

## CURRENT LITERATURE

*It is intended that the current literature of leprosy 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.*

LATAPI, F. and RODRIGUEZ, O. Rafael Lucio y Nájera. *Prensa Med. mexicana* **20** (1955) 154-157.

Rafael Lucio y Nájera was born in Jalapa, in Vera Cruz, on September 2, 1819, studied medicine in Mexico City, and passed his professional examination in 1842. While yet a student he won by competition a position in practical medical work, and afterward he occupied several faculty positions until, in 1851, he became head of the pathology department, a post which he held for 36 years until his death. He was a founder-member of the Academy of Medicine. One of his most notable works was the one he wrote with Alvarado when he was director of the San Lazaro Hospital, *Opúsculo sobre el mal de San Lázaro o elefanciasis de los Griegos* [A treatise on the disease of St. Lazarus, or elephantiasis of the Greeks], read at the Academy of Medicine in two meetings: December 31, 1851, and February 29, 1852.

The condition is characterized by red, painful spots ["spot" being used here for *mancha*, which does not signify macule in the ordinary sense] on the arms and legs, which ulcerate and on healing leave scars of special appearance. Prior to the appearance of these lesions there is suppression of sweating and decrease of sensation, and at the same time loss of the eyebrows and eyelashes, and of hairs of the arms and trunk. One or two years later the spots begin to appear, in two forms: (1) Beginning with pain and sensation of burning heat, there then appears a nodulation of clear light red color, firm and painful, at the vertex of which there is a small violaceous spot which later spreads and involves the whole elevation, the original light color changing to dark. (2) There appears, without the induration of the first kind, a spot of very bright, scarlet-red color, which later becomes dark and painful, with a sensation of burning pain, surrounded by a narrow margin of light pink color. The spots are oblong, linear or circular in shape, of various sizes, and regionally they appear in the following order: arms, thighs, legs, hands, and forearms. They usually appear on the extensor surfaces of the limbs.

The subsequent evolution of the lesions is similar in both forms. Some resolve and start to fade, becoming dark in color, and shortly thereafter they clear up and leave the skin normal. Sometimes the whole affected area dries up and peels off as a thin, dark-brown scale, and later the reddish skin underneath becomes normal. Other spots suppurate and present varied phenomena. After its appearance the epidermis peels off due to a turbid yellowish serosity, leaving a superficial reddish ulceration, or, better said, excoriation. In some instances a pustule is formed, and the pus it contains dries to form a thick yellowish-white scab. The pinkish-colored margin at the periphery of the spot grows wider and redder, and there appear the inflammatory phenomena of elimination of the necrotic tissue. This leaves an ulceration involving the skin and subcutis with pitted borders and with red base which secretes pus. The entire process lasts about 15 days.

The cicatrix which begins in a month is pinkish at first, then lustrous and transparent grayish-white, surrounded by a dark-colored margin. (Lesions of the bones, mucous membranes, etc., are described.) These patients may live on the average about 6 to 8 years. The course of the spotted form is more rapid than that of the nodular, and the latter is more rapid than the anesthetic. Certain observations from the anatomopathological point of view are described. The authors believed

that the capillaries are the primary site of the arterial system in which occur the changes which constitute the disease of St. Lazarus. —M. MALACARA

GONZALEZ, B. J. La lepra en Nuevo León. [Leprosy in Nuevo León.] *Sugestiones* **20** (1955) 32-40.

The author describes 34 cases studied and treated in Monterrey, Mexico, derived from private practice (13 cases), the Instituto Mexicano del Seguro Social (12 cases), the Hospital Universitario (4 cases), detected in epidemiological survey (4 cases), and found in the street (1 case). Only 14 of them were natives of the state of Nuevo León, most of the others coming from the neighboring states of Coahuila and Tamaulipas. Ages: mostly 20-60 years. Classification: lepromatous 21, and tuberculoid 13. One of the lepromatous cases had the diffuse form of Lucio, the first one reported in Nuevo León. The total index was 0.733 per 1000 for the state. Compared with 0.097 per 1000 found by Peyri in 1946, it appears that the prevalence rate has increased considerably in less than 10 years. It is suggested that there be established in Monterrey a dermatological center to attend to the patients and their families and contacts, and to stimulate awareness and private initiative. —M. MALACARA

BELTRAN ALONSO, A. Situación actual de la lucha contra la lepra. [Present situation of the fight against leprosy.] *Actas Dermo-Sif.* **46** (1954-1955) 199-203.

Careful study of the province of Spain with the highest incident, where—despite the suspension of the operation of the mobile unit—in 1954 there were found 42 new cases (17 lepromatous, 21 tuberculoid, and 4 indeterminate), has led the author to offer certain comments. He believes that the activity of the health organization has been reduced since the Madrid congress, perhaps because of the belief that the endemy is of mild intensity and easily cleaned up, whereas that fact should be a stimulus to terminate quickly a plague which is an anachronism in a European country. Reasons are given why all the mobile units should be continued and be allowed sufficient time, if it is desired that leprosy should soon disappear from Spain. —F. CONTRERAS

CORDERO SOROA, A. La lucha contra la lepra. (Contestando a un artículo.) [The fight against leprosy. (Replying to an article.)] *Actas Dermo-Sif.* **46** (1954-1955) 248-251.

Although in Spain publications on leprosy have decreased since the international congress in 1953, yet the social health program has been continued with interest, enthusiasm and determination. The substitution of some of the mobile units by others was done for well-considered reasons related with the statistics of 1953, in which 2,860 patients and 15,140 contacts were recorded. As evidence of the interest displayed in the matter, the author pointed to the postgraduate course on leprosy given at Fontilles and Trillo. —F. CONTRERAS

VILANOVA, X. and MONFORT, J. La Clínica Dermatológica Universitaria de Barcelona y el problema de la lepra. Comentarios a una segunda estadística (1954-1955.) [The dermatology clinic of the University of Barcelona and the problem of leprosy. Comments on the second statistics (1954-1955).] *Actas Dermo-Sif.* **47** (1955-1956) 3-4.

The detection of 19 new cases of leprosy in one year at the university clinic in Barcelona demonstrates the important and effective work of the universities in the fight against leprosy. With respect to clinical forms, the tuberculoid (47.3%) has slight predominance over the lepromatous (42.1%) and over the indeterminate (10.5%). —F. CONTRERAS

KUYP, E. VAN DER. Public health conditions in Surinam about 1950-1953. *Arch. Inst. Pasteur Guyane Française et Inini* **17** (1956) Publ. No. 402 (August). There are three leprosaria in Surinam. Owing to treatment with DDS many

patients have been discharged. The criteria of isolation have also been changed in recent years. The old outpatient clinic, which was too small, has been enlarged to about 5 times its previous size. The leprosy ward in the general hospital has also been enlarged. In 1951 a third leprologist was added to the staff. In January 1951 a special school for child suspects was opened, and in the last 2 years children with tuberculoid leprosy have also been admitted. These children are kept at school from 7 a.m. to 5 p.m., also on Saturdays and holidays. They are given meals, and they take baths there. They have a school garden and playground. They are daily under strict medical care.—[From excerpt copied.]

✓ LITALIEN, F. (Lèpre en 1955). Arch. Inst. Pasteur Guadeloup (1956) 15-16.

Three tables deal with the 54 new cases registered in 1955 (23 lepromatous, 31 others), with nothing about old cases. For treatment, there were given out 59,657 tablets of DDS (Disulone 40), and the following injections were made: 1,536 of DDS retard, 1,204 of chaulmoogra oil, and 1,699 of placental extract (these three intramuscular) and 432 intravenous of Dycholium. Nothing is said of results. —H. W. W.

ROLLIER, R., CHRAIBI, L. and LAYS, Y. Le problème actuel de la lèpre au Maroc. [The present leprosy problem in Morocco.] Maroc Méd. **35** (1956) 582-590.

After sketching the history of leprosy in Morocco, the authors show how the number of patients registered in Rabat has risen and fallen during the period 1925-1955. In 1925 the number was 302, in 1928 it was 139, in 1930 it rose again to 327 and by 1936 to 544; by 1944 it had fallen to 125, but rose again by 1954 to 580. This fluctuation was due to the degrees of popularity of the treatments available at different times. The authors calculate that among the Moslem population there are about 10,000 cases, or about 1 per 1,000; among the Jews and Europeans the rate is about 1 per 10,000. Of the known cases at present, 91.6% are Moslems, 6.4% Jews, and 2.0% Europeans. The difficulties in controlling leprosy in Morocco, besides finance, are the absence of special clinics outside of Casablanca, and the negligence and fatalism of the patients which make regular treatment impossible. —[From abstract in *Trop. Dis. Bull.* **53** (1956) 1344.]

LLANO, L. and CAPURRO, E. T. Ensayo sobre las modificaciones legales en el régimen del matrimonio en los hansenianos. [Concerning legal changes about marriage among persons with leprosy.] *Leprológia* **1** (1956) 77-80.

The authors review the evolution in concept regarding marriage among persons with leprosy, which concept was originally conceived and substantiated on exclusively scientific criteria, especially considering the poor therapeutic possibilities in the period when Law No. 11,359 was enacted. They propose fundamental modifications intended to regulate, not to prohibit, marriage between persons with leprosy. Their opinion that such marriages should be authorized is based on the progress in therapy in the last 10 years, and on the improvement of the social concept toward the disease. —[From the authors' summary, supplied by G. Basombrio.]

SCAPPINI, J. F. Consideraciones sobre el alta en el lepromatoso. [Considerations on the discharge of the lepromatous patient.] *Leprológia* **1** (1956) 81-84.

It is now possible for treatment to make the lepromatous patient negative and to clear up his lesions, so that he can be discharged from the sanatorium to continue treatment on the outside. The more discharges there are, the more attraction there will be for early cases to seek hospitalization. The more the antileprosy legislation is influenced by science, the greater will be its effectiveness. The concept of the dangerousness of a patient should not be based solely on the medical examination, but rather on his culture and responsibility. —G. BASOMBRI

CAPURRO, E. T., GATTI, J. C. and CARDAMA, J. E. Proyecto para el régimen de altas para enfermos de mal de Hansen. [Proposal governing discharges of leprosy patients.] *Leprológia* **1** (1956) 85-88.

This report discusses regulations for the discharge of leprosy patients. Based on their own experience and on those of leprologists from countries with better-organized leprosy service, the authors set forth the time norms and the bacteriologic and histologic conditions for the granting of temporary and final discharges to patients affected by the different clinical forms of leprosy.—[From the authors' summary, supplied by G. Basombrio.]

DEL VECCHIO, G. Profili di lotta contro le malattie sociali. Nota IV. Le recenti provvidenze legislative italiane e favore dei lebbrosi, recuperati o non, e dei loro congiunti, con brevi cenni alla situazione statistica epidemiologica della lebbra in Italia. [Outlines of campaigns against social diseases. IV. Recent Italian legislation concerning persons with leprosy, recovered or not, with a brief indication of the statistical epidemiological situation of leprosy in Italy.] *Igiene e San. Publ.* **12** (1956) 50-63.

At the end of 1955 there were in Italy 443 persons known to have leprosy, of whom 193 were in hospitals and 250 at home. There were also records of 213 such patients who had died in recent times. The largest concentration (102) was in Calabria, the second largest (80) in Sicily, and the third (50) in Apulia. Laws which have been recently promulgated provide for more accommodation for leprosy patients especially in rural colonies, and make provision for relatives and other dependents. The measures adopted in other countries for the control and relief of leprosy are cited; the present new regulations are based on the results obtained in these countries.—[From abstract in *Trop. Dis. Bull.* **53** (1956) 1240.]

WHO. Vaccination Against Tuberculosis; Sixth Report of the Expert Committee on Tuberculosis. World Health Org. Tech. Rep. Ser. No. 88, 1954, p. 101 (last section).

#### 8. BCG and Leprosy

Dr. de Assis presented his views to the committee on the role of BCG vaccination in the prevention of leprosy. The committee also considered the report of the Joint Meeting of Leprologists and Phthisiologists held in September 1953 under the auspices of the British Tuberculosis Association's Research Committee. The committee also noted with interest the opinions expressed by the WHO Expert Committee on Leprosy in its first report [*Wld. Hlth. Org. Tech. Rep. Ser.* 1953, 71, 13].

The committee did not feel qualified to take a decision in this matter which, it felt, was not within its field of competence. It believed, however, that the mass BCG-vaccination campaign, conducted against tuberculosis with the assistance of WHO in countries where leprosy is endemic, might perhaps be used by leprologists to study the possible value of BCG vaccination in the prophylaxis of leprosy. The committee did not know whether the conditions under which BCG programmes are conducted at present would allow any valid conclusions to be drawn regarding leprosy. Were it not possible to do so, and should certain changes in the organization of BCG campaigns permit that data be more easily obtained, the committee felt that such changes might be considered, provided that they did not interfere with the correct execution of a mass campaign against tuberculosis.—[Copied verbatim.]

DHARMENDRA. Planning of investigations regarding the likely prophylactic role of BCG against leprosy. *Leprosy in India* **27** (1955) 177-179.

Details regarding the planning of an investigation of the prophylactic value of BCG vaccination in leprosy are given. For arriving at statistically significant results at the end of a period of 5 years, it is considered desirable to work in an area of high endemicity (incidence 3%-4%) with a total population of at least

5,000 of which about 1,000 may be effective (i.e., children aged 2 to 15 years). In order that the vaccinated and unvaccinated halves of the effective population may be really comparable, all factors influencing transmission of the disease in them should as far as possible be equalized. This may be achieved by working on the basis of families, working in one area divided into two parts, or working on a community basis.

—N. MUKERJEE

*Conference on Tuberculosis and Leprosy*

Held by the East African Council for Medical Research in Dar-es-Salaam in January, 1957.

BROWN, J. A. K., SHORT, G. M. and BLENSKA, W. The leprosy, tuberculosis relationship. *East African Med. J.* **34** (1957) 339-348.

This is a review of the evidence in the literature of relationship between the two diseases, and especially between the late lepromin (Mitsuda) and the tuberculin reactions, with a considerable bibliography. From data obtained in nonendemic areas it is concluded that lepromin positivity can occur in the absence of leprosy infection. Also that among healthy people the frequency of agreement between the two reactions is such as to indicate that, in many healthy people, they are not independent of each other. (One table, however, is devoted to data of persons tested in whom there was disagreement between them.) Mention is made of evidence that repeated testing with lepromin may induce reactivity to that antigen; also that unknown factors may sometimes be operative. Mass vaccination with BCG is discussed, ending with a plea that any such antituberculosis campaign should be a joint operation with leprosy control personnel.

KUPER, S. W. A. Hypersensitivity in tuberculosis and leprosy: skin reactions; preliminary report. *East African Med. J.* **34** (1957) 349-350.

This report describes results of skin tests with various antigens: human tuberculin, avian tuberculin, lepromin, killed human tubercle bacilli, histoplasmin, and *Candida albicans*. The reactions were observed after 48 hours and 28 days. Involved in the testing were 114 healthy persons: 102 persons with leprosy, some lepromatous and some tuberculoid; and 57 persons with pulmonary tuberculosis. Biopsies of the lepromin reactions were made in 150 cases of leprosy.

BROWN, J. A. K. The epidemiology of leprosy. *East African Med. J.* **34** (1957) 351-360.

This paper is an account of the prevalence and distribution of leprosy in Uganda, largely based on the author's experience of 6 years work. He concludes that in rural areas neither climate nor density of population has any influence on prevalence; the sex distribution varies with the predominating type, probably due to endocrine factors; that the social structure influences the age frequency; that these factors may indicate a natural decline in the frequency of leprosy in some parts; that relatively few patients are not infectious at some time; that leprosy is a disease of susceptible people; and that immunity, resistance, and susceptibility form a complex which may behave genetically.

REES, R. J. W. Some experimental approaches to leprosy. *East African Med. J.* **34** (1957) 361-362.

The greatest single barrier to study of human leprosy is the failure to transmit the infection to any species other than man, and the failure to culture the causative organism. At the National Institute for Medical Research, London, studies of rat leprosy are being carried out. In the mouse, *M. leprae murium* divides approximately every 12-15 days. Suramin markedly increases the susceptibility of mice. Studies are also being made of the effects of cortisone, various diets and x-irradiation. A standard mouse test has enabled drugs to be evaluated. Macrocydon is of particular interest therapeutically. The behavior of the rat bacillus in macrophage-cell cultures

and in other cell cultures has been followed up to 80 days. Electron microscopy has revealed differences between degenerate and normal bacilli.

✓ COCHRANE, R. G. Comparative significance of leprosy and tuberculosis in the overall health problems of tropical Africa. *East Africa Med. J.* **34** (1957) 363-372.

Tuberculosis is a killing disease and affects the economic life of the community and, therefore, attracts attention. Leprosy is slow and not a mortal disease, and therefore its importance is seldom realized. Newer treatments have led to wishful thinking that the problem is solved. Leprosy is important in the British Commonwealth. Because leprosy mainly affects Africans, it is politically important. That leprosy and tuberculosis are considered together in one conference indicates that governments in Africa are beginning to realize the importance of leprosy. The etiology, epidemiology and immunology of the two diseases are discussed. A plea is made for cooperation between workers in the two diseases in educational work. The need for sociological research and work is pointed out.

✓ BROWN, J. A. K. Leprosy control in rural areas. *East African Med. J.* **34** (1957) 373-376.

Traditional compulsory isolation failed as a method of control, but voluntary settlements promise far more. Voluntary settlements were started in Nigeria first at Itu fortuitously, then deliberately at Uzuakoli, and later at Oji River and elsewhere. Based on Uzuakoli a system of treatment villages was started in 1936, because there were far too many patients in the area to be taken care of in the leprosarium itself. A similar system has been built up in Uganda by the author starting in 1951, based on the results of surveys for prevalence. At present there are more than 50 treatment villages. The essentials in choosing a site for a village are: nearness to a hospital or health center, a satisfactory water supply, and fertile soil. A village will serve an area of 15 miles in radius. The village is built by communal labor with help from the District Council and the Community Development Department. Communal effort is good psychology. Home segregation in the tropics is an illusion, and even educated people cannot be trusted to take treatment as they should when pills are given them in quantity. The treatment village makes regular treatment possible, as opposed to irregular attendance at an outpatient clinic. It reduces contact between patients and the community. It provides a useful social life, and acts as a focus for communal effort against leprosy. The treatment village is economically practicable. The outpatient clinic is the line of least resistance, requiring less effort, but it is more open to abuse.

✓ WHEATE, H. W. A small-scale leprosy control scheme in Rungwe District, Tanganyika. *East African Med. J.* **34** (1957) 377-380.

Methods similar to those employed in the control work in Eastern Nigeria have been used. Based on Makete leprosarium, there has been set up a system of outpatient treatment centers to take care of 2,000 cases, and staffs have been trained. In consultation with the administration and the African District Council, clinics have been located so that no patient is more than 5 miles from a clinic. Cooperation with chiefs and headmen is sought. Treatment is based on oral DDS. Infectious and reacting cases are advised to seek admission to the leprosarium. With a bicycle, one dresser can supervise 3 clinics with 100 or more patients attending each. Within 2 years one-third of the estimated cases were getting treatment. Child contacts are kept under supervision. East Africans show differences from West Africans in their reaction to leprosy and its treatment.

✓ HODGES, W. A. A. Surgery in leprosy. *East African Med. J.* **34** (1957) 381-384.

There is basic surgery (i.e., draining abscesses, removing sequestra, and such-like), and reconstructive surgery, of which decompression of nerves is a part. Nerve

decompression is advocated in both lepromatous and tuberculoid leprosy. Pain is relieved, but recovery of motor or sensory loss is rarely marked. Arrest of progress of the loss occurs up to 1 year, and no increase was seen. Pain and swelling recur in about 10%. A general anesthetic is preferred. Anterior transplantation of the ulnar nerve is advocated. Cortisone has only a temporary effect on neuritis, and should be regarded as an adjunct to surgery.

✓ DAVISON, A. R. Chemotherapy of leprosy in South Africa. *East African Med. J.* **34** (1957) 385-390.

DDS with slow induction is generally the best therapy. Up to 1,200 mgm weekly is safe, and in most cases efficacious. Of the lepromatous cases admitted during 1950, 63% had been discharged by January 1957. In some cases injectable sulfones are preferred. Complications of DDS treatment have been dermatitis, neuritis, erythema nodosum leprosum, psychosis, and occasionally hepatitis and anemia. Thiosemicarbazone should be used only during periods when the patient is unable to take DDS. INH has no effect on leprosy in doses up to 15 mgm/kgm body weight. Streptomycin has been used without complications in lepromatous cases with an effect similar to DDS. Mepacrine and chloroquine are valuable in tuberculoid cases. Camoquin is being investigated. Trivalent antimony alone is also being investigated in tuberculoid cases. Cortison and ACTH are finding increasing use. They are valuable in ENL, leprotic neuritis, local reactions and exfoliative dermatitis. The dose must be tapered off. Hydnocarpus ethyl esters are absolutely essential in the treatment of tuberculoid macules.

✓ HARDEN-SMITH, W. and SMITH, M. What is the minimal dose of DDS effective in leprosy? *East African Med. J.* **34** (1957) 391-394.

For one year the authors supervised carefully the issue of DDS tablets at an outpatient clinic. The tablets were issued once a week up to a maximum dose of 600 mgm. Attendance was so irregular that the mean dose averaged 0.77 mgm/kgm daily for adults (i.e., .25 gm weekly), and 0.95 mgm/kgm daily for children. There were 190 cases of tuberculoid leprosy; 29.5% resolved, 44.2% improved, 25.2% remained stationary, and 1.1% got worse. Blood and urine levels were estimated; 20 samples of urine showed measurable quantities of sulfone when blood levels were too low to determine.

✓ ROSS-INNES, J., SMITH, M. and HARDEN-SMITH, W. An interim report on SU1906 (diphenylthiourea) in leprosy. *East African Med. J.* **34** (1957) 395-402.

This drug, which stems from an entirely new chemical group, was administered to 17 lepromatous, 17 tuberculoid, and 4 dimorphous cases—21 of them for over 5 months, 17 for varying lesser periods. Dosage was at the rate of 50 mgm/kgm in 28 cases (i.e., approximately 3 gm daily for adults and 1.5 gm for children, but 10 received 100 mgm/kgm daily for 6 weeks. There were no signs of gastric intolerance or other toxicity. Liver and kidney function tests, blood counts and hemoglobin estimations were carried out before and during treatment. Intercurrent diseases such as malaria, anemia, helminthiasis and bilharziasis were treated concurrently. The drug is not well absorbed from the gut. It does not appear in the blood in quantities of the same order as a sulfonamide or sulfone. It is present in body fluids as a solubilized derivative. Clinically, the drug is as effective as DDS. It is inconvenient to administer because of the high dosage.

—J. GARROD

MUIR, E. Relationship of leprosy to tuberculosis. *Lep. Rev.* **28** (1957) 11-19.

This paper was read in the symposium on leprosy and tuberculosis held in Dar-es-Salaam, Tanganyika, in January 1957. It is first noted that this symposium, and two conferences previously held in London (Ciba, 1954, and NAPT, 1955) signify

a broader outlook on mycobacterial diseases. There are resemblances and divergencies between tuberculosis and leprosy. [At Dar-es-Salaam, Himsforth suggested that to study the divergencies would be the more profitable.] These diseases, and also yaws, belong to a group which appear to accompany various stages in social (etc.) development. Yaws is attached to tribal, primitive, and isolated communities. As communications improve but sanitation lags behind, yaws diminishes and leprosy, a disease of villages, takes its place. As tuberculosis gains sway, leprosy tends to die out; as tuberculosis comes under control, cancer becomes the chief public health problem. Reviewing the bacteriological relationships, the author describes Hanks' concept of the whole range of mycobacteria as a continuous spectrum from saprophytes through commensals and intermediate forms to pathogens, with cultivability present at the lower end but not at the upper, and increasing restriction in hosts from the lower to the upper. With the pathogens there is also the tendency towards intracellular retirement, associated with limited ability to gain energy from substrates *in vitro* and with susceptibility to tissue derivatives and serum. In addition, the pathogens develop certain lipids which act on the leucocytes to prevent their migration. *M. tuberculosis* prevents phagocytosis by producing mycolanoic acid, but the relation of *M. leprae* to the phagocytic cell is more variable resulting in epithelioid or lepra cells of limited mobility, depending upon the rates at which these cells destroy *M. leprae* and upon some substance contained or given off by the bacilli. This substance may either paralyze the cell and produce the lepra cell type, or be countered by the cell and result in the epithelioid cell type. *M. leprae*, however, differs from all other known bacteria in having a refuge or resort additional to the lesion cells, namely, the peripheral nervous system. It seems that it can enter the axons, but at any rate it can enter the fine cutaneous twigs and spread upwards, whether inside the axons or in the adjacent extra-axonic lymph spaces. *M. leprae* also contrasts with *M. tuberculosis* in that it has not yet been grown in cultures, nor has the infection been transferred experimentally. A flank assault has been launched recently by the studies of *M. leprae murium*. As regards immunology, there is a cross-immunity between tuberculosis and leprosy which has an influence on the endemy of each disease. The lepromin reaction and its significance are discussed. We have no adequate proof as yet that a positive reaction induced by BCG has the same significance as a "natural" positive reaction. Whether leprosy infection causes cross-sensitivity to tuberculosis, and whether there is a nonspecific low-grade sensitivity to tuberculin, are under study. Clinical and pathologic contrasts between tuberculosis and leprosy lie mainly in the different selectivity for organs and tissues, the most remarkable being the peripheral neurophilic faculty of leprosy, and the absence of scar formation in the skin after healing has taken place. It is in therapeutics that leprosy and tuberculosis come closest together. In epidemiology and control, cooperation between workers from the two fields is highly desirable, and joint research projects are urgent and practicable.

—J. ROSS INNES

FERNANDEZ, J. M. M. Leprosy and tuberculosis; antagonistic diseases. A.M.A. Arch. Dermat. **75** (1957) 101-106.

This review article is in support of the thesis indicated in the title, with the admission at the outset that "conclusive proof has not yet been attained." The hypothesis is that a previous tuberculosis infection, spontaneous or due to BCG vaccination, affords nonspecifically a certain degree of protection against leprosy infection, as evidenced by positivization of the lepromin reaction in nonreactors. The positive lepromin reaction indicates resistance, especially to the development of the malign form of leprosy, and thus the effect of the tuberculosis factor referred to obstructs the infective effects of the leprosy bacillus. On the other hand, leprosy infection does not protect against infection with the tubercle bacillus. In discussing the tuberculin reaction in leprosy patients it is noted for one thing that lepromatous cases,



nonreactive to lepromin, are said to be less frequently tuberculin positive than those of other forms of the disease because of an inhibitory factor, and the author gives his own results in 100 cases given the Mantoux test with 1:1000 OT [-10 TU]: lepromatous, 43%; tuberculoid, 97%; indeterminate, 70%. On the clinical side, reports are cited which indicate that BCG vaccination affords a material degree of protection, especially against the development of the malign form. Epidemiologically, certain authors hold that where leprosy exists it tends to disappear as tuberculosis increases in prevalence. In favor of an antagonistic action between leprosy and tuberculosis, the author tells of having found that in 87% of the contact cases in conjugal infection (which had occurred in no less than 20% of 190 couples investigated), the disease was tuberculoid, which type rate is explained on the ground that most of them must have been tuberculin positive because that is the case with 75% of adults generally in the same community. Several points requiring further study are outlined. —H. W. W.

OKLAND, F. *Leprosy and fleas in Norway.* [Leprosy and fleas in Norway.] *Nordisk Med.* 57 (1957) 751-754.

The English summary appended to the paper is as follows: "This paper considers the geography of leprosy in Norway with reference to previously known factors and, especially, to the 'flea theory.' This theory maintains that leprosy is transmitted by the human flea (*Pulex irritans*) . . . Primitive housing conditions, unsanitary environment and neglect of personal hygiene favor the occurrence of leprosy as well as of fleas. The flea pest is due to low hygienic standards and, according to the flea theory, leprosy depends on the human flea. If this is correct, the geography of leprosy cannot be discussed without reference to this temporary parasite. In Norway, leprosy always seems to have had its main distribution and highest incidence in the Western districts. This fact may be due partly to the introduction of leprosy from Western Europe into those parts of Norway, and partly to the low hygienic standard long prevailing there."— [Summary copied from *Trop. Dis. Bull.* 54 (1957) 965.]

UTSUNOMIYA, S. On the peripheral blood volume of the skin of the leprosy patients particularly on the Burden tests. Studies on the peripheral blood volume in the skin (Report XII). *Shikoku Acta Med.* 9 (1956) No. 1, pp. 19-31 (in Japanese; English abstract p. 19).

The skin sensitivity of leprosy patients to various stimuli was studied with respect to the changes in the skin blood volume. As the physical stimuli, thermal and reactive hyperemia tests were employed, and the blood-volume-histamine-index (BHI) was calculated after the subcutaneous administration of histamine as the chemical stimulus. The thermal stimulus applied to a normal sensory area gave rise to a typical increase of the blood volume at remote places, especially at the symmetric site. The same stimulus given to an anesthetic area failed to show a typical increase of the blood volume; there was no change except slight hyperemia observed only at the symmetric site. The reactive hyperemia seen at a normal sensory area was slight, and somewhat slow to appear; whereas a considerable prolongation of recovery time was noted in anesthetic regions. A somewhat particular tendency was observed in patients with active ENL: they not only failed to show any reactive hyperemia, but they exhibited a constrictive reaction at the acute stage. The BHI observed in 48 leprosy patients gave an average of  $32.2 \pm 4.00$ , which exceeds the normal value, with the following tendencies: tuberculoid type > lepromatous type > neural type; severe case > intermediate case > mild case. There was no significant difference in BHI between the ordinary leprosy patients and those with vascular spider. The average value of BHI in 5 lepromatous cases complicated with ENL was  $36.0 \pm 5.24$ , the highest value obtained in the present investigation. It showed the highest value during the acute stage and began to decrease gradually during convalescence; the value was low in chronic exacerbations. In short, a definite functional disturbance of the

peripheral blood vessels is present in leprosy. The degree of dysfunction depends on the severity of the disease. However, the vasomotor system retains its function for some time in spite of sensory disturbance.—[From the English abstract.]

✓ SHIONUMA, E. Study on orbital neuralgia in leprosy. *Acta Soc. Ophthalmol. Japan* **60** (1956) 1069-1076 (abstract in English).

This paper deals with some clinical observations on orbital neuralgia in leprosy and the histopathologic study of 8 supraorbital nerves which had been partially extirpated from 7 patients (6 lepromatous and 1 neural) for the sake of diagnosis and treatment. In 95 patients who received ophthalmic treatment in the past three years, supraorbital neuralgia was observed more frequently than infraorbital neuralgia, and the longer the duration the more often did these symptoms occur. As for the treatment of inveterate recurrent neuralgia due to orbital nerve thickening, partial extirpation of the nerve is effective. The usual histopathologic picture is interstitial leprous neuritis, small round-cell infiltration occurring especially in the epi- and perineurium. Sections of the orbital nerves obtained from a lepromatous patient who had reacted positive to Mitsuda reaction—the state of secondary neural leprosy—showed the tuberculoid granuloma.—[From author's abstract.]

✓ KOBAYASHI, S., ITO, M. and TERAKADO, S. Treatment of malum perforans in lepers. A modification of extension treatment of nerves. *Iryo* **8** (1954) 3-8 (in Japanese).

Extension treatment of the ischiadic nerve was tried in 10 cases of neural and 16 cases of lepromatous leprosy, all with plantar ulcers. Permanent cure was obtained in 64% of neural cases and 79% of lepromatous cases, while sympathectomy was effective only in 20% and 60%, respectively. In order to prevent relapse after the extension treatment, deformities of the foot should be treated additionally.

—K. KITAMURA

✓ ITO, M. and KOBAYASHI, S. A study of leprotic foot-drop (1). *Iryo* **8** (1954) 29-32 (in Japanese).

Foot-drop was seen in 107 (15%) of the lepromatous patients, and 87 (32%) of the neural cases. As to the relationship of foot drop to the malum perforans complication, the latter was located in most cases on toes. For foot-drop in its earlier stage, or for temporary foot-drop, conservative therapy such as massage and splinting is effective. The best treatment is arthrolysis or arthrodesis; shoes should be reformed to the use after such operations.

—K. KITAMURA

BASOMBRI, G. and POCH, G. Anestesia postraumática; su importancia para no fundamentar el diagnóstico de lepra. [Post-traumatic anesthesia; its importance in ruling out the diagnosis of leprosy.] *Leprológia* **1** (1956) 93-95.

A 23-year-old man was kicked on the leg, and the injury caused an inflammatory and erythematous-violaceous spot which, although it did not seem to be of leprous nature, nevertheless showed definite anesthesia. This neural disturbance, and the fact that the patient came from an area with a high density of leprosy, led to the consideration of that disease; but the relation to trauma called for caution. Repeated bacteriologic and histologic examinations ruled out leprosy, and led to the conclusion that the case was one of post-traumatic anesthesia.

—AUTHORS' ABSTRACT

GATTI, J. C., CARDAMA, J. E. and BALIÑA, L. Importancia del estudio completo del enfermo de lepra para la catalogación de forma clínica. [The importance of complete examination of leprosy patients for determining the clinical form.] *Leprológia* **1** (1956) 96-97.

A case is described in which there was a single lesion of lepromatous appearance, but whose complete study led to the tuberculoid classification. This decision

was based on the histology of the lesion, an ascending neuritis, negative bacteriology, and positivity to lepromin. The importance of a complete examination of leprosy patients for cataloging the clinical forms is emphasized.—[From the authors' summary, supplied by G. Basombrio.]

TEIXEIRA COELHO, J. Considerações sobre uma lesão atípica constatada em doente lepromatoso. [Considerations of an atypical lesion found in a lepromatous patient.] *Arq. mineiros Leprol.* **16** (1956) 312-315.

Report of a case in which the symptoms began with neuralgic disturbances located in the spinal column, radiating to the right lumbar region. Later there appeared a plaque in this region in which there was a lesion with elevated borders. It is concluded that the lesion was lepromatous, although it had features rarely observed in leprosy. The disturbances in the spinal column which caused the compression and nerve degeneration were undoubtedly the prepondering factors tending to produce the leprotic neurocutaneous morbidity. Regarding treatment, in the present case extirpation of the lepromatous lesions is regarded as inadvisable, application of trichloric acetic acid superficially and sulfone therapy being more advantageous.—[From author's summary.]

FENTON, R. L. and AUSTIN, F. H. Indeterminate leprosy acquired during military service; report of a case and review. *A.M.A. Arch. Int. Med.* **99** (1957) 290-293.

This is a case report of an army officer 59 years old, stationed in the Philippines for 16 months in 1946 and 1947, who prior to military service beginning in 1941 had never been away from Kentucky and eastern Tennessee. In July 1951 he noticed a slightly red area on the lateral aspect of the left ankle, which (misdiagnosed) gradually enlarged while additional lesions appeared. Numbness to touch was noted in April 1954, whereupon the diagnosis of leprosy was made; the bacteriological examination was positive, the lepromin reaction negative. The experiences of the armed services with leprosy up to 1947 are reviewed. Service men returning from areas of endemic leprosy should be watched closely for evidence of the disease. [The reason for the "indeterminate" classification in this case is not given.] —SR. HILARY ROSS

PRIETO LORENZO, A. Nuestra experiencia en el tratamiento de la neuritis leprosa. [Experience in the treatment of leprosy neuritis.] *Med. Colonial* **27** (1956) 542-560.

Treatment of leprosy itself with sulfones and other drugs not only fails to relieve neuritis but even aggravates it at first; the patient may have to suffer severe pain for months if it is not relieved by other remedies. Of the many therapeutic measures that have been used with more or less effect, some act in some patients but not in others and some give relief only temporarily. Notes are given on the following: ephedrine, adrenalin, formic acid, histidine, histamine, venoms of various animals, alcohol infiltration, local anesthetics, gold salts, sodium bicarbonate orally or intravenously, methylene blue, and vitamins D, K, E, B<sub>1</sub> and B<sub>12</sub>. Of them all, the author places most reliance on a combination of vitamins B<sub>1</sub> and B<sub>12</sub>, although even better results may be had with corticotropin and cortisone. It may be necessary to try one remedy after another before relief is obtained. Diathermy is useful. Some workers have used ultrasonic vibration. Lastly, there is recourse to surgery, especially in acute reactions where in a short time irreparable damage may be done to nerves by pressure if not quickly relieved.—[From abstract in *Trop. Dis. Bull.* **53** (1956) 1352.]

PRIETO LORENZO, A. Manifestaciones neurales de la lepra. [Neural manifestations in leprosy.] *Med. Colonial (Madrid)* **27** (1956) 435-459.

This is a fairly full account of the various changes found in the nervous system in leprosy and the resulting clinical manifestations. The author has noted a certain amount of confusion in the description of these lesions in the literature, and his paper is an attempt to present them in a clear and systematic form. In this object

he is moderately successful. He first describes with the help of line drawings the areas of cutaneous nerve distribution in the upper and lower limbs, and the pathological and clinical changes which take place, especially in the tuberculoid type of leprosy. Next he describes the motor changes in the limbs and the face, and follows these with a description of trophic changes in muscles, skin and subcutaneous tissue, and in bones. Next he gives an interesting account of the disturbances of the vasomotor and secretory systems of the skin, and lastly he refers to the very rare pathological changes that have been found in the central nervous system, and to the mental conditions in leprosy which are not a direct but rather an indirect result of the disease.—[Abstract from *Trop. Dis. Bull.* **53** (1956) 1124.]

WILKINSON, F. F. and BRUSCO, C. M. Acción de un inhibidor de la anhidrasa carbónica en las neuritis hansenianas. [Activity of carbonic anhydrase as an inhibitor in leprosy neuritis.] *Leprológia* **1** (1956) 75-76.

One such inhibitor (Diamox) was used in 10 leprosy patients with neuritic pains, given orally in 25 mgm tablets daily for 30 to 70 days. The relief was manifest, and the favorable effect was interpreted by the authors as due to the action of the drug upon the fluid and electrolyte balance which usually is so disturbed in lepromatous reactions. The method is recommended because it is economical and practical, and causes little disturbance to the patients. —G. BASOMBRI

PRIETO LORENZO, A. Tratamiento de la leprorreacción por el ACTH y cortisone. [Treatment of lepra reaction with corticotropin and cortisone.] *Med. colonial (Madrid)* **27** (1956) 227-250.

After discussing lepra reaction and citing the experiences of other workers with these drugs, the author relates their effects in controlling the various symptoms of lepra reaction in 25 of his own patients. He gives corticotropin intramuscularly as follows: 15 mgm on the first day, 10 on the second and third days, and 5 daily for the next 3 or 4 days. In some cases the dose of 5 mgm was not exceeded. Cortisone is used orally as follows: 200 mgm on the first day, 150 on the second, 100 on the third, 75 on the fourth, and 50 on and after the fifth, the treatment not prolonged for more than 15 days. In 60% of cases there was a fall of temperature within 4 hours, and in practically all by the second day. Neural symptoms do not always clear up satisfactorily, and vitamins B<sub>1</sub> and B<sub>12</sub> in large doses should be used to supplement the hormone treatment.—[From abstract in *Trop. Dis. Bull.* **53** (1956) 1007.]

NICHOLAS, G. J. Cortisone in the complications of leprosy. *West Indian Med. J.* **5** (1956) 196-200.

A trial of cortisone treatment in acute neuritis, nonfebrile erythema nodosum, and the febrile type of lepromatous reaction was carried out at the Mahaica Hospital, British Guiana. Cortisone was administered to 26 patients on 76 occasions in courses ranging from a single dose of 50 mgm to a daily dose of 200 mgm for 7 days. The average period of administration was from 3-5 days, discontinuance being dictated either by aggravation of symptoms or by complete relief of symptoms. It was felt that any tendency to spreading of the bacilli as a result of the "loosening up" of the natural defensive fibroblastic barriers could be countered by antileprosy treatment, and with few exceptions the sulfone treatment was continued throughout. Cortisone merits a place in the chemotherapy armamentarium, not as a leprostatic drug but as an aid in dealing with complications. Its use is generally agreed on in sulfone sensitivity and ocular inflammations, and with the author it is the standard form of treatment in neuritis. While good results were not obtained in subacute erythema nodosum leprosum, in the more acute febrile lepromatous reaction ("lepra fever") its cautious use is justified. The normal antileprosy therapy, possibly in reduced dosage, should be continued during cortisone administration.—[From abstract in *J. American Med. Assoc.* **163** (1957) 597.]

JOPLING, W. H. and COCHRANE, R. G. The place of cortisone and corticotrophin in the treatment of certain acute phases of leprosy. *Leprosy Rev.* **28** (1957) 5-10.

Cortisone and corticotrophin (ACTH) have an important role in the treatment of certain allergic complications of leprosy. Severe erythema nodosum responds dramatically, and 1 or 2 short courses are often sufficient; but prolonged courses may be necessary in some cases, even up to 12 months or more. Sulfone treatment can be continued without interruption. The authors' patients so treated have not suffered any aggravation of the disease. (Mention is made of the new synthetic steroids, prednisone and prednisolone.) Steroid therapy is also important in the management of acute ophthalmic and neural reactions, and, lastly, of severe sulfone sensitization. It is concluded that there is a definite place for the use of these drugs in certain acute complications of leprosy and of sulfone therapy, not only for the relief of distressing symptoms but also for the prevention of lasting disability.—[From authors' summary and conclusions.]

FLOCH, H. and MAILLOUX, M. Doit-on provoquer des réactions lépreuses à titre thérapeutique? [Should lepra reactions be induced for therapeutic purposes?] *Arch. Inst. Pasteur Guyane Française et Inini* **17** (1956) Publ. No. 410 (October).

Reactions in lepromatous leprosy are distinguished as (1) acute lepromatization, or lepromatous leprosy in reaction, (2) eruptions of erythema nodosum or multiforme type, and (3) the kind called variously pseudo-exacerbations (de Souza Lima), or acute infiltration (Tajiri), or reversal reactions (Wade). The prognosis of the reactional episodes in lepromatous patients, and their effects on the later course of the disease, are studied. Some leprologists believe that lepra reaction has a favorable influence, while others hold the contrary. It is necessary, in fact, to distinguish (a) the true lepromatous reactions which aggravate the disease, (b) the nodular and the polymorphous erythemas which have variable effects on prognosis, and (c) the pseudo-exacerbations which have a beneficial effect on the evolution of the disease. The authors have compared 26 lepromatous cases which had had reactional episodes with 26 lepromatous controls without any reaction in the many years of treatment and evolution. Of the former, 17 (65%) were clinically improved—13 (50%) bacteriologically negative, and 4 (15%) almost so. Of the control group, 20 (77%) have improved—13 (50%) bacteriologically negative, and 7 (27%) almost negative. Of the reaction group, 7 (27%) had become worse, against 6 (23%) of the controls. An important fact is that among the reaction cases there had been 2 deaths recorded as due to those episodes, but no deaths in the controls. It is concluded that it is hazardous to recommend the precipitation of lepra reaction so long as we are not in control of the nature of the condition.

—AUTHORS' ABSTRACT

RELVICH, A. L. Relapses in lepromatous leprosy. *Trans. Roy. Soc. Trop. Med. & Hyg.* **50** (1956) 97-101.

The author, working in the Benin and Delta provinces of Western Nigeria, deals with an average population of 5,500 leprosy patients of whom about 800 are in the central settlement (Ossiomo) and the rest in segregation villages. Of the former about 60% are lepromatous, of the latter about 25%. All are on sulfone treatment. Of the lepromatous patients in the settlement, 39 had been discharged "symptom free" (cleared of clinical symptoms and bacilli), and 154 had been negative for periods ranging from 3 years to less than 6 months. The problem discussed is the occurrence in such negatives, after months or years, of new macular lesions which remain bacteriologically negative. They are erythematous, sometimes highly so, and rather vague in outline but not as vague as typical lepromatous macules. Such lesions had caused 4 of the discharged cases to report back, and had occurred in 17 of the negatives still in the settlement and under treatment. It does not matter whether the patient has had the nodular, infiltrated, or macular form of lepromatous leprosy, he is liable to develop fresh macules; and as yet only macular lesions had occurred. Almost all

had remained lepromin negative, and the few positives were very weak. The macules showed, histologically, characteristics of both lepromatous and tuberculoid forms of leprosy, but no lepra cells (Cochrane); and the lesions are therefore regarded as dimorphous macules. [The abstractor remarked that, if the same standards are followed for determining that a patient is "negative" as at Uzuakoli in the Eastern Region of Nigeria, where relapses are much less frequent, it would appear that leprosy is of a more intractable nature in the part of the Western Region from which the author's patients are drawn.]—[In part from abstract in *Trop. Dis. Bull.* **53** (1956) 761.]

✓ DHARMENDRA and CHATTERJEE, K. R. Studies with dihydronocarpyl-4:4'-diaminodiphenyl-sulphone in leprosy. *Bull. Calcutta Sch. Trop. Med.* **3** (1955) 175.

The authors report on the pharmacological action and therapeutic effect of a condensation product of hydronocarpic acid with DDS (Hydnosulphone.) The compound was found to have bacteriostatic activity against some acid-fast bacilli and *Streptococcus hemolyticus* in a dilution of 1/20,000. A daily dose of 50 mgm/kgm over a period of 2 months did not produce any toxic symptoms in laboratory animals. With a daily dose of 150-200 mgm in patients, the blood concentration varied from 0.5 to 0.8 mgm/%. From 85% to 90% of the total intake was found to be excreted through the kidney. After administration for a period of 3 months, traces of the drug could be found in the blood for more than a month after cessation of treatment. The compound did not appear to break up in the body into its integral parts. A therapeutic trial was undertaken in 26 cases (L-18; N-8). The drug was given orally, each day, starting with 25 mgm and gradually increasing to a maximum of 150-200 mgm. (Parenteral administration of an oily suspension gave rise to abscess formation and was discarded.) The periods of treatment ranged from 30-106 weeks, averaging 70 weeks in the lepromatous cases and 72 weeks in the nonlepromatous. No toxic effects were noticed, except temporary decrease of erythrocytes and hemoglobin in 4 cases. Of the 18 lepromatous cases, 3 became bacteriologically negative and in another 5 the bacillus index was reduced to 0.5. In 6 the improvement was moderate, and in the remaining 4 it was slight. All of the 8 nonlepromatous cases showed marked clinical improvement.

—N. MUKERJEE

✓ SAIKAWA, K. and ITO, N. Studies on chemotherapy of leprosy. Proethyl therapy in leprosy. *Iryo* **9** (1955) 37-42 (in Japanese).

Proethyl was used in 30 cases of lepromatous leprosy, from 1.5 to 5.0 gm per day orally, for 6-18 months. Remarkable improvement was seen in 7 and lesser degrees of improvement in 18 cases, while the other 5 showed no change. In no case was aggravation seen. Resorption of superficial lepromas began after 5-6 months of treatment. Improvement of infiltrations and ulcers in the nasal and oral cavities and the pharynx also was observed by the 6th month. ENL appeared in 10 cases. Bacteriological examination of the skin and nasal mucosa revealed decrease in the numbers of bacilli in many cases. There was slight improvement of liver function, and anemia was less prominent than in cases treated with promin.

—K. KITAMURA

FIOL, H. and MANZI, R. Dihidroestreptomycin intradérmica en lepra. [Intradermal dihydrostreptomycin in leprosy.] *Leprológia* **1** (1956) 72-74.

The authors treated two groups of patients [type not stated], one of them with DDS alone and the other with DDS plus dihydrostreptomycin given intradermally for an average of 5 months. No difference between the two groups could be seen.—[From the authors' summary, supplied by G. Basombrio.]

✓ NAGUIB, M. and ROBSON, J. M. The activity of diethyldithiolisophthalate alone and combined with isoniazid in the treatment of murine leprosy in the mouse cornea. *Lancet* **270** (1956) 411-412 (Apr. 14).

Diethyldithiolisophthalate belongs to a class of compounds known to have action

in tuberculosis. The experiment was designed to determine whether it will have an action on leprosy, using rat leprosy. Mice were inoculated intracorneally with *M. leprae murium*, producing a lesion the progress of which can be observed. Treatment was with this drug, or with isoniazid, or with both, given orally, the former in doses of 5 mgm at intervals of 2 or 7 days, and isoniazid in a daily dose of 0.3 mgm. Both drugs reduce the rate of development of the lesions, but complete arrest of their development for 22 weeks was achieved only by giving both drugs, the diethyldithiolisophthalate at 2-day intervals.—[From abstract in *Trop. Dis. Bull.* **53** (1956) 1011.]

UTKU, I. E. Travaux et resultats d'essais de la chimiothérapie de la lèpre en Turquie. [The work and the results of chemotherapy of leprosy in Turkey.] *Türk İjyene ve Tıbbi Biyoloji Dergisi* (Ankara) **16** (1956) 86-109.

Isoniazid (Rimifon) was first tested with rat leprosy, where it was found that the highest tolerated doses retarded but did not suppress the progress of the infection. Isoniazid was then tried in 50 untreated leprosy patients, the dosage 300 to 500 mgm. Amelioration was obtained in one-third, the general condition being improved especially in the acute and subacute phases of the disease, but it was concluded that the sulfones had 2 or 3 times greater effect, but were much more toxic. It was found that a combination sulfone-isoniazid therapy gave the best results, and toxic effects were diminished. In 12 months there was improvement clinically in 87% of 50 patients, and bacteriologically in 91%. Good results were also obtained by injecting a solution of isoniazid into leprosy nodules.—[From abstract in *Trop. Dis. Bull.* **53** (1956) 1124.]

ILARSHIE, M. I. Opyt gip noterapii bolnykh leprosy. [Experiments in hypnotherapy on leprosy patients.] *Sbornik Nauchnykh Rabot po Leprologii i Dermatologii* [Collected Scientific Papers in Leprology and Dermatology] No. 8, 1956, pp. 231-233.

Writing from the Rostov-on-Don Experimental and Clinical Leprosarium, the author quotes an observation of L. V. Sobolev, "I rarely send them to sleep. I make use of the depression and enhanced suggestibility which already exist in the [leprosy] patients." He then recounts his own experience of the treatment of leprosy neuritis by hypnotic suggestion. The patient was made to lie comfortably on a couch, gazing on a small percussion hammer and listening to a monotonous stream of verbal suggestion, till he sank into hypnotic sleep; he was asked to go on sleeping with his eyes open. The signs of hypnosis were: absence of pupillary reflexes to light, deep breathing, and slowing of the pulse. During a session of 40 to 50 minutes he was given therapeutic suggestions, in a firm assured tone, of the cessation of pain, better sleep, and a cheerful state of mind. Depending on results, 5 to 12 sessions were given. Out of 6 patients with acute or subacute neuritis, 3 lost their pain entirely and recovered the power of sleep. Of 6 others with distal paresthesia of the limbs which disturbed their sleep, all recovered; but in 2 the trouble recurred after 14-17 days owing to an insufficient length of treatment. In 2 out of 3 other patients with more generalized symptoms there were good results lasting over a month's observation. This method is also of use when patients are suffering from depression.—[From abstract in *Trop. Dis. Bull.* **54** (1957) 1092.]

SELMÍ GUIMARÃES, A. Índice de lípase em 590 doentes de lepra. [Lipase index in 590 leprosy patients.] *Arq. mineiros Leprol.* **16** (1956) 323-327.

It is concluded, (1) that the determination of the lipase index is useful for verifying the lowering of the patient's resistance, and (2) that the higher the bacillus index the lower the lipase index. The conclusions would have been better if we had examined contacts, and if we had accompanied the evolution of the disease in the tested patients. However, it was impossible to get a sufficient number of contacts willing to return to the dispensary under strict fasting conditions. Again, it was impossible to accompany the evolution of the disease, which is slow and irregular in its progress and presents unexpected events.—[From author's conclusions.]

RODRIGUES VIEIRA, I. A defesa na lepra lepromatosa. [The defense in lepromatous leprosy.] *Arq. mineiros Leprol.* **16** (1956) 316-322.

In lepromatous leprosy there is a special defense mechanism by which the organism tends to exclude the germ from contact with the living tissue. The germs are secluded within the lepra cells, of which the elements of Virchow are the supreme expression. This defense mechanism culminates in the production of small intratissue cells or cavities full of bacilliferous magma which result from the fusion of various vacuolated cells. This tends to enclose the germ in cysts, which may be eliminated through ulcerations of the skin surfaces. Even in complex lepromatous structures epithelioid cells may appear, showing a change in the immunoallergic state of the organism. This constitutes a safe criterion for determining the pathogenic virulence of each case and its prognosis.—[From author's summary.]

FURNISS, A. L. The testis in leprosy. *Indian J. Med. Sci.* **10** (1956) 506-510.

For this study material was obtained from 30 autopsies (22 lepromatous cases and 8 tuberculoid), and by biopsy from 10 lepromatous cases. The ages of the patients were 25-55 years. None of the specimens from the tuberculoid cases showed evidence of involvement by leprosy. In the lepromatous cases, no affected testes were macroscopically normal, most of them appearing reduced in size with thickening of the tunica albuginea. The normal brown tissue was replaced by strands or patches of white fibrous tissue, and sometimes there were yellow areas similar to those seen in leprosy lymph glands. Microscopically, the newest cases showed arrest of spermatogenesis and regressive changes in the tubule epithelium. Between the tubules there was infiltration of round cells and histiocytes, among which there were acid-fast bacilli. Later there was increased separation of the tubules, edema and fibrosis. Still later the tubules became hyaline and lost their structure. Bacilli were found in 2 cases which were negative in the skin. The epididymis was less affected than the testis. There were only 5 instances of gynecomastia in the 40 cases concerned (against 73 instances in 190 lepromatous patients), so there is no apparent correlation between that condition and atrophy of the testes. The atrophy of the testis which is so conspicuous in leprosy occurs "early in the disease process and unrelated to the degree of lepromatous infiltration." It may not be simply a local reaction to injury, but a result of a more generalized endocrine disorder, or injury by a toxin or bacterium. Regarding the possible cause of gynecomastia, the author suggests that leprosy provides an opportunity for investigating the hormonal imbalance concerned in its development. Regarding the frequency of affection of the testis, it is suggested that for some unknown reason the testis, like the nerve, provides a nidus for the leprosy bacillus, and that if this reason could be discovered it might elucidate the problem of culturing the bacillus.—[From abstracts.]

PODESTÁ, M. L., BALIÑA, A. and BALIÑA, L. M. Leproma testicular residual en lepromatoso aparentemente curado y con reacciones lepromínicas positivas. [Residual testicular leproma in an apparently cured lepromatous patient with positive lepromin reactions.] *Leprológia* **1** (1956) 90-92.

Presentation of a case of testicular leproma in a probably lepromatous patient who had given positive lepromin reactions for 7 years, and who had been bacteriologically negative for 3 years and without skin manifestations for 2 years. The lesion was a bean-sized tumor which histologically showed reactional connective tissue with a specific infiltrate and numerous Hansen bacilli.—[From the authors' summary, supplied by G. Basombrio.]

MASTROENI MARISCA, P. Contributo alla conoscenza dell' endoarterite obliterante nel lebbroso. [Contribution to the knowledge of endoarteritis obliterans in leprosy.] *Gazz. Int. Med. Chir.* **61** (1956) 598-611.

A case of endoarteritis obliterans of the popliteal artery and its collateral branches



in a leprosy patient is studied. The process of occlusion developed solely from the tunica intima, the other vascular layers having no part in the process. The author thinks that this degeneration was probably due to a chronic hemoplastic condition caused by the leprosy, perhaps encouraged locally by mechanical and toxic factors.— [From abstract in *Excerpta Med.* **11** (1957) 12.]

MOTCHALOVA, A. G. Og izmeneniakh innervatsionnogo apparata pochek pre lepre. [Alterations of the renal nerve supply in leprosy.] *Arkhiv Patologii* (Moscow) **18** (1956) 105-106.

The material for this study was obtained from 6 autopsies on patients with lepromatous leprosy, 3 of whom had secondary lesions of the nervous system. The kidneys, the coeliac, aorticorenal, mesenteric and paravertebral ganglia and segments of the spinal cord were examined. The tissue was fixed in a neutral 12% solution of formalin in alcohol and frozen sections were stained for Nissl's granules, by the Ziehl-Neelsen method, and by the silver impregnation method of Gross-Bielschowsky as modified by Lavrentiev. The ganglion cells of the spinal cord contained large amounts of lipofuscin and showed nuclear decentralization and condensation of the Nissl's granules. The sympathetic ganglia showed occasional satellitosis and hypertrophy of the pericellular apparatus characterized by proliferation, coarsening and irregular thickening of the nerve fibrils, and there was thickening and coarsening of the afferent and efferent nerve fibers. The Nissl was present in the nerve cells of the ganglia. In the kidneys the nerve fibers of the blood vessels were thickened, coarsened and vacuolized, and the nerve fibers supplying the convoluted tubules were altered and invested by small mononuclear cells. The changes of the renal nerve supply in leprosy reflect the generalized involvement of the body in this disease—[Abstract from *Excerpta Med.* **11** (1957) 14.]

DE FARIA, J. L. Der heutige Stand der Forschung über das Wesen der Leprominreaktion mit besonderer Berücksichtigung der histopathologischen Befunde. [Modern views on the lepromin reaction with special consideration of its histopathology.] *Arch. Dermat. u. Syph.* **198** (1954) 37-50.

This article is a summary review [very similar to one which appeared in *Rev. brasileira Leprol.* **22** (1954) 145-156] of the author's studies of the lepromin reaction in leprosy patients and the dog, concerning which he first published in 1947. His opinion is that the reaction, in both patients and dogs, does not depend upon a developed allergy or hyperergy, but is due to a natural defense mechanism which is independent of infection with *M. leprae*. The lepromin reaction, he holds, is caused by the lipid fraction of lepromin. If the bacilli are filtered off from the lepromin, the filtrate only gives the early Fernandez reaction, not Mitsuda's late one. An adult dog reacts to lepromin, as does a person with tuberculoid leprosy, with a nodular late reaction which, however, attains its maximum a week or so earlier than in man. At the site of injection, in both man and the dog, there is first an exudative process, then proliferative changes, and finally a tuberculoid granuloma. In man the bacilli in lepromin vanish within 90 days after the injection, in dogs from the 35th day. If only the lipid fraction of lepromin is injected, then a relatively small nodule occurs early, directly after the early reaction and without any period of latency; and it disappears more rapidly. This lipid fraction is responsible for the reaction chiefly associated with the production of epithelioid cells, but if it is used alone the cellular response is relatively slight, and so is proliferation. Consequently, no typical granuloma reaction results as it does with usual lepromin, from the bacilli of which the lipids are released only slowly. Whether a lepromin reaction is positive or not can be ascertained in some cases only by histologic examination. It is interesting to note that 50% of the tuberculoid cases tested with an extract of normal skin also gave reactions with a tuberculoid histology.

—E. KEIL

CONTRERAS, F., GUILLEN, J., TARABINI, J. and TERCENIO, J. Resultados clínicos e inmunológicos en hansenianos adultos vacunados con BCG por vía oral. [Oral BCG vaccination of adult leprosy patients; clinical and immunologic results.] *Fontilles* 4 (1956) 33-38.

The authors vaccinated with BCG 16 patients which were divided into 3 groups: (1) 5 lepromatous patients who were about to be discharged; (2) 9 lepromatous patients with frequent lepra reactions; and (3) 2 patients (1 borderline and 1 lepromatous) in full activity but without lepra reactions. Most of the patients in the second and third groups improved clinically, especially those in the former one. Almost all of them no longer experienced lepra reactions, and they began to tolerate the sulfones which previously they did not; only 2 of them had, after the BCG vaccination, a few reactions of short duration. The degrees of bacterial positivity and the Middlebrook-Dubos hemagglutination titers were also checked in the clinically-improved patients. No changes were noted, in any of the 3 groups, in the results of lepromin tests made before, during or after BCG vaccination, these results contrasting with those reported by earlier workers in similar studies. —AUTHOR' ABSTRACT

DE OLIVEIRA LIMA, S. Índice de Vélez na reação leprótica. [The Vélez index in lepra reaction.] *Rev. brasileira Tuberc.* 24 (1956) 399-406; also *O Hospital* 49 (1956) 509-515.

On the basis of 3,312 leucocyte counts made on 343 leprosy patients, the author concludes that, in the absence of active tuberculosis, or lepra reaction of the ENL type, or infected ulcers of either kind (leprotic or perforating plantar), the Vélez leucocyte index is always normal or negative. On the other hand, the positive index manifests itself 1-2 weeks before the appearance of a lepra reaction, which makes it possible to anticipate its appearance and the course of its development. If, in spite of improvement of this reaction, the Vélez index remains inverse a relapse is to be feared. Among the treatments tested, the best results were obtained by means of an antihistaminic (Tephorine).—[From abstract in *Excerpta Med.* 11 (1957) 71.]

CONTRERAS, F., GUILLEN, J., TARABINI, J. and TERCENIO, J. La diferenciación del bacilo de Hansen y de Koch mediante la tinción con el negro Sudán. [Differentiation of the Hansen and Koch bacilli by means of Sudan black staining.] *Actas Dermo-Sifiliogr.* 47 (1955-1956) 475-480; also *Fontilles* 4 (1956) 15-18.

The Sudan black staining method, suggested by Chaussinand, has served well in tests carried out in Fontilles. In 62 examinations of 40 leprosy patients and of 2 with pulmonary tuberculosis the two mycobacteria could always be differentiated perfectly. This method also serves to differentiate other acid-fast which are frequently encountered on the nasal mucosa, and to detect the association of the Koch bacillus in leprosy patients. In this study the authors repeated the experiments and the technique described by Chaussinand. They believe that this method is of great value, and they plan to continue to use it in further experiments by which they hope to clarify the participation of the Koch bacillus in some processes of leprosy patients. —AUTHORS' ABSTRACT

✓ JOHNSTON, D. G. Combination stain for acid-fast bacilli and fungi. *Lab. Invest.* 6 (1957) 187-190.

A combination of Kinyoun's carbol-fuchsin and Gridley's fungus stain has provided a method for the detection of acid-fast bacilli and/or fungi (except *Histoplasma capsulatum*) in tissue sections on a single slide. Formalin fixation. Kinyoun's carbol-fuchsin, heated to steaming, 8 mins; acid alcohol decolorization until pink; running water, 5 mins; 4% chromic acid, 5 mins; again wash; place in Coleman's preparation of Feulgen reagent, 15 mins; sulfurous acid rinse, 3 changes, 5 mins each; running water 15 mins; aldehyde-fuchsin, 15-30 mins; rinse in 95%

alcohol, then distilled water; counterstain with metanil yellow (alternatives suggested); water alcohol, xylene, mount.  
—H. W. W.

WADE, H. W. A modification of the Fite formaldehyde (Fite I) method for staining acid-fast bacilli in paraffin sections. *Stain Tech.* **32** (1957) 287-292.

For maximal demonstration of acid-fast bacilli in tissue sections it is necessary to avoid sequences of reagents which, first, affect the integrity of the complex upon which acid-fastness depends, and, second, extract it from those bacillary elements which have been made vulnerable by age or other factors. The greatest damage occurs during dewaxing of paraffin sections by xylene and alcohols; the older and more decrepit bacilli being especially affected. In the technique presented, which is a modified combination of two processes devised by Fite, sections are deparaffinized by a "protective" mixture of rectified turpentine and heavy liquid petrolatum (2:1) and blotted to water. Staining is with Fite's new fuchsin (magenta III) solution, overnight (preferably) at room temperature. The sections are then treated with reagent grade formaldehyde, which turns the color of the bacilli deep blue-black, followed by an aqueous sulfuric acid decolorizer, the potassium permanganate-oxalic acid sequence, and a modified Van Gieson counterstain, nuclear staining with hematoxylin being omitted. For total demonstration of all stainable bacilli, "restorative" treatment in the turpentine-oil mixture before staining is sometimes required, most frequently with leprosy material but also with some tuberculosis lesions.

—AUTHOR'S ABSTRACT

KONNO, K. New chemical method to differentiate human-type tubercle bacilli from other mycobacteria. *Science* **124** (1956) 985.

The differentiation is based on a test for niacin. A few well-established colonies from a culture are suspended in 1 cc. of 4% aniline in 96% ethyl alcohol, and then is added 1 cc. of a 10% water solution of cyanogen bromide. In a positive result an intense canary yellow color develops. Such results were obtained only with strains of the human tubercle bacillus, whether virulent or avirulent. Bovine bacilli, virulent and avirulent (BCG), and avian strains were all negative, as were certain nonpathogenic mycobacteria, and also 10 strains of "atypical" acid-fast obtained from patients.

—H. W. W.

PRISSICK, F. H. and MASSON, A. M. Cervical lymphadenitis in children caused by chromogenic mycobacteria. *Canadian Med Assoc. J.* **75** (1956) 798-803.

Ten strains of chromogenic acid-fast bacilli were obtained in pure culture from pus aspirated from suppurating facial, submaxillary, or cervical lymph nodes in 10 children aged 1-½-7 years in whom the clinical aspect suggested tuberculous infection. All had closed lesions. Lymph nodes that were excised were histologically compatible with tuberculosis, although some differences were noted. The clinical course was benign, and healing occurred slowly without sinus formation. Two similar strains were isolated from empyema in adult male patients, and 2 additional strains were isolated from a bronchial aspiration fluid and from tissue of a tuberculous knee joint in children. These 4 strains could not be correlated with the clinical pictures of the patients from whom they were obtained, and tests for their pathogenicity were not conclusive. All 14 strains produced markedly pigmented colonies, ranging from bright yellow to deep orange. All grew best on media used for isolation of *M. tuberculosis*, although good growth was obtained also on a wide variety of other media; 11 of the 14 strains utilized paraffin as a sole source of carbon. The strains isolated from the acute lymph node infections differed in pathogenic behavior from the tubercle bacillus in not causing progressive disease or ulcerative lesions in patients or experimental animals. Allergic responses were obtained in guinea-pigs and hens inoculated with tuberculin-like extracts of the strains, but the response of all inoculated animals to human or avian tuberculin was poor or absent. These findings suggest that

the 10 strains belong to a different species of mycobacterium and must be considered as the actual cause of the lymphadenitis in the children from which they were isolated. The name *M. scrofulaceum* has been proposed.—[From abstract in *J. American Med. Assoc.* **163** (1957) 400.]

WOLINSKY, E., SMITH, M. M., MITCHEL, R. S. and STEENKEN, W. JR. Atypical chromogenic mycobacteria associated with pulmonary disease. *American Rev. Tuberc. & Pulmon. Dis.* **75** (1957) 180-198.

Three case reports are presented of patients with chronic, cavitary pulmonary disease from whose sputum and resected lung tissue chromogenic acid-fast bacilli, avirulent to the guinea-pig, were isolated repeatedly, but no typical tubercle bacilli. The differentiation of atypical mycobacteria associated with pulmonary disease in man from *M. tuberculosis* may be made easily by virtue of their pigmentation, morphology, drug-susceptibility patterns, greater catalase activity, poor cord formation, negative neutral-red reactions, and by their lack of pathogenicity for the guinea-pig. The growth rate of the atypical strains when first isolated is usually slower than that of saprophytes. For those strains that are photochromogenic, the dependence of pigmentation on exposure to light is a unique feature. Animal pathogenicity is characteristic for the photochromogens; fatal disease, with extensive lung and kidney lesions, may be produced in mice by intravenous or intraperitoneal inoculation of large numbers of the bacilli, and progressive fatal disease may be caused in hamsters. *M. ulcerans* and *M. balnei* produce characteristic superficial lesions in patients and in experimental animals. Their temperature requirements (optimal growth at 28° to 33°C) set them apart from other atypical strains. Four tables summarize the biologic characteristics of the growth, *in vitro* susceptibility to drugs, and pathogenicity for guinea-pigs and mice of these strains. —SR. HILARY ROSS

ELEK, S. D. and HILSON, G. R. F. The evolution of lepromata in the rat. *J. Path. & Bact.* **72** (1956) 427-437.

Small inocula of rat leprosy bacilli were injected intradermally and intraperitoneally into rats, and the progress of the resultant lesions was observed histologically at intervals up to 16 weeks. Control groups of rats inoculated intraperitoneally with heat-killed rat-leprosy bacilli and with living timothy-hay bacilli were studied in the same way. The natural history of the development of lesions due to these different inocula shows that, during the first 2-3 months, neither the tissue reaction nor the presence of intracellular bacilli can be accepted as proof of successful infection. Tissue reactions similar to those caused by the living pathogen were induced by the killed bacilli and by the saprophytes. These are due to the liberation of substances shared by many mycobacteria, and are not necessarily due to the metabolites of growing bacilli. Nonviable rat or human bacilli are readily ingested by tissue phagocytes and persist for very long periods; this appearance has been confused in the past with that due to actual intracellular multiplication. Multiplication begins after 6-8 weeks, preceded by a period of increase of the average length of the bacilli. It is suggested that if cultivation of rat-leprosy bacilli in monocyte cultures is to be successful, maintenance of cultures for at least a similar period of time will be necessary. If suitable artificial culture conditions could be found, macroscopic growth might—by analogy with *M. tuberculosis*—require 3 months or more for its appearance.—[From authors' summary.]

HADLER, W. A. and ZITI, L. M. Algumas observações sôbre o modo de ação do 4-4'-diaminodifenilsulfona na lepra murina. [Some observations on the mode of action of DDS in rat leprosy.] *Rev. brasileira Leprol.* **24** (1956) 56-68.

This experiment involved 180 Wistar rats, aged 60-90 days and weighing  $103 \pm 27.5$  gm, used in groups of 20 each. Inoculations were intraperitoneal with a measured dose

of leproma suspension, and treatment was begun with DDS in the food (0.2% or 0.3%) on the 7th day after inoculation. The 9 lots used were as follows:

- Lot 1A, treated with 0.2% DDS;
- Lot 1B, untreated controls;
- Lot 2A, inoculated with bacilli from an animal of Lot 1A after treatment with DDS for 180 days; these animals then received 0.2% DDS;
- Lot 2B, inoculated with bacilli from an animal of Lot 1B; no treatment;
- Lot 3A, inoculated with bacilli from an animal of Lot 2A, which had previously been treated with DDS for 180 days; afterward given 0.2% DDS;
- Lot 3B, inoculated with the same material as Lot 3A, but afterwards treated with 0.3% DDS;
- Lot 3C, inoculated as 3A, kept as untreated controls;
- Lot 3D, inoculated with bacilli obtained from an animal of Lot 2B, afterward treated with 0.3% DDS;
- Lot 3E, untreated controls, inoculated with the same material as Lot 3D.

Judgment of the results of treatment was based upon the survival time and the severity of the lesions. Based on the statistics of average survival time, the different lots constitute 3 groups: Lots 1B, 2B and 3E (controls) shortest survival; Lots 1A, 3C and 3D; medium survival; and Lots 2A, 3A and 3B (inoculations with bacilli from treated rats, treated afterward), longest survival. There are significant differences in the survival times ( $P < 0.01$ ). The severity of the lesions was inversely proportional to the survival time, meaning that the latter depends upon the rate of evolution of the disease. The DDS treatment seems to slow the evolution of the disease, apparently not because of a bacteriostatic effect but because of an alteration of the vitality of the bacilli. Thus bacilli subjected to a preliminary treatment become altered, and when reinoculated into fresh rats cause a disease of slow development even without further treatment. However, with prolonged treatment no sulfone-resistant bacilli appear.

—H. W. W.