

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.

COCHRANE, R. G. A critical appraisal of the present position of leprosy. *Internat. Rev. Trop. Med.* **1** (1961) 1-42.

This is an eleven-chapter (or section) review, in which the author's personal point of view is given free rein. Only a limited number of points can be mentioned. Regarding terminology, "mycobacterial reticulosis" is proposed to get away from the term "leprosy." Incidentally, there is evidence of a little carelessness about dates. The first resolution against use of the word "leper" is ascribed to the Madrid congress (1953) whereas it was in fact first adopted at the Havana congress (1948). Hansen's discovery of the bacillus is dated 1872 (actually 1873), and Koch's discovery of the tubercle bacillus as 1886 (actually 1882). Infection apparently depends upon entrance of the bacilli into the fine nerve terminals of the skin. Acquired immunity (as differentiated from natural immunity) depends upon hypersensitivity. One is surprised to see it stated that the Tokyo congress "unanimously" adopted a practical, or fixed, classification, clinical and not scientific, but no evidence of any such action is to be found in the reports of the meeting. The "dimorphous zone" of developing leprosy is given a paragraph and included in tables; "reactional dimorphous leprosy" is given another paragraph in a later section. A new form of reaction in tuberculoid leprosy is called "*poussée bacillifère*." Cortisone is not approved for reactions except as a last resort. Etisul is regarded as the most interesting of the newer drugs. Regarding prophylaxis, chemoprophylaxis with DDS is not favored as a general measure; the value of BCG vaccination is held to be still unproved. Finally, the establishment of a world center for the study of leprosy is advocated.—H. W. W.

SANSARRICQ, H. and DUCASSE, B. A propos d'un voyage d'études de léprologie. [An account of a leprology study tour.] *Méd. Trop. (Marseilles)* **20** (1960) 473-481.

The study tour, which took place from May to November 1959 under the auspices of WHO, included Spain, the Belgian Congo and Venezuela. In *Spain* there are some 3,810 known leprosy patients (but in actuality perhaps 8-10 thousand). The endemicity is irregular, varying from 0.48 per thousand in the Canaries and 0.37 in Andalusia to 0.09 per thousand in Galicia. Of the known cases 59% are lepromatous. The prophylactic campaign includes examination at least once a year of all contacts with known patients; BCG vaccination as a preventive is not considered practicable. In *Venezuela*, with over 2½ million people in the areas especially affected, the number of known patients was 4.48 per thousand, of whom 40% were lepromatous. The incidence in the total population (7 million) was 1.77 per thousand. Most of these are treated with DDS tablets as ambulatory patients. The authors were particularly interested in the experiment conducted by Convit in prophylaxis with BCG. In a colony of Germans, among whom there was a leprosy infection of 100.4 per 1,000, BCG vaccination was given in 1950 to 584 healthy persons, while 522 were controls. In the vaccinated group 5 years later there were only 3 tuberculoid cases, while in the controls there were 25 cases, 9 of which were lepromatous or borderline. In the *Belgian Congo*, with a population of over 12½ million, there were 155,362 known cases of leprosy, of which 6% were lepromatous and 81% tuberculoid. The antileprosy campaign includes the systematic examination once a year of the entire population. Reference is made to efforts at restoration and prevention of

deformities, and it is believed that this should be considered as a function of residential institutions; but the authors add that, important as this is, the chief emphasis should be placed on diminishing foci of infection by bringing under treatment as many patients as possible.—[From abstract by E. Muir in *Trop. Dis Bull.* **57** (1960) 1268.]

HARTER, P. Quelques aperçus géographiques sur la maladie de Hansen. [Certain geographic features of Hansen's disease.] *Bull. Soc. Path. exot.* **53** (1960) 841-847.

During travels in the past seven years, the author has been struck by the marked variations, clinical and sometimes even immunologic, of leprosy in different countries. These differences sometimes make its features difficult to compare. Resistance (frequency of reactive tuberculoid cases) and receptivity (susceptibility to infection; frequency of clinical cases) is seen to vary inversely:

Country	Endemy	Tuberculoid	Lepromatous
Japan	0.130/00		67%
Mexico	0.420/00	25%	60%
Viet Nam (littoral)	40/00	45%	42%
Africa, equatorial	220/00	60%	10%
Viet Nam (upland)	550/00	83%	7%

The author speaks of the "vanity" of an absolute and universal classification which does not take count of the ethnic and geographic features and customs.—H. W. W.

CANIZARES, O. Geographic dermatology: Mexico and Central America. *Arch. Dermat.* **84** (1960) 870-893. 82 (2)

Geographic factors, in their broad sense, affect the ecology of skin diseases. This introductory study is an effort to correlate some of the geographic factors by giving a panoramic review of dermatology in Mexico, Guatemala, Honduras, El Salvador, Nicaragua, Costa Rica, and Panama. A section devoted to leprosy includes the following data: *Mexico* has 30-40 thousand cases (Central America has 10-15 thousand) distributed irregularly as foci, of which the midwestern is the most important. The distribution is apparently unrelated to climate, latitude, humidity, or altitude. It is possibly related to Spanish Conquistadors, to commercial relations with the Philippines, and to Chinese immigration. The incidence is 8 times more frequent in mestizos than in either whites or Indians; it affects all social strata but especially the peasants. Regarding types, 60-70% of cases are lepromatous. Mention is made of diffuse lepromatosis of Lucio, a form seen in the State of Sinaloa. In *Costa Rica*, the incidence is 0.7 per thousand, 64% lepromatous, with many of the Lucio variety seen. *Nicaragua* has about 2,000 cases. *Honduras* has most of its cases in the southern section, where the tuberculoid case of sarcoidal form predominates. *El Salvador* has 0.09 cases per thousand, with 53% lepromatous, 17% tuberculoid, and 28% indeterminate. *Guatemala*: 0.02 cases per thousand, with 82% lepromatous. *Panama*: not common; the lepromatous form predominates.—J. A. ROBERTSEN

[INNES, J. R.] Visits to Malaya, Sarawak, Sierra Leone and Gambia. *Leprosy Rev.* **32** (1961) 4-10 (editorial).

This is an interesting, informal note reporting on visits made for Belra in the latter part of 1960. It is not susceptible to proper abstracting, but a few highlights are noted. In Malaya, on the Island of Pulaw Ketam, the population had been surveyed for leprosy and a carefully planned trial of BCG vaccination was started to ascertain, in future years, its effect in the control of leprosy. In both Malaya and Sarawak, where lepromatous cases predominate, cases of the diffuse form believed to be of the Lucio variety have been seen (not previously reported from that part of the world). In connection with O'Byrne's thyroid depression theory of the treatment of leprosy there are, in Sarawak, valleys between limestone hills in which goitre is prevalent and leprosy is thought to be

minimal and clinically less grave than in nongoitrous areas, and a comparative epidemiologic survey is recommended. In Sierra Leone, with perhaps 80,000 cases of leprosy, 20% of them lepromatous, antileprosy work is in an early stage of development, and a leprosarium center is being built. In Gambia, with 8,000-10,000 cases, a medical officer for leprosy was still to be obtained. [Since then, we are informed, Dr. I. A. Susman has been appointed and has taken over the duties.]—H. W. W.

KAMP, H. Leprabestrijding in Nederland. [Antileprosy service in the Netherlands.] *Nederlandsche Tijdschr. Geneesk.* **103** (1959) 1769-1770.

The "Q. M. Gastmann-Wiechers-Foundation" offers free treatment to outpatients at a special clinic at Rotterdam, maintains the 40-bed leprosarium "Heidebeek" at Heerde, and offers social assistance to patients in this country. Also, members of the families of patients are examined periodically. There is no compulsory segregation in this country. Of the 254 patients registered with the Foundation, the majority came from the East and West Indies. In one-third of these cases, the first symptoms appeared after immigration; but with the exception of a few dubious cases, all patients have been infected in endemic countries. About 36% of the cases are lepromatous or borderline.—D. L. LEIKER

URKU, E. La lèpre et la lutte anti-lépreuse en Turquie. [Leprosy and the antileprosy campaign in Turkey.] *Türk İjiyen ve Tecrübi Biyoloji Dergisi*, (Ankara) **20** (1960) 147-151 (Turkish version, pp. 139-145).

The campaign against leprosy began in 1922 with a hospital of 250 beds in Elazig for the compulsory isolation of patients. Since the subsequent organization of the Turkish Association of Leprology it has been realized that such methods are out of date. About the amount of leprosy in Turkey, the author believes there is an absolute minimum of 13,800 cases, or 50 per 10,000 population, but a maximum of 25,000 is possible. The endemic areas are in the east and southeast, and in some central and northern areas of Asia Minor. For the proposed campaign there has been set up a plan, accepted by the government, which involves: legislation along modern lines; the establishment of dispensaries and other institutions in all the endemic areas, already begun; leprosy surveys and collection of statistics (with the hope of help from WHO); a research and teaching institute with 30 beds in the neighborhood of Ankara; sanatoria and leprosy villages; a preventorium for each 3 endemic provinces; and the necessary medical and paramedical personnel. It is hoped, with the necessary help, to have all this organized within the next 5 years.—[From abstract by E. Muir in *Trop. Dis. Bull.* **58** (1961) 71.]

ELLIS, B. P. B. Four surveys of leprosy in the Lango District of Uganda. *Leprosy Rev.* **32** (1961) 103-107.

Surveys were made in four "parishes" of the Northern Province of Uganda with a population of 4,904 people, of whom 4,686 (95.5%) were examined. In total, 135 cases of leprosy were found, or 28.8 per thousand (23.1, 26.4, 30.1 and 34.6 in the different areas), 64 males and 71 females. The percentages of lepromatous cases varied from 4 to 19.6 (average 13.3). The age distribution of the patients followed in general that of the population, although among the cases of the 0-14 group was 34% of the whole and among the total population it was 46%.—H. W. W.

[UZUAKOLI] Annual report, 1959, Leprosy Research Unit, Uzuakoli. Ministry of Health, Eastern Nigeria, 1961, 7 pp.

This report was rendered by Dr. S. G. Browne, who took over from Dr. T. Frank Davey during the year, and Mr. S. O'Neill, laboratory superintendent. Drugs under trial include 3 previously used. (1) diphenyl thiourea (Ciba 1906), (2) diethyldiphenyl sulfexide, and (3) diethyldithiolisophthalate; and trials of 2 new drugs, (4) sulfaphenazole (Orisul), and (5) a repository sulfone (Compound 59 K 401, Bristol) had been begun. The first continues to give satisfactory results, but cases of undesirable side-effects have been seen. The second is liable to have toxic effects in adequate

dosage. The third has therapeutic value, especially in initial treatment of lepromatous cases, enhanced by combination with DDS or Ciba 1906. A "double-blind" test with a placebo was under way, DDS being used in conjunction with both substances. The control system introduced by Davey, because use of "control" groups of patients in the different trials gives an erroneous impression of objectivity and mathematical dependability of results, was still being employed. This consists of comparison of bacteriologic results in the trial groups with a norm derived from large numbers of patients on standard (DDS) therapy.—H. W. W.

RINALDI, D. R. AND CAPURRO, E. T. Comentarios sobre la evolución de la lepra en la República Argentina. [On the evolution of leprosy in Argentina.] Arch. argentina Dermat. **10** (1960) 209-224.

At the end of 1959, 11,026 leprosy patients were recorded at the Dirección de Lucha Dermatológica (the official antileprosy headquarters), which means a prevalence rate of 0.530/00. Since 1951 this rate has increased as follows: 1951, 0.460/00; 1952, 0.470/00; 1955, 0.490/00; 1957, 0.510/00; and 1959, 0.530/00. The study realized in each province shows the importance of some of the prevalence rates. For example, Misiones, Corrientes, Formosa, Chaco and Entre Rios are at the head of the ranking with 1.84, 1.72, 1.12, 1.08 and 0.980/00, respectively. Of 4,214 patients recorded from 1950 to 1959, 59% were lepromatous, 23% tuberculoid, 6.8% indeterminate, and 2.7% borderline. The ages between 20 and 40 were the most frequently attacked. The ages between 1-9 had a prevalence of the tuberculoid type. The dermatologic examination of all children of school age, and BCG vaccination, are recommended. Comparatively, Argentina is among the five most affected countries in America: Brazil, with 121,314 patients, rate of prevalence 2.02 (1957); Mexico, with 11,855 patients, rate 0.42 (1958); Venezuela, with 10,405 patients, rate 1.64 (1958); and Colombia, with 10,085 patients, rate 0.72 (1958). The prevalence rate, however, is much higher in French Guiana, 480/00. The rates in Surinam, British Guiana, and Paraguay are 7.3, 2.8 and 1.40/00, respectively.—E.D. L. JONQUIERES

MENEZES, D. Aspectos epidemiológicos e clínicos da lepra em Uruguaiana. [Epidemiologic and clinical aspects of leprosy in Uruguaiana.] Rev. brasileira Leprol. **27** (1959) 192-212.

Uruguaiana is a town situated on the western frontier of the State of Rio Grande do Sul, in Brazil, with a population of 63,256. Between 1939 and 1959 there was a 100% increase in population. It has a semi-tropical climate with an average humidity of 72%, and a temperature varying from 38° to 0°C. Diet is precarious for the poor, and consists chiefly of meat; vegetables are not eaten much. During the period of 20 years, 101 leprosy patients were registered, 45 lepromatous, 16 undifferentiated, and 40 tuberculoid. The sex incidence was 1 male to 1.06 female. There were 5.1 times more cases among the white population than among those of mixed race, and 2.2 times more than among the Negroes. The incidence was highest in the 30-39 age group and least in the 15 years group. The coefficient among immigrants was 5 times as high as among nationals. The immigrant patients amounted to 17% and were mostly from Uruguay or Argentina. In the control work, 606 contacts were registered. Out of 250 such contacts who were tested with lepromin (excluding those converted with BCG and those who developed leprosy) 98.4% gave positive reactions. The incidence of leprosy was 77 times greater among the contacts not vaccinated with BCG than among those who were vaccinated.—[From abstract by E. Muir in *Trop. Dis. Bull.* **57** (1960) 1269.]

FONTAN, R. and MASSACRIER, A. Evolution de l'endémie lépreuse en Guyane Française après dix ans d'utilisation des sulfones. [The evolution of the leprosy endemy in French Guiana after 10 years of use of sulfones.] Arch. Inst. Pasteur Guyane Française et Inini **21** (1960) Publ. No. 463.

After describing briefly the geography and the people of French Guiana (90,000

sq. km. and 31,000 pop.) the authors discuss the organization of the antileprosy service, and give a short history of leprosy which was introduced by colored slaves about the year 1740. The present situation of the various population groups of people is then discussed: (1) The Amerinds (American Indians), who are free from infection because of their isolation and their mode of life. (2) The Europeans, who are free from contact with leprosy because of the level of their social life. (3) The European convicts (now non-existent) on the contrary paid a heavy toll to the disease. (4) Among the mulattoes, who form the biggest segment of the population, the disease was especially studied since 1939 as shown by three graphs: (a) total cases, (b) new cases, and (c) polar forms (proportion of tuberculoid forms). The spread of leprosy was checked about 1957, since when it has been decreasing slowly. Although the percentage of tuberculoid cases increased since 1957, the lepromatous and borderline forms dropped to 6.4% in 1960. The authors attributed this evolution to the exclusive use of the sulfone since 1959. Despite the foregoing, the disease is rather tenacious due to social factors: lack of personnel, misunderstanding of the mass, and rejection by the patients. It is for these reasons that the fight against leprosy must be revised.—[From authors' summary.]

HURMAN, J. E. J. Mkunya: An experiment in leprosy control. *Leprosy Rev.* **32** (1961) 91-102.

After giving data on the leprosy situation in the Southern Province of Tanganyika, the author relates the history of an unsuccessful attempt to establish a second lepro-sarium in the region which was to be self-supporting. Three Native Authorities and Belra contributed to the scheme, 125 acres of land being allocated for the colony. The buildings for the patients were pre-fabricated. The crop, to be worked by the patients, was mainly cashew nuts. The place was opened in 1955, with a capacity of 110 inpatients, and a system of outpatient centers was started, the patients to pay a small registration fee. Financial difficulties were experienced, and it was decided that the scheme was not fulfilling its purpose. In 1959 the cashew crop exceeded expectations, but a severe tropical storm destroyed most of the buildings and uprooted most of the cashew trees, and the project had to be abandoned. However, the experiment of placing the control of a public health service of this nature in the hands of the African local authorities is considered to have been successful. The unfavorable factors are discussed. The rest of the paper is a discussion of how leprosy control work under conditions met in Africa, and present means of treatment, can best be pursued.—H. W. W.

STEVENSON, C. J. Leprosy: A review of 79 patients seen in London. *British Med. J.* **1** (1961) 925-928.

Of the 79 leprosy cases dealt with, 70 were natives of endemic regions and the others had acquired the infection while working in such regions. In 31 of the cases the symptoms were known to have developed after their arrival in Great Britain, although the diagnosis had been made there in 55 of them. One patient had come to avoid enforced isolation at home (Malta), as frequently is done. The finding of bacilli, when present, apparently depended upon histologic examination of biopsy specimens. In the discussion of types, dimorphous cases (Cochrane) are also called "borderline"; annular lesions are said to be seen in such cases. Regarding indigenous cases it is recalled that 3 in young contacts had been reported by Macleod in 1925, but none since; in the present series there apparently was 1 such contact case in the 3-year-old son of a patient. Two cases were diagnosed after urticarial or macular eruptions had occurred after treatment with antibiotics (1 with streptomycin and 1 with penicillin). The symptoms of leprosy as seen in these cases is discussed briefly.—H. W. W.

GARRETT, A. S. Report of a case of leprosy in a Norfolk practice. *Leprosy Rev.* **32** (1961) 82.

Description of a case of leprosy in a 22-year-old man, resident for 14 months in Cyprus 3 years previously, encountered in private country practice by the author who

had had previous experience with leprosy in Africa. For some 2 months there had been a small plaque on the chest, and many new small red lesions had appeared shortly before he was seen; the condition was thought to be borderline. During 3 weeks on DDS alone new lesions continued to appear, but when Etisul inunctions were added the condition promptly began to improve, and all smears were negative within 2 months.—H. W. W.

CHAUSSINAND, R. Classification of leprosy. *Leprosy Rev.* **32** (1961) 74-81.

This article is a discussion which it is difficult to reduce to a brief summary, although some of the author's personal opinions may be noted. Of the four current classifications, those of the WHO Expert Committee and of the Madrid congress—which differ but slightly—are held to be acceptable in spite of several imperfections. The lepromatous and tuberculoid forms should be retained in primary classification, and also the indeterminate (initial) one despite the fact that it has been strongly criticized. It would be a mistake to change the type diagnosis of the first two to the last one when the lesions regress until only banal chronic inflammatory changes remain. The indeterminate form should not be called "maculoanesthetic." The author questions if the borderline form should be included in the primary classification, since he regards it as an unstable form of the tuberculoid one (to be included as a variety of tuberculoid) but the practice is admissible since it does not cause any confusion; but it should not be given any other name, and it should not be made to include, as "dimorphous," cases in the earlier stages of the disease. Inclusion of a "pure polyneuritic form" in primary classification is not approved, because it would include various kinds of cases the cutaneous lesions of which had disappeared. [Sic!] Adoption of a binary primary classification, "benign" and "malignant" [malign], would have advantages (but not "lepromatous" and "nonlepromatous," or "open" and "closed"), but a more detailed classification is undesirable. After listing the varieties of the tuberculoid and lepromatous forms, and setting up a tabulation to include them all, the author concludes with the statement that, since no doctrinal differences exist with respect to the clinical, immunologic or histologic aspects, an acceptable classification could quickly be decided on if leprologists would agree to remove from consideration certain regional or personal preferences.—H. W. W.

DAVISON, A. R. Classification of borderline leprosy. *Leprosy Rev.* **32** (1961) 43-47.

The author states that he accepts the Madrid classification except for the description of "conspicuous asymmetry" as a feature of borderline, and that he includes macules that are flat, infiltrated, and bacteriologically positive. Also, the lesions must arise in normal skin; smears taken from a short distance away must be negative. Great stress is also laid on the presence of immune areas, the sites ("centers") of old, healed tuberculoid lesions. Under the author's "triple treatment" with DDS, Atebrin and Stibophen [see *THE JOURNAL* **28** (1960) 487], borderline lesions should resolve in 12 to 15 months and should be bacteriologically negative in less than 2 years; the treatment has been found ineffective for lepromatous cases. The various lesions found in borderline cases [as defined] are described, with illustrative case photographs. Borderline cases may go into reactional phases.—H. W. W.

DE SOUZA CAMPOS, N. Contribuição ao estudo clínico da lepra dimorfa. [Contribution to the clinical study of dimorphous leprosy.] *Rev. brasileira Leprol.* **28** (1960) 61-69.

DE SOUZA, P. R. Contribuição ao estudo histopatológico de lepra dimorfa ("borderline"). [Contribution to the histopathologic study of dimorphous ("borderline") leprosy.] *Ibid.* pp. 70-76.

[These papers were read at the Symposium on Borderline Leprosy held by the Brazilian Association of Leprology, March 11-13, 1960 in Rio de Janeiro. (The article by J. Gay-Prieto which appears in this issue was read on the same occasion.) The "dimorphous" form, for which de Souza Campos frequently uses the term *limitante*, is the

"borderline" of the first WHO committee and the Madrid Congress, and that term is used in these abstracts.]

1. De Souza Campos first reviews the history of recognition of the borderline form, with mention of the inclusion (as "dimorphous") of macular cases by certain authors. He himself had described "reactional tuberculoid leprosy" as occurring in both tuberculoid and indeterminate cases, and sometimes in cases without previous manifestations of leprosy. These he holds constitute the "major" tuberculoid subdivision recognized by the Havana congress. It is argued that the borderline cases are so few that a separate group for them is not justified. They are difficult to diagnose clinically, and the clinical and histologic pictures are often not in accord. Returning to the reactional tuberculoid group, there is a parallel tabulation of its features and those of ordinary (polar) tuberculoid form with respect to the clinical, bacteriologic, histologic, immunologic and evolutive aspects. Mutation of these and of indeterminate cases to lepromatous is discussed. There are two unstable, intermediate, transitional groups between the polar forms, namely, indeterminate and reactional tuberculoid, in which the borderline cases should be included. With the removal of them from the tuberculoid type, the latter would regain its polar nature. To maintain the reactional tuberculoid form as a variety of the tuberculoid type is neither practical nor logical, and—together with the borderline cases—they should be regarded as a separate group, for which several names are available.

2. Rath de Souza also points out the small number of biopsy specimens in his material that were diagnosed "dimorphous or 'borderline'" and lists the numerous clinical diagnoses that had been sent in with them. The histopathologic features of borderline leprosy and of reactional tuberculoid leprosy are described separately. (a) The former is understood to be a leprosy granuloma which at the same time has resemblances to the lepromatous and the reactional tuberculoid granuloma, with a mixture in varying proportions of epithelioid-type cells, frequently vacuolated by edema, and of histiocytes resembling the macrophages of the lepromatous lesion. There is no tendency to form Langhans' giant cells, although some may be present. As for bacilli, a lesion can be regarded as borderline only if bacilli are relatively abundant (its only real resemblance to the leproma), although generally less abundant than in the leproma and not tending to form globi. The bacilli he has found are usually short, seldom longer than 4μ , whereas in the leproma they are longer, often up to 6.5μ . Short bacilli are characteristic of all leprosy lesions other than the leproma, a fact which is related to relative suitability (or unsuitability) of the internal biochemistry of the cells which conditions the (immunobiologic) "resistance" in leprosy. Thus between the two poles is a whole gamut of intermediate degrees of resistance and of clinical "varieties": the so-called reactional tuberculoid form and the borderline form; and this also applies to the indeterminate group. (b) The granuloma of reactional tuberculoid leprosy is composed chiefly of epithelioid cells, with the important characteristic of edema—intracellular edema causing vacuolation of the epithelioid cells, and intercellular edema causing dissociation of the elements of the granuloma. Bacilli may be found in about 75% of the lesions, often in small numbers and never as many as in the leproma. Here, too, they are short, seldom more than 4μ . Reactional tuberculoid leprosy is not true tuberculoid leprosy, and should not be included in that polar type. Besides other reasons argued, the most important is that, whereas polar tuberculoid cases are stable within the type, the reactional cases are unstable and may evolve to lepromatous. The two conditions described overlap in such a way as to form a natural group, and it is artificial to place them separately in classification.

3. Neither of the papers reviewed has separate conclusions: the following is the gist of the conclusions jointly offered at the end. (a) The "borderline" group should be suppressed. (b) The "reactional tuberculoid" variety should be removed from the tuberculoid type, which would reestablish the true polar concept. (c) A new group should be created, to comprise the reactional tuberculoid variety and the borderline group. (d) For a name, there are several which might be used: "dimorphous," "bipolar," "inter-polar," "transitional," "limitrofe," "limitante," and of these "interpolar" merits special

consideration. "Borderline" should be rejected because it is foreign to the [Portuguese] language. (e) Whatever name is chosen, the letter "t" should be applied for the Mitsuda-positive cases of the present reactional tuberculoid variety, and "l" for the Mitsuda-negative cases and for those of the present borderline group.—H. W. W.

BECELLI, L. M. and QUAGLIATO, R. Lepra dimorfa ("borderline"). Sua classificação. [Dimorphous ("borderline") leprosy; its classification.] *Rev. brasileira Leprol.* **28** (1960) 129-140.

The authors consider the position of the "dimorphous" (borderline) group in classification, based on 28 cases and the following elements: clinical examination, bacteriology, histology, lepromin test, and frequency. They think that lepra dimorfa is only a transitional phase, which seldom occurs in the natural course of the disease or by the influence of therapeutics; and that it should be excluded from the classification of leprosy. They hope to increase their material and to observe the results of serologic and biochemical examinations to confirm or modify the present opinion.—[From authors' summary.]

DUGOIS, P., MOUNIER, R. and GAGNAIRE, J. Fausse sarcoidose réalisée par une lèpre "borderline." [False sarcoidosis in a case of borderline leprosy.] *Bull. Soc. française Dermat. et Syph.* **67** (1960) 812-814.

A case report of a 43-year-old patient, a Spaniard, with a 5-year history. Nodular lesions which had developed little by little on various parts of the body had suggested sarcoidosis when the patient was seen by others, and this diagnosis was consistent with the biopsy findings. Treatment for that condition, notably prolonged use of isoniazid, had been of no benefit. The diagnosis of leprosy was entertained when the authors first saw the patient and nerve enlargement was found, and bacilli in the nasal mucus; the Mitsuda reaction was negative, and a biopsy specimen was diagnosed lepromatous. In summing up it is said that the lesions at first had been major tuberculoid, and then, without much apparent modification of their appearance, the histologic aspect had completely changed to lepromatous. [Nothing is said of the possibility of a reactional condition in the interim, which leads to the question whether the authors were prepared to recognize it.]—H. W. W.

PRICE, E. W. Studies in plantar ulcer in leprosy. V. The complications of plantar ulcer. *Leprosy Rev.* **31** (1960) 97-103.

This is the fifth in a series of articles on plantar ulcers in leprosy, and deals with 6 complications which may occur. (1) Subcutaneous plantar infection occurs owing to breaking of the skin of the lesion. It is important therefore to recognize infection without ulceration. Deep necrosis without infection produces pain which will subside with a few days' rest; if it does not, antibiotics and rest should be given. When in doubt, the swelling should be aspirated before opening. (2) Bone and joint infection may be masked by anesthesia. (3) Phlebothrombosis of the foot and lower leg starts near ulcers and spreads along deep channels into the calf. Repeated attacks of fever and swelling occur, and the overlying skin may become eczematous. Chronic lymphedema, although less common, is also liable to recur; in this condition the venous circulation is not affected, nor is the healing of ulcers of the sole. (4) Another condition is the chronic edema of disuse. There is swelling of both feet including the soles, and splaying of the toes, but the skin does not pit on pressure. Institutional treatment for increasing the circulation is called for. (5) The neuropathic (Charcot) joint resembles that seen in diabetes. With anesthesia present, it may be difficult to distinguish from spreading infection, but signs of inflammation or joint fluid are absent, and x-ray shows general decalcification. (6) The last complication described is the results of metatarsectomy. The author objects to this operation, as other ulcers may occur and footwear is difficult to fit; but the chief objection is the fact that healing can be achieved by nontraumatic methods.—[From abstract by E. Muir in *Trop. Dis. Bull.* **57** (1960) 1273.]

SHAPIRO, L. and STOLLER, N. M. Erosion of phalanges by subungual warts; report of a case. *J. American Med. Assoc.* **176** (1961) 379.

This case report is of interest in connection with the article by Paterson in this issue of *THE JOURNAL*, in which he relates association of lepromatous nodules with destruction of underlying phalanges. Pointing out that it is well known that benign masses, such as for example glomangiomas and giant-cell tumors of the tendon sheath, which press on bone may cause bony absorption, the authors report a case in which subungual warts had caused pressure resorption of portions of the terminal phalange of the two fingers affected.—H. W. W.

LANGUILLON, J. and BOISSAN, R. H. Note sur l'évolution des lésions osseuses des extrémités chez le lépreux après traitement sulfone. [Note on the evolution of bone lesions of the extremities after sulfone treatment.] *Méd. Trop. (Marseilles)* **20** (1960) 482-492.

After quoting work of similar nature by Lechat and Chardome in the Belgian Congo, the authors describe their own experience with 282 sulfone-treated patients of whom 165 were lepromatous, 102 tuberculoid, and 15 undifferentiated. Radiographs taken January-May 1959 are compared with those taken in the beginning of 1960. At the beginning, 45.6% of the patients had bone lesions; at the end, 48.6% had lesions. Of the 137 patients with lesions at the end of the period, 44 showed no changes. Of the 70 patients in whom lesions had increased, 60 had either perforating ulcers or abscesses, and 85% of them were due to exogenous superinfections. New lesions in the phalanges were caused by single or multiple cystic foci, which tended to become shut off as geodes or to invade the joints. When healing takes place it is characterized by claustration of small foci of bacilli which remain quiescent. Curiously, this "healing" is most commonly found in the lepromatous type. The authors conclude that the sulfones are totally ineffective in stopping the evolution of pre-existing bone lesions. [Nothing is said about precautions to prevent injuries, or about physiotherapy and other methods of restoring mobility and function.]—[From abstract by E. Muir in *Trop. Dis. Bull.* **57** (1960) 1274-1275.]

MINATO, J. Functional and surgical classification of paralysis, in particular, of motor paralysis in the upper extremity in leprosy. Clinical observation of nerve involvement in leprosy (II). *Sci. Rep. Res. Inst. Tohoku Univ.* **C 9** (1960) 345-350.

The results described (in two papers, Parts I and II) led to the following conclusions: (1) Motor paralysis in leprosy is principally associated with the lesion produced at the site of predilection in the nerve trunk concerned, but sensory paralysis mostly with that of the peripheral terminals developed in the skin. (2) There are found ten basic patterns concerning motor paralysis in every nerve trunk of the upper extremities, which are represented by signs. Accordingly, all sorts of leprosy paralyses appeared there as a clinical entity can be classified into eleven forms, which can also be expressed simply by using each of these ten signs, singly or in combination. (3) The classification is serviceable in reconstructive surgery.—[From author's conclusion.]

POCH, G. F. Polineuritis y mononeuritis múltiple en la lepra. [Polyneuritis and multiple mononeuritis in leprosy.] *Leprológia* **5** (1960) 27-30.

The author insists that polyneuritic symptoms and signs (profound arreflexia and level hypoesthesia), when present in leprosy patients are due to a concomitant toxic or avitaminotic state (i.e., beriberi, pellagra, sprue, alcoholism, arsenicosis, diphtheria, etc.), and that they differ from multiple mononeuritis typical of leprosy, although they may be superimposed.—E. D. L. JONQUIERES

BASOMBRIÓ, G. and BOSQ, F. J. Lepra lepromatosa de comienzo oligoneurítico puro. [Lepromatous leprosy with pure neural onset.] *Leprológia* **5** (1960) 31.

Report of 2 cases, negative to lepromin, in which cutaneous signs appeared 14 and 2 months, respectively, after the diagnosis of leprosy had been made. In both cases the diagnosis was made by nerve biopsy, performed before the outbreak of cutaneous lesions, which had revealed bacilli and lepromatous structure. The skin lesions when they appeared were also lepromatous.—E. D. L. JONQUIERES

BASU, S. P., GHOSH, S., MUKERJEE, N. and ROY, K. P. Angiography in leprosy. *Indian J. Radiol.* **14** (1960) 180-190.

Arteriography of the affected upper extremity was done in 20 cases of nonlepromatous leprosy to note any change in the hemodynamics. Nine control cases consisted of 4 leprosy cases with unaffected upper extremities, and 5 cases of other skin conditions. Vascular changes noticed were in the form of a circulatory stasis in the digits. Stasis was not dependent on the duration of the disease. In cases with associated bone absorption, the vessels appeared thinner, and there was delay in emptying due to venous stasis. A shunt was noticed in most of the control cases, producing a poor filling of the digital vessels.—[From author's summary.]

OTEIZ SETIEN, A. and PINEYRO RODRIGUEZ, R. Alopecia en la lepra. [Alopecia in leprosy.] *Bol. Soc. cubana Dermat. y Sifilog.* **17** (1960) 26-33.

Among 803 leprosarium patients studied for alopecia, the authors found it in 2.5% of the cases. Racial and other factors may play a role. Several types were observed: diffuse alopecia; regional alopecia, usually localized to the temples; circumscribed alopecia, resembling alopecia areata; Mitsuda type of alopecia, a form described by this author in which there is loss of hair along the pattern of the large veins of the scalp, but it is present along the arteries; and "wig-type" alopecia, in which there is loss of hair in a band distribution along the nucha and temporal regions. Alopecia of the eyelashes and eyebrows may be the first symptoms of the disease; it was observed in Cuba by Ibarra and Gonzalez Prendes in 2.1% of 760 patients. Alopecia of other parts of the body may exist, especially on lepromatous lesions. Adequate treatment may improve the alopecia or cure it entirely. Permanent alopecia of the eyebrows may, for cosmetic reasons, be treated with skin graft from the scalp.—[From abstract by Orlando Canizares in *Arch. Dermat.* **83** (1961) 886.]

WILHELM, E., RICHÉ, P., ALT, J., LOBSTEIN, J. and BLEGER, G. Lepre longtemps méconnue chez un Marocain. [Long unrecognized leprosy in a Moroccan.] *Bull. Soc. française Dermat. et Syph.* **67** (1960) 176-177.

A case in a Moroccan soldier who, since 1953, had had repeated eruptions of skin lesions which had been diagnosed psoriasis or psoriasiform parakeratosis, biopsic findings being in accord with that diagnosis. Seen (for expertizing) in 1959, he presented widespread macules and anesthesias, with ulcers of the right great toe. The nasal mucus was negative for bacilli, but "the strongly positive Mitsuda reaction to lepromin nevertheless confirmed the diagnosis of leprosy" [sic].—H. W. W.

BRAND, N. A case of leprosy simulating chronic malaria. *Dapim Refuim* (Tel Aviv) **20** (1961) 32-34.

A case of lepromatous leprosy in a 40-year-old person is reported. The patient came under observation because of clinical symptoms which resembled chronic malaria with a much enlarged spleen, and a splenectomy was therefore performed. Only after the patient was seen later, when ulnaris thickening and contractures of fingers and other lesions had appeared, was the diagnosis of leprosy made.—F. SAGHER

PRAKKEN, J. R. De ziekte van Lazarus. [Lazarine leprosy.] *Nederländsche Tijdschr. Geneesk.* **103** (1959) 389-394.

This is the case history of a 23-year-old girl with bullous reactions. The first symptom, a red itching macule, was noticed in 1944. Two years later several lesions of the

same type appeared. No acid-fast bacilli were found; Mitsuda positive. Classification: tuberculoid. In 1950, after 4 years of sulfone treatment, only a hypopigmented macule and an enlarged auricular nerve were left. Symptom-free discharge, 1953. In the next year there was a relapse, with reddish macules, nodules and papules. Smears were strongly positive, Mitsuda: negative. Classification: lepromatous. Between 1954 and 1956 the patient showed reactions of the ENL type and iridocyclitis. In 1957, a severe reaction occurred and bullous and pustular lesions appeared on the dorsal surfaces of the limbs. The bullae gave place to ulcers, which healed with irregular scars, but at the same time new lesions appeared. Cultures from blisters were negative, and antibiotics were without effect. In the pus there were acid-fast bacilli. The reaction was diagnosed as pemphigoid or lazarine leprosy. The reaction subsided after treatment with DDS, prednisone and streptomycin, but in the next year two even more severe reactions of the same type appeared. Patient complained of severe pain in the legs. An x-ray picture showed extensive osteomyelitis of both tibiae and fibulae. The last reaction responded well to a blood transfusion. Leprosy treatment was continued with DPT, so far without further complications. [Clearly this is not a case of Lucio leprosy. The first lepromin reaction was only weakly positive, the second test was done with a different antigen. Nothing is said about the definition of the first lesions. A borderline classification would explain some contradictory findings.]—D. L. LEIKER

STEIGER, R., RICHÉ, P., DE BEER, P. and LOBSTEIN, J. Une dermatose érythémato-squameuse apparue brusquement s'avère être une lèpre. Guérison clinique par les sulfones. [An erythematous-squamous dermatosis of abrupt development which proved to be leprosy. Clinical cure by sulfones.] Bull. Soc. française Dermat. et Syph. **67** (1960) 156-158.

The patient, French, who had been in France for 3 years after 2½ years in Indo-China, had suddenly developed arthralgias and some 10 red nonelevated, hypoesthetic areas on the face, trunk and extremities, preceded by some two weeks by sensory disturbance on the right hand without skin lesions at that time. Mitsuda reaction, 2+ on the 8th day. Nasal smears negative. Histology: tuberculoid in the deeper levels, more of lepromatous aspect superficially. The acute phases yielded quickly to a corticosteroid, and the skin lesions cleared up after some 7 months on DDS.—H. W. W.

JOULIA, P., LAVIGNOLLE, WONE, Ch. and AUBERTIN, J. Lèpre tuberculoïde et maladie de Hodgkin. [Tuberculoid leprosy and Hodgkin's disease.] Bull. Soc. française Dermat. et Syph. **67** (1960) 976-977.

A case report of a 70-year-old woman who after a sojourn in Egypt had developed tuberculoid leprosy proved by skin biopsy; Mitsuda positive; treated with good results. Later she had developed cervical adenopathy thought at first to be of bacillary nature but found histologically to be Hodgkin's disease, which had progressed.—H. W. W.

WATANABE, Y. Clinical studies on the pulmonary tuberculosis complicated with leprosy (Report 2). The results of mass examination on tuberculosis from 1948 to 1959. La Lepro **29** (1960) 200-208 (in Japanese; English abstract).

Mass examinations of all leprosy patients at Tama Zensho-en were made once a year from 1948 to 1959. All patients were photofluorographed, and cases with definite or suspicious tuberculous findings were radiographed. For active cases, medical treatment was administered, and for inactive cases, check examinations were repeated at least twice a year. The findings are summarized: 1. Prevalence rate, including healed lesions, increased from 20.5% in 1954 to 29.4% in 1959. Prevalence of active and inactive tuberculosis was 13.3% in 1948, and remained at about the same level (13.2%) in 1959. Active cases, 8.9% in 1954, decreased with advances in tuberculosis control to 3.5% in 1959; bacillus-positive cases decreased from 2.5% to 0.5%. 2. Prevalence was higher among males than females. Highest value was obtained in the 50-59 age

group from 1954 to 1956, and over 60 after 1957. 3. By the grade of the disease, severe cases decreased markedly, and slight cases were relatively increased. 4. Total prevalence in newly-admitted cases was nearly the same as that of already-admitted patients, but the prevalence of active cases was much the higher among newly-admitted cases. 5. The incidence of tuberculosis is decreasing markedly in recent years, and deaths have decreased markedly since 1952.—[From author's abstract.]

WATANABE, Y. Clinical studies on the pulmonary tuberculosis complicated with leprosy (Report 3). The relation between leprosy and tuberculosis observed from the results of mass examination on tuberculosis. *La Lepro* **29** (1960) 209-213 (in Japanese; English abstract).

In the same subjects dealt with in the preceding abstract, the author compared the prevalence of tuberculosis with the type of leprosy, and found that it was slightly higher among lepromatous than among tuberculoid cases, but that the difference was not statistically significant. Observing by the type and grade of tuberculosis, distribution of the two types of leprosy was nearly equal among any type or grade of tuberculosis. The results show that there is no significant correlation between the type of leprosy and tuberculosis.—[From author's abstract.]

ROGERS, J. H. Coronary thrombosis, cerebral vascular accident and pulmonary embolism in leprosy. *Ann. Intern. Med.* **53** (1960) 746-753.

The author presents evidence that the incidence of fatal heart attacks, strokes and pulmonary embolism in people afflicted with leprosy is a great deal less than could ordinarily be expected. It is postulated that leprosy, like tuberculosis, provokes a response in the body which has a protective action against these diseases. It is suggested that this is associated with an *in vivo* hypocoagulable state of the blood, mediated through an increase in the plasma globulins. This may be brought about by complexing of the unusual globulins with clotting factors, or by increased fibrinolytic activity, or both. If these concepts prove to be correct, then the basic information necessary for the development of an immunization against thrombosis is provided.—[From summary; copied from the *Carville Star*, May-June, 1961.]

COT LESMES, V. Tratamiento continuo y prolongado de la lepra por las sulfonas. [Continuous and prolonged treatment of leprosy with the sulfones.] *Bol. Soc. cubana Dermat. Siflog.* **17** (1960) 62-66.

The object of this experiment was to test the toxicity of sulfones and to find out in what dosage they are tolerated over a prolonged period of years. It was found that 14 patients, with all types of the disease, were able to continue with a daily dose of 1.80 gm. of Diasone for periods of 7 to 9 years continuously and without any signs of toxicity or intolerance. [No mention is made of the progress made by the patients under this treatment.]—[Abstract by E. Muir in *Trop. Dis. Bull.* **58** (1961) 73.]

UTKU, E. Essai de la chimiothérapie de la lèpre avec SU 1906 Ciba et ses premiers résultats. [Trial of SU-1906 Ciba in the chemotherapy of leprosy and the first results.] *Türk İjiyen ve Tecrübi Biyoloji Dergisi* (Ankara) **20** (1960) 163-166 (Turkish version, pp. 153-162).

The trial was made on 21 patients (11 lepromatous, 2 indeterminate and 8 tuberculoid). There were favorable results in the lepromatous cases, both clinical and bacteriologic, within 6 months; the results with the indeterminate cases were not so favorable after a year; the tuberculoid cases began to improve within 2 to 5 months, but were not entirely better at the end of a year, although the results were better than with the indeterminate type. It is held that the results are similar to those with the sulfones, that the effects on the general health of the patient are inferior to those with isoniazid, but that the toxic effects are less than those of DDS and isoniazid. Probably—it is held—the best treatment is a combination of these three drugs.—[From abstract by E. Muir in *Trop. Dis. Bull.* **58** (1961) 74.]

GOLDMAN, L. Side effects of Ciba-1906. *American J. Trop. Med. & Hyg.* **10** (1961) 382.

The reactions noted in a series of 286 nonleprosy patients treated with Ciba-1906 for various dermatologic conditions were mild, and they subsided after the drug was discontinued. In one patient the eruption recurred promptly following a test dose. Nausea, diarrhea, and a bad taste in the mouth were other reactions noted. Drug allergy should be considered when morbiliform eruptions appear in patients under treatment with this drug.—[Author's summary, supplied by J. A. Roberts.]

HARTER, P., LITALIEN, F. and TRINH-THI-KIM-MONG-DON. Emploi d'une diphénylthiourée (4-butoxy-4'-diméthyl-amino-thiocarbamilide ou Summit-1906) dans certaines variétés de lèpres. [Use of a diphenyl thiourea (Summit 1906) in certain varieties of leprosy.] *Bull. Soc. Path. exot.* **53** (1960) 950-960.

The authors report 23 cases which confirm the effectiveness of 4-butoxy-4'-diméthyl-amino-thiocarbamilide (SU 1906; Ciba 1906), already demonstrated by others. The action of this compound is perhaps more rapid than that of the sulfones, but it must be handled as carefully as the other antileprosy remedies. The dose varies from 2 to 4 gm., depending on body weight, and is increased rapidly. The frequency and the duration of treatment are similar to those employed in sulfone therapy.—[From authors' summary.]

CONTRERAS, F., GUILLEN, J., TERCENIO, J. and TARABINI, J. Tratamiento de la lepra con D-cicloserina. [Treatment of leprosy with D-cycloserine.] *Rev. Leprol. Fontilles* **5** (1960) 49-55.

The authors first describe previous trials that have been made in the treatment of tuberculosis and leprosy with the antibiotic D-cycloserine (D-4 amino 3 isoxonylidone) and then give details of the treatment of their own 12 patients over periods up to 11 months. They find the drug most useful, causing rapid improvement or disappearance of leprosy lesions of skin and mucous membranes. Bacterial changes are also good, although less rapid. [Than what?] With a maximum daily dose of 1 gm., tolerance is very good and there are no reactions or changes in the blood or other systems. It is expected that it will be particularly useful for patients with repeated reactions or who are intolerant of sulfones.—[From abstract by E. Muir in *Trop Dis. Bull.* **58** (1960) 212-213.]

OPROMOLLA, D. V. A. and QUAGLIATO, R. A "serociclina" na lepra; observação em 32 casos. [Serocycline in leprosy; observations in 32 cases.] *Rev. brasileira Leprol.* **28** (1960) 165-202.

Serocycline with INH has therapeutic activity in leprosy. In most cases "focal reactions" are excited, after which most patients show clinical and bacteriologic improvement, with histologic changes in agreement. No neural disturbances were observed during the treatment.—[From the authors' conclusions.]

JAMISON, D. G., PALMER, E. and VOLLUM, R. L. Preliminary trial with Etisul in Northern Nigeria. *Trans. Roy. Soc. Trop. Med. & Hyg.* **55** (1961) 142-148.

Four cases of advanced lepromatous leprosy were treated with Etisul by the usual method of inunction, with the conclusion that total-body inunction for 3 to 4 months may prove to be the optimum. Reactions may occur in children with large dosages which may require temporary discontinuance of the treatment. Illustrations, including 8 postage-stamp sized color photomicrographs, are unsatisfactory.—H. W. W.

BROWNE, S. G. An acceptability trial of Etisul liquid formula. *Leprosy Rev.* **32** (1961) 83-84.

The manufacturers of Etisul cream (Imperial Chemical Industries, Pharmaceuticals, Ltd) have brought out an improved liquid preparation (Etisul Formulation F-565) which is less expensive and has other advantages. This has been tried out on 14 patients

already under treatment with DDS or Ciba-1906 (also referred to as thiambutosine), and it has proved acceptable to them. Those who had had experience with the cream found it much superior to that preparation. It rubs in much more easily, and disappears from the skin more rapidly.—H. W. W.

SCHNEIDER, J., LANGUILLON, J., CLARY, J., PICART, P. and BOISSAN, R. H. Traitement de la lèpre par un sulfamide retard: la sulfaméthopyrazine. [Treatment of leprosy with a delayed-absorption sulfonamide: sulfamethopyrazine.] *Méd. Trop. (Marseilles)* **20** (1960) 543-564.

In testing sulfamethopyrazine [sulfamethoxypyridazine; Sultirène] for its therapeutic effects in leprosy, it was given orally in tablet form to 29 tuberculoid, 21 lepromatous, and 8 indeterminate cases, the dose being 0.75 gm. every second day. It was also given by intramuscular injection in a 25% aqueous suspension to 5 lepromatous, 4 tuberculoid and 1 indeterminate patients, 2.50 gm. being injected once a week or in some cases 5 gm. twice a month. A 23% suspension of acetyl-sulfamethopyrazine was also injected in 30 other patients, divided into 3 groups of 10 each, treatment of each group being begun when the results of the preceding group had been found satisfactory; the dose was at first 2 gm. weekly, but was later raised to 4 gm. twice a month. After 2½ years' trial of sulfamethopyrazine it was concluded that the drug is very well tolerated; given by mouth it does not cause gastric disturbance, nor are there any signs of toxicity; the intramuscular injections are not more painful than those with sulfones. It has shown therapeutic activity in all three clinical forms treated, but improvement was most remarkable in the tuberculoid type—better than with the sulfones or with any other form of treatment that the authors had used. For mass treatment the intramuscular injections of acetyl-sulfamethopyrazine are the best. [No controls appear to have been used in these trials.]—[From abstract by E. Muir in *Trop. Dis. Bull.* **58** (1961) 211.]

LANGUILLON, J., CLARY, J. and PICART, P. Étude de la sulfamidémie obtenue après administration espacée de sulfaméthopyrazine dans le but de préciser la posologie optimum dans le traitement de la lèpre. [A study of blood levels obtained after spaced administration of sulfamethopyrazine with the object of fixing the optimum dosage in the treatment of leprosy.] *Méd. Trop. (Marseilles)* **20** (1960) 565-588.

Two suspensions of sulfamethopyrazine are under consideration: a 25% suspension of simple Sultirène (7522 RP), and a 23% suspension of acetylated Sultirène (9760 RP). The purpose of the experiment was to find out the duration of sulfonamide blood levels, and to study the course of these blood levels after weekly, fortnightly, 3-weekly and monthly injections necessary to maintain between 20 and 25 mgm. per liter. The results indicate that for weekly treatment, 10 cc. of the suspension of either drug would serve. If treatment is given twice a month, then 20 or 25 cc. of suspension 9760 should be given as one injection. The dosage for monthly injections is still to be worked out.—[From abstract by Muir in *Trop. Dis. Bull.* **58** (1961) 211-212.]

MAJUMDAR, S. Chloramphenicol therapy in reactional leprosy. *Leprosy Rev.* **32** (1961) 85-87.

Having found chloromycetin effective in reaction cases in which intravenous injections of potassium antimony tartrate or of mercurochrome had failed, the author has used it alone (1 capsule of 250 mgm. by mouth daily for about 6 days), and found that the reactions ceased within a few days. Brief notes of 14 cases are given.—H. W. W.

EKAMBARAM, V. and SHARMA, C. S. G. Treatment of reactions in leprosy by aqueous sulphetrone injections and oral INH in a rural centre. *Leprosy Rev.* **32** (1961) 88-90.

Sulphetrone was given in daily dosage of 0.5 cc. of the 50% solution parenterally,

and INH 150 mgm. daily in 3 doses. The results are said to have been good in 7 of 9 reaction cases. The average time of treatment required for subsidence of the reaction in "TM" and "RTL" cases was 45 days, and 60 days for the subsidence of the lesions in 1 borderline case. The treatment is not recommended for nonreactional cases.—H. W. W.

THANGARAJ, R. H. and THANGARAJ, S. Phenylbutazone in the treatment of some reactive and painful complications of leprosy. *J. Indian Med. Assoc.* **35** (1960) 395-397.

The authors treated with phenylbutazone 52 leprosy patients suffering from one or more of the following reactive complications: acute arthritis, chronic arthritis, erythema nodosum, neuritis, burning sensation, and thrombophlebitis. This drug was given either orally (800 mgm. a day in 4 divided doses for 3 days and then 400 mgm. for another day or two), or intramuscularly (600 mgm. daily for 3 days and then 300 mgm. for another day or two). There were side effects (edema, jaundice) in only 4 patients, which cleared up in a few days. All but 7 patients showed improvement. Oral use has been particularly useful with outpatients living at a distance, who are not able to attend frequently.—[Abstract by E. Muir in *Trop. Dis. Bull.* **58** (1961) 326.]

TERENCIO, J. and TORRENT, F. La monosemicarbazona del adenoeromo en el tratamiento de las leproreacciones. [Monosemicarbazone of adenoerome in the treatment of lepra reactions.] *Rev. Leprol. Fontilles* **5** (1960) 23-30.

This substance (Cromoxin) is the monosemicarbazone of n-methyl-2:3-dihydro-3-hydroxy-5-6 quinone indol (MCA) and is derived from adrenaline by oxidation. It is a brilliant orange in color, and is generally obtained in a 0.05% solution. With this substance, 7 reacting lepromatous leprosy patients were treated, with a dosage of 1 mgm. every 8 hours (or variations). There was satisfactory remission of symptoms in 5 of these patients. This substance may be used as a substitute for the more expensive corticosteroids, the latter being retained for more obstinate cases.—[From abstract by E. Muir in *Trop. Dis. Bull.* **58** (1961) 212.]

MERKLEN, F. P., RIOU, M. V. and WESSELY, F. Poussées réactionnelles au cours de la maladie de Hansen avec le 4-butoxy-4'-diméthyl-aminothiocarbonilide (1906-Su). [Reactions in the course of Hansen's disease with 4-butoxy-4'-diméthyl-aminothiocarbonilide (SU-1906).] *Bull. Soc. française Dermat. et Syph.* **67** (1960) 914-916.

The activity of this drug (Ciba-1906) in leprosy has been confirmed at the Hôpital St. Louis in Paris, mention being made of its benefit in a case of cubital neuritis, which had continued to progress under sulfone treatment in spite of clearing up of all the cutaneous lesions. However, its use does not seem more exempt from reactional outbreaks than other active antileprosy medicaments, and sometimes they are particularly intense. Five cases are related. Two were lepromatous cases that were highly reactional under sulfone treatment, which did not cease when changed to Ciba-1906. A third case was of the borderline form, in which the drug induces particularly violent reactions, much more than had occurred while under sulfones. Finally, in 2 cases with leprous neuritis, one lepromatous and the other tuberculoid, the drug induced extremely violent painful reactions of the cubital nerves.—H. W. W.

LITALIEN, F., HARTER, P., TRINH-THI-KIM-MONG-DON and NGUYEN-THI-DANH. Détermination cutanée de la maladie de Hansen chez des lépreux névritiques purs sous l'influence du traitement sulfoné. [The occurrence of cutaneous lesions of leprosy in pure neuritic cases under the influence of sulfone treatment.] *Bull. Soc. Path. exot.* **53** (1960) 943-949.

The authors report 3 cases of cutaneous manifestations of leprosy in subjects considered to be cases with purely neuritic involvement, and in 2 patients with minimal lesions in whom significant cutaneous symptoms appeared during sulfone treatment.

They believe that this exacerbation results from the administration of a specific medicine.—[Authors' summary.]

[In discussion, Harter said that they had not dared to suggest in the paper the idea that the reactogenic power of sulfones might be used as a determinative cutaneous test in pure primary neural leprosy without clinical modification of the nerve trunk, but he then presented notes on a case in which the diagnosis of leprosy had been regarded as unjustified until a test dose of 15 mgm. of disalone by mouth had resulted, 13 days later, in the appearance of a small macule with tuberculoid histopathology.]

SCHUJMAN, S. Exacerbación del proceso lepromatoso en algunos enfermos durante el tratamiento sulfónico. [Exacerbation of the lepromatous process in some patients during sulfone treatment.] *Leprológia* **5** (1960) 32 (summary only).

The author describes what should be understood by exacerbation, reactivation, or progression of the process during and in spite of adequate treatment, the concept should not apply to cases with insufficient or irregular treatment. Exacerbation has been observed more frequently with thiosemicarbazone treatment than with sulfone medication.—[From summary.]

MONTESTRUC, E. La réactivation par le B.C.G. des lèpromateuses résiduelles, test de blanchiment et de suspension du traitement? [Should reactivation of residual lepromatous leprosy by BCG be used as a test of cure and for suspension of treatment?] *Bull. Soc. Path. Path. exot.* **53** (1960) 398-401.

The author cites his own experience and that of others of the occurrence of acute reactional reactivations called forth by inoculation with BCG in lepromatous type patients who had become apparently cured both bacteriologically and clinically. The question is raised whether, as such severe reactions do sometimes occur, it is justifiable to inoculate with BCG patients of this type and stage. It is also asked if it is not better rather to continue treatment indefinitely, or to assure complete cure by testing with some other form of reactivation. The author, after many experiences, is opposed to the use of BCG in residual lepromatous patients. The effect regarding conversion of the Mitsuda reaction is doubtful. He reports the frequency of spontaneous conversion of the Mitsuda reaction in 295 lepromatous patients, in whom (after periods of from 3 to 10 years) 18 became doubtful, 17 became 1+, 3 became 2+ and 1 became 3+, the rest remaining negative. It thus appears that the Mitsuda reaction remains negative in the great majority of cured lepromatous patients, and in such cases it is not considered justifiable to attempt conversion by means of BCG, and thereby to run the risk of producing severe reaction.—[From abstract by E. Muir in *Trop. Dis. Bull.* **58** (1961) 326-327.]

ROLLIER, M. R. Lépre tuberculoïde réactionnelle "explosive" après intervention chirurgicale. ["Explosive" reactional tuberculoid leprosy after surgical intervention.] *Bull. Soc. française Dermat. et Syph.* **67** (1960) 546-548.

A detailed case report of an adult male patient, Moroccan, who had presented in September 1959 with only sensory changes of the left hand, with no cutaneous manifestations but with some enlargement of the left ulnar nerve. Mitsuda reaction \pm ; bacilli negative. The patient was operated on for perforating gastric ulcer in February 1960, and 24 hours later complained of violent pain in the left ulnar and in the area of analgesia, which had become red. That area became a red, violaceous elevated plaque, and other lesions appeared on the affected arm and on the face. The Mitsuda reaction was then 4+; the skin lesions were 1+ for bacilli. Deformity of the hand developed rapidly. The severity of the pain prevented sleep, and its treatment proved particularly difficult.—H. W. W.

MARTINS FILHO, M. G. Contribuição da cirurgia plastica para a reabilitação dos doentes de lepra. [Contribution of plastic surgery in the rehabilitation of leprosy patients.] *Rev. brasileira Leprol.* **28** (1960) 221-228.

The author advocates plastic surgery soon after the patients' admission, simultaneously with specific medication or even before it. The principal advantage of this procedure is an initial psychic rehabilitation, which induces the patients to help the treatment. Good results are obtained. The current limitation of plastic surgery to "cured" or arrested cases should be substituted for the removal of the deformities in the acute and active disease. Eight successfully-treated cases are presented, 1 of "cured" leprosy and the other 7 with acute and active disease, bacteriologically positive.—[From author's summary.]

FAGGIN, J. E. Cirurgia reparadora da mão na lepra. [Surgical repair of the hand in leprosy.] *Rev. brasileira Leprol.* **28** (1960) 141-148.

The author first tells about the troubles of the upper members, especially the hands, affecting the cutaneous and peripheral nerves, consequently causing sensory motor, and trophic disturbances, affecting the social and economic problems of the disease. After considering the functional anatomy of the hand and the physiopathology of the grip of the fingers, the author speaks of therapy surgery for the morphologic and functional alterations, stressing the advantage of the operation by the multiple grafting of Brand.—[From author's summary.]

CANNON, B. and PEACOCK, E. E. Plastic surgery: the hand. *New England J. Med.* **263** (1960) 184-189; 238-242.

This review summarizes some of the recent important advances in hand surgery, and is slanted towards the general medical public rather than the specialist. In a section on "The Hand in Leprosy" it is noted that "Perhaps the most beneficent surgical development is the restoration of function in the palsied hand of leprosy." Brand at Vellore and Riordan at Carville are cited as having "led the way." A number of methods are mentioned for substituting uninvolved muscles for those paralyzed, for transplanting tendons, and the like, so that "from a condition of complete dependency patients can realize useful occupations for themselves."—J. A. ROBERTSEN

CONTRERAS R., F., TARABINI, G. and TERENCEO, J. Estudio histológico de nefrosis y amiloidosis en lepra. [Histologic study of nephrosis and amyloidosis in leprosy.] *Rev. Leprol. Fontilles* **5** (1960) 1-22.

The question is raised as to whether the nephrotic syndrome so common in leprosy is of infective origin (either purely bacterial or immuno-allergic), of toxic origin, or of mixed nature. The authors' experience suggests the third possibility. Of 4 patients studied, 3 were in different stages of development of renal amyloidosis, while the fourth was probably suffering from toxic nephrosis. Lesions of the kidney tubules are divided into 2 categories. Initially, through the influence of intercurrent inflammations which complicate leprosy, there is anoxia which results in amyloidosis. The second type of lesion comes later, when the existing lesions develop into lipoidal nephrosis. The vascular lesions also consist of amyloid deposits. The authors have also been studying the formation of hyaline casts, and conclude that in addition to their protein composition they also contain phospholipids and neutral mucopolysaccharides and mucoproteins. The study is continuing.—[From abstract by E. Muir in *Trop. Dis. Bull.* **58** (1961) 210-211.]

THOMPSON, S. W., GEIL, R. G. and YAMANAKA, H. S. A histochemical study of the protein nature of amyloid. *American J. Path.* **38** (1961) 737-748.

Amyloid is a hyalin-like, structureless, translucent substance which accumulates between parenchymatous cells and in connective tissues, and was so named by Virchow to denote its gross appearance and iodine affinity. What little is known of its origin or composition is reviewed. To further elucidate its protein nature, amyloid deposits in humans, fowl, and a number of animals were subjected to a battery of staining procedures. Amino acids and polypeptides containing disulfide linkages were found to be a constant and significant component of amyloid, regardless of tissue or species in which

it occurred. The authors postulate that this apparently represents a protein degradation product (oxidized glutathione) not usually found in parenchymatous tissues, possibly related to abnormal protein metabolism influenced by factors as yet unknown. [Amyloidosis is seen as a serious complication in a significant number of cases of leprosy in the United States.]—J. A. ROBERTSEN

LEVADITI, J. C., DESTOMBES, P. and GRUMBACH, F. Comparaison des lésions macrophagiques et folliculaires de la lépre et de la tuberculose. Éventualité d'une bactériostase intratissulaire. [Comparison of the macrophagic and follicular lesions of leprosy and of tuberculosis. The occurrence of an intratissular bacteriostasis.] Bull. Soc. Path. exot. **53** (1960) 430-435.

The ingestion of tubercle bacilli by macrophages is not a phenomenon peculiar to this organism, but is common to many other acid-fast organisms during the first hours after their inoculation. In human tuberculosis, whether the lesions be exudative, follicular or caseous, the multiplication of the mycobacteria (bacilli) in the tissues is never on a scale comparable with that in lepromatous leprosy; they are few in number, as in tuberculoid leprosy, dispersed, and extracellular. It is only in exceptional circumstances that tubercle bacilli multiply in the tissues to the degree found in the leproma and become intracellular, as when the H37Rv strain is injected into mice under certain conditions. The sparsity of bacilli in tuberculosis and tuberculoid leprosy is explained by the formation of a bacteriostatic action due to allergy, of which the follicular reaction is one of the visible results. This reaction is perhaps a general one, of which leishmaniasis furnishes another example.—[From abstract by E. Muir in *Trop. Dis. Bull.* **58** (1961) 324.]

MOREIRA DIAS, D. Simplificação da técnica de Perdrau. [Simplification of the Perdrau technique (silver impregnation).] Rev. brasileira Leprol. **28** (1961) 149-156.

The author describes a technique for silver impregnation as a modification of the Perdrau method. The new technique presents the following advantages: (1) Saving of time, as it needs only 25 minutes. (2) Saving of raw materials. (3) Good results with smears. (4) It allows the use of several fixatives. The results are comparable to the classical method. Preparations in the files up to 4 years are still in very good condition.—[From author's summary.]

CAMBIAGHI, O. BCG oral e reação de Mitsuda em escolares. [Oral BCG and the Mitsuda reaction in schoolchildren.] Rev. brasileira Leprol. **28** (1960) 211-220.

In a group of noncontact schoolchildren, aged 5-13 years, who had given negative, doubtful or weakly positive results to a preliminary lepromin test, was treated with BCG. The vaccine was administered orally in 3 doses of 200 mgm. each, the first interval about 3 months and the second interval 1 month. After another 17 months 149 children were retested. Of the 88 in the negative and doubtful group, 81% gave the same result, and only 19% were 1+. Of the 61 who had been 1+ positive, none was more strongly positive while 62% were negative or doubtful. There was no evidence, after 17 months, of intensification by the oral BCG vaccination.—[In part from the author's conclusions.]

SOUZA, P. R. and BECHELLI, L. M. Correlação entre as reações lepromínica e tuberculínica em crianças de 0 a 4 anos. [Correlation between the lepromin and tuberculin reactions in children aged 0-4 years.] Rev. brasileira Leprol. **28** (1960) 203-210.

A study of this matter in 46 young children is reported. None of the 8 tuberculin-positives was Mitsuda negative, whereas 27 of the 38 tuberculin-negatives were Mitsuda-negative. Among the 8 Mitsuda positives, the reactions were 1+ or 2+, none 3+. The lepromin reactors were retested with tuberculin, but no conversion of that reaction was found. There was an association between the positive Mantoux and Mitsuda reactions, but a relation of cause and effect is to be proved.—[From authors' summary.]

YANAGISAWA, K., ASAMI, N., MAEDA, M., ISHIHARA, S., GOTO, S., KOBAYASHI, S. and TACHIKAWA, N. Comparative studies of intradermal reactions provoked by Dharmendra antigen and the antigens of various acid fast bacilli. *La Lepro* **29** (1960) 226-231 (in Japanese; English abstract).

In a search for an adequate antigen for the testing of leprosy patients in place of the Dharmendra antigen, comparative studies were carried out in leprosy patients by intradermal reactions using the bacillary antigens of the avian tubercle bacillus, *M. phlei*, the Johne bacillus and the Dharmendra antigen. None of the antigens tested gave reactions similar to those of Dharmendra antigen.—[From authors' abstract.]

YANAGISAWA, K., ASAMI, N., MAEDA, M., MUROHASHI, T., ABE, M., NAKAYAMA, T., GOTO, S., KOBAYASHI, S. and ISHIHARA, S. Comparative studies of intradermal reactions provoked by Kedrowsky bacillus antigen and Dharmendra antigen. *La Lepro* **29** (1960) 232-238 (in Japanese; English abstract).

The antigenicity of a pyridin extract of the Kedrowsky bacillus, prepared by Chatterjee's original method, was compared with that of the Dharmendra antigen in sensitized animals and in leprosy patients. The pyridin extract of the Kedrowsky bacillus contains a large amount of polysaccharides, and a rather small amount of proteins. Intradermal reaction was tested on three groups of animals sensitized either with heat-killed Kedrowsky bacillus, tubercle bacillus, or human leprosy bacillus respectively. The results that the reaction provoked by the Kedrowsky bacillus was specific. The human leprosy bacillus did not show any positive reaction in the animals sensitized with human leprosy bacillus. Correlation between the pyridin extract as well as PPD of Kedrowsky bacillus and the Dharmendra antigen was found to be very low also in the leprosy patients.—[From authors' abstract.]

FERNANDEZ, J. M. M., MERCAU, A. R., SERIAL, A. and AGUERO, H. G. Inmunología de la lepra. Fenómenos de Wade y de Olmos Castro en el perro. [Immunology of leprosy. The phenomena of Wade and of Olmos Castro in the dog.] *Leprológia* **5** (1960) 3-19.

Fernandez had designated as the "Wade phenomenon" the reactivity to lepromin induced in normal individuals and in dogs free from previous contact with *M. leprae* or *M. tuberculosis*, by the injection of lepromin. This phenomenon, as Wade states, is not the result of a previous hypersensitivity but evidences the ability of the organism to develop an allergic sensitivity to the lepromin itself. Olmos Castro *et al.* demonstrated in 1959 that the individuals previously sensitized to *M. leprae*, by spontaneous infection or by lepromin inoculation, react in a different way to this antigen than do normal, not sensitized individuals. The former reacts by an immediate and acute process, followed by the formation of an accelerated nodule with the acme in the second week (Olmos Castro phenomenon), instead of the late the reaction (nodule) which develops only after a latent period of about a week (Mitsuda phenomenon, or reaction). The authors report a comparative study of these two phenomena made in 16 young and adult dogs. On reinoculation of either subject, man or dog, after sensitization there is usually an early, 48-hour reaction (the Fernandez reaction in man), followed by an accelerated nodule formation. Dogs previously inoculated with antigens derived from other acid-fast bacilli (murine leprosy bacillus, or BCG) also react to lepromin with an early reaction and an accelerated nodule. These observations confirm those of Wade and of Olmos Castro and Arcuri, and show the great similarity there is in the way dogs and human subjects react to lepromin.—E. D. L. JONQUIERES

OLMOS CASTRO, N., ARCURI, P. B., USANDEVARAS, R. L., CONEJOS, M., BONATTI, A. A. and LEBRON, E. J. Inyección subcutánea de lepromina en perros sensibilizados con lepromina. Manifestaciones locales. [Subcutaneous injection of lepromin in dogs sensitized with lepromin. Local reactions.] *Leprológia* **5** (1960) 20-22.

The subcutaneous injection of lepromin in adult dogs, previously sensitized with *M. leprae*, is followed by the formation of a palpable, hard, deep infiltration which rapidly—within a week—becomes an elevated, erythematous lesion which later is fluctuant and ulcerates. In the normal dog there is no local manifestation resulting from the injection. It is believed that the reaction described has the same significance as the Koch phenomenon in tuberculosis.—E. D. L. JONQUIERES

OLMOS CASTRO, N., ARCURI, P. B., USANDIVARAS, R. L., CONEJOS, M., BONATTI, A. A. and LEBRON, E. J. Acción de la prednisolona sobre la reacción de Fernandez y la formación acelerada del tubérculo en perros sensibilizados con lepromina. [Effect of prednisolone on the Fernandez reaction and on the accelerated nodule formation in dogs sensitized to lepromin.] *Leprológia* 5 (1960) 23-26.

In the authors' experiments, prednisolone was injected intramuscularly in the dose of 2.5 mgm. daily for 13 days, and on the 3rd day lepromin was given. The early (Fernandez) reaction of protein hypersensitivity was suppressed. The accelerated (7-day) nodule formation was not completely suppressed, although the nodules were much smaller than before (av. 4 mm. vs 12 mm.). It is believed that the mechanism of the reaction to the bacillary proteins is different from that of the reaction to the bacillus bodies, although normally the former activity influences the development of the latter.—E. D. L. JONQUIERES

DE SOUZA-ARAÚJO, H. C. Attempts to obtain Mitsuda reactions in the skin of leprosy patients, using fresh suspensions of nodules produced in black mice by inoculations of *M. leprae*: Greatly increased virulence of *M. leprae* by passage through black mice (with an addendum on work using boiled inoculum). *Leprosy Rev.* 31 (1960) 92-96.

The author transmitted infection with *M. leprae* to "black mice of American race" and produced subcutaneous nodules with lepromatous structures, or abscessed lesions. With material from these nodules, unboiled, he inoculated 7 volunteer leprosy patients to test their skin reactions. The inoculum caused strong local reactions in all of the 7 patients, of a kind which differed clinically and histopathologically from the Mitsuda reaction. Later, he used the same inoculum after boiling it to inoculate 10 other patients; and 5 of them, N2 and N3 in type, gave a 1-plus reaction, 2 others (of regressive L type) were doubtful, while 3 L2 and L3 cases were completely negative. It is concluded that this boiled antigen "gave results not different from the classical Mitsuda Test."—[From abstract by E. Muir in *Trop. Dis. Bull.* 57 (1960) 1271.]

DE SOUZA-ARAÚJO, H. C. Experiments in immunology of leprosy by means of inoculation of patients with living and dead suspensions of acid-fast bacilli cultures. Rio de Janeiro: Departamento de Imprensa Nacional, 1959, pp. 34-63 (Portuguese version, pp. 3-33).

The author inoculated 30 patients with various suspensions of acid-fast bacilli living and dead. Among these were cultures derived from human leprosy lesions, the Stefansky bacillus, and the tubercle bacillus. In 24 of these patients there was a general reaction with fever, etc., and "the leprolin skin-test produced craters in 10 patients, evidently due to the concomitant action of one of the three living inocula." The results obtained in 12 of the patients are described in detail. It is concluded that the positivity of the Mitsuda test with "human and Stefansky lepromins" during lepra reactions, or in patients with menacing lepra reaction, is false; and that the Mitsuda reaction with Stefansky lepromin is always strongly positive and has no value for classifying leprosy, but it seems to have some immunizing action. The histopathology of residual lesions of Stefansky and Rhesus lepromin tests was a tuberculoid granuloma, similar to that produced by the classical Mitsuda test. In L-2 and L-3 cases of leprosy inoculated repeatedly with acid-fast bacilli from leprosy patients the prognosis was better than that in cases treated

with sulfone alone [a statement which is not backed by controls.]—[From abstract by E. Muir in *Trop. Dis. Bull.* **58** (1961) 72-73.]

DE SOUZA-ARAÚJO, H. C. I. Bacteriology of rat leprosy: Electron micrographs of rat lepromas and cultures. II. Bacteriology of human leprosy. *Leprosy Rev.* **31** (1960) 178-188.

The author mixed 1 part of Hydrazide (Schering) [a 10% solution of isonicotinic acid] with 1 part of a suspension of rat leproma, and inoculated batches of white rats and black mice. From the lesions produced he was able to obtain a mixed white and yellow culture, which he was able to separate by successive transplants on Loewenstein medium. Both strains are strongly acid- and alcohol-fast. The white strain is a medium-sized bacillus, while the yellow one shows the aspects of a fresh suspension of rat leproma. The Hydrazide did not change the staining properties of the bacilli, or prevent them from producing the disease in rats. (There are photographs of certain strains of acid-fast organisms which the author has cultivated, and also several plates of electron micrographs of mycobacteria which are regarded as resembling *M. leprae*.)—[From abstract by E. Muir in *Trop. Dis. Bull.* **57** (1960) 1276.]

SHEPARD, C. C. The experimental disease that follows the injection of human leprosy bacilli into foot-pads of mice. *J. Exper. Med.* **112** (1960) 445-454.

The author found that when acid-fast bacilli from nasal washings of leprosy patients were inoculated into the foot-pads of CFW mice, a microscopic granuloma containing acid-fast bacilli developed. The procedure was successfully repeated in all of 22 instances. It was successful in 12 of 16 instances with material from skin biopsy specimens, but in none of 16 attempts from nasal washings which contained no bacilli. Quantitative studies of the multiplication of the acid-fast bacilli in the granulomas were carried out, which indicated a longer incubation period the lower the infecting dose. The organisms increased in number from 50- to 1,000-fold. Passage to new groups of mice was successful in 11 of 12 attempts; 1 strain has been through 4 passages with a total increase of 4 million-fold. Cultures on bacteriologic media favorable for the growth of most known mycobacterial species have remained negative. The author contrasts his results with previous attempts to pass the human leprosy bacilli to animals, and indicates some of the shortcomings of previous work. [The abstractor expressed his high esteem of this report.] [From abstract by Harvey Blank in *Arch. Dermat.* **83** (1961) 529.]

BAYLET, R., CAMAIN, R. and BASSET, A. Tentative de culture de bacilles de Hansen sur cellules de rein de singe. [Attempt to culture the Hansen bacillus on monkey kidney cells.] *Bull. Soc. Path. exot.* **53** (1960) 836-841.

The bacilli inoculated on renal cells of the monkey remained in the interior of the cells for the period of observation of one month. Their presence provoked marked cytologic changes, the cells coming to resemble the multivacuolate morphology of Virchow-type histiocytes. The bacilli retained the morphology and tinctorial affinities they had had *in vivo*. During the early days there seemed to be a slow multiplication, which was not observed in a second passage. It is thought possible that a human tissue would be more favorable.—H. W. W.

CHANG, Y. T. Changes in the length of *Mycobacterium leprae murium* in the evolution of murine leprosy in mice. *American Rev. Resp. Dis.* **82** (1960) 409-411 (notes).

In the recent reports on limited multiplication of *M. leprae murium* in tissue cultures, no notice seems to have been taken of the length of the bacilli. Since the bacilli were obtained from animals soon after infection, the increase may have been caused by the long bacillary forms, present at this stage of the infection, dividing into shorter forms. The author has therefore reexamined the sizes of the bacilli in the mesentery, spleen

and liver in mice injected intraperitoneally. Elongation of the bacilli was apparent by the fourth day, reaching by the eleventh day a maximum increase of at least 2.6 times in the mesentery and omentum, and 1.8 times in the liver and spleen. The bacilli then showed little change for 6-9 weeks, after which they began to diminish in average length so that by the 110th day they were of minimal size. Therefore, unless changes in bacillary length are taken into account, an increase of 2- to 3-fold in numbers during incubation in tissue cultures will not necessarily indicate successful cultivation.—[From abstract by S. R. M. Bushby in *Trop. Dis. Bull.* **58** (1961) 327.]

MICHELSON, E. H. An acid-fast pathogen of fresh water snails. *American J. Trop. Med. & Hyg.* **10** (1961) 423-434.

The author describes what he claims to be the first isolation of a mycobacterium from an invertebrate, the snail *Helisoma anceps*. The organism, unidentified as to species, is an acid-fast bacillus 2.5 to 5.5 microns in length and 0.3 to 0.4 microns in width, which will grow on a variety of media used for mycobacteria where both smooth and rough colonies occur. Highly chromogenic (yellow), it grew at temperatures from 18° to 40°C, with 25° to 28°C as optimum. Growth was visible on solid media in 9 to 15 days. Disease is grossly manifested by early clubbing of tentacle tips, accompanied by localized increases in pigmentation. Small spherical "yellow bodies" were observable in tissues, associated with tubercle-like lesions. The organism may occur as an intracellular parasite in the amebocyte. Eight of 13 strains of snail, representing 6 species in 4 genera, could be infected experimentally; all are of the family *Planorbidae*. The author suggests that since recent studies have emphasized association between certain atypical acid-fast bacilli and human clinical disease, it is possible that mycobacteria of snails and other invertebrates should be considered in the epidemiology of human disease.—J. A. ROBERTSEN