62** (1969) 982-987.

From a study of serodiagnosis by immunofluorescence with the Stefansky bacillus in 700 cases, the authors confirm the value of the reaction in nontreated cases, especially in bacilliferous forms. The positivity limit permits a positive diagnosis up to a serum dilution of at least 1:128. Detection of leprosy antibodies by passive sensitization of the terminal ileum of rodents is based on 22 cases. Terminal ileums of rodents were sensitized passively by exposing them to the suspected human serum. In cases of positive reaction a second addition of ground murine leproma caused a contraction (Schultz-Dale phenomenon).—P. HARTER

Zweiman, B. and Phillips, S. M. *In vitro* lymphocyte reactivity during depression of tuberculin hypersensitivity by 6-mercaptopurine. Science **169** (1970) 284-285.

Administration of 6-mercaptopurine suppressed appearance of tuberculin skin test reactivity for up to 6 weeks after mycobacterial injection. Lymphocytes obtained during the period of suppressed tuberculin reactivity exhibited normal *in vitro* proliferative responses to tuberculin, suggesting that the drug may not be qualitatively affecting function of immunologically competent cells.—AUTHORS' SUMMARY

Achimastos, A., Tolis, G., Papadopoulos, G. and Kouzoutzakoglou, K. Occurrence of biologic false positive reactions with RPR (circle) card test on leprosy patients. Publ. Hlth. Rept. **85** (1970) 66-68.

The rapid plasma reagin (RPR) card test is a precipitin test for syphilis introduced in 1962. The authors' observations with this test in a series of leprosy patients indicate that it has the same disadvantage of other precipitin tests for syphilis in that it shows biologic false positive reactions in patients with leprosy.—G. L. FITE

Choudhuri, S. K. and Ghosh, S. A comparative study of tuberculin and refined lepromin in leprosy. Bull. Calcutta Sch. Trop. Med. **17** (1969) 11-12.

Postive correlation between tuberculin and lepromin tests was observed in 58% of tuberculoid group, in 12% of lepromatous group and in 31% of healthy persons. From the above observation it appears at the first glance that cross sensitization exists only in tubeculoid cases but among 40% of the tuberculoid group, in 12% of lepromatous group 38 cases were lepromin positive. Moreover there is not much variation in the percentage of tuberculin reactivity among leprosy patients and normal population. So it tends to indicate that there is no appreciable cross-sensitization between the two tests, tuberculin and the lepromin.—AUTHORS' SUMMARY

Nakamura, M. Factors affecting elongation of *Myc. lepraemurium in vitro*. La Lepro **38** (1969) 162-166. (In Japanese, English summary)

Factors affecting elongation of *M. lepraemurium in vitro* were investigated by

slide culture method, and the following results were obtained: The most important factor influencing elongation of the bacilli *in vitro* was acid (pH 6.0) in the culture fluid. Bovine serum was the best stimulator of elongation but glycerine and sucrose also enhanced elongation. Among the substrates of the Krebs cycle tested, l-malic stimulated the elongation phenomenon. Among the metabolic inhibitors employed, only malonate did not inhibit elongation of the bacilli. From these results obtained, it might be presumed that the Krebs cycle would be needed for the elongation phenomenon, but probably there were other pathways. The log phase of elongation of the bacilli was between 3 and 6 days after incubation. Elongation was inhibited by antibiotics.—AUTHOR'S SUMMARY

Nakamura, K. and Hisai, S. Multiplication of *M. leprae* in the hind foot-pad of golden hamsters. A comparison with the results of *M. leprae* in the mouse foot-pad. La Lepro **38** (1969) 147-152. (In Japanese, English summary)

The inoculum was approximately 10^4 bacilli per foot pad. Cortisone was given intramuscularly into each hind leg of the hamsters in the daily dosage of 7.0 mgm. for 6 days beginning at the first, or 17th day, and 11 weeks after the inoculation. First passage in the hamster showed counts of acid-fast bacilli similar to those seen in the mouse foot pad at late stages but the number of *M. leprae* in the hamster was greater than that in the mouse at approximately 20 weeks after inoculation. Second passage (hamster to hamster and hamster to mouse examined at the 24th week) showed counts of acid-fast bacilli similar to those of the passage. The number of *M. leprae* in the hamster foot pad rose to a plateau level of approximately 10^6 bacilli. The number of bacilli in the cortisone-administered hamster rose to a plateau level at an earlier stage after the inoculation.—(*From* authors' summary)

Rees, R. J. W. and Weddell, G. Transmission of human leprosy to the mouse and its clinical implications. Trans. Roy. Soc. Trop. Med. & Hyg. **64** (1970) 31-47.

The authors' summary states that an account is given of the transmission of human leprosy to mice and the development of models for studying the disease. There is rather more to the exposition than this would suggest, especially in the examples presented of the application of mouse foot pad infections in research. Under a section on experimental and applied chemotherapy, experiments on susceptibility and resistance of *M. leprae* to dapsone are illuminated, and applications of the methods to the investigation of Rifampicin are presented. The striated muscle fiber as a vehicle for the growth of the leprosy bacillus is shown, and the mechanisms by which bacilli invade and injure peripheral nerves are illustrated. Only 10 years old now, the usefulness of Shepard's 1960 demonstrations are clearly demonstrated.—G. L. FITE

Karat, A. B. A. The growth of *Mycobacterium leprae* in the foot pads of Swiss white mice (Rockefeller strain) without constant thermoregulation. Leprosy Rev. **41** (1970) 93-99.

A preliminary report of the successful adoption of Shepard's technic for obtaining multiplication of *M. leprae* in the foot pads of mice in Karigiri, India, is presented. The lack of thermoregulatory devices and the seasonal and diurnal fluctuations of temperature in the animal laboratory did not materially affect the "take" rate. The histologic sections have confirmed the findings of "foot-pad" harvests. Significant multiplication of the organism in the foot pads was obtained with inoculum containing less than 1% solid organisms (according to Shepard's technic) in some of the experiments, suggesting that multiplication of the bacilli in the foot pads is a sensitive index of viability of these organisms. A tentative figure for generation time has been computed, which is found to be on an average longer than those reported by Shepard and by Rees. The longer generation times thus observed may be in part, or wholly, related to the fact that the majority of the harvests were probably carried out in the plateau phase rather than the logarithmic phase of the growth curve.—G. L. FITE

Epidemiology and Prevention

Bechelli, L. M. *et al.* BCG vaccination of children against leprosy. Preliminary findings of the WHO-controlled trial in Burma. Bull. WHO 42 (1970) 235-281.

The interest of the World Health Organization in this matter began in 1952 and, following the recommendations of certain advisory committees, it was decided to institute a field trial in Singu township in Burma. The main purpose of the investigation was to observe, in a highly endemic area the protective effect, if any, of BCG vaccine against leprosy in the child population not exposed to *M. leprae* at home but possibly exposed to the infection elsewhere. Field operations began at the end of August 1964 and the preliminary findings obtained up to the end of June 1968 relate to 3 annual reexaminations. So far, from the material studied, it appears that, under the conditions prevailing in Singu township, no significant effect of BCG vaccine can be seen within a period of 3 years. When children in both trial groups are followed-up for much longer periods, mainly children aged 0-4 years at intake, it is possible that a significant difference may emerge. However, to be operationally desirable, a merely significant difference is not enough; the protective effect of BCG should be substantial to warrant its large-scale use as an immunization procedure against leprosy.—AUTHORS' SUMMARY

[Although labelled preliminary findings, this is actually a fairly comprehensive account of the Burma WHO study, which permits comparison with the Uganda and Karamui trials. These latter differ in methodologies to a degree that makes exact comparison impossible, one significant difference being the populations included in the immunization campaigns. Differences in findings between these three main trials of BCG vaccination are discussed, and an appendix provides the technical outline used in Burma. Twenty-five tables and 4 figures are available for the statistically-minded reader, who might prefer to analyze the results for himself, at best an engrossing task, and at least a puzzling one.— G. L. FITE]

Lubusquiere, R. La lutte contre la lèpre en Afrique centrale. [Leprosy control in central Africa.] Acta Leprol. N.S. **No. 36** (1969) 5-18.

The thesis developed by the author in this paper is that, in the ex-French colonies of central and west Africa, experience during the past 15 years demonstrates conclusively that leprosy can be controlled and that the numbers of new infections show a progressive reduction. He supports this contention with sober statistics drawn from the 5 countries comprising the French-oriented Union, in which high prevalence rates (above 10% in some districts, and 45% in some villages) and dispersal of the population presented a challenge to the public health administrator and the mobile leprosy teams. The total population covered in the report is about 10 million; 165,576 patients were under treatment for leprosy at the end of 1968, 41,335 having been discharged "disease arrested" since the beginning of the campaign. For the last 2 years, the number of new infections registered is about a third of those discharged. Attention is drawn to the two countries (Cameroun and Gabon) whose progress lags far behind that of the other three, and the valid explanation is offered that these two have failed to adopt modern methods of mass control.

[This paper is both salutary and reassuring. It provides evidence to support the thesis that leprosy can be controlled in the environment of central and west Africa, where despite inherent difficulties of communications and scattered populations, mass treatment measures can be applied persistently by supervised teams of medical auxillaries. It is salutary in the sense that these results can be paralleled by extremely few leprosy control projects in those populous countries where the prevalence of leprosy is high, where the lepromatous/tuberculoid ratio is also high, and where prejudice against leprosy is greater. The local success registered in populations

totalling 10 millions does not unfortunately invalidate the far from optimistic conclusions based on much larger figures from countries where only 1 in 5 of those with leprosy are at present able to get treatment. S.G.B.]—(*Abstract by* S. G. Browne. *Trop Dist. Bull.* **67** (1970) 418-419)

Gomez-Vidal, M. Lucha contra la lepra. Cinco anos de experiencia con trabajo movil. [Leprosy control. Five years experience with mobile units.] Dermatología (Mexico) **13** (1969) 331-336.

Attention must be given to leprosy as a problem of all the world. The control effort must be planned according to local or regional conditions and needs. Prejudice, ignorance and drastic measures are historically related to the disease. Leprosaria maintain the idea of compulsory isolation. Integration of leprosy work into general medical services is a precious goal but such an abrupt introduction would be an epidemiologic paradox. Mobile teams are a valuable arm in the control of leprosy in rural areas, where they are effective in detecting early cases.—A. SAÚL

Jaso-Corti, E. La lepra en el estado de Tamaulipas, México. [Leprosy in the State of Tamaulipas, Mexico.] Proc. IV Mexican Congr. Dermatology, Tampico, Mexico 1967, pp. 37-43.

Prevalence of leprosy in Tamaulipas was 0.09/1,000 until 1960, but new cases have been detected especially in Matamoros and Tampico. The capital city on the United States border had in 1960 only 30 cases registered, but in the last 6 years, 31 new cases have been reported. Nine patients are in Reynosa and 60 in Tampico and Madero. Leprosy is increasing slowly in the state of Tamaulipas partly because of the little interest paid by public health authorities and partly because only a few dermatoleprologists practice in the state, who can detect early cases and direct proper treatment and control.—A. SAÚL

Yew, K. K. Leprosy in Singapore: a survey of this disease between the years 1962-1967. Singapore Med. J. **10** (1969) 194-197.

In the 6 years of this study 1,358 patients were registered at the Government Skin Clinic. Of the 1,358 patients 510 were classified as positive (lepromatous 287, borderline dimorphous 77, and reactional tuberculoid 146), and 848 as negative (tuberculoid 460, neural 192, and indeterminate 196). Prevalence rates among the Indian and Pakistani members of the community were nearly twice those among the Chinese, and five times among the Malays where it was 1:23,300. The real prevalence may be much higher than the figures suggest, or even different according to racial origin, because contact examinations are often restricted.—(*From* abstract by S. G. Browne. *Trop. Dis. Bull.* **67** (1970) 515-518)

Vicente, G., Alonso, H. and Moliner, R. Importancia de las grandes enfermedades transmisibles en la sanidad pública de Guinea Ecuatorial y su relación con las grandes compañas de masas. [Public health significance of the main transmissible diseases of Equatorial Guinea and its relation to mass campaigns.] Med. Trop. (Madrid) **44** (1968) 282-297.

The campaign against leprosy is well organized and surveys of the population are carried out regularly. There is a central dispensary for leprosy control in Micomeseng in Río Muni where patients are screened and further disposal determined. Attached to this are a leprosarium and a children's department in which all children born in the leprosarium are kept under observation for at least 5 years. In the whole territory 4,649 new cases were diagnosed between 1938 and 1953 and 888 between 1957 and 1966. The incidence of leprosy is greatest in the continental region and Fernando Póo is the least infected area. In Río Muni the incidence is greater in the interior than in the coastal area.—(*From* abstract by H. J. O'D Burke-Gaffney. *Trop. Dis. Bull.* **67** (1970) 369-371.

Tin Shwe. Leprosy in Burma. Leprosy Rev. **41** (1970) 121-125.

From 1956 onwards, UNICEF has

helped the leprosy campaign with equipment and transport. In 1964-1965 the following 3 organizations assisted the Burma Leprosy Control Programme by contributing $150,000 (U.S.) through WHO to pay for additional staff over a period of 5 years, namely: (1) International Committee for Assistance to Leprosy of the Order of Malta, (2) Committee of Emmaus Suisse (Switzerland), and (3) Deutsches Aussätzigen Hilfswerk (Germany). A 5-year program (1963-1968) was drawn up for leprosy control throughout the country. In July 1966, the Burmese Government established 2 leprosy hospitals (after nationalizing leprosy asylums in Rangoon and Mandalay) to serve as the main centers of the campaign. The leprosy control work in Burma, which has now been expanded to 34 project areas covering almost the whole of Burma, is under the Assistant Director of Health Services, Rangoon. The main objects of these field units are to discover new cases of leprosy and to provide regular treatment for all registered patients either through leprosy clinics or by house-to-house visits. By March 1968, 181,524 leprosy patients had been registered, of whom 172,616 (or 76% of the then estimated total number of patients in Burma) were under regular treatments; 85% of them are in the rural areas, where the bulk of the population lives.—G. L. Fite

Drake, A. H. "Mobile" leprosy control in the Eastern Province of Zambia. I. Planning and operation of treatment circuits. II. Landrover modification for dapsone injections and clinical examination. Leprosy Rev. **41** (1970) 107-114.

There is need for a strong, practical built-in unit for giving drugs by injection, in relation to rural circumstances. This need would become even more important if "depot" injections of sulfones were to come into general use in appropriate regions. The hope is expressed that the prototype of equipment described in detail in these back-to-back articles may lead to a perfected unit for "mobile" injection purposes.—(*From* author's summary)

McDougall, C. and Drake, A. H. "Mobile" leprosy control in the Eastern Province of Zambia. III. Impressions of the first year of a joint campaign by the Zambian Department of Health and the British Leprosy Relief Association (Lepra). Leprosy Rev. **41** (1970) 115-125.

One year after the start of this joint project, 2 of 3 leprosaria in the Province have been closed, attendance rates have improved very greatly, and remarkable changes in statistical information have been revealed. As the second year of the work proceeds plans are being made to extend the work into another Province, Luapula. Within the framework of the plans are thoughtful considerations of (1) an estimate of the leprosy prevalence in the Province and a further definition of the overall size of the leprosy problem, and (2) the total reintégration of leprosy control into the general medical services before the end of the third year of operations—(*From* authors' summary)

Browne, S. G. Leprosy. An imported disease, Trans. Roy. Soc. Trop. & Hyg. **64** (1970) 223-227.

The leprosy register at the Department of Health of the Minister of Social Security of Britain showed 343 patients, of whom 212 were considered quiescent and 109 to have active disease. Only about 10% at any one time will be confined to a hospital. Most are treated by general practitioners or dermatologists. The resources of the National Health Service stand in favor of the individual patient for medical and surgical treatment, social assistance, and prostheses. The questions of the significance to Britain of these cases of an infectious disease are raised, receiving conservative answers.—G. L. Fite

General and Historical

Aceves-Ortega, R. La lepra en Jalisco. Reseña histórica y bibliografica. II Parte. [Leprosy in Jalisco. Historic and bibliographic review. II Part). Dermatología (Mexico) **13** (1969) 167-190.

The second part of this documentary deals with the geography of Jalisco and its history in relation to that of the whole country. (Part I. IJL **38** (1970) 109-110). Jalisco measures 81,058 square kilometers and the current population is 2,245,000, most living in the capital, Guadalajara. The first inhabitants were Otomi Indians and, later the Olmecas, Cokas, and Tepehuanes. At first this region was known as Chimalhuacan Atenco and at the time of arrival of the Spaniards there were four groups or Heuitlatoanazogos: Tonala, Volima, Xalisco and Aztatlan. The first Spaniards to arrive were Cristobal de Olid and Alonso de Avalos. Nuno de Guzman subjugated the country with his characteristic cruelty and the whole region became known as Nueva Galicia. Guadalajara was its capital. After several relocations Guadalajara flourished and became the principal and great city of the West in the then vast district of Nueva Galicia. The hospitals of this colonial period were San Juan de Dios and San Miguel. This part of the country played an important role in the Mexican struggle for independence, which was achieved following the revolution of 1810.—A. Saúl

Aceves-Ortega, R. La lepra en Jalisco. III Parte. [Leprosy in Jalisco. Part III.] Dermatología (Mexico) **13** (1969) 281-300.

The publications concerning leprosy in Jalisco range from the first information contained in the work of Muriel, who wrote about the patients in the Hospital of Belen, to other references by Lyon, Casillas, Casteneda, De la Pascua, Lucio, and Chavarin. Orvananos writes about leprosy in various municipalities of the state such as Teocaltice, Ameca, Ahualulco, Atotonilco el Alto, Ayo el Chico, and La Barca. In 1907 it was reported that 340 patients existed in Jalisco. In 1927, the year of the first census, Jalisco was known as the state most affected by the disease in Mexico. Nevertheless, this study was incomplete. Other reports of this period mention some of the drugs which were used such as iodides and ephedrine. This bibliographic review gives an account of the ideas which at that time prevailed about leprosy in Jalisco.—A. Saúl

Hernandez-Perez, E. La Biblioteca de Leprología de São Paulo. [The São Paulo leprosy library.] Dermatología (Mexico) **13** (1969) 161-166.

The library of all that pertains to leprosy in São Paulo, Brazil, is the most highly developed institution of its kind in the world. It numbers 40,000 volumes and its catalog contains everything referable to leprosy, from the beginning of literature up to the present time. Founded in 1932, the author considers the institution a source of pride for world dermatology and leprosy study.—A. Saúl

Contreras Dueñas, F. Lutte contre la lèpre et philatelie. [Philately and the campaign against leprosy.] Acta Leprol. N.S. **No. 36** (1969) 48-64.

A concise inventory, supported by numerous photographs, is presented, covering the postage stamps of the world bearing on the problem of leprosy.—P. Harter

Other Mycobacterial Diseases

Smith, J. H. Epidemiologic observations on cases of Buruli ulcer seen in a hospital in the lower Congo. American J. Trop. Med. & Hyg. **19** (1970) 657-663.

Ninety-seven cases of skin ulcers due to *Mycobacterium ulcerans* were seen at two mission hospitals in the Lower Congo between 1961 and 1968. There were more

cases than expected among those 5 to 14 years old and fewer than expected in those 15 years old or older. No secular changes were noted during the 7-year study period. There was no association of the disease with nationality, nor was there significant familial clustering of cases. The geographic distribution of cases appeared to approximate the population distribution, and there was no temporal relation between geographically clustered cases. The anatomic distribution of skin ulcers differed from that found in Uganda in that there were more lesions on the arms. Comparison of the anatomic distribution of ulcers with the distribution of total skin area among the body parts showed an excess of lesions on the arms and a deficit on the head-neck-trunk. There was no association between climatic variables and the data of onset or presumed date of infection of all cases or of cases by age, sex, or by anatomic distribution of lesions.—AUTHOR'S SUMMARY

Reznikov, M. Atypical mycobacteria; their classification, identification and aetiological significance. Med. J. Australia **1** (1970) 553-557.

This not too technical paper presents the atypical mycobacteria first according to their significance as pathogens in man and animals, and then follows with notes on the biochemical tests which can be used to identify the groups, serotypes, and species. It is not intended to be a detailed review, but draws attention to the current classification of atypical mycobacteria, methods of identification, and to the potentials for causing disease processes in man and animals. The current debates about some groupings acknowledge that the geographical occurrences of some are of apparently etiological importance, and that final resolution of classifications is still to be achieved.

Nakayama, Y., Nakayama, H. and Takeya, K. Studies of the relationship between *Mycobacterium fortuitum* and *Mycobacterium runyonii*. American Rev. Resp. Dis. **101** (1970) 558-568.

The relationship between *M. fortuitum* and *M. runyonii* was studied with respect to their biologic and immunologic properties (tuberculin specificity). The results of Adansonian classification were in accord with those of tuberculin specificity studies, and it was suggested that *M. fortuitum* and *M. runyonii* can be classified as different species.—AUTHORS' SUMMARY

Jagadisan, T. N. The Delhi leprosy conferences. Leprosy in India **41** (1969) 117-128.

The papers and discussions of the Eleventh All India Leprosy Workers' Conference underlined the fact that from the era of optimism which came in the wake of sulfones and advances in reconstructive surgery, we have passed on to the era of sober assessment and revaluation. This is not to deny that we have, in the last two decades made phenomenal advances. We have taken the leprosy patient from custody to care, from care to cure and from cure to rehabilitation. We have to a large extent succeeded in taking leprosy out of its isolation and linked it up with the general stream of medicine and brought to it the benefits of collaboration between various disciplines of medical research. But we have to look at the road ahead and be realistic and critical of our own achievements so that we may march with a clear head and steady pace to our ulimate goal.—AUTHOR'S EDITORIAL SUMMARY

[The entire 118 pages of this issue (No. 3 for July 1969) are given to the report of the conference. During five days of scientific sessions of the Indian Association of Leprologists 34 topics were presented, all abstracted in some detail, with reports of the main discussions which followed presentation occupying 22 pages. Unfortunately, it is not practical to present these here, and even a synopsis is impossible, because of the wide range of subjects, although chemoprophylaxis, treatment, and epidemiologic control seem to have dominated the scene. Twenty-five pages report the three sessions of the All India Leprosy Workers' Conference proper. The principal themes were control programs, epidemiologic prevention of leprosy, the role of various agencies in rehabilitation, and the ever changing institutions designed to protect those exposed to leprosy. The student of this issue of LEPROSY IN INDIA *will derive an awesome sense of the problem at hand, the difficulties that are faced, and the attacks currently working.—G. L. Fite]*