

## 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 Course

**Miranda, R. N.** Aspectos clínicos da reação na lepra tuberculóide. [Clinical aspects of reaction in tuberculoid leprosy.] Publ. Centro Estudos Leprol. (Parana) 8 (1968) 75-78. (Same article in English, 79-82)

Tuberculoid leprosy is classified by the author as (1) torpid and (2) torpid made acute or in reaction. In torpid tuberculoid leprosy lesions have slight inflammatory character, characterized by the now well recognized physical signs, positive Mitsuda reaction, without visceral manifestations, and with a tendency toward spontaneous healing. Three types of tuberculoid leprosy in reaction are described: (1) infiltrative (most frequent, 96.3% in author's experience), (2) ulcerative in reaction, and (3) characterized by caseous reaction (very rare). A patient may exhibit both types of lesion when tuberculoid leprosy in reaction originates from a torpid case. Tuberculoid leprosy in reaction accounted for 63.5% of the cases studied by the author.—(From author's summary).

**Manigand, G., Paillas, J., Lardy, B. and Deparis, M.** La polyarthrite de la lèpre. Apropos d'une observation de polyarthrite diffuse symétrique et fébrile révélatrice d'une lèpre lépromateuse jusqu'alors méconnue. [The polyarthritis of leprosy. Apropos of an observation of diffuse symmetric and febrile polyarthritis indicative of a case of lepromatous leprosy unrecognized up to then.] Sem. Hôp. 45 (1969) 543-552.

A case of progressive lepromatous leprosy in a 21 year old female is reported, first clinical evidence of which was symmetric arthritis involving the large joints of the limbs and hands closely resembling an acute attack of rheumatoid arthritis. The

synovial fluid was of inflammatory character and leprosy bacilli were found in the fluid and synovial membrane. Polyarthritis was the main feature in a reaction marked by fever, lepromatous nodules, anemia, raised erythrocyte sedimentation rate, hypoglobulinemia and the presence of C-reactive protein. The arthritis regressed spontaneously, while other elements of lepromatous reaction persisted. The onset and course suggested an immunologic disturbance.—(From authors' summary)

**Wemambu, S. N. C., Turk, J. L., Waters, M. F. R. and Rees, R. J. W.** Erythema nodosum leprosum: a clinical manifestation of the Arthus phenomenon. Lancet 2 (1969) 933-935.

Granular deposits of immunoglobulin and complement were found by fluorescence microscopy in the dermis of lesions from patients with erythema nodosum leprosum. In some cases the deposits apparently also contained soluble mycobacterial antigen. The distribution of these deposits corresponded with the areas of polymorph infiltration. It is suggested that erythema nodosum leprosum is a manifestation of the Arthus phenomenon. In a few of the patients studied the level of the third component of complement in the serum was raised.—AUTHORS' SUMMARY

**Miranda, R. P. G.** Osteo-dental alterations and anomalies in children suffering from leprosy. Publ. Centro Estudos Leprol. (Parana) 9 (1969) 17.

The work of Møller-Christensen and other authors on osteo-dental alterations in adults with lepromatous leprosy has been confirmed. A case of 12 years' duration in a 41 year old man is described, with absence

of upper incisors, bone rarefaction, destruction in the anterior region of the maxilla increasing the nasal opening, and absence of the nasal spine. In leprosy children these characteristic alterations were not seen, although slight changes in the region of the roots of the upper incisors suggested their commencement. It is believed that typical changes require a longer time for their development.—E. R. LONG

**Sanchez, N. I. and Rojas de Acevedo, R. F.** Lepra tuberculoides infantil de la variedad nodular. [Infantile tuberculoid leprosy of nodular type.] *Rev. Dominicana Dermat.* 3 (1969) 44-45.

A case of nodular infantile tuberculoid leprosy in a 2 year old girl is reported. The lesions began to decrease after treatment (DDS, 20 mgm. daily) was started.—AUTHORS' SUMMARY

**Gatti, J. C., Petrolito, J., Cardama, J. E., Crespi, H. G., Bianchi, O. and Korbenfeld, P.** Estudio hepático, funcional e histológico, en enfermos de lepra. [Functional and histologic hepatic study in leprosy patients.] *Leprológia* 13 (1968) 6-10.

In a study of leprosy cases, 21 lepromatous, 3 tuberculoid and 1 indeterminate, morphologic lesions were found in 12 lepromatous cases, one of which was in reaction. Functional alterations in the group were limited to increase in alkaline phosphatase in 11 lepromatous cases. Four of these had in addition an increase in leucoaminopeptidase, and 2 of them an increase in glutamino-dehydrogenase. Of the 11 patients 2 showed an alteration in bromsulfalein clearance. The findings support the view that anatomic lesions of the liver involve the interstitial tissue and not the hepatocyte.—(From authors' summary, through E. D. L. JONQUIÈRES)

**Bogaert, H.** Diagnóstico de la lepra. [Diagnosis of leprosy.] *Rev. Dominicana Dermat.* 3 (1969) 5-16.

The main clinical and diagnostic findings in leprosy are reviewed, pointing out various dermatologic and neurologic entities that may be confused with leprosy. Reference is made to some misdiagnosed cases

treated over long periods of time by general physicians.—AUTHOR'S SUMMARY

**Mansfield, R. E., Storkan, M. A. and Cliff, I. S.** Evaluation of the earlobe in leprosy. A clinical and histopathological study. *Arch. Dermat.* 100 (1969) 407-412.

Biopsy of the earlobe in leprosy patients has revealed histopathologic findings and acid-fast bacilli of a diagnostic nature, substantiating, on a histologic basis, the use of the earlobe as a site for useful clinical information. The best correlation of clinical appearance and histopathologic findings in the earlobes is found in patients with lepromatous leprosy. In most instances skin smears and biopsies of earlobes of leprosy patients appear to provide similar information. The systemic form of leprosy reaction was reflected in the earlobe histopathologic findings. Positive histopathologic findings in dimorphous leprosy patients could not be predicted.—(From authors' summary)

**Chitre, V. S. and Balasubrahmanyam, M.** Changes in serum copper and PPD-oxidase in different diseases. Part I. Differential observations in certain types of leprosy and kwashiorkor. *Indian J. Med. Res.* 57 (1969) 228-236.

Serum copper and PPD-oxidase activity have been observed to increase in lepromatous leprosy patients with and without gynecomastia; patients with gynecomastia show more elevated levels than those without. Comparisons are in course with the disease kwashiorkor to see if there is a similar correlation. The significantly raised levels of serum copper and PPD-activity in lepromatous leprosy with gynecomastia indicate that, in addition to chronic infection, hormonal imbalance might be an additional factor for further elevation of serum copper and PPD-oxidase activity.—E. R. LONG

**Usandivaras, R. L., de los Rios, E. H., Alperovich, B. A. and Lopez, J.** Ainhum en un enfermo de lepra lepromatosa. [Ainhum in a patient with lepromatous leprosy.] *Leprológia* 13 (1968) 23-27.

Case report of ainhum in 5th toe of neural leprosy patient with foot claw.—E. D. L. JONQUIÈRES

## Chemotherapy

**Barry, V. C.** Synthetic phenazine derivatives and mycobacterial disease: A twenty year investigation. *Scient. Proc. Roy. Dublin Soc., Series A* 3 (1969) 153-170. (*Boyle Medal Lecture*)

Dr. Barry has again placed us in his debt. In this Boyle Medal Lecture he retraces with unadorned skill the fascinating Odyssey he pursued in company with his Dublin colleagues in the search for an antimycobacterial drug. He allows us to peep into the captain's chartroom and to share with him, in retrospective imagination, some of the hazards of the voyage, the false courses taken in ignorance, and the crucial calls at the Isle of Serendip, where he made valuable and unsought discoveries. From synthetic antimetabolites to the conscious and progressive modification of diploicin (the first organic chlorine compound found in nature), we can follow the story of the synthesis of scores of riminophenazine compounds, until the development of some that were far more active than streptomycin or the thiosemicarbazones in experimental murine tuberculosis. B.663 proved to be the most active, both as a causal prophylactic and also as a treatment for the established infection; it is still the only compound known to achieve this effect on oral administration. It is strange that no published report had appeared concerning its value in human tuberculosis. However, B.663 is still the only drug that has held murine leprosy in check for as long as 816 days without the development of drug resistance. The supposition that B.663 is of no value in human tuberculosis may be correlated with the observation that the drug is concentrated in macrophages. This fact suggested to Barry and his fellow chemists, and subsequently to R. G. Cochrane and S. G. Browne, that B.663 should be tried in human leprosy. The subsequent results of the clinical investigations conducted at Uzuakoli have received wide publicity. B.663 has been found of value in treating ulceration due to *M. ulcerans* and also to an atypical avian strain of bacillus. The anti-inflammatory proper-

ties in erythema nodosum leprosum may be associated with some impairment of macrophage action in processing antigen, and hence to some immunosuppressive activity. Barry briefly touches upon the mode of action of these riminophenazine compounds. Since B.663 is strongly taken up by living mycobacteria, it is possible that it interferes with terminal hydrogen transfer, but much is still obscure. B.663, or Lamprene (Geigy) has now passed the Dunlop Committee, and has received the approved name of clofazimine.—S. G. BROWNE

**Shepard, C. C.** Chemotherapy of leprosy. *Ann. Rev. Pharmacol.* 9 (1969) 37-50.

Extensive review (96 references) of the action of the principal drugs used in recent years in clinical and experimental (chiefly mice) studies on the treatment of leprosy, including the bases for trials, toxicity of drugs, tests for determination of activity, the phenomenon of drug resistance, the metabolism of drugs tested, and their general pharmacology.—E. R. LONG

**Baliña, L. M. and Lódolo, J. C.** Lisozima en el episodio reaccional de lepra, manifestación autoinmune. [Lysozyme in leprosy reaction, an autoimmune manifestation.] *Leprológia* 13 (1968) 44-47.

Lysozyme is muromidase, an enzyme breaking up the polysaccharide wall of mycobacteria and probably preventing the rupture of the lysosomes and the action of their hydrolytic enzymes. Twenty reactional lepromatous patients were treated with lysozyme in a dosage of 8 100 mgm. tablets daily or 1 or 2 injections of 75 mgm. daily. In 16 patients good improvement was noted.—E. D. L. JONQUIÈRES

**Ghosh, S., Bose, R. and Ganguli, S. R.** Compound 377 in the treatment of leprosy. *Bull. Calcutta Sch. Trop. Med.* 15 (1967) 18-20.

This drug (isonicotinylhydrazone of 2-carboxymethoxybenzaldehyde, (compound 377), Chang, Y. T., *Internat. J. Leprosy* 25 (1957) 130-146), synthesized at the Cal-

cutta School for this study, proved effective up to one year in the treatment of 79 cases of active, previously untreated lepromatous leprosy. Twenty active patients receiving DDS orally were observed simultaneously for comparison. Marked clinical improvement was noted in all the patients treated with compound 377 after 7-10 months of treatment. After 18-21 months of treatment, however, improvement ceased to progress and after 28-32 months was practically at a standstill. In the DDS group evident improvement was still continuing after 40-44 months. The authors conclude that drug resistance had developed in the experimental (compound 377) group, and suggested that in treatment with this drug DDS should be combined with from the start.—E. R. LONG

**Chang, Y. T.** Suppressive activity of streptomycin on the growth of *Mycobacterium lepraemurium* in macrophage cultures. *Applied Microbiol.* 17 (1969) 750-754.

The effect of streptomycin on the growth of *M. lepraemurium* grown in cultures of mouse peritoneal macrophages was studied. Since these organisms do not grow in bacteriologic media, the influence of extracellular bacterial growth can be ruled out. The suppressive activity of streptomycin was observed in a total of 5 experiments. At the end of 4 weeks, the average number of organisms per macrophage for the controls was 65.7; for cultures with streptomycin at concentrations of 0.5, 1.5, 10, 50, and 100  $\mu\text{gm./ml.}$  of medium, it was 45.4, 38.3, 28.7, 13.4, and 8.2 respectively. A good dose-response relationship was evident. *M. lepraemurium* that had been treated in macrophage cultures with various concentrations of the antibiotic for 6 to 8 weeks was used to infect fresh macrophages. These cultures were in turn treated with streptomycin. Resistance of the organisms to streptomycin did not occur.—(From author's summary)

**Goodwin, C. S. and Sparell, G.** Inhibition of dapsone excretion by probenecid. *Lancet* 2 (1969) 884-885.

In 12 Ethiopian men probenecid given with dapsone caused a significant reduction

in urinary excretion of acid-labile dapsone metabolites, and to a lesser extent of free dapsone, and also raised the blood levels of dapsone. The method of estimating serum levels of dapsone by Schiff base formation was modified for use with urine.—AUTHORS' SUMMARY

**Saqueton, A. C., Lorincz, A. L., Vick, N. A. and Hamer, R. D.** Dapsone and peripheral motor neuropathy. *Arch. Dermat.* 100 (1969) 214-217.

The clinical pictures of 2 young men who developed peripheral motor neuropathy in the course of dapsone therapy are described. The clinical findings were supported by motor nerve conduction studies. In both cases, complete clinical recoveries were observed following discontinuance of dapsone.—AUTHORS' SUMMARY

**Hastings, R. C., Trautman, J. R. and Mansfield, R. E.** Antibacterial effects of G 30.320 Geigy (B.663) in lepromatous leprosy. *Dermatol. Internat.* 8 (1969) 21-26.

Eight cases of lepromatous leprosy were treated with B.663 for periods of 11 to 36 months. Three had B.663 combined with INH; 4 had B.663 alone; and 1 had B.663 combined with DDS. Antibacterial effect was demonstrated clinically, bacteriologically and histopathologically. The rate of improvement clinically and on serial biopsies was slower than that previously observed with standard sulfone treatment of uncomplicated lepromatous cases.—(From authors' summary)

**Sanchez, N. I. and Rojas de Acevedo, R. F.** Eritrodermia por DDS. [Erythrodermia from DDS.] *Rev. Dominicana Dermat.* 3 (1969) 41-43.

A case of erythrodermia due to DDS is reported in a patient (55 year old woman) with lepromatous leprosy. The erythrodermia remitted on stopping medication.—Authors' Summary

**Gatti, J. C., Cardama, J. E., Baliña, L. M., Carnevale Bonino de Garrido, R. M. and Franco, N.** Talidomida y reacción leprosa. [Thalidomide and leprosy reaction.] *Leprológia* 13 (1968) 30-31.



Six lepromatous patients in cortisone-dependent reaction were treated with short courses of thalidomide, in a dosage of 400 mgm. daily for 1 week and 300 mgm. daily thereafter. Four patients were treated for 1 month, 1 for 40 days and 1 for 60 days. All patients improved. Edema of the legs was seen in 2 of the patients.—E. D. L. JONQUIÈRES

Duperrat, B., Puissant, A., Pringuet, R., Revuz, J., Lauret, Ph. and Ghezzi, Mlle. Echec de la thalidomide dans un cas d'erytheme multiforme lepreux. [Failure of thalidomide treatment in a case of leprous erythema multiforme.] Bull. Soc. Dermat. et Syphilig. 75 (1968) 736-737.

In a Portuguese lepromatous patient a first attack of ENL was easily overcome by a daily dose of 100 mgm. of thalidomide, without need of modifying the specific treatment in course. A second attack, more

severe, required not only 300 mgm. of thalidomide but also discontinuation of the specific treatment and association, with the latter, of Glucantime and streptomycin.—P. HARTER

Merklen, F.-P. and Cottenot, F. Deux cas d'inefficacite antireactionnelle de la thalidomide dans la lèpre. [Two cases of anti-reactive ineffectiveness of thalidomide treatment of leprosy.] Bull. Soc. Dermat. et Syphilig. 75 (1968) 738-739.

A case of major tuberculoid leprosy with reactional exacerbation in an African patient yielded on the first occasion to a daily dose of 400 mgm. of thalidomide, but a second attack, with ulceration, was not modified after 6 weeks of the same treatment. A second African case, of lepromatous type, in neuritic and febrile reaction did not yield after 10 days of the same treatment, but was improved by 3 blood transfusions.—P. HARTER

## Surgery and Surgical Specialties

Santoni Mendoza, J. Diagnóstico diferencial del mal perforante plantar. [Differential diagnosis of perforating plantar ulcer.] Rev. Dominicana Dermat. 3 (1969) 22-24.

Salient neurologic and dermatologic features in differential diagnosis of the following diseases, in which plantar ulceration may occur, are discussed: leprosy, diabetes, tabes dorsalis, lumbar syringomyelia, traumatic sciatic nerve lesions, various hereditary neurologic disorders, including radicular neuropathy, and Charcot-Marie-Tooth disease and the hypertrophic interstitial neuropathy of Dejerine and Sottas.—E. R. LONG

Matsuda, H., Otsuka, S., Kozuma, A. and Inage, M. Spontaneous avulsion fracture of calcaneus in leprosy. La Lepro 38 (1969) 15-22. (In Japanese, English summary)

Seven cases of avulsion fracture of the calcaneus at the insertion of the Achilles tendon in leprosy during the last 6 years are

reported. There was no subcutaneous rupture of the tendon. These fractures occurred on walking without any appreciable trauma. The mechanism of development of the fracture is believed to be pathologic fracture; it is logical to think that the avulsion fracture demonstrated in leprosy is related to the powerful force with which the gastrocnemius muscle acts on the calcaneus already the seat of slight atrophy because of disturbance of both sensory and motor nerves.—(From authors' summary)

Cyi, K. and Lay, K. The eye in non-institutional cases of leprosy. Un. Burma J. Life Sci. 1 (1968) 371-375.

Two hundred noninstitutional cases of leprosy were examined to determine the incidence of eye lesions caused by leprosy and to compare the incidence against that found in institutional cases of leprosy. Only 7.5% of the noninstitutional cases had eye lesions with defective vision, comparing favorably against 37.3% of the institutional cases. Trachoma incidence was found in

34.5% of the survey group, while the control group had an incidence of 51.5%. The ocular lesions are mainly corneal. Eradica-

tion of leprosy and trachoma will certainly reduce the incidence of ocular lesions.—

AUTHORS' SUMMARY

## Pathology

Rees, R. J. W. New prospects for the study of leprosy in the laboratory. *Bull. WHO* 40 (1969) 784-800.

Although *M. leprae* was identified earlier than *M. tuberculosis*, it has still not been cultured *in vitro*. Only in 1960 was an infection obtained in laboratory animals. However, important advances have been made in experimental leprosy in the last decade, with development of new techniques and models for studying *M. leprae in vivo*, thus overcoming limitations imposed by a noncultivable mycobacterium. Quantitative techniques using *M. lepraemurium* provided the first model for an indirect method for distinguishing dead (noninfectious) from living (infectious) bacilli, based on morphologic differences in organisms stained by the Ziehl-Neelsen method. However, the most important advances resulted from the limited and localized growth of *M. leprae* inoculated into the foot pads of mice and, later, the more substantial and generalized multiplication of *M. leprae* in immunologically deficient mice (thymectomized and irradiated with a dose of 900 r). Moreover, in the immunologically deficient animals, the infection eventually resulted in a disease replicating that of lepromatous type leprosy in man, including the involvement of peripheral nerves.—(From author's summary)

Rees, R. J. W., Weddell, A. G. M., Palmer, E. and Pearson, J. M. H. Human leprosy in normal mice. *British Med. J.* 3 (1969) 216-217.

It has now been shown that normal mice can be used as models for studying the early stages in the development of leprosy. Inoculation into the foot pads of mice of as few as  $10^4$  leprosy bacilli leads to infections which spread to distant sites via the blood stream and after two or more years give rise to granulomata and neural damage at

the sites of inoculation. Where the tissue response had fully developed it reproduced exactly the histologic features of human leprosy in the borderline range.—AUTHORS' SUMMARY

Fite, G. L. and Mansfield, R. E. The role of histology in the study of leprosy. *Arch. Dermat.* 100 (1969) 478-483.

Study of histologic changes in leprosy antedates the discovery of *M. leprae* by approximately a generation. The history suggests two distinct periods. The first began in 1847 with Danielssen's and Boeck's illustration of a section of a nodule, and continued into the 1920's. This period of observation and record was followed by a later phase in which histologic studies entered into modern classification of types of leprosy.—(From authors' summary)

Maeda, M., Nakamura, K. and Katayama, H. Experimental inoculation of *M. leprae* into the hind foot pads of guinea-pigs. *La Lepro* 38 (1969) 10-14. (In Japanese, English summary)

Multiplication in the foot pads of guinea-pigs was not recognized in the experimental inoculation of *M. leprae*, not only with an emulsion of leproma but also with an emulsion of mouse foot pad tissue containing *M. leprae*. In the skin reaction provoked by Dharmendra antigen, however, it was found that guinea-pigs may be sensitized with *M. leprae* at 5 months after the inoculation. These results are discussed with relation to the activity of phagocytosis in foot pad tissue. Phagocytosis in guinea-pigs was stronger than in the mouse. It may be concluded from the results of this investigation that successful transmission of *M. leprae* into the hind foot pad of guinea-pigs could not be obtained.—(From authors' summary)

**Nakamura, K. and Maeda, M.** Experimental inoculation of *M. leprae* into the hind foot pads of fowls. *La Lepro* 38 (1969) 23-25. (In Japanese, English summary)

Primary and mouse-passaged strains were inoculated into the hind foot pads of fowls. It may be concluded from the results obtained that successful transmission of *M. leprae* was attained. No cultivable acid-fast strain was isolated from a fowl as a contaminant.—AUTHORS' SUMMARY

**Kawaguchi, Y.** The behavior of murine leprosy bacilli in guinea-pigs. Part 1. The fate of murine leprosy bacilli inoculated into the foot pads and ears of guinea-pigs. *La Lepro* 38 (1969) 1-4. (In Japanese, English summary)

The observation by Shepard of limited multiplication of *M. leprae* in the mouse foot pad, its confirmation by Rees and others, and the report by Waters and Niven of limited multiplication of *M. leprae* in the hamster ear and foot pad, stimulated the author to study the fate of *M. lepraemurium* in the foot pads and ears of guinea-pigs. Bacterial suspensions recovered, at varying intervals, from tissues at the inoculation site were used for counting bacilli and for reverse transfer of mice to examine their multiplication and viability in the guinea-pigs. There was no evidence of multiplication of organisms in the ears and foot pads and viability of organisms therein was remarkably diminished with time.—(From author's summary)

**Kawaguchi, Y.** The behavior of murine leprosy bacilli in guinea-pigs. Part 2. The growth pattern of murine leprosy bacilli subcutaneously inoculated in guinea-pigs. *La Lepro* 38 (1969) 5-9. (In Japanese, English summary)

In the previous experiments (Part 1) no finding concerned the macrophage-parasite relationship, although multiplication and viability of the bacilli were estimated by counting the bacilli and reverse transfer. Therefore a study was made of the macrophage parasite relationship. Guinea-pigs were inoculated subcutaneously in the back with a suspension of murine leprosy bacilli. At intervals of 5 days subcutaneous con-

nective tissues at the inoculation site were removed and spread on a glass slide, and the behavior of the bacilli within mononuclears was examined. After 5 days elongation of the bacilli was observed in mononuclears, and 15 days later many enlarged mononuclears filled with the elongated bacilli appeared at the site of inoculation. From the findings of this observation and of reverse transfer, it seemed that the growth patterns of murine leprosy bacilli subcutaneously inoculated in guinea-pigs were identical with those in mice up to 15 days after inoculation. From then on, however, infectivity of the bacilli in the guinea-pigs became remarkably reduced. After 30 days, nonleprous granulomata appeared at the inoculation site and the number of bacteria was significantly decreased. In a similar experiment inoculation from Kirchner's medium back to the mouse, was performed to examine the viability of the *in vitro* cultured organisms. Elongation of the bacilli occurred in Kirchner's medium, but viability of the *in vitro* cultured bacilli was greatly reduced with time. On the basis of these observations it was considered that macrophages of guinea-pigs play only a short role in multiplication of murine leprosy bacilli (about 15 days). It is desirable to prolong that short duration for development of a study on transmission of murine leprosy to guinea-pigs.—(From author's summary)

**Rodriguez, E., de Bonaparte, Y. P. and Morgenfeld, M. C.** Cultivo de linfocitos en enfermos con lepra lepromatosa. Comunicación previa. [Culture of lymphocytes in patients with lepromatous leprosy. Preliminary report.] *Leprológia* 12 (1967) 61-63.

In simple culture, within 72-96 hours, phytoagglutinin, a product extracted from the seeds of *Phaseolus vulgaris*, transforms 70% of the lymphocytes of normal peripheral blood into large cells with one or more nucleoli and open nuclear network with vacuolated cytoplasm (blast-like cells). The rest of the nuclei are not transformed. Neutrophils are destroyed, but basophils and eosinophils are not. In malignant lymphoma and chronic lymphatic leu-

cemia lymphocyte reactivity to phytoagglutinin is less. The test was made on 20 lepromatous patients, 14 patients with malignant lymphoma and 8 healthy controls. In lepromatous leprosy 29.5% of blasts resulted, in malignant lymphomas 34.5% and in the controls 66.0%. The authors query if diminished lymphocyte reactivity is a cause of the etiopathogenesis of lepromatous leprosy, or if the latter is a consequence of the effect of the bacillus on the reticuloendothelial system.—E. D. L. JONQUIÈRES

**Chaudhury, S. K. and Ghosh, S.** Histological observations on "reaction in tuberculoid leprosy." *Bull. Calcutta Sch. Trop. Med.* 15 (1967) 16-33.

Forty-six untreated cases of "reaction in tuberculoid leprosy" were selected for biopsy. Tissues were stained by hematoxylin and eosin, Fite-Faraco hematoxylin, and toluidine blue. Hyperkeratosis, granulomatous change, acanthosis and parakeratosis were observed, each in a high percentage of cases, with typical tubercle formation in 41%. Langhans giant cells were not common. When they were seen they were atypical and poorly formed. Mast cells were numerous, but more than 75% of these cells were degranulated. Most of the cases in the series showed conspicuous changes in the nerves, varying from complete loss of structure to persistence with cellular infiltration and edema.—E. R. LONG

**Chaudhury, S. K. and Ghosh, S.** Distribution of tissue mast cells in "reaction in tuberculoid leprosy." *Bull. Calcutta Sch. Trop. Med.* 16 (1968) 13-14.

Report of a continuation of studies recorded in the previous abstract. Fifteen cases of "reaction in tuberculoid leprosy" were selected for biopsy. Sections were stained with Lison's toluidine blue. In addition to changes in the size and shape of the mast cells, swelling and the phenomenon of degranulation, leaving degenerated "ghost cells," distributed at cell peripheries, were

frequent. In contrast the granules of mast cells in tuberculoid cases not in reaction were deeply stained and distributed throughout the cells. The mean of mast cells found per microscopic field in reaction cases was 0.9, as compared with about 40% in tuberculoid cases not in reaction.—E. R. LONG

**Riva, J. P. and Serial, A.** Presencia de los mastocitos en los infiltrados tuberculoideos y lepromatosos. [Presence of mast cells in tuberculoid and lepromatous infiltrates.] *Leprología* 13 (1968) 3-5.

Quantitative variations in mast cells were studied in 15 lepromatous and 12 tuberculoid cases. Averages of 16 mast cells per 10 microscopic fields for lepromatous cases and 3.8 for tuberculoid cases were found. The granules observed were intracellular in 56% of tuberculoid cases and extracellular in 44%. The corresponding figures for lepromatous leprosy were 75% and 25%. No conclusions are given.—E. D. L. JONQUIÈRES

**Vishnevskaya, L. G. and Bogush, T. G.** [Some conditions of the endometrium in patients with leprosy.] *Akusherstvo i Gynecologia* 8 (1968) 64-68.

The state of the endometrium was studied in 20 females of childbearing age suffering from lepromatous leprosy and treated with sulfone preparations. Menstruation was regular in all. Curettage was performed 3-4 days before menstruation. In 5 only out of the 20 the mucous membrane of the uterus corresponded to a stage of adequate secretion. In 7 there was inadequate secretion by the endometrium. In 8 there were no signs of endometrial secretion. A disturbance of growth was noted with marked atrophic changes in the endometrium. The most marked manifestations of endometrial hypotrophy were observed in an unfavorable course of the disease with frequent exacerbations, as well as in females in whom, for a protracted time, the disease was treated with non-sulfone agents.—AUTHORS' SUMMARY



## Bacteriology and Immunology

Papavassiliou, J. and Antoniadis, G. Erfahrungen über den Nachweis von *Mycobacterium leprae* im "dicken Tropfen" nach Markiano und im Nasenausstrichpräparat. [Experience with the demonstration of *M. leprae* by the "thick drop" method according to Markianos, and in nasal swab preparations.] Zentbl. Bakt. I Orig. **208** (1968) 260-265.

Microscopic recognition of *M. leprae* is still the only reliable method of bacteriologic diagnosis, and of assessing results of treatment. In 100 patients with leprosy, specimens were examined for acid-fast bacilli from nasal smears, ear lobe and leprosy lesions. For nasal specimens, the mucosa of both nostrils was scraped with a platinum loop and the specimen smeared on a slide, which was then fixed by heat. The ear lobe and skin lesions were punctured with a needle, and a thick drop of fluid 3 mm. in diameter was allowed to exude on a slide. This was dried for 24 hours at room temperature, hemolyzed with ethanol diluted 1 in 3 for 15 minutes, and then washed with absolute alcohol and flamed. All preparations were stained with Ziehl-Neelsen. Acid-fast bacilli were found in 44 patients. Positive findings were: nasal smear only: 5 weakly positive; ear lobe only: 5 weakly positive; leprosy lesion only: 8 weakly positive; ear lobe and leprosy lesions positive, nasal smear negative: 8 patients; ear lobe lesions and nasal smear positive, leprosy lesions negative: 1 patient; ear lobe, leprosy lesions and nasal smear all positive: 17 patients. As controls, specimens from the ear lobe of 100 students were examined. All were negative. The authors consider it necessary to examine all 3 specimens from each patient.—(From abstract by R. L. Vollum. *Trop. Dis. Bull.* **66** (1969) 922-9237)

Levy, L., Fasal, P. and Murray, L. P. Correlation with results of mouse foot pad inoculation. *Arch. Dermat.* **100** (1969) 618-620.

The morphologic appearance of *M. leprae* in acid-fast stained sections of skin

biopsy specimens from patients with lepromatous leprosy has been found to correlate well with the infectivity of the specimen for the mouse. Viable *M. leprae* were demonstrated in 15 of the 16 patients with previously untreated lepromatous leprosy. Ten of 38 specimens obtained early in the course of dapsone therapy of previously untreated patients were found to contain viable *M. leprae*; viability of the organisms was found to be much reduced in 5 of these 10 specimens. By contrast, of 15 specimens obtained during dapsone therapy from 5 patients proven to harbor dapsone-resistant *M. leprae*, 14 were demonstrated unequivocally to contain viable organisms.—AUTHORS' SUMMARY

Palmer, M. H. Rapid staining and identification of mycobacteria by fluorescence microscopy using uranine. *American J. Clin. Path.* **49** (1968) 886.

Uranine ( $\text{Na}_2\text{C}_{20}\text{H}_{10}\text{O}_2$ ), the sodium salt of fluorescein, has been added as a stain for mycobacteria for rapid identification by fluorescence microscopy. The preparation of the stain, staining technic, and results are described. Acid-fast and nonacid-fast atypical mycobacteria, including acid-fast *M. tuberculosis*, are detected by this method. Positive slide specimens should be confirmed by the usual cultural methods.—(Abstract by E. Dunner, *American Rev. Resp. Dis.* **100** (1969) 290)

Fusillo, M. H. and Burns, H. D. Simultaneous auramine and Kinyoun stain for screening smears for acid-fast bacilli. *American J. Clin. Path.* **48** (1968) 753-754.

A rapid method is presented for screening tuberculosis slide specimens by fluorescence and confirmation by Kinyoun stains on the same slide. An average of 40 specimens per day may be screened and confirmed on the same slide in about 2 hours, whereas 6 to 8 hours were required when two separate technics were used.—(Abstract by E. Dunner, *American Rev. Resp. Dis.* **100** (1969) 290)

Wilkinson, F. F., Santabaya, J. G. de and Santabaya, E. Lesiones piógenas en lepra. Estudio etiológico. [Pyogenic lesions in leprosy. Etiologic study.] *Leprológia* 12 (1967) 100-103.

In 148 examinations of malum perforans, ulcus cruris, urine, nasal exudates, abscesses, sputum and pyoderma *Pseudomonas aeruginosa* was found in 36.4%, *E. coli* in 36.6%, *Streptococcus fecalis* in 30.9%, *Staphylococcus epidermidis* in 14.6%, *Staphylococcus aureus* in 6.5%, *Candida albicans* in 5.9%, *Aerobacter aerogenes* in 1.6%, *Proteus vulgaris* in 1.09%, *Bacillus proptermiam* in 1.09% and *Streptococcus sp.* in 1.09%. The need of antibiograms to avoid bacterial resistance is emphasized.—E. D. L. JONQUIÈRES

Chang, Y. T. and Andersen, R. N. Morphological changes of *Mycobacterium lepraemurium* grown in cultures of mouse peritoneal macrophages. *J. Bact.* 99 (1969) 867-875.

Studies on morphologic changes of *M. lepraemurium* grown in cultures of mouse peritoneal macrophages revealed 2 types of nonsolid or irregularly stained *M. lepraemurium*. One type occurred in the growth phase of the organisms during the stage of preparation for bacillary multiplication. The nonsolid bacilli appeared as elongated organisms having pointed ends, isolated acid-fast dots, or faintly stained areas at the ends of the bacilli. It is possible that this irregularity in staining is due to a very gradual, versus an instantaneous, acquisition of acid-fast material during bacillary multiplication and maturation. Solid forms were again observed upon maturation. Nonsolid bacilli were also observed in macrophage cultures infected with autoclave-killed *M. lepraemurium*. Under these conditions organisms emerged showing irregularly stained areas and various forms of deformity unaccompanied by elongation or multiplication. These irregularities were most probably due to the destructive process of digestion of bacillary protoplasm. The present study does not support the current hypothesis that all nonsolid acid-fast organisms are nonviable.—(From authors' summary)

Kim, K. S. and Barksdale, L. Crystalline inclusions of Bacterium 22M. *J. Bact.* 98 (1969) 1390-1394.

Crystalline inclusions have been found in an occasional cell of the bacterial strain 22M, isolated from a case of leprosy by C. V. Reich (*Internat. J. Leprosy* 33 (1965) 527-532). They have not been found in fresh cultures, in the first 18 hours of incubation, but can be seen in cells from centers of colonies after prolonged incubation. Arrays consist of parallel rows of polyhydral subunits, 7.5 mm. in diameter, 2.0 mm. apart, with a distance of 3.0 mm. between rows. A relation between the inclusions and defective bacteriophage does not appear likely. Strain 22M is lysogenic and when induced with ultraviolet light does not produce bacteriophage. In induced cells the authors have not observed crystalline inclusions.—E. R. LONG

Turk, J. L. and Waters, M. F. R. Cell-mediated immunity in patients with leprosy. *Lancet* 2 (1969) 243-246.

Fifty per cent of patients with lepromatous leprosy could not be sensitized to 2,4-dinitrochlorobenzene (DNCB). However, 10 DNCB nonreactors could be induced to show delayed hypersensitivity to keyhole-limpet hemocyanin (KLH). Failure of cell-mediated immunity is, therefore, not absolute. This is confirmed by the finding of small numbers of small lymphocytes in the depleted paracortical areas of lymph nodes from these patients. No difference could be found in the lymph nodes of DNCB reactors and nonreactors, a fact consistent with the nonspecific failure of cell-mediated immunity being relative. It is concluded that induction of DNCB sensitivity is a relatively weak indication of cell-mediated immunity as compared with KLH. In leprosy, nonspecific loss of cell-mediated immunity, as evidenced by loss of ability to be sensitized with DNCB, is probably secondary to the infiltration of the paracortical areas of lymph nodes with histiocytes, rather than a primary event leading to the development of the lepromatous state.—AUTHORS' SUMMARY

[Cellular immunity in infectious diseases]  
*Editorial. Lancet* 2 (1969) 253-255.

The role of cell-mediated immunity (CMI) in leprosy has lately attracted great interest, much of which has been stimulated by the work of Rees and his co-workers, who found that a disease similar to lepromatous leprosy could be produced in experimental animals only after a general depression of CMI by thymectomy and deep x-irradiation. Under these conditions *M. leprae* could be induced to disseminate widely throughout the tissues as in the human disease. The possibility therefore arose that lepromatous leprosy could develop in man as a result of a general deficiency in CMI, similar to that seen in babies with congenital aplasia of the thymus. Job and Karat recorded a delay in heterologous skin-graft rejection for as long as 70 days in patients with lepromatous leprosy. An additional phenomenon which has been associated with a deficiency in CMI is an impairment in lymphocyte function, which can be demonstrated by a decreased ability of these cells to be transformed into blast cells in culture by phytohemagglutinin (PHA). Impairment of transformation of lymphocytes by PHA has been shown to parallel the inability of patients to be sensitized with contact sensitizers, such as DNCB in Hodgkin's disease, sarcoidosis, and primary biliary cirrhosis as well as leprosy and congenital thymic aplasia. It seems that inability to be sensitized to DNCB, or a deficiency in the response of lymphocytes to PHA may reflect only a relative depression of CMI insufficient to make the patient more susceptible to infection. That impairment of contact sensitivity does not demonstrate a complete inability of the patient to develop CMI is clear from a paper by Turk and Waters (see preceding abstract). Patients with lepromatous leprosy who could not be sensitized with DNCB could be induced to develop hypersensitivity reactions to a more powerful antigen—hemocyanin. Failure of CMI in leprosy is probably directed at first specifically against *M. leprae*. The failure of immunologic response does not, however, affect humoral antibody production, since these patients can have a high

concentration of antimycobacterial antibodies in their serum and they may have a chronic "serum-sickness"-like disease (erythema nodosum leprosum) due to deposition of immune complexes, formed between antigen and antibody, in their tissues. Nonspecific impairment of CMI would then be a secondary rather than a primary event, and it would be the result of the replacement of those parts of the lymphoid tissue where lymphocytes proliferate during the development of a cell-mediated immune response by histiocytes containing mycobacteria. These cells probably drain down to the central lymphoid organs from the peripheral tissues where they are present in large numbers. The evidence suggests that lepromatous leprosy develops in patients with an intrinsic constitutional defect. Conceivably a primary inability of the cellular immune mechanisms allows the infective agent to gain a foothold in the tissues. The organism then proliferates to such an extent that a state of specific immunologic tolerance develops. This state, however, affects cellular immune processes only, leaving humoral antibody-producing mechanisms intact. Evidence so far indicates that the tests used, such as the development of DNCB sensitivity, reflect a secondary rather than a primary defect in CMI, and more sensitive tests will have to be found to discover the cause of the initial defect which allows the organism to proliferate in the first place.

Rees, R. J. W. BCG vaccination in mycobacterial infections. *British Med. Bull.* 25 (1969) 183-188.

Immunization against mycobacterial infections has been directed mainly against tuberculosis, as representing the most serious of these infections. Although BCG vaccination has been available since 1921, it has taken 40 years to establish beyond doubt its efficacy against tuberculosis. Evidence is now accumulating which indicates that BCG may also be of value in protecting against other mycobacterial infections, including leprosy (Uganda, New-Guinea and Burma trials), and *M. ulcerans* infections (Uganda trials). This would be consistent with the wide range of common anti-

gens shared by many species of mycobacteria. It is the appreciation of these immunologic features of mycobacteria that during the last decade has helped to unravel the complexities surrounding vaccination against mycobacterial infections.—Author's Summary

**Kundu, S. K. and Chosh, S.** Precipitable antibody in leprosy against homologous skin antigen. *Bull. Calcutta Sch. Trop. Med.* **16** (1968) 78-79.

Antigen obtained by physiologic saline and alkali extraction from healthy human skin was tested in serial dilutions against sera from 21 tuberculoid and 15 lepromatous cases of leprosy and 7 normal persons, also in serial dilutions. Large floccules were seen with 1:40 and 1:50 dilutions of antigen only in lepromatous leprosy. Changing the pH of the antigen slightly toward the acid side prevented the later demonstration of flakes. The authors note that the antigen was from homologous but not autogenous skin, and that therefore the absence of precipitable antibody may not be of help in dismissing the possibility of an auto-immune mechanism in leprosy.—E. R. LONG

**Bravo, T. C. and Andrade, A. A.** Estudio de las cutirreacciones a la histoplasmina, coccidioidina, esporotricina y lepromina. [Study of skin reactions to histoplasmin,

coccidioidin, sporotrichin and lepromin.] *Salud Publ. Mex.* **10** (1968) 173-194.

A long review of previous work on this subject is given. In the present investigation 500 patients were studied in a tuberculosis hospital in Mexico City; 0.1 ml. of the various antigens was injected intradermally and the size of the resultant induration was measured 48 hours later. Of the patients, 86% were male; they were of all ages, but 36% were aged 21-30 years. With the Mantoux test, 94.8% were positive and 5.2% negative. With histoplasmin, 56 cases (11.2%) were positive. With coccidioidin antigen, 10 patients (2%) were positive. With the polysaccharide of *S. schenckii*, 33 patients (9.1% of 359 tested) were positive; with the levaduriform antigen of *S. schenckii* 139 cases out of 359 (38.7%) were positive. Among 100 patients tested with lepromin, 3 were positive. Many patients reacted to more than one antigen, indicating a cross-sensitivity which may be due to similar chemical groupings occurring in the different organisms. It is considered that skin reactions are valuable to investigate the geographic distribution of mycotic infections and also to some extent for individual diagnosis. It is necessary, however, to standardize the technic and to use purified antigens.—(From abstract by F. Hawking. *Trop. Dis. Bull.* **66** (1969) 923)

## Genetics

**Baliña, L. M., Gatti, J. C., Lódolo, J. C. and Nicholson, R.** Lepra y genética. II. Estudio de las impresiones digitopalmares (dermatoglifias) en pacientes de lepra y convivientes. [Leprosy and genetics. II. Study of digitopalmar impressions (dermatoglyphics) in patients with lepromatous leprosy and household contacts.] *Leprológia* **12** (1967) 64-71.

Dermatoglyphics of 195 hands were an-

alyzed (50 normal controls, 77 contacts, 22 tuberculoid and 46 lepromatous patients). A statistically significant increase was found of the furrows of lepromatous women, as compared with those of normal women. An increase in the proximal triradii in the  $t'$  and  $t''$  positions was demonstrated, indicating a more distal position in contacts and lepromatous patients than in normal persons.—E. D. L. JONQUIÈRES

## Epidemiology and Prevention

[Leprosy. Communicable diseases in 1968. Some aspects of the WHO programme.] *WHO Chronicle* **23** (1969) 367.

In leprosy control, WHO continued as-

sistance to countries and provided technical advice for UNICEF-assisted projects. Case-finding proceeded satisfactorily in many projects. Over 90% of infectious cases



had been registered and treated in some projects but diphenylsulfone (DDS) has to be taken for many years, and poor attendance of outpatients continued to be a problem. In a "double-blind" trial with thalidomide in Venezuela beneficial results have been reported in the treatment of the acute lepra reaction that may occur in lepromatous patients. Cases of acute polyneuritis incidental to the lepra reaction were also reported to be controlled rapidly and completely with thalidomide. A preliminary appraisal of WHO double-blind coordinated trials in India, Mali, Somalia, and Spain seems to confirm this result. In the long-term chemoprophylaxis trial with DDS in India, it was found, after 5 and one-half years' observation, that 53% protection had been conferred. Certain subgroups among the contacts appeared to have received greater protection than others. In the WHO-controlled field trial in progress in Burma since August 1964 to ascertain the value of BCG vaccination in the prevention of leprosy, preliminary results indicate that BCG vaccine has not conferred significant protection either on household contacts or on children not exposed to *M. leprae* at home but possibly exposed elsewhere. At this stage, it is premature to recommend worldwide BCG vaccination for prevention of leprosy.

**Annual Report of the Director, Pan American Sanitary Bureau, Regional Office of World Organization, 1968.** Section devoted to leprosy. Official Document No. 95. August 1969, pp. 16-21.

Leprosy exists in all the countries of the Americas with the exception of mainland Chile, but the true magnitude of the problem is unknown for want of complete information. According to data supplied to the Pan American Sanitary Bureau of the World Health Organization by 30 countries and territories in the Americas, there were 176,572 cases of leprosy in the active register at the end of 1968, of which 136,298 (77.2%) were under surveillance. Available figures on the number of cases in the active register in 17 countries and other political units show that out of 121,175 cases, 64,706 (53.4%) were lepromatous, 26,627 (22.0%) tuberculoid, 28,075 (23.1%)

indeterminate, and 1,767 (1.4%) of other clinical forms. Data submitted by 18 countries and other political units indicate 330,705 registered contacts, of which 159,848 (48.3%) were under surveillance. A series of tables and several paragraphs of text summarize statistical data and the character of programs in individual countries. Countries with more than 9,000 registered cases, included, in descending order, Brazil (107,518), Colombia (16,389), Mexico (14,387), Argentina (9,783), and Venezuela (9,066).

In recent years there have been significant developments in the control of leprosy. Leprosaria have tended more and more to be converted into leprosy hospitals where special cases are treated over a limited period, instead of being subjected to lifetime isolation. Periodic supervision of patients and contacts is considered essential in the early diagnosis of new cases, and a means of breaking the infection chain and preventing deformities. Leprosy has been added to the category of communicable diseases, from which it had formerly been excluded by prejudice. Control of this disease as a regular activity of the general health services has been accepted, and renewed emphasis has been placed on physical and social rehabilitation and the prevention of deformities.

The Pan American Sanitary Bureau worked in close cooperation with the governments of Argentina, Ecuador, and Venezuela in various aspects of organization, conduct, and evaluation of programs in conformity with the administrative methodology recommended by the Cuernavaca Seminar (1963). The 3 countries subsequently presented the results of the experience to the Seminar on Administrative Methods for Leprosy Control Programs held in Guadalajara, Jalisco, Mexico. In order to ensure the submission of comparable reports to the Seminar, the PASB prepared a guide for their presentation, which was discussed in detail with the authorities responsible for leprosy control in the 3 countries.—E. R. LONG

**Enna, C. D. and Trautman, J. R.** Leprosy in the military service. *Military Med.* 134 (1969) 1423-1426.

From 1894-1921, 330 new patients were admitted to the U.S. Public Health Service Hospital at Carville (then the Louisiana Leper Home). Additional new cases admitted to Carville plus those reported to the registry and not admitted have totaled 4,513 as of 1 January 1969. Of 3,461 leprosy patients reported from 1894 to 1968 inclusive 345 have had military service. There is no record of leprosy among service men or veterans prior to the Spanish-American War (1898). Figures for veterans of the several wars are as follows: Spanish-American 26, World War I, 97, World War II, 137, Korean War 25, Vietnam War 11, peace time veterans or undetermined 39. The majority (236 out of 345) had Army service; 56 served in the Navy, 24 in the Air Force and 17 in the Marine Corps. The numbers were much smaller in the other service branches. Service-acquired leprosy due to foreign assignment is considered of minor significance in relation to other sources of the disease in the United States.—E. R. LONG

**Brusco, C. M. and Mercadante, F. F.** Algunos puntos a considerar en la acción sanitaria antileprosa. [Some points to be considered in antileprosy health activity.] *Leprológia* 12 (1967) 107-113.

Leprosy is contagious. The number of susceptible persons varies (averaging about 20%). In endemics of the kind found in Argentina, the interrelation between patients and susceptibles is such that the secondary attack rate decreases to 4%. Susceptible persons contract the disease as soon as they enter the leprosy environment, regardless of age. Patients detected among contacts are usually closed cases (74%); in cases originating from other sources closed cases drop 55%. Early sulfone therapy is most effective. Treatment must be regular and lasting. Suspension gives rise to relapse. In the first year effective dosage is taken by 80% of patients, 65% in the second year, 40% in the third, and after the fourth year 15%. Bacilloscopy remains positive in 40-50% of patients who have taken 75% of the useful dose up to the fourth year.—(From authors' summary, through E. D. L. Jonquières)

**Schaller, K. F.** Die geographische Verbreitung der Lepra in den Entwicklungsländern. [Geographical distribution of leprosy in developing countries.] *Ztschr. Tropenmed. Parasit.* 20 (1969) 10-20.

The number of leprosy patients in the world is estimated to exceed 10 millions, less than one-third of which have been registered. The majority live in Asia, but Africa has the highest relative prevalence of leprosy, with 10 in 1,000 people. In countries where leprosy is endemic, males are more frequently affected than females, the ratio being approximately 2 to 1. The fact that leprosy is nowadays more or less confined to tropical and subtropical regions is attributable mainly to environmental factors, among which the climatic conditions are of secondary importance. The prevalence of certain clinical manifestations of the disease varies in the different ethnic groups; whereas the tuberculoid type predominates in the negroid races, the lepromatous type is more frequently encountered in Caucasians. In many developing countries the impairments due to leprosy are a major public health problem which can be overcome only with international collaboration.—AUTHOR'S SUMMARY

**Leprosy in England.** *British Med. J.* 3 (1969) 730-731. (*Editorial*)

Leprosy has again stirred exaggerated fears and led to charges of governmental secrecy in its reporting, largely because of discovery of cases in Leicester. Actually only 22 patients have been registered in the Leicester district since 1951, a number considered small in the light of the size of the population, and care that has been taken by general practitioners and dermatologists in the recognition of cases.—E. R. LONG

**Aceves-Ortega, R.** La lepra en Jalisco. Reseña histórica y bibliográfica. Primera parte. [Leprosy in Jalisco. Historic and bibliographic sketch. Part 1.] *Dermatología (Mexico)* 13 (1969) 45-62.

The early history of leprosy in the State of Jalisco, at present one of the most affect-

ed states in Mexico, is reviewed. At the time of the Spanish conquest of Mexico, leprosy was rife in Spain, and presumably the disease was brought to Mexico by the Conquistadores. Cortez founded a leprosy hospital in Mexico between 1521 and 1524. It is not known why the disease went so

long unrecorded in Jalisco, but presumably little attention was devoted to it until it reached epidemic proportions. The later high prevalence is attributed to commerce with the Orient, and the important role played by Guadalajara, capital of the State of Jalisco, in this commerce.—E. R. LONG

## General and Historical

Saúl, A. Los nuevos caminos de la leprología. [New roads in leprology.] *Dermatología (Mexico)* 13 (1969) 1-3. (*Editorial*)

In the last international congress on leprology, held in London in 1968, a new tendency in the study of leprosy was evident, marked by departure from empiricism, with stronger emphasis on scientific and experimental research. This ancient disease has stimulated bacteriologists, immunologists, geneticists, biochemists, neurologists and others to apply their particular talents to its great and difficult problems. Experimental studies predominated in the London reports. The themes of major attention in previous years, viz., therapy, classification and control, were treated less extensively in London. Did it mean that there is nothing more to know about the clinical manifestations of this ailment? Working on leprosy in the laboratory is not the same as dealing with patients' problems in the dispensary or the field. The answer is that all is important. The two types of endeavor are not in opposition but in reality complementary. What is truly lamentable is that many of those who deal so competently with the bacillus in the laboratory, and the sera of patients, never see the patients themselves and therefore do not know leprosy as a disease, with its myriad problems. In contrast those who work where leprosy is an overwhelming burden commonly lack the background, training and resources to carry out investigations that are obviously needed. In other words practice and experimental study are disarticulated. It is inescapable that leprology will benefit steadily from work in the fields of technical science, a wholly desirable future. Not to be overlooked, however, is the fact that our principal and immediate

objective is adequate attention for the thousands of sick who live and hope in countries where leprosy is always present.—E. R. LONG

[NOTE: *The abstractor, who holds firmly to the view that an abstract should be just that, viz., a condensation of an author's own report, not supplemented by the views of the abstractor himself, cannot refrain in this case from departing from his own principles. Dr. Saul's lament, if it can be called that, is a familiar one today in many fields. What he has said has been expressed many times with respect to tuberculosis, cancer and other major diseases of wide concern. It will surely be agreed that his call for closer partnership between the practicing profession and the technical experts in pursuit of a common goal is sound logic.*]

Enna, C. D. and Byrd, C. F. The history and development of the National Leprosarium in the United States. *Internat. Surg. Sect. II* (1969) 11-14.

Establishment of the leprosarium at Carville, Louisiana, is credited to the discernment and perception of a 17-year-old "cub" reporter of the *New Orleans Picayune*, J. K. Smith, who wrote a series of articles on leprosy which were published in that paper. An overwhelming response from the public, the medical profession, and the state legislators led to the founding of the "Louisiana Leper Home" at Carville in 1894. The home was purchased in 1921 by the United States Government and designated as the National Leprosarium. It is the present U.S. Public Health Service Hospital. Early care was primitive, but marked by devoted service from the nursing staff. Most patients were lepromatous and severely ill. Because of the frequent presence of unsightly deformities patients

assumed aliases. Distinguished service was rendered by many patients and staff members, including Sister Hilary Ross, long Chief of the Laboratory Branch, and Sidney Levysen, founder of the *Carville Star*, who became famous under the alias of Stanley Stein, working incessantly to promote the interest of leprosy patients throughout the world. Medical leaders have included Drs. O. E. Denny, first medical officer in charge, and Guy Faget, the first to recognize the efficacy of sulfone drugs. The institution now has approximately 100 buildings on 336 acres of land, providing a wide variety of medical, social and recreational services.—E. R. LONG

**Bushnell, O. E.** The United States Leprosy Investigation Station at Kalawao. *Hawaiian J. Hist.* 2 (1968) 76-94.

This is a documented history of federal care of leprosy on the Island of Molokai in Hawaii. It starts with the premise, set forth by Hawaiian islanders, that the financial benefits to the American people through the territorial annexation of Hawaii were not met in the beginning by suitable provision for certain of the Islands' problems, among which was leprosy. In time the defect was partially remedied, but at first help through Congress was on a limited scale. Land from the leprosy settlement on the island of Molokai was granted to the Federal Government for a site to be devoted to the investigation of leprosy, in return for which Congress appropriated funds for buildings and staff. In June 1905, by proclamation of the Hawaiian governor,

one-sixth of the area of the existing leprosy settlement at Kalaupapa was conveyed to the Federal Government in perpetuity. For a variety of reasons, however, relations between the patients and the newcomers were strained. The patients were aware of a great difference between the program of the new scientific staff and that set up by Father Damien and Brother Dutton years before. Ultimately the investigative station failed in its purpose and closed, but, in the author's words, "the tragedy of errors dragged on for many more years." In 1922 Congress passed an act restoring the station to the Territory of Hawaii, but administrative difficulties in the rearrangement were such that the appropriation lapsed. Ultimately part of the once ambitious institution was torn down.—E. R. LONG

**Bogaert, H.** Seminario sobre métodos de administración en programas de control de la lepra. [Seminar on administrative methods in programs of leprosy control.] *Rev. Dominicana Dermat.* 3 (1969) 17-21.

A brief review of the main conclusions reached at the Leprosy Control Administrative Program meeting in Guadalajara last year (1968).—AUTHOR'S SUMMARY

**Lutz, L.** Lepra. [Leprosy.] *Med. Lab.* (Stuttgart) 22 (1969) 65-71.

General review of leprosy from historical and epidemiologic points of view, with consideration of its bacteriology, manner of spread, course and diagnosis, and the characteristics of its principal forms.—E. R. LONG

## Other Mycobacterial Diseases

**Barter, C. E. and Camens, I. M. H.** Lung infection with anonymous mycobacteria. *Med. J. Australia* 1 (1968) 408-410.

During the period Jan. 1963 to Sept. 1966, 149 cases of suspected tuberculosis were investigated at the Repatriation General Hospital, South Australia. Six were considered to have atypical disease. All were men, with an average age of 46 years,

and anonymous mycobacteria were isolated from each on at least one occasion. In only 2, however, was there convincing evidence of pathogenicity. The findings were in striking contrast to those of Queensland and Western Australia, where anonymous mycobacteria have proved a problem, but no satisfactory explanation for this has, as yet, been determined.—J. C. HARGRAVE



Saito, H., Hujiwara, M. and Numata, K. Two cases of mycobacterioses caused by atypical mycobacteria (Battey bacilli) with special reference to bacteriologic investigations. *Kekkaku* 44 (1969) 25-33. (In Japanese)

Two strains of atypical mycobacteria (Okada and Okutsu) were isolated from 2 patients who had been treated for pulmonary tuberculosis. These strains were considered causative agents in the patients because they were isolated frequently. The first patient was a 65-year-old woman with a cavity in the right upper lobe and the second was a 55-year-old man with two cavities in the right lung. Various bacteriologic and biochemical characteristics of the S-type, nonphotochromogenic, and slowly growing bacilli isolated from these patients were investigated. It was concluded that the bacilli were different from *M. terrae*, *M. gastri*, subgroup "V," *M. tuberculosis*, and *M. bovis*, but they could not be distinguished from *M. intracellulare* and *M. avium*. However, from the standpoint of

pathogenicity for rabbits, the two isolates were identified as *M. intracellulare* rather than *M. avium*.—(Abstract by I. T. Ebisawa, *American Rev. Resp. Dis.* 100 (1969) 291)

Inman, P. M., Beck, A., Brown, A. E. and Stanford, J. L. An outbreak of injection abscesses due to *Mycobacterium abscessus*. *Arch. Dermat.* 100 (1969) 141-147.

Over a period of 14 months 12 patients were seen with multiple abscesses of their arms following histamine injections. From 3 of these cases a fast-growing nonpigmented mycobacterium was isolated. This was identified by detailed bacteriologic and serologic investigations as *M. abscessus*, an organism different in several respects from *M. fortuitum*. The difficulties in distinguishing between these two species are stressed. It is thought that the outbreak was caused by injection of a batch of histamine solution which had become infected with this organism.—AUTHORS' SUMMARY

## Book Review

Aujoulat, L. P. Santé et Développement en Africa. Librairie Armand Colin, 103 Boulevard Saint-Michel, Paris 5, France. 1969, 285 pp.

For far too long, and with some justification, leprologists used to be accused of isolationism. They kept themselves to themselves, blissfully unmindful of the ferment and turbulence going on around them in the world of scientific medicine. Nowadays, they may face the charges that they are so concerned that leprosy should not be forgotten or neglected that they tend to overemphasize its importance and commandeer more than their fair share of cash and publicity.

Here is a book that should be read by all those interested in leprosy as it occurs in the setting of the medical and economic problems of the developing countries.

Dr. Aujoulat is not a specialist leprologist, and some of his expressed views on the success of leprosy campaigns may appear

unjustifiably optimistic, but he has an unrivaled and intensely practical knowledge of the larger problems of health and disease, of rural and tribal Africa, of control of tropical endemic disease and the disquieting health hazards of the new industrialization and urbanization. He paints on a wide canvas, with sweeping strokes, but his touch is so sure and so elegant that the reader follows him with mounting interest. He insists time and again that medical policy has to take account of the human factors and nonmedical considerations; it must anticipate, and if necessary mitigate, the results of its own spectacular successes.

The book is written in the eloquent French characteristic of the author, and its severely practical passages are illumined by flashes of personal experience culled from distant days in the African bush or more recent contacts with health administrators around the conference table. It is unfortunate that the proofreading is below standard.—S. G. BROWNE