

## CURRENT LITERATURE

*It is intended that the current literature shall be dealt with in this department. It is a function of the Contributing Editors to provide abstracts of all articles published in their territories, but when necessary such material from other sources is used when procurable.*

RISI, J. B. Relatório sobre o tema "lepra." [Reflections on leprosy.] Bol. Serv. Nac. Lepra **20** (1961) 205-224.

This report gives data on the distribution of leprosy in Brazil for the 4 main regions, wherein the incidence varies as follows:

	Incidence	Lepromatous rate
Rio Grande do Sul.....	4.6 per 100,000	45.2%
Santa Catarina .....	3.6 " "	70.2%
Paraná .....	21.1 " "	46.3%
Mato Grosso .....	21.7 " "	52.3%

The lepromatous rate is fairly high everywhere. The great incidence of leprosy in the frontier regions presents a special problem. The author describes and analyzes the control program and suggests plans for international cooperation in the future: (1) notification to the respective countries of domicile of patients who were diagnosed and registered outside their native lands; (2) a standard annual interchange of information, giving the latest epidemiologic situation; (3) undertaking by each country to carry on epidemiologic control of its frontiers; (4) periodic meetings of leprologists of the countries concerned; (5) undertaking by each country to maintain active leprosy control and treatment services; (6) mutual technical cooperation between the countries in prophylaxis and control; (7) study scholarships and help in training of leprologists; (8) analysis of the situation of patients as to infectivity and perhaps arrangement for their repatriation to the country of origin.—[From abstract by J. R. Innes in *Trop. Dis. Bull.* **60** (1963) 947-948.]

SANSARRICQ, H. L'endémie lépreuse et la campagne antihansénienne au Congo (Léopoldville) jusqu'à une date récente. [The leprosy endemy and the antileprosy campaign in the Congo (Léopoldville) up to a recent date.] Presse méd. **69** (1961) 2348-2350.

In the Congo the people living under poor hygienic conditions, which is common in Africa, pay a heavy tribute to leprosy. In December 1958 the total number of known cases rose to 192,764, equivalent to a total prevalence rate of 28.8%. The multibacillary forms of the disease represented 6.4% of the cases registered in the entire country. In the low, wet areas of high endemicity, the percentage of the multibacillary forms is not as high as in the elevated and dry areas of low endemicity. The campaign against leprosy is based lately on the following principles: *Detection* by systematic yearly visits of the whole population. The clinical and bacteriologic examinations help in diagnosing and classifying the cases. Home treatment of the patient by periodical rounds for the paucibacillary cases. Isolation in leprosaria of the agricultural-village type for the multibacillary cases. Physiotherapy of the neurotrophic sequelae is often used. *Prophylaxis*: This calls for isolation of a large part of the multibacillary cases, sometimes partial isolation of the children living in the leprosaria; systematic BCG vaccination, recently employed, especially for antituberculosis prevention.—[From author's summary, supplied by N. Bourcart.]

SUSMAN, I. A. The pattern of leprosy in the Gambia, West Africa. *Leprosy Rev.* **34** (1963) 83-94.

The author describes the incidence of leprosy in the Gambia from data of previous surveys and his own tours. Of a total of about 4,000 cases, only about 6% were lepro-

matous, but there was a prominence of deformities and secondary nerve lesions. The incidence of these lesions and clinical disabilities is set out in detail. [The campaign has been mainly based on dispensaries and clinics and the use of Land Rovers. There is a great need of a leprosy center for laboratory work, physiotherapy, and surgery.]—[From abstract by J. R. Innes in *Trop. Dis. Bull.* **60** (1963) 749.]

✓ RODRIGUEZ, J. N. The development of the leprosy control program in the Philippines. *Leprosy in India* **35** (1963) 73-82.

This article contains an interesting map, supported by a table, of the comparative distribution of leprosy in the Philippines, wherein it is seen that the highest rates of 2.00 to 4.00 per 1,000 population occur in the extreme northwestern part of the northern island and the lowest rate in the far south; very few islands escape. The total population of 55 provinces is over 26 million, and the registered leprosy cases 11,867; in 14 cities, with a total population of nearly 3 million, the cases recorded are 2,022. The leprosy control program has progressively developed since the introduction of control in 1907. Many epidemiologic studies have been made, in which 52 municipalities of Cebu province were found to have 40% to 45% of known cases. Doull *et al.* intensified the preliminary surveys by Rodriguez at Cebu, and showed that the lepromatous type was from 4 to 8 times more contagious among house contacts than the "closed" tuberculoid and indeterminate types. In the control program the aim was to place as many as possible of all [bacteriologically positive] patients in the active stages of the disease under effective and sustained treatment. As time went on, 8 leprosaria were set up with a total bed capacity of 7,620. The results of treatment are assessed every 6 months. Four stationary skin clinics cover 28 provinces and have registered 9,800 patients. Their work is envisaged as being carried out in 3 stages: (a) preliminary or survey stage; (b) the second or operational stage; (c) the third stage, of complete integration with rural health units.—[From abstract by J. R. Innes in *Trop. Dis. Bull.* **60** (1963) 946-947.]

✓ REED, S. Bali leprosy campaign. *Leprosy Rev.* **34** (1963) 40-42.

In the island of Bali, 3,305 leprosy patients have been treated. This is the known number and does not exclude the possibility of the existence of many more. In the whole campaign, which has been in progress since 1956, arrest of the disease has been secured in 750 patients by means of standard methods based on DDS, but the author has also tried Ciba-1906 and Etisul. For large reactions the standard treatment was the injection of a 50% aqueous solution of Sulphetrone, besides the use by mouth of antimony compounds and chloroquine. Minor deformities were found in 22-29% of the patients, but severe deformities are now rarely seen. The campaign included an outpatient program, wherein most patients who attend have to walk to the clinics not more than 3 to 5 km. and have maintained regularity of attendance at 90%. The author maintains that a leprosy campaign is a good argument with the people against fear and prejudice, but a great deal of educational propaganda is still needed.—[From abstract by J. R. Innes in *Trop. Dis. Bull.* **60** (1963) 639.]

✓ SAGARÓ, B., CASTANEDO, C., HERRERA, M. A., RODRÍGUEZ HERNÁNDEZ, N., GUTIÉRREZ DE LA SOLANA, J. and ENTIENZA, J. Control de la lepra. Organización de servicio de control. [Control of leprosy and its organization.] *Rev. cubana Med.* **1** (1962) 32-44.

The authors describe the control of leprosy in Cuba and the organization of its services. On the basis of consideration of 3 factors, namely, the degree of infection of the patient, the susceptibility of the person exposed to infection, and the type of contact, they have built up their control campaign in Cuba on 4 practical lines: (a) discovery of every leprosy patient possible; (b) treatment of every patient; (c) protection of contacts; and (d) rehabilitation. Endemic leprosy seems to have begun in Cuba at the

beginning of the 17th century, and is traced to commerce, African slaves, and the immigration of Europeans, chiefly Spanish. The first mention of the disease is by the Town Council of Havana in 1613. In recent times there have been surveys in 1944 (2,010 cases), 1946 (2,802 cases), 1947 (2,840 cases). The lepromatous type predominated, and whites accounted for 69%, Negroes 13%, and mixed-bloods 16%. Since then there has been a slow progressive increase (3,000 in 1948, 3,944 in 1955, and 4,496 by 1961), and it has become clear that an urgent campaign is called for. The patients are not distributed uniformly, but there are leprogenic foci. It is largely a familial disease and associated with those who live at a low economic and hygienic level. The province of Camagüey has the highest index of prevalence, 0.9 per 1,000. In practice the antileprosy campaign has been based on the 14 rules, which include obligatory confidential notification and compulsory segregation, prophylactic measures for contacts, and integration of antileprosy activities into the general public health services.—[From abstract by J. R. Innes in *Trop. Dis. Bull.* **60** (1963) 749-750.]

BIDEAU, J. Epidémiologie de la lèpre en Guadeloupe au cours de ces 28 dernières années de 1932 à 1959. [Epidemiology of leprosy in Guadeloupe during the last 28 years, from 1932 to 1959.] *Arch. Inst. Pasteur Guadeloupe* (Annual Rep.) 1960, pp. 81-106.

Up to January 1, 1960, 1,496 leprosy cases were registered in Guadeloupe, which gives a morbidity rate of 6.5 per 1,000. The real number of patients can be placed at from 7 to 8 cases for every 1,000 inhabitants. The author fears that the decentralization, presented to the documentation center, endangers the future of the correct appraisal of the epidemiologic findings of one of the most serious diseases of the territory.—R. CHAUSSINAND.

BROWN, J. A. K. and STONE, M. M. A trial of BCG vaccination in the prophylaxis of leprosy. *Leprosy Rev.* **34** (1963) 118-122.

The authors, in Uganda, give a preliminary account of a field trial of BCG in the prophylaxis of leprosy. Because of the opinion that the genetic inheritance of the contact is a significant factor in determining infection, they have made a careful study of the families. They concentrated on children related to patients, whatever the type of leprosy. The trial began in 1960 in the Teso District, where there were 154,466 children under 16 years of age. The leprosy prevalence rate in the area was 26 per 1,000, almost 3 times that among the general population 9 years ago, and nearly 6 times that of the active cases found 4 years ago. The type of contact was recorded as "house," "compound," or "neighbor." A total of 18,848 children were tested with tuberculin (Heaf method), among whom 1,267 were related contacts of lepromatous patients but not necessarily their children. Alternate "negatives" were vaccinated with BCG. It is intended to make return visits to every parish periodically to examine those already in the trial and to vaccinate every alternate child born into the various families since the previous visit. They have found a suggestion that *M. leprae* can stimulate a weak response to tuberculin.—[From abstract by J. R. Innes in *Trop. Dis. Bull.* **60** (1963) 1123.]

BROWNE, S. G. Erythema nodosum in leprosy. *J. Chronic Dis.* **16** (1963) 23-30.

Speaking of ordinary erythema nodosum, the author states that the first accurate description was by Willan (1798-1808); since then little has been added. In Britain probably three-quarters of the cases are associated with tuberculosis and occur in children before puberty, but there are many diverse causes and of recent years drugs have figured increasingly. In the tropics erythema nodosum leprosum is conspicuous, as it occurs in a proportion of patients with lepromatous leprosy, and exclusively in that form. Its occurrence has no relation to age, but apparently it is more frequent in males than females. Unlike the classical (nonleprosy) form, it is a feature of the established

and progressive disease. It also differs in certain clinical features, such as the sites of predilection of the lesions, the duration of the individual elements, and the frequency of prolonged episodes and recurrences. Other peculiar features are chronic fibrosing panniculitis, localized and symmetrical edema, localized bandlike subcutaneous fibrosis, and fibrotic myositis. It is now generally conceded that erythema nodosum leprosum is a serious condition, usually of bad prognosis. It indicates a state of hypersensitivity to the leprosy bacillus or its products. It is often accompanied by severe and progressive lepra reaction, and is part of the clinical picture of tissue allergy. Severe cases respond only to corticosteroid therapy, which may have to be continued for long periods.—[From abstract by J. R. Innes in *Trop. Dis. Bull.* **60** (1963) 641.]

DOBROVIC, D. and SCHALLER, K. F. Eye changes and sight defects in leprosy patients. *Ethiopian Med. J.* **1** (1963) 147-155.

The authors studied eye changes and reduced vision in a group of leprosy patients in a hospital in Addis Ababa where eye complications are frequently found; so the incidence of these complications may not represent the real occurrence of eye complications in leprosy throughout Ethiopia. Fifty-three out of 100 patients with eye complaints were found with reduced vision, 16 being blind in both eyes and 18 in one eye. In 9 of the 16 and 7 of the 18, leprosy was the cause. Trachoma was involved in 25 patients, iridocyclitis in 16 and leprosy keratitis in 7 of the 53 cases. The authors conclude that eye changes occur more often and show greater deterioration in patients who do not receive treatment.—[From abstract by D. P. Choyee in *Trop. Dis. Bull.* **60** (1963) 847.]

TERENCIO DE LAS AGUAS, J. Método gráfico para el estudio de los pies y manos de los enfermos de lepra. [Graphic method for the study of the feet and hands in leprosy patients.] *Rev. Leprol. Fontilles* **5** (1962) 619-624.

The author has used a graphic procedure, called photomanogram or photopodogram, for the study of the hands and feet in leprosy patients. The procedure consists in applying the palm of the hand and the sole of the foot for 5 minutes to paper impregnated with developing liquid; the paper is previously-sensitized radiographic paper, which is later fixed and washed. The tracings form a faithful reflection of the neural, motor, and trophic changes. The method was found to be simple and useful for following the development of paralytic lesions under specific treatment and physiotherapy.—[From abstract by J. R. Innes in *Trop. Dis. Bull.* **60** (1963) 847.]

PRICE, E. W. The prevention of plantar ulcer in leprosy. *Leprosy Rev.* **34** (1963) 16-25.

This is a study of the *prevention* of plantar ulcer, by analysis of the distinction between the pliant foot and the rigid foot. The author has developed a method which ensures the recognition of early sensory loss, early motor loss, vasomotor disturbance, and the preulcerative state, using the kinetograph or the dynamic foot-print which gives an accurate record of the site and type of the lesion. The method of obtaining this accurate record is very simple; it involves the use of inked rubber mats (obtainable from Down Bros. Ltd., Toronto, Canada) or scraper-board (from Winsor & Newton, Ltd., Wealdstone, England). The author thinks that among the multiple factors that precipitate ulcers of the foot are the following: sensory loss, motor loss, vasomotor loss, lack of foot inspection, lack of cooperation from the patient.—[From abstract by J. R. Innes in *Trop. Dis. Bull.* **60** (1963) 643.]

HSUEN, J., THOMAS, E. and JESUDIAN, G. A, B, O blood groups and leprosy. *Leprosy Rev.* **34** (1963) 143-147.

The authors, at the Schieffelin Leprosy Research Sanatorium in South India,

determined the blood-group distribution of 526 leprosy patients and of a control series of 1,000 first-time blood donors who came from same areas and belonged to the same racial group as the leprosy patients. The results (5 tables) show that there was a significant difference between the leprosy patients and the control series, the incidence of leprosy being high in the O group and low in the B group; nearly twice as high in the O's as in the B's.—[From abstract by J. R. Innes, in *Trop. Dis. Bull.* **60** (1963) 1121.]

CARAYON, A., LANGUILLON, J., BOURREL, P. and BASSET, A. Lésions des os longs chez les lépreux (a propos de 30 cas). [Lesions of the long bones in 30 leprosy patients.] *Bull. Soc. Méd. Afrique Noire Langue Française* (Dakar) **7** (1962) 660-665.

It is recalled that one of the authors, in 1950, was the first to report the presence of new bone in the bones of the leg in 3 leprosy patients treated by sulfones, and in 2 forearm bones in a 4th patient. In the present report the authors deal with the frequency of periostitis observed on systematic radiography of the lower limbs of a group of 30 patients. In 35 legs without ulcerous lesions or plantar perforation, periostitis was found in 5; and in 25 legs showing plantar ulcers, periostitis was encountered 14 times. They distinguish 2 types of bony lesion, which they call the lytic type and the constructive type. The lytic consists of diffuse decalcifications associated with osteoporotic lesions. The constructive type consists of 4 subtypes: (a) periostitic mantle; (b) periostitic proliferation (such as spicule); (c) periostitic blisters; (d) periostitic proliferations leading to "worm-eaten bond" [abstractor's translation]. The mechanism of these lesions the authors believe to be compounded of direct infection by the leprosy bacillus, superinfection by other microorganisms, chemotherapy, muscular and neural changes, and hormonal changes. On the whole the infectious mechanism predominates, modified sometimes by chemotherapy.—[From abstract by J. R. Innes in *Trop. Dis. Bull.* **60** (1963) 640-641.]

SAUL, A. and HILL, G. Algunas investigaciones recientes en lepra. [Some recent investigations in leprosy.] *Dermatología* (Mexico) **7** (1963) 97-113.

This is a preliminary report on a cooperative venture of the Departments of Health of Mexico and of the United States concerning three patients with leprosy: one with the reactional tuberculoid form, one with diffuse leprosy, and the third with incipient lepromatous leprosy. The initial studies, performed in Mexico, concerned mainly the bacteriologic and lepromin tests, the histopathology, and the social status of the patients. In the United States some of these studies were repeated but emphasis was on biopsy of skin, lymph nodes, liver, kidneys, gums, jejunum, subcutaneous tissue and testes. In addition, a search for bacilli was made in the sputum, gastric contents, bone marrow, blood, spinal fluid, urine, feces, and the liquid of hydroceles. Other studies include that of the suprarenal function, immunoelectrophoresis of the seroproteins, and the radiography of different organs. These studies were correlated with clinical changes under sulfone therapy. Neurologic, ophthalmologic and other consultations as well as the services of rehabilitation were enlisted in order to complete the investigation and aid for these three patients.—[From authors' summary.]

[Since this report serves only to whet the reader's curiosity, it is to be hoped that the results of the unprecedented international collaboration described will presumably be reported in another article.—EDITOR EMERITUS.]

VIEIRA, J. V. Forma do síndrome do canal cárpico, na lepra. [The carpal tunnel syndrome in leprosy.] *Rev. portuguesa Doença de Hansen* **2** (1963) 42-51.

After discussing the concept and etiopathogeny of the carpal tunnel syndrome, the author describes the form which this syndrome presents in leprosy. Based on the anatomopathologic lesions, he proposes for treatment section of the transverse carpal ligament and intraneural neurolysis.—[From author's summary.]

DAVIDSON, J. T. and ALADJEMOFF, L. Anaesthesia in a leprosarium. *British J. Anaesth.* **35** (1963) 484-487.

This report discusses the anesthetics for 110 operations on 34 patients performed between 1953 and 1962. The operations were mainly orthopedic procedures and plastic reconstructive operations of the nose, ears and eyebrows; ulnar nerve neurolysis (performed on 10 occasions), and ophthalmologic operations, keratoplasty and correction of eyelid retraction. A striking feature of the situation has been the enthusiasm and hopefulness with which the patients viewed their forthcoming surgery. Preoperatively, the general condition of the patients was comparable with that of a similar age group in the general population. Testing sensation in and around the operative site preoperatively, it was found that 5 operations on the upper limbs could be performed without anesthesia because of preexisting analgesia. Premedication consisted of atropine and morphine, but the latter was omitted when any suggestion of laryngeal stenosis existed. Patients who had received steroid therapy within a period of one year for the control of lepra reactions received cortisone in the accepted doses before and after anesthesia. Of the 110 operations, 87 were performed under general anesthesia. Induction was with intravenous thiopentone, and maintenance with nitrous oxide, trichloroethylene or ether. Endotracheal intubation was carried out where indicated, using suxamethonium for relaxation. Nasotracheal intubation is generally contraindicated and is often impossible. In 2 cases disease of the larynx was evident on laryngoscopy; in 1 of these, because of stenosis and fixation of the epiglottis, exposure of the glottis proved impossible with the Macintosh laryngoscope. However, good exposure was achieved by using a straight-bladed instrument to lift the epiglottis forward, and the glottis was found to be somewhat stenosed. Local infiltration anesthesia with 0.5% lignocaine was used in 16 procedures, and brachial plexus block in 2. Endotracheal instruments and connections and detachable parts of the anesthetic machine were thoroughly washed in soap and water after use, and were sterilized by means of exposure to formalin vapor for 24 hours in a hermetically sealed container.—F. SAGHER.

TRAN-VAN-BANG and CAO-XUAN-SON. A la recherche des tests de la guérison de la lèpre. [A study of the tests of cure of leprosy.] *Bull. Soc. Path. exot.* **56** (1963) 346-356.

The authors have studied 51 former patients who had been subjected to sulfone treatment for 10 years. Among the findings are: clearing of the skin was total in all the cases; sensory troubles were cured in 2 cases, and improved in 16 cases; there was regression of neuritis in 9 cases; perforating ulcer of the foot healed in 4 cases; there were 5 cases of impotence or frigidity; in 4 cases, the leprosy bacillus was still to be found; the Mitsuda reaction was changed in only 3 cases; there was no histologic cure; 8 patients were strongly affected by the psychic complex of "leprosy for life." From these findings it may be concluded that, after 10 years of sulfone treatment, these patients are not yet cured. Medical surveillance and the treatment should be kept up.—[From authors' summary.]

LITALIEN, F., HARTER, P., TRINH THIKIM-MONG-DON and NGUYEN-THI-LAU. Essai de traitement de la lèpre lépromateuse par la sulfaméthopyrazine. [Trial treatment of lepromatous leprosy by sulfamethopyrazine.] *Bull. Soc. Path. exot.* **54** (1961) 219-231.

The authors have placed 30 lepromatous cases and 1 borderline case under sulfamethopyrazine treatment from 12 to 16 months, and they believe the results were encouraging from the clinical and bacteriologic points of view. However, various side-effects were observed in 19 of the cases. Accordingly, the treatment had to be suspended temporarily in 3 cases and definitely stopped in 2.—R. CHAUSSINAND.

✓ ROSTANT, M. Essai de thérapeutique anti-hansénienne par l'acétylsulfaméthoxyypyridazine. [Trial of acetylsulfamethoxyypyridazine in antileprosy treatment.] Bull. Soc. Path. exot. **56** (1963) 320-336.

In 12 cases of leprosy, 1 major tuberculoid, 2 borderline, and 9 lepromatous, treated for 6 months with intramuscular injections of acetylsulfamethoxyypyridazine (2 gm/week for 6 weeks then 4 gm/week for 6 months), the drug showed therapeutic efficacy. Time will show in which measure this treatment is comparable to the already known leprostatic drugs.—[From author's summary.]

✓ HIRAKO, T. Chemotherapy of leprosy with diethyl-dithiol-isophthalate 'Etisul.' Leprosy Rev. **34** (1963) 62-67.

In the Tama Zenshoen National Leprosarium, the author made a trial of Etisul in 21 patients, of whom 15 were lepromatous, as an inunction of 5 to 10 gm. 5 days a week. He confirms its favorable action, both clinically and bacteriologically, and found it well tolerated, but dermatitis was frequently provoked. He thinks that the dermatitis is caused by the drug itself, and factors of race, type of disease, type of skin, and kind of inunction require further study. He thinks the tendency to dermatitis will restrict the use of the drug, but welcomes the addition of a new and different, and effective, type of drug to our armamentarium. He suggests a combined use of drugs.—[From abstract by J. R. Innes in *Trop. Dis. Bull.* **60** (1963) 751-752.]

✓ MACADEN, V. P. and JOB, C. K. Diphenyl thiourea in the treatment of patients with recurrent lepra reactions. Leprosy Rev. **34** (1963) 73-79.

In the Schieffelin Leprosy Research Sanatorium, in South India, the authors used diphenyl thiourea in 4 lepromatous cases and obtained definite benefit, which leads them to conclude that this drug is the best available treatment for recurrent or persistent leprosy reactions. The number of days the patient was in reaction was very much less than with other drugs, and the number of days the patient could take antileprosy treatment with this drug was more than with other drugs. When reactions did occur their severity seemed unchanged.—[From abstract by J. R. Innes in *Trop. Dis. Bull.* **60** (1963) 751.]

✓ SCHALLER, K. F. The use of triamcinolone in the treatment of severe lepra reactions. Leprosy Rev. **34** (1963) 139-142.

Triamcinolone (9 alpha-fluoro, 16 alpha-hydroxy prednisolone) was used for 30 patients in Addis Ababa suffering from erythema nodosum leprosum. The starting dose was 23-32 mgm. daily, quickly reduced to the maintenance dose of 2 to 8 mgm. The average period during which treatment was needed was 12 days. By the end of that time the reaction had generally subsided completely, 27 out of the 30 patients showing marked improvement in their symptoms. The author thinks that this drug is indicated in severe lepra reactions, and calls for further studies with long-acting corticosteroids, especially those of the repository type.—[From abstract by J. R. Innes in *Trop. Dis. Bull.* **60** (1963) 1125.]

✓ MAYAMA, A. Plasma lipoprotein lipase (clearing factor) in leprosy. La Lepro **32** (1963) 199-203 (in Japanese; English summary).

The plasma lipoprotein lipase has been studied by Stork-Kucerová's method in 4 normal individuals and 26 leprosy patients, 10 tuberculoid, 14 lepromatous, and 2 borderline. After an overnight fast two 10-cc. blood samples were obtained, the first (control) before administering heparin and the second 10 minutes after the injection. Heparin sodium, 50 mgm. in 5 cc., injected intravenously, was used as the clearing-factor stimulus. The plasma was promptly separated in a refrigerated centrifuge. The activity of the lipoprotein lipase was determined by the reduction in turbidity—measured as a fall in optical density—of a mixture of the specimen and a dilute milk emulsion containing 0.03% of fat. After incubation of the mixture for 2 hours at

37°C, the turbidity was measured in a spectrophotometer at 610 m $\mu$ . In the tuberculoid cases, the degree of clearing activity ranged from 12% to 34%, the average being 21.5%—not different from the results with the plasmas of the healthy persons. The enzyme activities were considerably lower in the lepromatous and borderline cases, in the former from 3.5% to 29.5% (mean 13%), and in the latter around 9.5%. In 3 cases which had had recurrent attacks of erythema nodosum leprosum there was a moderate decrease. Electrophoretically, in most of the cases, a slight decrease in the mobility of plasma albumin was observed after intravenous administration of heparin, irrespective of age, sex, or leprosy type.—[From author's summary.]

- MIYAMA, T. and SAITO, N. Enzymatic activities in the serum of leprosy patients. (1) On phosphatase. *La Lepro* **32** (1963) 192-198 (in Japanese; English summary).

The evaluation of enzymatic activities in the patient's serum has been emphasized with respect to the diagnosis and prognosis of the disease. These various serum enzymes are known to be produced by tissue cells, and they are said to be restored in the cells and metabolize themselves and are excreted via the endocrine organs and degenerated or damaged cells. (1) Alkaline phosphatase, P and Ca remain unchanged in the serum of leprosy patients. (2) Acid phosphatase and ATP-ase remain at normal levels. (3) Alkaline ATP-ase, which is activated by Mg, increases somewhat above normal. It can be said that instability of alkaline ATP-ase in leprosy depends on leprous tissue and its destruction rather than on secondary muscle atrophy.—[From author's summary.]

- DHOPLE, A. M. and MAGAR, N. G. Studies in the blood chemistry of leprosy. (Calcium, magnesium, phosphorus and phosphatase activity content of the blood sera of leprosy patients.) *Leprosy in India* **34** (1962) 299-305.

The blood serum samples of 105 leprosy patients of different types and at different stages of the disease were analyzed for their Ca, Mg, and P contents, and then alkaline phosphatase activity. Also the blood serum samples of 8 normal persons were analyzed for the same constituents. Lower values for Ca were observed in the patients, showing an inverse relationship with the severity of the disease. As against Ca, the values for Mg and P constituents were higher, and this also shows a direct relationship with the advancement of the disease.—[From authors' summary.]

- BIDEAU, J. Recherche d'anomalies protidiques dans la maladie de Hansen. [Investigation of the protein anomalies in leprosy.] *Arch. Inst. Pasteur Guadeloupe* (Annual Rep.) 1960, pp. 107-113.

The sera of 95 leprosy patients (55 lepromatous, 20 tuberculoid, and 20 indeterminate) were submitted to the following tests: that of Huerfano and Popper with ammonium sulphate, Kimmel's zinc test, paper electrophoresis, starch gel electrophoresis, and total protein determinations. The techniques employed have in no case shown evidence of notable dysglobulinemia.—R. CHAUSSINAND.

- BRU, P. and ROLLIER, R. Étude histologique des manifestations hépatiques de la lèpre lèpromateuse. [Histologic study of the liver manifestations of lepromatous leprosy.] *Sem. Hop. Paris (Arch. Anat. Path.)* **9** (1961) 279-303.

In lepromatous leprosy the liver parenchyma has the appearance of lesions of the reticuloendothelial tissue. The hematogenic dissemination of the bacilli causes the formation of nodular granuloma, small and disseminated without order. The parenchyma itself is not altered, or shows only small lesions in the immediate neighborhood of the nodules. On the contrary, in the portal spaces the banal mesenchyma participates early in the production of inflammatory sclerosis with evolutive and extensive tendency. This observation seems to indicate that leprous cirrhosis starts from the portal spaces.—R. CHAUSSINAND.

CONTRERAS RUBIO, F. Formas inestables de la lepra. [Unstable forms of leprosy.] *Rev. Leprol. Fontilles* **5** (1962) 597-617.

This paper deals with the histology of leprosy, especially that of the unstable forms. The author agrees with Pardo Castello that the classification of leprosy, often made under difficult conditions especially in under-developed countries, should be as scientific as possible. In a scientific classification only specific histologic phenomena should be used, and the less specific and nonspecific should be disregarded. The histology of dimorphous or borderline leprosy is not well-defined. Dimorphous granulomata have often been diagnosed in reactive lepromatous lesions and in reactional tuberculoid lesions. There is a tendency to develop under sulfone treatment a histiocytic hyperplasia which the author thinks represents an improvement in the body resistance, and it is accompanied by tissue and bacillary changes. In more than 1,000 biopsies in 500 leprosy patients the author has not met with typical polar features. He has noted reactional tuberculoid features in the histologic pictures in some patients which have not agreed clinically with that diagnosis, and is inclined to call them dimorphous for clinical convenience, always remembering that the basis is reactional tuberculoid. Because dimorphous lesions are not bipolar in histology but include elements of reactional tuberculoid, he proposes in classification an "intermediary" group which would unite the present dimorphous leprosy and reactional tuberculoid leprosy, and replace the present dimorphous group. Histologically the diagnosis of dimorphous leprosy is not possible, and the diagnosis of "intermediary" should be substituted when there is histologically a more or less modified reactional tuberculoid granuloma but clinically the case cannot be included in the tuberculoid type but is unstable, with frequent oscillations towards the tuberculoid type. Such cases seldom reach the lepromatous polar type; only rarely among patients under treatment. Proposals are made for the study of this matter in preparation for the next international congress.—[From abstract by J. R. Innes in *Trop. Dis. Bull.* **60** (1963) 845-846.]

REYES, P. A. Modificación a la técnica de Fite-Faraco para la coloración de bacilos ácido alcohol resistentes en cortes de tejidos. [Modification of the Fite-Faraco technic for staining acid-fast bacilli in tissue sections.] *Dermatología (México)* **7** (1963) 138-142.

This report describes a modification of the [so-called] Fite-Faraco technic of staining acid alcohol-resistant bacilli in tissue sections, the object being the demonstration of greater numbers of bacilli. The principal modification consists in the use of an aqueous solution of sulfuric acid instead of the classic hydrochloric-acid alcohol.—[From author's summary.]

MONTESTRUC, E. and GARCIN, D. Un exemple de diffusion bacillaire lépreuse en milieu scolaire. [An example of diffusion of the leprosy bacillus in a school.] *Bull. Soc. Path. exot.* **56** (1963) 288-291.

Twenty girls, schoolmates of one found to have lepromatous leprosy with a highly bacilliferous rhinitis, yielded without exception a delayed positive lepromin test. This fact shows the part played by contamination in a school environment. The 20 positive girls were subjected to prophylactic sulfone treatment. Such an example shows the difficulties met with in antileprosy prophylaxis, even in socially developed countries like Martinique.—[From authors' summary.]

[The question arises what proportion of a control group, of the same age range, who had not been so exposed would have given positive reactions to lepromin.—EDITOR EMERITUS.]

MONTESTRUC, E. and GARCIN, D. Cas d'infection lépreuse observés pendant la période 1954-1962 parmi les enfants contacts de lépreux vaccinés au B.C.G. a la Martinique. [Cases of leprosy infection observed in Martinique from 1954-1962

among BCG-vaccinated children who were contacts of leprosy patients.] Bull. Soc. Path. exot. **56** (1963) 314-320.

Between 1954 and 1962 the authors observed 3 cases of lepromatous and 4 of tuberculoid leprosy, out of 691 children vaccinated with BCG and living in contact with leprosy patients. The lepromatous children gave no reaction to either tuberculin or lepromin; of the tuberculoid children whom it was possible to follow, 2 reacted to both antigens, and they presented a very benign leprosy. It is suggested that BCG immunization induces a high degree of protection against leprosy.—[From authors' summary.]

TAKAHASHI, Y. and YAMAMOTO, K. Sur l'antigène commun entre le bacille tuberculeux et le bacille de la lèpre. [On the antigen common to the tuberculosis and leprosy bacilli.] Compt. Rend. Soc. Biol. **154** (1960) 2160-2163.

The authors have applied the hemagglutination reactions to sera from leprosy patients who do not react to the intradermal tuberculin test and to the sera of patients with pulmonary tuberculosis, against 3 purified tuberculosis purified antigens, the polysidic, proteidic and phosphatidic. The most frequently-found antigen common to the tuberculosis and leprosy bacilli was the polysidic antigen.—N. BOURCART.

RHODES-JONES, R. An investigation into bacillaemia in leprosy. Leprosy Rev. **34** (1963) 26-28.

Low suggested that the thick film method for detecting bacilli in blood is unreliable because puncture through the skin may contaminate the blood. In the present paper the author reports withdrawing 2 cc. of blood from the median basilic vein of 101 patients, in 2 of whom he first exposed the vein surgically. Thick smears were made from 1 drop of the blood. In 6 patients, mock withdrawal of blood was made by passing the needle of a syringe containing 0.5 cc. of saline through the skin parallel to the vein. Of the smears from 59 lepromatous patients, 26 were positive for acid-fast bacilli, and in 8 of these bacilli were found within leucocytes. Positive smears were also obtained from 4 of 22 tuberculoid cases, 4 of 7 borderline cases, 5 of 9 dimorphous cases, and 3 of 4 indeterminates. In 1 dimorphous case bacilli were also found in leucocytes. Bacilli were found in the blood of the 2 patients in whom venipuncture was done on exposed veins. In the 6 mock venipuncture samples, 1 bacillus was found in each of the samples from 2 dimorphous cases, and 3 bacilli were found in that from a borderline case.—[From abstract by S. R. M. Bushby in Trop. Dis. Bull. **60** (1963) 640.]

WISE, M. J. Club-forms of *Mycobacterium leprae*. Leprosy Rev. **34** (1963) 68-72.

Club forms of *M. leprae*, recognized since 1900, have been sought by the author in smears from patients before and during treatment. They were examined by 9 staining methods, and by their solubility in common fat solvents. A comparison was also made with similar forms in actively-growing cultures of tubercle bacilli by means of phase-contrast microscopy, solubility, and staining by PAS and other methods. The forms were scanty in both untreated lepromatous cases and in those with active relapsing lesions. In the treated patients their proportions decreased as the granularity index increased with improvement. The clubs were strongly acidfast, and were located mainly towards the poles of the bacilli; there were never more than 3 in the same bacillus. Fluorescent staining showed them as condensation rather than swellings. They were isotropic and stained well with fat stains. They were strongly osmiophilic, but no phospholipids were demonstrated. They were PAS-positive and showed gamma metachromasia. Like the bacillus, they reacted strongly with Gomori alkaline phosphatase. They did not stain with spore stains or give the Millon reaction, and neither did they stain after treatment with xylene or chloroform although staining was partially restored by the Fite-Faraco method. They appeared to be of the same type of

structure as those of the tubercle bacillus. Homogenization for electron microscopy apparently destroyed the clubs, for they were not observed by this method. It is concluded that the clubs are not granules, and that they do not form as the result of chemotherapy; they appear to be associated with growth, or possibly with the earliest phase of natural involution.—[From abstract by S. R. M. Bushby in *Trop. Dis. Bull.* **60** (1963) 1120.]

SATO, S. Experimental inoculation of leprosy to hybrid mice. *Leprosy in India* **34** (1962) 241-248.

This is a preliminary report of an attempt to confirm the claim by Chatterjee of successful transmission of leprosy to a hybrid black mouse. The original strain not being available, the author used F<sub>2</sub>-hybrid mice obtained by cross-breeding F<sub>1</sub>-hybrid mice from Chatterjee's male (black) and C<sub>57</sub>B<sub>1</sub> female mice. In a series of 5 experiments the animals were inoculated intraperitoneally with bacilli from skin nodules. Only young mice were used, although they weighed from 1.4-18 gm., more than half of them 3-7 gm. Small, grayish-white, pin-head lesions developed in 8 of the 70 inoculated black mice; 6 of these mice were in one experiment in which 10 such mice had been inoculated. The lesions were situated in the mesentery, and were seen in autopsies made 134-525 days after inoculation. The largest, about 4 mm. × 2 mm., were composed of fibrous tissue and fibroblasts in which were mingled small foci of foamy cells containing scanty acid-fast bacilli; the smaller nodules consisted of many foci of histiocytes containing numerous acidfasts. In 2 experiments young white mice of the 'SM' strain were inoculated, and in one of them in which 10 mice were used 1 animal developed the macroscopic lesions. In the second experiment, 5 'SM' mice and 4 hybrid mice were inoculated, but none of these animals developed lesions. Attempts to passage this infection to F<sub>3</sub> hybrids have so far been unsuccessful, possibly because of the difficulty of obtaining sufficient bacilli to form an adequate inoculum. Control experiments with boiled bacilli were negative.—[From abstract by S. R. M. Bushby in *Trop. Dis. Bull.* **60** (1963) 644.]

SEN GUPTA, P. C., MUKERJEE, N., MAJUMDAR, K. S. and GHOSH, S. Attempt at transmission of human leprosy to the rhesus monkey: preliminary observations. *Bull. Calcutta Sch. Trop. Med.* **10** (1962) 157-159.

Two adult, lepromin-negative, male rhesus monkeys were injected with 5 mgm. prednisolone t.d.s. for 9 days and then inoculated subcutaneously in the forehead with a heavy suspension of bacilli from a patient with lepromatous leprosy. Nodular granulomatous lesions developed at the injection site 3 weeks after the injection, their size by the 28th day being 0.75" in diameter in one monkey (KA-I) and 0.5" in the other (KA-II). The granuloma in monkey KA-I did not conform to lepromatous or tuberculoid histology. There were large histiocytes with swollen, vacuolated cytoplasm (foamy cells) containing many acid-fast bacilli, and there were collections of epithelioid cells and occasional giant cells; the histology thus resembled that of the dimorphic type of human leprosy. For 3 months the lesion remained fairly large, and it could still be classed as dimorphic with greater accumulation of round cells and fibroblasts. Acid-fast bacilli were not found in the granuloma at that time, and the one small, somewhat rod-shaped acid-fast structure seen in a nerve was apparently not *M. leprae* but was derived from a local tissue mast cell. The lepromin test remained negative. The biopsy specimen taken from the second monkey (KA-II) 3 months after inoculation also showed a dimorphic pattern, with marked round cell infiltration. There were no acid-fast bacilli and the nerves were unaffected. In this monkey the lepromin test became positive at this stage, and the lesion was in the process of regressing. From these data it appears that a granuloma resembling that of dimorphic leprosy develops in the lepromin-negative rhesus monkey when inoculated with *M. leprae*. The acid-fast bacilli are gradually destroyed and the granuloma healed spontaneously.—[From abstract by S. R. M. Bushby in *Trop. Dis. Bull.* **60** (1963) 1126.]

✓ BERGEL, M. Valoración de actividad quimioterápica sobre el *Mycobacterium leprae* en animales con dietas prooxidantes. [Evaluation of chemotherapeutic activity on *Mycobacterium leprae* in animals on prooxidant diets.] Rev. Asoc. Med. Argentina **77** (1963) 99-112.

Previous experiments having shown that the leprosy bacillus can multiply in laboratory animals on prooxidant diet (very low in tocopherol and high in unsaturated fatty acids), it is now possible very largely to standardize procedures for evaluating the effects of certain drugs in the treatment of leprosy infections. Adult male rats and mice fed on the standard diet were inoculated 20-30 days later into each testicle with a fresh suspension of *M. leprae*. The untreated controls always included a group treated with DDS for comparison. The drugs tested were: Ciba-1906 and Ciba-6704. After periods of 4-8 months the animals were killed and the organisms in the testicles counted. There was first a period in which the organisms were easily detected (period of elimination), then a silent phase in which they could not readily be seen, then a period of fresh growth in which the bacilli were numerous, numbers of globi could be seen, and the organisms could be found in the kidneys, spleen and liver.—[From abstract by W. K. Duncombe in *Trop. Dis. Bull.* **60** (1936) 847-848.]

✓ HADLER, W. A. and ZITI, L. M. The influence of the animal age upon the rate of evolution of the murine leprosy. *La Lepro* **32** (1963) 187-191 (in English; Japanese summary).

The influence of the animal's age when inoculated upon the rate of evolution of murine leprosy was studied in rats and hamsters inoculated intraperitoneally. The results, based on the evolution of the lesions and the rate of evolution of the disease, show as a consequence of the animal's age: (1) In rats, the length of the latent phase becomes altered; it is shorter in adult rats than in sucklings. (2) In hamsters, the initial phase of evolution is shorter in sucklings than adults. The rate of evolution of the infection is similar both in sucklings and young adult rats, showing that it is not influenced by the age at the time of inoculation. In suckling rats, contrary to what happens in young adults, there is a correlation between the size of inoculum and the mean of survival.—[From authors' summary.]

NAKAMURA, M. and KOHI, T. Growth of *Myc. lepraemurium* in mice transplanted with Ehrlich ascites tumor cells. *Kurume Med. J.* **9** (1962) 174-177.

✓ The experiments here reported were designed to see whether the changes in cell metabolism caused by neoplasms enhance the growth *in vivo* of the murine leprosy bacillus. The bacilli were injected, subcutaneously or intraperitoneally, into mice either at the same time as, 5 days before, or 3 days after the injection of the Ehrlich ascites tumor cells; the cells were injected by the same route. Mice which died were examined at once, and those that survived approximately 100 days were killed and examined. The results show that there was no effect when the subcutaneous route was used except that the bacilli disseminated more widely, especially to the liver and lungs, when cells and bacilli were injected on the same day. After injection by the intraperitoneal route, with the bacilli injected simultaneously or before the tumor cells, the presence of the cells apparently prolonged the life of the mice. [It would appear from Table 2 that these results are based mainly on observations on 1-3 mice, and the survival time of mice inoculated only with the tumor cells is not given.]—[From abstract by S. R. M. Bushby in *Trop. Dis. Bull.* **60** (1963) 752.]

WONG, P. C. and MA, L. Effect of suramin on serum protein in *Mycobacterium lepraemurium*-infected mice. *J. Trop. Med. & Hyg.* **66** (1963) 99-101.

✓ Rees and Hart showed that suramin enhances experimental tuberculosis, although it had no effect on the growth of tubercle bacilli *in vitro*. They suggested that suramin affected the lipid surface of the tubercle bacilli, so that they became less susceptible

to destruction by the host. Hilson and Elek showed that there was an enhancing effect on murine leprosy in mice. The present authors have investigated the effects of suramin on serum proteins of mice infected with murine leprosy. Four groups of 18 mice were used in this study: (1) normal mice; (2) mice injected with 1 mgm. suramin, subcutaneously twice weekly up to 5 months; (3) mice infected with the bacilli; (4) infected mice treated with suramin. At intervals counts of the bacilli in the liver and spleen were made (method of Hart and Rees) and the proteins in the serum were determined electrophoretically. The counts showed that the generation time of the bacilli in mice treated with suramin was shorter than that of those in the untreated mice, and differential counts showed no difference in the monocytes in the infected or treated mice. The concentration of the gamma globulin was 23.6 ( $\pm 4.8$ ) gm/100 cc. in the infected untreated mice, and 19.0 ( $\pm 4.5$ ) gm/100 cc. in the infected treated group. These concentrations compared with 15.3 ( $\pm 3.1$ ) gm. in the normal mice, and 17.4 ( $\pm 3.6$ ) in the uninfected mice treated with suramin. The uninfected, suramin-treated mice showed an increase in beta globulin, the concentration being 19.9 ( $\pm 3.3$ ) gm.; the concentration of beta globulin in the normal mice was 24.8 ( $\pm 4.1$ ) gm. and in the infected and suramin-treated mice was 20.1 ( $\pm 3.0$ ) gm. There were also changes in the concentration of albumin. That in the normal mice was 52.5 ( $\pm 4.6$ ), but in the infected, untreated mice it was 40.4 ( $\pm 4.8$ ) gm., and in the infected, treated group 43.6 ( $\pm 5.1$ ) gm.; the suramin-treated, uninfected mice showed little change in this protein. The authors are unable to offer any explanation for the increase in beta and gamma globulins and the fall in albumin in the infected animals. Because of the rise in the beta globulin of the mice treated with suramin they suggest that the drug may have a specific effect on this protein, which is usually increased in conditions associated with increases in phospholipids and cholesterol. The higher concentration of gamma globulin in the untreated, infected animals compared with those treated with suramin suggests that suramin may inhibit or weaken the defense system of the host.— [From abstract by S. R. M. Bushby in *Trop. Dis. Bull.* **60** (1963) 950-951.]