

## 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.*

- ✓ RICHTER, J. H. Albert Neisser; centenary of his birth: 1855-January 22-1955. A.M.A. Arch. Dermatol. **71** (1955) 92-94.

A rather conspicuous and unusual feature of this commemorative note, by a non-medical relative of Neisser's, is the reiteration of the claim of Czaplewski that the discoverer of the gonococcus played a much greater role in the discovery of the leprosy bacillus than is generally recognized. Graduating in medicine at Breslau in 1877, at a time when research in bacteriology was active there, Neisser went into dermatology and within two years, at the age of 24, discovered the gonococcus. In the summer of the same year he went to Norway to study leprosy, visiting Hansen "and discussing with him Hansen's unsuccessful attempts at proving conclusively that the bacilli seen by Hansen . . . in leprosy skin were indeed the cause of leprosy." With the new Weigert staining method applied to material he had brought back from Norway, "Neisser conclusively proved [the bacilli found] to be the cause of leprosy." This observation was published in 1879. Hansen, in 1880, published "a report of his own unsuccessful experiments in 1873 . . . claiming his priority over Neisser in the discovery of the bacillus." This passage ends: "In the ensuing unhappy situation Neisser was obliged to point out that he himself had given Hansen credit for having been the first to see the bacilliform bodies, but that it was his, Neisser's, merit to have brought objective and convincing proof of their relationship to leprosy, and of having given them their just place." His interest in leprosy continued, although his main concern was with venereal diseases. "Hansen's unnecessarily curt and belittling effort to assure himself of a priority which Neisser had freely granted him" had hurt Neisser, "who always considered his second discovery to have been the more important."

—H. W. W.

- ✓ WARDEKAR, R. V. Gandhi Memorial Leprosy Foundation. Annual Report of Anti-leprosy Work for the Year Ending 1953. Wardha: Sadashiv Printing Press, (undated), 15 pp.

This is the report of the second year of work done under the auspices of the Foundation. The main activities were as undertaken during the previous year: (1) maintenance of several leprosy control units and clinics in endemic areas; (2) training of personnel, including doctors, social workers and organizers; (3) financial assistance to other local agencies; and (4) sponsoring research work at the rehabilitation center at Vellore, Madras, and at the Tata Cancer Research Hospital, Bombay. Altogether 6 control units and 4 control clinics functioned during the year in different parts of India, while 1 control unit was closed. The rehabilitation research at Vellore consisted of preventing or minimizing the deformities of hands of patients, and training them in suitable cottage industries. The study in Bombay consisted of (a) further simplification of the method of concentration of acid-fast bacilli from skin biopsy specimens, particularly with a view to examination of a cell-free filtrate with a fluorescence microscope, and (b) a study of the qualitative and quantitative changes in the cutaneous nerve fibers, with intravital methylene blue staining and silver impregnation of frozen sections.

—DHARMENDRA

- ✓ LEE, R. K. C. The Hansen's disease program in Hawaii. An open letter to Senator Eva K. Borwing. Hawaii Med. J. **14** (1954-1955) 212-214.

Official facilities for isolation of leprosy patients in Hawaii were first established in 1865. In 1905, the U. S. Congress provided for the establishment of a leprosy investigation station, which began at Kalaupapa in 1909, moved to Honolulu in 1914, and was closed because of the war in 1942. Thereafter no Federal aid for the leprosy program was forthcoming until 1953, when \$500,000 was granted, an amount which was doubled in the next two years. This money, granted as reimbursement for the cost of caring for the patients, is uncertain of renewal from year to year. As of Sept. 30, 1954, there were 458 registered cases in Hawaii, 252 inpatients, 129 outpatients, and 77 inactive cases on "temporary release" status. Of these, 376 are U. S. citizens, 6 are U. S. nationals, and only 76 are aliens. The total has declined from 2,000 hospitalized patients in 1900, and is still declining despite importation of new cases from the Philippines and Samoa. The per diem cost per patient in Hawaii's leprosaria is \$9.74 as compared to \$11.50 at Carville. Federal reimbursement of only \$9.10 of this is allowed at present. The 11 acres of land at Waimano, near Pearl Harbor, occupied by the Hale Mohalu ("House of Comfort") leprosarium, is owned by the U. S. Government, and should be transferred to the Territory. The leprosy program in Hawaii is fourfold: early diagnosis and the best treatment; segregation of infectious patients throughout the stage of infectiousness; provision of adequate recreation, education, and rehabilitation facilities; and an educational program regarding leprosy in general. There is an almost total lack of funds for research.

—H. L. ARNOLD, JR.

- ✓ ARNOLD, H. L., JR. Leprosy, in *Cyclopedia of Medicine, Surgery and the Specialties*. Philadelphia: F. A. Davis, 1954, p. 163 ff.

This concise review of the essential clinical, histologic and epidemiologic facts about leprosy includes a summary of the definitions agreed upon at the Madrid Congress in 1953. No new viewpoints or facts are presented. There is a short discussion of the author's reasons for preferring "leprosy" to "Hansen's disease."

—AUTHOR'S ABSTRACT

- ✓ BADGER, L. F. Leprosy in the United States. *Pub. Hlth. Rep.* **70** (1955) 525-535.

From data that are set forth in four figures, two large tables and numerous small ones, the author concludes that leprosy in the United States is a definite public health problem although not a great one, and that it may occur in, and be transmitted in, any section of the country. Although a large proportion of the recognized cases have been in persons of foreign birth, a majority were in natives of the United States. Of the former, probably a majority were infected before entry into the United States, but not necessarily all of them. Of the latter, a majority contracted the disease in the United States. Most of the American-born patients have been natives of Louisiana, Texas or Florida, and the disease has been concentrated in limited areas of those states and California. A number of patients recognized in the nonendemic states became infected in the endemic states.

—SR. HILARY ROSS

- ✓ KLUTH, F. C. Leprosy in Texas; a study of occurrence. *Texas J. Med.* **51** (1955) 1-7.

This report is restricted to cases of leprosy reported in Texas. Each patient was interviewed by the writer, and most of them were admitted to the Federal leprosarium at Carville. The topics dealt with are: history, incidence since 1930, geographic distribution, age, sex and race, duration of symptoms before discovery, motivation and agency of discovery, relation between cases, occupation, and causes of death. There are fourteen tables, and a map of Texas shows the distribution of the cases. This is an informative paper, and should be consulted in the original by anyone desiring to make surveys in other states or countries.

—SR. HILARY ROSS

- ✓ REYES, E., BARRIENTOS, E., RODRÍGUEZ, J. J., RAMÍREZ, O. and CARRANZA AMAYA, A. Contribución al estudio de la lepra en El Salvador, C. A. [Contribution to the

study of leprosy in El Salvador, Central America.] *Arch. Coleg. Méd de El Salvador* 6 (1953) 403-412.

The first case of leprosy recorded in Salvador was in 1895 in a Negro imported to work in the mines when the Indians refused to work there. Later there were many people with leprosy in that town. There is no further record of cases until one reported by Reyes, in 1937. In 1953, in a population of 1,929,756, there were 62 known cases, with 10 of the 14 administrative departments affected. No leprosy was found among pure Indians (Amerinds), but only among Indians of mixed race. Modern treatment is bringing the disease under control.—[From abstract in *Trop. Dis. Bull.* 52 (1955) 983.]

- 6 LAVIRON, P. Méthodes d'organisation de la lutte contre la lèpre. [Methods of organization of the antileprosy campaign.] *Ann. Soc. belge Méd. trop.* 34 (1954) 575-587.

The lengthy English summary of this paper used at the meeting (supplied by A. Dubois) covers the subject in a general way too extensively for full presentation here. Specifically, in French West Africa the control of leprosy is entrusted to a service in charge of all the important endemic diseases, the General Service of Mobile Hygiene and Prophylaxis. The leprosy section of this service controls the antileprosy activities within the service itself, and also in other units ("formations") under the local Directions of Public Health. The territories are divided into sectors, or tactical units, covering a large part of F.W.A.; there are 25 special sectors, and 16 accessory sectors with reduced activity. The campaign, carried out with mobile teams, has 29 European and 35 African doctors for detecting and treating cases. To facilitate mass treatment, increasingly simple methods are needed. For leprosy, this has led to the use of the "retard" sulfone treatment, with injections twice a month. Because of the simplicity of this treatment the trend is to put it in the hands of the nonmedical staff. "The lepromatous patients treated with sulfones necessitate, however, a minimum medical control." [Which may be understood to mean that they require a certain amount of medical supervision. It may be recalled, however, that only a very small proportion of the leprosy cases in this region are of that type.] —H. W. W.

[From a Madrid Congress note by this author, not to our knowledge published, certain data of the situation in F.W.A. about 1953 are gleaned. At that time the service (S.G.H.M.P.) reached only about 8,800,000 of the 16 million population of the Federation. From 1946 to 1952 an average of 3 million had been examined each year with a view to detecting leprosy cases, and at the end of 1952 there were registered 121,585 leprosy cases living in the sectors covered. Treatment was from fixed centers from which nurses made weekly rounds of as many villages as they could cover, and with 404 such centers in operation the numbers of cases under treatment was 52,800, up from 4,700 in 1946. Of the lot, 50,000 were receiving chaulmoogra oil or esters and only 2,800 were getting DDS, of which a minor part was in suspension. However, sulfone tablets given weekly had been found impracticable for mass treatment in F.W.A., and the use of the DDS suspension in a chaulmoogra mixture was to be extended. Information of the present status of that work is being obtained.—EDITOR.]

- 6 RICHET, P. Une question d'actualité: La maladie de Hansen en A.E.F. [A present-day problem: Hansen's disease in French Equatorial Africa.] *Ann. Soc. belge Méd. trop.* 34 (1954) 589-602.

Since the second part of 1953 a global antileprosy campaign has been undertaken in the whole of F.E.A., and its development has given rise to the greatest hopes. By the end of June 1954 the team had checked a total of 75,117 cases, a number which seems to be very near the reality. During the same period 41,986 patients—more than one-half of the total—were put under regular sulfone treatment through a system involving the use of motors and bicycles. This system has more and more acquired

the favor of the people, and 34,763 of the patients did not miss a single treatment meeting during the month of June 1954. It has not covered all of the two territories most affected, Oubangui-Chari and Tchad, but the author is hopeful about the development of this broad antileprosy campaign. He expects, in a very near future, to get to treat regularly the great majority of the leprosy cases in A.E.F., estimated to be about 80,000.

—A. DUBOIS

- 6 GILLET, J. La lèpre au Congo Belge. [Leprosy in the Belgian Congo.] Inst. Roy. Colon. Belge, Bull. Séances **25** (1954) 303-325.

As an explanatory note to a map published in the Atlas Général du Congo Belge, the author gives geographical and statistical details about leprosy in the Belgian Congo. The number of cases, estimated in 1937 to be about 60,000, had been increased to 150,000 in 1952, this being practically 13 per thousand. The increase is of course due to the extension of the antileprosy campaign, and to the propaganda resulting from the encouraging results of sulfone treatment. The unequal distribution of the disease is pointed out. There are two important foci: the Equatorial and the Uele regions, the latter being the extension of the first to the northeast. These two foci have more than 100,000 of the total number of cases.

—A. DUBOIS

- 6 DUBOIS, A. Evolution des méthodes de prophylaxie de la lèpre. [Evolution of the methods in the prophylaxis of leprosy in the Belgian Congo.] Ann. Soc. belge Méd. trop. **34** (1954) 565-574.

The author gives historical data on the beginning of the leprosy control work in the Belgian Congo, where in 1952 it was said there were more than 150,000 cases, which would be a prevalence of about 12 per thousand. In the leprosaria of the Pawa area, and in the Congo generally, the lepromatous cases are relatively few, accounting for about 10-15% of the total. The system of prophylaxis employed—very incompletely—up to 1945 was based on isolation in agricultural villages, a measure that was rather severe. Since the introduction of the sulfones the doctors in the Congo seem to have agreed to limit isolation to the lepromatous cases, and to treat the paucibacillary cases as outpatients. Not only are the lepromatous cases the active agents of the infection, but also the fact that their treatment is difficult and requires a careful control which outpatient treatment does not permit. The germs' rarefaction due to the treatment will surely entail progressive eradication of the endemy, but it is necessary to associate with the treatment measures aimed to improve the general hygiene. In Africa, as formerly in Europe, it is improvement of the general living conditions that will eliminate leprosy. Incidentally, the author discusses what should be done about mild cases, sometimes with uncertain diagnosis, and about the cases occurring among Europeans in Africa.— [From the author's summary.]

- 6 DRICOT, CH. Organisation actuelle de la lutte contre la lèpre au Congo Belge et au Ruanda-Urundi. [Actual organization of the leprosy control in the Belgian Congo and Ruanda-Urundi.] Ann. Soc. belge Méd. trop. **34** (1954) 631-636.

In September 1953 the government entrusted the Queen Elizabeth Foundation (FOREAMI) with proceeding, in agreement with the Father Damien Foundation, with the organization and systematic carrying out of the leprosy control work in the Belgian Congo and Ruanda-Urundi, as well as the improvement of the lot of the people with leprosy. After this decision a plan was developed aiming to secure treatment of all known cases and to continue it in order to eradicate the disease. It is estimated that there are 210,000 cases in the Belgian Congo, an endemicity index of practically 18 per thousand. Three phases of the program are considered: (1) Big leprosaria: The 13 existing leprosaria can, with their actual or pending development, comply with the conditions required by the government for recognition as "organized isolation centers," and it is expected that new ones will be created in areas that at present are little occupied. (2) Small leprosaria: The government



will recognize as "local treatment centers" the small leprosaria able to secure regular control of the patients. (3) Outpatient treatment: This will be generalized in the rural dispensaries and injection centers. A Central Committee and Provincial Committees are entrusted with preparing and coordinating these activities.—[From the author's summary, supplied by A. Dubois.]

- 6 SWERTS, L. L'organisation de la lutte antilépreuse dans la zone C.R.C. au Népoko. [The organization of the fight against leprosy in the Congo Red Cross zone in Nepoko.] *Ann. Soc. belge Méd. trop.* **34** (1954) 639-641.

The author gives the scheme of the Congo Red Cross antileprosy campaign at Pawa (Nepoko). It includes the segregation center for contagious cases, the treatment of noncontagious cases as outpatients, and a laboratory common to both of these services. There follow a few details about desirable improvements for the future.

—A. DUBOIS

- 6 HEMERIJCKX, F. L'évolution des lépreux dans une léproserie. Rapport sur une partie des lépreux de la léproserie de Tshumbe Sainte-Marie. [The evolution of the cases in a leprosarium. Report on a part of the leprosy cases of the leprosarium of Tshumbe Saint Mary.] *Ann. Soc. belge Méd. trop.* **34** (1954) 603-629.

The lengthy English summary of this paper used at the meeting (supplied by A. Dubois) is very general, short on concrete facts, long on highly optimistic predictions. It appears that the reactional conditions in leprosy are discussed, but just how the author distinguishes between them is not apparent. It is asserted that the sulfones provide a relatively easy weapon with which leprosy can be wiped out in a few years. Treatment for 2-3 years will "stabilize" 75% of the tuberculoid cases, leaving 25% ulcerated and mutilated ones needing more or less institutional care; but they will disappear in 30-40 years, and among the newer treated cases there will be no more mutilated ones. The prospects for success with the lepromatous cases are not so good, but their numbers are relatively small, 10% on the average. In 5-6 years 50% of them will be made negative, and perhaps 60% in 10 years; those which will need continued care will disappear more rapidly than such cases among the tuberculoids, in 20-25 years. The author goes on to reckon, on the basis of 200,000 cases in the Belgian Congo (180,000 tuberculoid and 20,000 lepromatous) how many will have to be cared for and how long, and when there will be no more new cases.

—H. W. W.

- 6 INNES, J. R. The leprotic child in Africa. *East African Med. J.* **31** (1954) 161-168.

From data derived from his extensive leprosy surveys in East and Central Africa, 1947-1951, the author analyzes 1,492 cases of child leprosy. The following facts and inferences emerge: The child case rate was 21%, which is taken to mean that leprosy is on the increase in these countries. The sex incidence was 4 to 3, males preponderating, perhaps because females have a greater vital endowment and are cleaner. The age incidence showed that between 5 and 14 years there is a great inrush of cases, of whom a considerable proportion must have been infected at a tender age. Generally speaking, leprosy is acquired in childhood and youth, and is mainly a problem based in the environment and living conditions of children and the young. The clinical types of child leprosy show a contrast with the clinical picture of leprosy at other ages. Among the points that emerge is the relative infrequency of indeterminate and polyneuritic forms in African children. Regarding the question of how the children acquired their leprosy, for the most part it was by living in poor hygienic conditions in contact with adult cases. Segregation of children from infection is indicated as the key to the abolition of leprosy from a community. As for the fate of the children with leprosy, there does exist an evanescent leprosy of childhood, but in a great proportion of these children the disease would progress, and they would become infectors of others. There is not adequate accommodation for all cases of leprosy in these countries, but special attention to children is recommended

as one of the most economic and fruitful forms of attack on the leprosy problem.

—AUTHOR'S ABSTRACT

- 6 BROWN, J. A. K. The incidence and epidemiology of leprosy in Uganda. *Trans. Roy. Soc. Trop. Med. & Hyg.* **49** (1955) 241-252.

Uganda, with a population of about 5 million and an area of 93,981 square miles, of which one-seventh is open water, is divided into Eastern, Western and Northern Provinces with the kingdom of Buganda in the center. The provinces are subdivided, down to parishes. As there are no towns or villages, surveys were made at the parish or subcounty level. The author discusses methods of sampling, methods of survey, and the validity of surveys, and gives tables of his own survey results, of population analysis for his 42 surveys, and percentage analysis with his samples and the census compared. Because of its varied climatic conditions Uganda is a particularly suitable country for studying the effect of climate on the prevalence of leprosy, but a careful study revealed no apparent correlation. Also with respect to population density, there was no correlation with prevalence. The sex rates were almost equal, except that there were more lepromatous cases among men than women. Among 882 subjects, 19% were children under 15. The general results showed a series of prevalence values ranging from 0.0 to 41 per thousand, with a mean of 17 for all the surveys. An interesting finding was that where families were larger, household infection produced a higher child rate. On the other hand, the fewer the children and the smaller the families the higher was the rate among adults. In most countries childhood is the period when infection takes place; in Uganda the majority of cases arise in adults. In Nigeria the intimacy of life in the compound means that from the day of its birth each child is associated with the whole community and contact with a leprosy case at an early age is almost inevitable. In Uganda, however, contact during childhood is usually limited to the immediate family. The general lepromatous rate was 20 per cent. The author thinks that tuberculoid leprosy cases can act as the source of infection. With such low lepromatous rates, "It would require the greatest mobility and popularity on the part of the lepromatous subjects if all the leprosy in the country could be attributed to them." A low lepromatous rate implies a high general level of resistance. Why, then, with this higher resistance should the potentialities of the fewer lepromatous cases be the greater? "The more intimate communal life may be sufficient explanation in a compound or a village but not under the different conditions of East Africa. There are parishes of 1,000 people dispersed over 20 sq. miles without a single lepromatous case, and tuberculoid cases occur five miles or more from the nearest lepromatous patient." Emphasis, it is pointed out, is usually laid on contact "to the exclusion of susceptibility," and that factor is discussed at some length. This includes the significance of the lepromin reaction, in connection with which it is recalled that Khanolkar demonstrated bacilli in the tissues of all the lepromin-positive contacts he examined, but in none who were lepromin-negative.—[From abstracts supplied by J. Ross Innes and A. R. Davison, with passages from one in *Trop. Dis. Bull.* **52** (1955) 903.]

- 8 LOWE, J. The leprosy bacillus and the host reaction to it. *Lep. Rev.* **26** (1955) 15-24.

The first part of this paper deals with the fractionation of leprosy bacilli and skin reactions. The fractions, it is said, resemble and are in similar proportions to those of tubercle bacilli. In the lepromin test the early phenomenon is increased and the late one diminished in proportion as the bacilli in the antigen are broken up; only the whole bacilli cause the late lepromin (Mitsuda) reaction. The early reaction is considered to be similar to that in the tuberculin test, indicating sensitivity to protein. It is possible by repeated injections of the protein fractions of the leprosy bacillus to desensitize to the early reaction, and yet this leaves the late one unchanged. The various serological tests give evidence that in lepromatous leprosy there are circulating antibodies, but in proportion as these tests are positive the lepromin test is

negative. Recent evidence shows that in a tuberculin-positive person the tissues can react to the leprosy bacillus by tubercle formation (for that is what a positive late lepromin reaction means) and this is a more definite indication of immunity than mere protein sensitivity. Contrasting leprosy and tuberculosis, it is pointed out that of the former most cases belong to two distinct types: those with sensitization and immunity on the one hand, and those with complete lack of those conditions on the other. In tuberculosis, by contrast, there is "an interplay of findings, some indicating the invasive powers of the infection, and some indicating sensitization and resistance of the host tissues." In lepromatous leprosy there are abundant circulating antibodies but no sensitization, and no cellular antibodies are revealed by the lepromin test. In the tuberculoid type, conversely, the comparatively few bacilli cause marked cellular reaction, and circulating antibodies are few. "There is some factor or group of factors operating in the tuberculoid case which is absent or inactivated in the lepromatous case, and this absence renders the patient susceptible and the disease progressive." The importance of cooperation in leprosy and tuberculosis research is suggested.—[From abstract in *Trop. Dis. Bull.* 52 (1955) 544.]

- 6 COCHRANE, R. G. The reaction of the host tissue in relation to *Mycobacterium leprae*. Ciba Foundation Symposium on Experimental Tuberculosis, 1955, 355-363 (reprint).

The favorable host tissue response in tuberculoid leprosy and the relatively ineffectual response in the lepromatous form depend upon the behavior of the cells of the R-E system. In the first instance, the author holds, they are able to focalize the infection in the dermal tissue (infection in leprosy being via the skin) and so to prevent its spread, this response being of the nature of an "id" reaction, an acute response of the tissue due to its sensitization. In the absence of this defensive mechanism there is no walling off of the infection in the dermis. "Once tuberculoid leprosy has been established . . . it does not change its type." This is asserted in connection with "the borderline or dimorphous response," to explain which it is said that "the patient's tissue seem to be developing an adequate defensive response, . . . but this does not happen. At first every type of cell is mobilized in the attempt of the tissues of the host to deal with the parasite," the response, clinically and histologically, being so varied that it amounts to "tissue panic." Reaction occurring in tuberculoid cases "is just a more acute phase of the tuberculoid response." Of the three kinds of reactions in lepromatous leprosy, (1) the erythema nodosum kind is held to be analogous to the Herxheimer reaction, the cells becoming less tolerant of the bacilli and destroying them more rapidly; (2) the "progressive reaction (subacute and chronic lepra reaction)" is not a true lepra reaction but a more or less sudden exacerbation of the disease, of serious prognostic significance; and (3) the Lucio phenomenon, which "has only been described in South America [*sic*] and particularly in Mexico." This presentation ends with a brief section on the lepromin reaction and immunity. It is asserted that when the first leprosy lesions appear the lepromin reaction is invariably positive, and that cases that are to be negative become so later. —H. W. W.

- 6 MONTESTRUC, E. and BERDONEAU, R. Deux nouveaux cas de lèpre du nourrisson à la Martinique. [Two new cases of leprosy in the newborn in Martinique.] Bull. Soc. Path. exot. 47 (1954) 781-783.

In two babies, leprosy lesions appeared 3 weeks after birth. In one, the primary lesion was noted at the umbilicus, then other lesions appeared on the face. In the other, the lesions were on the face. In both cases they were achromic macules in which were found acid-fast bacilli, isolated and nongranular. In the former case the mother did not have leprosy; there is no information about the father. In the latter case both parents were free from leprosy, but other members of the family had it. The authors raise the problem of congenital leprosy, and emphasize the excessive sensitivity of the

newborn to infection. They recommended compulsory isolation of babies born in leprosy surroundings, and BCG vaccination. —M. VIETTE

- ✓ BERTACCINI, G. Sulla diagnosi precoce di lebbra e il controllo immunologico. [Early diagnosis of leprosy and immunological control.] *Gior. italiano Dermat. e Sifil.* **95** (1954) 1-10.

The so-called "indeterminate" or "incharacteristic" early phases of leprosy, observed by many authors in areas where leprosy is heavily endemic, are very rare in the author's experience at the leprosarium of Acquaviva delle Fonti, at Bari. He reviews the symptoms and laboratory tests useful for early diagnosis of these clinical forms.

—MAURIZIO TERNI

- ✓ COSSERMELLI, W., OKUMURA, M. and DA SILVA, R. P. Resultado da ionização da acetil- $\beta$ -metilcolina (Mechoil) em 114 casos de lepra. [Result of ionization of acetyl- $\beta$ -methylcholine (Mechoyl) in 114 cases of leprosy.] *Rev. Med.* **209** (1954) 39-42.

The authors employed ionization of acetyl- $\beta$ -methylcholine (Mechoyl) (3% aqueous) in determining the disturbances of sweating in leprosy patients of the different clinical forms. Following the passage of the current from 5 to 10 minutes, they use 1:4 iodide solution and then the amide, in this way demonstrating disturbances of sweating and also the visible clinical lesions. They conclude that the test is one of high sensitivity and of simple technique, which is useful in the leprosy outpatient clinic as an aid in the diagnosis of the frustrate forms of the disease.

—N. DE SOUZA CAMPOS

- ✓ SPOSITO, M. and NAZZARO, P. Un caso di lebbra acuta. Considerazioni sulla diagnosi, sulla terapia e sulla biopsia epatica.) [A case of acute leprosy. Considerations of diagnosis, therapy and liver biopsy.] *Policlin. Sez. Prat.* **61** (1954) 237-245.

A 20-year-old man suddenly developed facial, and especially nasal, edema and rhinitis; a few days later, joint swellings, intermittent-remittent fever, and headache; finally, broad, brownish erythematous zones, generally symmetric. At the clinic (Rome) he was found to have hepato- and splenomegaly, enlargement of the ulnar nerves, paresthesia, anhydrosis, diffuse adenopathia, and beginning alopecia. Negative to the Mitsuda and syphilis tests. Positive with the Rubino, Middlebrook-Dubos hemagglutination (1/128), tuberculin ( $\pm$ ), histamin (Rodriguez-Ferrari), and philo-carpine reactions. Liver biopsy showed diffuse granulomata and many acid-fast bacilli. Skin biopsy: granulomata with cells like the lepra cell, and many acid-fast bacilli. The diagnosis was lepra acuta lepromatosa, not "lepra reaction" because the disease was quite recent. This case is considered interesting since the acute beginning of leprosy is uncommon. The first symptoms rather suggested a diagnosis of sepsis. The treatment consisted in streptomycin (1 gm., daily, total 20 gm.) and sulfones (cycles of 6 gm. daily intravenously, for 30 days, 15 days interval). Improvement was rapid and marked, and 7 months later the patient seemed to be completely recovered. The acid-fast bacilli had disappeared from the skin and liver, and the liver nodules had undergone sclerosis.

—MAURIZIO TERNI

- ✓ ACHARYA, B. K. During lepra reaction. *Patna J. Med.* **28** (1954) 323-326.

On the hypothesis that lepra reaction is an allergic reaction probably associated with the liberation of histamine, the author assumes that a low content of histamine in the early phase helps in some way the multiplication of the organisms, and that when the content is high during later phase it affects them adversely. To investigate the effect of histamine on the leprosy bacillus, the author added a freshly prepared suspension of a nodule to test tubes containing 1 to 5 mgm. of histamine in 5 cc. of nutrient broth, with a control of nutrient broth alone. These inoculated tubes were incubated, and loopfuls from them were examined weekly for 9 weeks. In the control tubes the acid-fast bacilli were found throughout that period, without any appreciable



decrease in their numbers. In the histaminized tubes (if uncontaminated) there were two very interesting findings: (1) from the 3rd week onward the acid-fast organisms became progressively fewer, and after the 6th week there were none; (2) inoculation of the material after the disappearance of acid-fast organisms produced growth on blood agar, but not in plain agar or Loeffler's blood serum, of nonacid-fast coccoid and diphtheroid organisms; no cultures were made from the control tubes. The author concludes that histamine plays an important role in the mechanism of reaction, and also in the elimination of the bacilli on subsidence of reaction. It is also surmised that the nonacid-fast coccoid or diphtheroid forms that were grown may represent a certain phase in the life cycle of the bacillus.

—DHARMENDRA

- 6 PAUTIER, L. M. Pathogénie et nature de l'érythème noueux. [Pathogenesis and nature of erythema nodosum.] *Semaine Hop. Paris* **31** (1955) 187-190.

Erythema nodosum was formerly thought by pediatricians to be exclusively tuberculous in origin, while dermatologists regarded it as a syndrome that might be caused by several factors. Recent studies by Löfgren and others seem to show that while it may be considered tuberculous in form 50-60% of the cases, in the remaining 40-50% it is due to such varied factors as streptococcal infection, drugs, especially sulfathiazol; radiotherapy; and exposure to ultraviolet light. These findings support the belief long held by the author that erythema nodosum is a polyvalent allergic reaction precipitated by any one of a series of allergens. Further supporting evidence may be found in the histological character of the erythematous lesions, which closely resemble those produced by allergic reactions, especially reactions to such antigens as tuberculin and trichophyton. The uniformity shown by these lesions, regardless of the nature of the intercurrent disease, makes it impossible to regard them as symptomatic of any of the conditions to which they have been ascribed, including tuberculosis. An alternative theory, advanced by Marie, uses the principle of biotropy to explain the appearance of erythema nodosum. Reactivation of a latent germ or virus by an infectious disease would, in this case, lead to the development of a second, autonomous disease accompanying or following the first. Thus herpes, though a distinct disease caused by a specific virus, may appear as the result of reactivation of the virus by pneumococcal or meningococcal infection. The principle of biotropy, however, does not seem to be applicable to erythema nodosum, because it presupposes a specific bacterial or viral cause for the autonomous disease and no such cause has yet been established in the case of erythema nodosum.—[From abstract in *J. American Med. Assoc.* **157** (1955) 1445.]

- 8 HOLMES, W. J. Changing concepts of ocular leprosy. *Trans. Pacific Coast Oto-Ophthalm. Soc.* **35** (1954) 51-56.

Eye involvement in leprosy is probably chiefly hematogenous, although exogenous involvement, or ascending involvement from the nose, may occur. Lesions of the ocular adnexa are enumerated, but no new viewpoints are presented. Pterygia are said to be common in Hawaiian patients, "but not more so than in a corresponding group of the general population." Cataract is also little if any more frequent than in the general population. Cataract surgery is surprisingly well tolerated. A symmetrical nodular temporal episcleritis is said to be frequent, and to respond well to ACTH or cortisone administered either topically or systemically. Pannus formation may be checked by beta radiation. Tarsorrhaphy is recommended for corneal ulceration. Lepromatous chorioretinitis is rare, if it occurs at all. Resistance of the pupil to dilatation in leprosy patients is commented upon, as are the conditions probably required for corneal transplantations.

—H. L. ARNOLD, JR.

- 6 PINKERTON, F. J. Leprosy of the eye, ear, nose and throat. *Trans. Pacific Coast Oto-Ophthalm. Soc.* **35** (1954) 179-188.

The author has for years successfully protected the cornea from exposure

keratitis in cases of orbicularis paralysis by a modified tarsorrhaphy which reduces the palpebral fissure to a mere slit—an operation which earned him the sobriquet, among patients, of "Pig Eye Pinkerton." He does not believe he has ever seen a fundus lesion attributable to leprosy, and suggests that any such diagnosis is best made with a microscope rather than an ophthalmoscope. Other aspects of leprosy of the eye, ear, nose and throat are briefly discussed. Of historical interest especially.

—H. L. ARNOLD, JR.

- 6 AMENDOLA, F. Estado atual da lepra ocular. [Present status of eye leprosy.] *Arq. brasileiros Oftal.* **17** (1954) 1-7.

After surveying the eye complications of lepromatous leprosy, complications which constitute a difficult problem for the ophthalmologists and a serious hazard for the patients, who often end up in total blindness, the author tells of the effects of the sulfones in minimizing eye involvement as regards both frequency and severity.

—N. DE SOUZA CAMPOS

- 6 ——— Die Sulfontherapie der Augenlepra. [Sulfone therapy in leprosy of the eye.] *Klin. Monatsbl. Augenhk. Stuttgart* **126** (1955) 207.

[An abstract of this article has been supplied by E. Keil. However, both it and the one dealt with in the preceding item would appear to be essentially the same as the one which appeared in *THE JOURNAL*, pp. 280-283 of the present volume.—EDITOR.]

- 6 LORD, E. Group Rorschach responses of thirty-five leprosarium patients. *J. Projective Tech.* **18** (1954) 202-207.

The author studied the Rorschach test (an intelligence test which measures also the emotional elements of personality) in 35 patients of the Kalaupapa leprosarium. She gives a weird and bleak picture of the institution and its administration, and of the personality changes brought about by this disease-enforced restriction and isolation. In summing up she says that the composite average protocol of the group suggested that some personality modifications are a concomitant of leprosy and enforced isolation. The most unusual deviations from normal protocols were 35 card rejections and 33 anatomical responses. Other data suggest a tendency toward reduction of productivity, restriction of both intellectual and emotional life, limitation of the range of interest, and a decrease in so-called "popular" thinking; there is also a tendency toward increased sensitivity and depression. In spite of these observed deviations from the norm, however, the examiner was impressed by the relatively healthy over-all picture, which would seem to reflect a certain flexibility and adaptability of the human personality when confronted with rather extreme, long-standing physical and environmental stresses. Considering these findings in the light of those with patients in tuberculosis sanatoria and other findings, the author would hesitate to infer that specific personality deviations may be associated with leprosy *per se*, but suggests the hypothesis that a physical disorder which leads to isolated colony living will lead to personality distortions of the sort reflected in this study. If this hypothesis is tenable, then corrective procedures lie as importantly within the realm of applied social psychology as within the area of therapeutic clinical psychology.

—SR. HILARY ROSS

- 6 LETAYF, S. Recherche sur la mentalité des malades de la lèpre. [Studies on the mentality of leprosy patients.] *Rev. Psicolog. Normal e Patolog* **14** (1955) 3-59.

In this psychological study of leprosy the author first considers the shock which persons suffer which when they learn that they have the disease, and then studies a community of such persons. As a result of inquiries, clinical interviews, and analysis of personal documents (confidential diaries, literary works, etc.) she proposes a hypothesis of the mentality of people suffering from leprosy. The attitudes of the

patients in relation to their life in the colony and the society outside are classified as, (a) negative attitude, refractory to life in the internment colony but desiring only normal life; (b) positive attitude, adapted only to the life in the colony; (c) ambiguous attitude, definitively unadapted to both social groups; and (d) adapted attitude, coincident of the objective reality. Finally, the factors upon which these attitudes depend are analyzed.—[From author's abstract, supplied by N. de Souza Campos.]

- X<sup>8</sup> UTSONOMIYA, S., IGUCHI, K., IGAWA, H. and HIDA, T. On so-called vascular spider in leprosy patients. *La Lepro* **24** (1955) 1-12 (in Japanese; English abstract p. 1).

Many cases of vascular spider [nevus araneus, N.A.] have been observed in the leprosy patients in Oshima Seisho-en. Hitherto this condition in leprosy has not been studied. It was observed in 82 (20.7%) of 396 cases examined, much more frequent in leprosy than in other skin diseases. It is conspicuously more frequent in the male than the female. It appears most often in nodular leprosy, at ages ranging from 31 to 51 years, and in persons who have had the disease from 11 to 20 years. It has a predilection for the upper half of the body, without any correlation with sensory disturbances. In all of 38 cases manifesting N.A. there was disturbance of liver function. In all of 7 cases with N.A. to whom the double glucose tolerance test was applied the result was abnormal. In nearly all of 10 cases with N.A. that were tested there was imbalance of the autonomic nerve function. Thorn's epinephrin test showed abnormal values. The results of skin function tests were also abnormal, but a difference caused by the existence of N.A. was not clearly demonstrated. Gynecomastia was found in 6 (2.6%) of 228 male patients and in 2 (2.9%) of 69 patients who also had vascular spider. The frequency of N.A. in leprosy patients can be attributed to superfluous circulating estrogen, caused by a decline of estrogen inactivating power due to the disturbances of liver function and destruction of the inner genital and other endocrine organs.—[From the abstract.]

- X<sup>8</sup> BERTACCINI, G. Attuali orientamenti e risultati nella cura della lebbra. [Present trends and results in the treatment of leprosy.] *Minerva Dermatol.* **30** (1955) 169-171.

Although the recent treatments have greatly improved the prognosis of leprosy, negative results occur not infrequently in the author's leprosarium, Acquaviva delle Fonti. These consists of: (1) decrease of the general improvement, as if the disease has become "resistant" to the therapy; (2) persistence of histological or bacteriological positivity in the skin; and (3) lepra reactions during the treatment. First among the most commonly used drugs are the sulfones, with treatment cycles of 6 days with 1 day interval, and one week interval every 3 weeks. TB-1, although effective, is more toxic than the sulfones. Streptomycin and PAS exhibited activity only in the acute illness, and in some tuberculoid forms. No good results were observed with INH. Some initial improvements were being observed at the time of writing with the *M. marianum* antigen, and with a new antituberculous drug [formula not given]. —MAURIZIO TERNI

- X<sup>8</sup> DHARMENDRA and CHATTERJI, S. N. Treatment of leprosy with "sulfadione" brand of DDS. *Lep. India* **25** (1953) 257-258.

The authors had previously found that in most cases there was a slight reduction in erythrocytes and hemoglobin during the first several weeks of sulfone treatment, not prevented by the administration of yeast, with or without iron. The present experiment was planned to see whether this temporary blood change would be prevented by starting the treatment with very small doses, 10 mgm. per day instead of the usual 50 mgm. After trials in 14 nonlepromatous cases it was found that the blood change was of the same order with the smaller initial dose as with the larger one. "Sulfadione" is a DDS preparation containing 10 mgm. in each tablet. These small tablets are

useful, especially for small children and for those who are intolerant of the usual doses.—[From abstract in *Trop. Dis. Bull.* 51 (1954) 276.]

- ✓ SCOHIER, L. La posologie des sulfones en thérapeutique de masse. [Sulfone dosage in mass therapy.] *Ann. Soc. belge Méd. Trop.* 34 (1954) 637 (summary only).

Entrusted with the task of organizing outpatient treatment clinics in the East Province, Belgian Congo, the author first experimented with oral DDS, injectable DDS-retard, and injectable sulphetrone in 3,000 patients in the Stanleyville area to determine the thresholds of efficacy and toxicity. The observations were on tuberculoid and indeterminate lesions. The efficacy threshold in adults is: (1) for oral DDS, 150 mgm. twice weekly; (2) for DDS by injection, 2 cc. of a 25% suspension (500 mgm.), once a week; and (3) for injectable sulphetrone, 2 cc. of a 50% solution (1 gm.), twice weekly. The toxicity thresholds are, respectively, (1) 300 mgm. twice weekly, (2) 4 cc. once a week, and (3) 4 cc. twice weekly. The useful margin lies between these two thresholds, as it is in that zone that administration of sulfones to rural masses, where doctors cannot exercise rigid supervision of the patients, is practicable. Only doses of over 230 mgm. of DDS (or of equivalent amounts with other drugs) can bring about adequate improvement in 20 to 24 months. However, withdrawal of treatment after such a period results in relapse in 70% of the cases. It is therefore necessary to pursue treatment for longer periods and to approach as close as possible to the toxic threshold.—[From author's summary, supplied by A. Dubois.]

- ✓ GRAMBERG, K. P. C. A. Ambulatory treatment of lepra patients with sulphones in Indonesia. *Docum. Med. Geog. et Trop.* 7 (1955) 73-82.

This paper surveys the results obtained in leprosy patients with sulfone drugs in outpatient clinics in Java. The survey is reported not because the results differ much from those published in the literature, but in order to answer the question whether we are justified, in view of the high costs, in continuing this outpatient treatment even after initial successes. Before the introduction of the sulfones, outpatient treatment among the uneducated population was impossible. In the period 1950-1952 60% to 70% of the patients were regularly attracted to the clinics in Kudus and Semarang by the subjective and objective results with sulfones. In the leprosaria, however, with advanced cases, the results are usually disappointing. On the whole the tuberculoid and indeterminate cases respond most satisfactorily; the results in lepromatous cases are generally not so satisfactory, even after 2-3 years' treatment. The greatest drawback is the development of erythema nodosum, which sometimes changes into violent lepra reactions against which there is as yet no simple and effective therapy that can be employed in outpatient clinics. A rather large staff is needed for the follow-up control, because of the high cost of the sulfones and the leprosy reactions. For the time being the outpatient clinics cannot contribute fully to the real control of leprosy in underdeveloped countries. Oral treatment of the population with BCG vaccine may perhaps one day solve the problem of leprosy as an endemic disease.—[From author's summary.]

[It would appear, from the reference to high cost of the drug, that in the period referred to, 1950-1952, DDS had not yet been introduced into the clinics of Indonesia.—EDITOR.]

- ✓ MONTESTRUC, E., LE SAGET, M. and BERDONNEAU, R. Le thérapeutique sulfonés dans la lèpre par voie intramusculaire. [Treatment of leprosy by the intramuscular route.] *Bull. Soc. Path. exot.* 48 (1955) 64-76.

For leprosy patients attending the dispensary at Fort-de-France twice weekly, DDS by mouth is satisfactory and they greatly prefer it to parenteral treatment, but it is otherwise for patients in the interior. To ascertain the effects of various preparations that have been recommended for intramuscular injections, the authors



made daily determinations of DDS in the blood and urine of 1 new case given the suspension in peanut oil, 2 new cases given the ethyl chaulmoograte suspension, and 3 new cases given a suspension of large-grain DDS (screen 150 and 180) in 0.02% agar-saline. As found by others, the absorption from the peanut oil was relatively rapid, giving irregular curves. The chaulmoograte preparation (1.25 gm. DDS) given every 8 days produced more uniform levels and is preferable for that reason. The agar-saline preparation (1.5 gm. DDS) is also good if given every 15 days instead of once in 3 weeks. No choice is indicated, except for the statement that the agar-saline suspension is less painful than that in chaulmoograte esters but is less easy to inject, large needles being required. Both preparations give blood levels similar to those obtained in oral treatment with 200 mgm. DDS a day. The intramuscular method, therefore, is the one of choice for patients living far from a physician, and also for those suspected of not taking their tablets properly. —H. W. W.

- 6 FLOCH, H. and GÉLARD, A. M. Injection retard, au rythme hebdomadaire, de sulfones solubles (diéthylldiaminodiphénylsulfone et succinylldiaminodiphénylsulfone) en thérapeutique antilépreuse. [Depot injections at weekly intervals of soluble sulfones (diethyldiaminodiphenyl sulfone and succinylldiaminodiphenyl sulfone) in antileprosy therapy.] Bull. Soc. Path. exot. **47** (1954) 646-652.

The stated drugs were employed by the intramuscular route in solution with the addition of 8% Subtosan and 0.2% agar. The average of the sulfone levels in 4 patients was, for diethylsulfone, 7.72 mgm. per cent in 4 hours, 1.03-0.65 mgm. during the first 3 days, then 0.08-0.03 mgm. from the 4th to the 7th day. With succinylsulfone the peak was less marked at the 4th hour, 1.41 mgm. per cent. The levels thereafter were 0.50-0.27 mgm. in the first 2 days, then 0.08-0.04 in the last 5 days. The dose of succinylsulfone was 5.0 gm. and that of the diethylsulfone 2.4 gm. The authors believe that the latter drug has the better retard effect, but that both can be employed in the weekly treatment of leprosy. —M. VIETTE

- 8 IGLESIA, M. H., SCAPPINI, J. H. and CASTAÑE DECOUD, A. La hidracida del ácido isonicotínico en el tratamiento de la lepra; nuestra experiencia. [Experience with isonicotinic acid hydrazid in the treatment of leprosy.] Rev. Asoc. méd. argentina **68** (1954) 91-93.

The authors administered isonicotinic acid hydrazid (Nydrazid, Squibb), by mouth in daily divided doses of 3-5 mgm./kgm., to 20 patients for one year. Since 5 of them abandoned the treatment, the results were only observed in the 15 others: 11 lepromatous, 3 tuberculoid and 1 indeterminate. No changes of the general condition were seen, but there was clinical and bacteriological improvement, without however complete negativization. The lepromin reaction remained negative in the lepromatous cases. The drug caused reactions in 2 cases of the L form, while in 1 tuberculoid case intolerant of sulfones it was well tolerated. It is concluded that INH is a useful remedy, especially when used in combination with the sulfones. —G. BASOMBRIO

- 6 FARRIS, G. Gli stati reazionali leprosi ed il loro trattamento. [The reactional states in leprosy patients and their treatment.] Arch. Maragliano Path. e Clin. **9** (1954) 1135-1177.

The author first reviews the different kinds of lepra reaction in the three main types of leprosy (lepromatous, tuberculoid and indeterminate) and some subtypes, and then describes 9 cases observed in the Clinica Dermatologica of the University of Genova. The patients were all lepromatous, duration varying from 4 to 20 years. All had high remittent fever for 1 to 4 weeks, and skin reactions often in the form of erythema nodosum or multiforme. Other symptoms observed with varying frequencies were neuritis, iritis and iridocyclitis, orchid-epididimitis, and disturbances of the liver, spleen and kidneys. Besides the more commonly used therapy (antihistaminics, vitamins, liver extracts, etc.) the author employed ACTH and cortisone therapy with

excellent results especially as regards the fever and the cutaneous symptoms (except edemas, ulcers and bullae) and the nerve and eye disturbances. There was no good effect on the eyes with general therapy, but very good results with local application of cortisone.

—MAURIZIO TERNI

- 6 MONTESTRUC, E. La cortisone dans le traitement des réactions lépreuses. [Cortisone in the treatment of lepra reactions.] *Bull. Soc. Path. exot.* **47** (1954) 848-856; also *Arch. Inst. Pasteur Martinique* **8** (1955) 31-38.

Cortisone was used in 5 lepromatous cases in which treatment with even small doses of sulfone or thiosemicarbazone precipitated lepra reactions. On the first day they were given from 200-300 mgm., one-half intramuscularly and the other half by mouth. In 3 or 4 days the dosage was lowered to the minimum which would inhibit the reappearance of the reactions, i.e., 50-100 mgm. per day. The reactions subsided after the first few days. The hormone treatment was continued during the 8 weeks of chemotherapy and the first week of rest. This treatment by cortisone has made possible the administration of normal doses of sulfone or thiosemicarbazone when the usual treatments (antihistamines, vitamins, antimony) were without effect. It has sometimes been continued for several months, and there has not been seen any aggravation of leprosy lesions, contrary to the experience of certain authors. On the other hand, when after the interruption of hormone treatment a new reaction appears, resumption of the treatment again stops the reaction.

—M. VIETTE

- 6 DEL POZO, E. C., GONZALEZ-OCHOA, A., RICO VENEGAS, S., MARTINEZ-BAEZ, M. and ALCARAZ, M. Long term treatment of leprosy with cortisone. *J. Invest. Dermat.* **24** (1955) 51-56.

This report concerns the treatment of 9 lepromatous patients of a continuous reactional type with cortisone at the Sanatorio Padre Lopez located at Zoquiapan, State of Mexico. Intense chronic lepra reaction was suppressed by the hormone given orally in doses of 25-100 mgm. a day, for a period of one year. During part of the period of observation, DDS was given in the amount of 100 to 300 mgm. a day, one patient receiving this treatment during the entire year. There were favorable results with respect to the evolution of the disease, with resorption of diffusely infiltrated lesions, fibrotic nodules, and keloid scars. DDS treatment, not tolerated before cortisone, was possible when it was given. Undesirable secondary effects did not appear. Two patients remained without lepra reaction for six months after cortisone was withdrawn, despite resumption of the DDS treatment.

—SR. HILARY ROSS

- 6 FRAZER, J. P. Surgical correction of laryngeal and tracheal stenosis in Hansen's disease. *Trans. Pacific Coast Oto-Ophthal. Soc.* **35** (1954) 201-210.

Five cases of laryngeal or tracheal stenosis operated upon by the author are reported in detail, with drawings. In two of the three cases, epiglottic retroflexion was corrected successfully by a new method, using the cautery to create a new scar in such a location as to draw the epiglottis forward. Both have retained adequate airway and voice, for 5 and 4 years respectively. Surgeons interested in this problem should refer to the original article for details.

—H. L. ARNOLD, JR.

- 6 FARINA, R. Colapso total da ponta do nariz na lepra; reparação do estofa nasal; retalho frontal versus retalho naso-geniano. [Total nose tip collapse in leprosy; repair of the nasal lining; nasal flap versus naso-labial flap.] *O Hosp.* **45** (1954) 477-486.

The author used two methods of repairing collapse of the nose in leprosy: frontal flap and nasolabial flaps. Both methods give excellent results. Gillies' method (free skin graft and prosthesis) is regarded as complicated and uncertain as regards results. —[From author's summary, supplied by N. de Souza Campos.]

- ✓ GEHR, E. Orthopädische Behandlung bei Lepra. [Orthopedic treatment in leprosy.] *Ztschr. Tropenmed. u. Parasitol.* **6** (1955) 116.

The author points out that many cases, especially arrested ones, need orthopedic treatment of reversible pareses, atrophies and contractures by massage and by active and passive exercises. The difficulties connected with such treatment and the good results obtained are described. It is recommended that there should be educated and employed for these curative gymnastics, specialists familiar with the special characteristics of leprosy.

—E. KEIL

- ✓ BUSHBY, S. R. M. and WOIWOD, A. J. Excretion products of 4:4'-diaminodiphenyl sulfone. *American Rev. Tuberc.* **72** (1955) 123-125.

In a preliminary communication from the Wellcome Research Laboratories, Kent, England, the writers report examinations of the excretion products of 4:4'-diaminodiphenyl sulfone and substituted derivatives, by paper chromatography and paper electrophoresis, made in an attempt to identify those products and to account for the activity of solapsone (Sulphetrone). Using paper chromatography and butanol-water as the solvent they found that in rabbits, after an oral dose of 100 mgm./kgm. of DDS, there are three substances present in the urine which can be readily detected with the reagent of Ehrlich. These substances must, therefore, have amino groups which are either free or become free under the acid conditions of the test. In man very little of the drug is excreted as free DDS. Ethyl acetate extraction of urine from patients on continuous oral sulfone therapy showed that less than 5% of the drug is present in that form. Although the concentration of Ehrlich-positive material in the blood after oral administration of DDS is too low for its chemical nature to be determined directly by the methods used, there can be little doubt that DDS exists in the body of the rabbit and man almost entirely in combination with glucuronic acid, with one  $\text{NH}_2$  group remaining free. The authors, therefore, assume that the antibacterial activity of DDS in man is due to a monosubstituted derivative, and that the presence of two free amino groups is not necessary for antituberculosis or anti-leprosy activity.

—SR. HILARY ROSS.

- ✓ KHANOLKAR, V. R. Perspective in pathology of leprosy. *Indian J. Med. Sci.* **9** (1955) Suppl. 1, 44 pp.

This is a series of four lectures which the author delivered in various countries, and which it was suggested "deserved publication, as they embodied some unorthodox ideas." The first gives the history of the pathology of leprosy since the time of Danielssen and Boeck. The second deals with lepra reaction, and also with the concentration of bacilli in skin biopsies, with special reference to children born in homes with leprosy and in highly endemic areas. The third deals with the nature and distribution of cutaneous nerves, the changes which they undergo in the various types of leprosy, and the question of nerve trunks as pathways for infection. The statement by Payling Wright that "the semisolid, or at least highly viscous, consistence of the [axonal] protoplasm discourages any belief that foreign material can be carried for long distances in relatively short times by streaming or circulation of the axoplasm" is contested: "We have recently been fortunate in obtaining transverse sections of fine cutaneous nerve twigs with the bacilli lying in situ and cut transversely. A study of these sections leaves no doubt in one's mind that bacilli are located and travel within the axons." This is illustrated in a few of the 27 illustrations. The last lecture describes the classification of leprosy and the changes which may take place in types. —[From abstract in *Trop. Dis. Bull.* **52** (1955) 647.]

- ✓ CREUTZFELDT, H. G. and KLEINE-NATROP, H. E. Tuberkuloide Lepra. [Tuberculoid leprosy. *Arch. Psychiatr. Nervenkr. u. Ztschr. Neurol. Psychiatr.*] **191** (1954) 523-536.

A biopsy was made of the pencil-thick, caseous auricular nerve of a 42-year-old

Chinese with tuberculoid leprosy of 4 years duration. The lesions had always been bacteriologically negative. It was seen that the primary process begins with productive inflammatory changes and infiltrations in the perineurium, these later spreading to the endoneurium which reacts with hypertrophic changes. The marked proliferative changes finally compress the medullary sheaths and nerve fibers, after which the tissue of the endoneurium dies. There develops a fibrous tissue which no longer takes the Bielschowski stain, but only a brownish color; and finally a mixed fibrous mass that contains no fat or lipid but only small clumps of an apparently protein substance. The leprosy neuritic disease process occurs practically exclusively in the mesenchymal tissue of the peri- and endoneurium. The ectodermal medullary sheath and nerve fibers die from secondary causes. Treatment with thiosemicarbazone (Conteben, 25-75 mgm. daily up to a total of 16.5 gm.) caused rapid improvement of the leprosy changes of the nasal mucosa. The elevated edges of the macules disappeared; sensation returned, and in some macules it was completely restored.

—E. KEIL

- OKADA, S. Pathological studies on the liver of autopsy material in leprosy. (Part 1). *La Lepro* 24 (1955) 13-22 (in Japanese; English abstract p. 13).

An analysis of the macroscopic findings in the liver and portal lymph nodes in autopsy material of 300 leprosy cases. In most lepromatous cases the development of lepromata in the liver is proportionate to the degree of the disease. The number of macroscopically recognizable lepromata in the liver tends to be smaller in the patients whose skin lepromata have markedly improved than in those whose skin lepromata have not yet been resorbed. Lepromata cannot be observed by the naked eye in the livers of the secondary neural cases. It takes more than five years from the first growth of lepromata in the skin before lepromata in the liver become recognizable macroscopically. Eliminating other diseases which cause interstitial proliferation, that condition cannot be seen in neural and macular cases. In little-improved lepromatous cases its degree is proportionate to the degree of disease and the development of liver lepromata, while in the markedly improved lepromatous cases it tends to be relatively conspicuous, although the number of lepromata is small. Eliminating other diseases productive of fatty degeneration, that condition is seen frequently in serious leprosy cases. In leprosy the capsule of the liver is smooth, and the typical granular liver is seldom caused by leprosy. The degree of lepromatous change in the portal nodes is in proportion to the disease and to the lepromata in the liver. This condition of the portal nodes develops more rapidly than the liver changes, and within 5 years it is more conspicuous. When lepromatous leprosy improves, the absorption of the lesion in the portal nodes tends to be slower than in the liver.—[From the abstract.]

- OKADA, S. Pathological studies on the liver of autopsy material in leprosy. (Part 2). *La Lepro* 24 (1955) 23-32 (in Japanese; English abstract p. 23).

Reporting results of a microscopic study of the liver from autopsy material of 20 leprosy cases, 19 lepromatous and 1 neural. The degree of histological and bacteriological improvement of lepromata in the liver is proportionate to that of lepromata in the skin. In relapse after temporary improvement, the course of liver lepromata corresponds to that of the skin lesions. The liver changes are not always subordinate to the skin lesions, however, for sometimes relapse of local lesions occurs in the liver and can be the source of aggravation of the skin lesions and the general disease. In some cases the process of the lobule differs from that in the interstitium. Macroscopic lepromata may be yellowish or whitish, depending on the quantity of lipids in the lepra cells of the lepromata. The distribution of hematogenously disseminated leprosy bacilli is not always uniform, but may vary in different lobules or different parts of a given lobule. Atrophy, necrosis and disappearance of liver cells may sometimes be attributed directly or indirectly to the leprosy changes. Fatty degeneration



caused by leprosy is of the peripheral type. Leprosy is more liable than tuberculosis to affect the central veins. Interstitial proliferation varies with different individuals, but in general it is proportionate to the degree of changes in the liver, and is also influenced by the ratio occupied by the improving lepromata. Elastic fibers are more easily affected than the reticular and collagen fibers, and they regenerate with difficulty. In some cases, however, new growth of elastic fibers, slight in degree, can be observed. The arteries often undergo leprous changes, and sometimes the veins are invaded.—[From the abstract.]

- ✓ DHARMENDRA and CHATTERJEE, K. R. Prognostic value of the lepromin test in contacts of leprosy cases. *Lep. in India* **27** (1955) 149-152.

Pointing out that while the prognostic value of the reaction in cases of leprosy is well established that has not been shown so well about contacts, the authors report a check-up of 680 out of 803 healthy persons in the heavily infected Bankura area who had been tested 15 and 20 years ago. The tests had been made with the Mitsuda-Hayashi antigen, and the late reaction was read. Of the 680, no less than 524 (77%) had given positive reactions, only 156 (23%) being negative. Yet the latter produced well over one-half of the cases of leprosy: 22 (14.0%) against 17 (3.2%); and two-thirds (15) of the 22 were lepromatous, while no lepromatous case developed among the positives. The weak positives had somewhat more cases (5.5%) than the stronger ones (2.2%). Now, of the original negatives in the tests made 20 years before, 109 had been given repeated injections of lepromin (3 in a year), and 93 of them had become positive in some degree. Consequently, the 156 negatives cited actually contained the 93 in which negativity had been induced. Deducting them leaves 63 cases negative (16 persistent negatives 20 years before, the rest after single tests 15 years before). Among these 63, no less than 17, or 29.6%, had developed leprosy; and the lepromatous-neural ratio was 14:3. (It cannot be told what happened among the 16 persistent negatives, but among the 93 that became positive there developed 5 cases (5.4%), one of them—in a 1+ case—lepromatous.) These results, it is concluded, indicate great prognostic value of the positive lepromin reaction in contacts, the negatives being liable to develop the disease more frequently and in the more serious form. [It would appear, also, that the original negatives who were made positive by repeated lepromin testing were protected thereby.] —H. W. W.

- ✓ FLOCH, H. La réaction de Mitsuda rendue positive par une primo-infection tuberculeuse est-elle accompagnée d'une immunité relative anti-lépreuse? [Is the Mitsuda reaction rendered positive by tuberculosis primary infection accompanied by a relative antileprosy immunity?] *Bull. Soc. Path. exot.* **47** (1954) 771-775.

Tuberculin skin tests were performed in 168 leprosy patients, 132 Creoles and 36 Europeans. Of the former group, 86 were found positive (72 had benign leprosy, 14 malignant), while 46 were negative (26 benign, 20 malignant). In the European, 28 were positive (24 benign, 4 malignant) and 8 were negative (all malignant). Note is made of the fact that 27% of the Creoles with the benign forms gave negative tuberculin skin reactions, while all of the Europeans with negative skin reactions had the malignant forms. [In total, of the 122 benign cases 79% were positive, but of the 46 malignant cases only 39%.] The author believes that the Creoles may have been relatively immunized by an inapparent infection by the leprosy bacillus during childhood, whereas in the Europeans—who arrived in the endemic area at an adult age, since they were prisoners—only tuberculosis primary infection could lead to an antileprosy para-immunity. He concludes that there is a para-immunity between leprosy and tuberculosis, and that although it is partial he is in favor of BCG vaccination for the prevention of leprosy. —M. VIETTE

- ✓ JONQUIERES, E. and MASANTI, J. Vacunación con el BCG y viraje de la leprominor-

reacción en enfermos de lepra. [BCG vaccination and conversion of the lepromin reaction in leprosy patients.] *Rev. argentina Dermatosis*. **38** (1954) 137-143.

BCG vaccination was given to 55 lepromin-negative patients at the Sanatorio Sommer. Vaccine for oral use (100 mgm. per dose) was used mostly; certain patients were finally given subcutaneous injections (0.02 gm.). The 55 were divided into groups: (a) 16 "residuals," of which 1 was tuberculoid, 3 indeterminate and 12 lepromatous; (b) 11 "recessive" lepromatous, slightly positive bacteriologically; (c) 17 "active" lepromatous, but stationary after long sulfone therapy; (d) 11 lepromatous in full activity, with little or no sulfone treatment. The tuberculin test had previously been positive in 36 of the patients, the dosage pushed to 1:10; the tuberculin-positivity of these cases was not increased after vaccination. Of the first group only 4 patients (25%) showed definite change to the positive Mitsuda reaction (control by biopsy), and 3 showed doubtful change; but only one (the tuberculoid one) maintained the positivity in an 8-month follow-up. Of the three other groups, only 8 (20%) developed doubtful positivity, which was not maintained. Three patients of the first group experienced accidents after the vaccination: two developed acute lepromatization, and the third an erythema nodosum with general symptoms (fever, loss of weight). Slight lepra reactions were seen in a few patients of the other groups.—[From authors' summary, supplied by G. Basombrio.]

- 6 FONTES MAGARÃO, M. and DE OLIVEIRA LIMA, S. Reação de prognóstico da tuberculose pulmonar em hansenianos-tuberculosos. [Prognostic test of pulmonary tuberculosis in tuberculous leprosy patients.] *Clín. Tisiol.* **8** (1954) 855-862.

A study of 60 leprosy patients in the Hospital-Colônia Curupaiti, of which 44 also had pulmonary tuberculosis, has led the authors to consider the BCG test in connection with the prognosis of tuberculosis in leprosy patients. This is an intradermal test which is considered positive if there is a nodule after the third week. Of the tuberculoid patients 76% were positive, and of the lepromatous patients 61% developed nodules. The authors think that the positive answer is of good prognosis. They conclude that the speed of answer allows evaluation of the degree of immunity of the patients with leprosy.—[From authors' summary, supplied by H. C. de Souza Araujo.]

- 8 VILANOVA, X., DE DULANTO, F. and CATASUS, J. M. Etude comparée des résultats des réactions sérologiques classiques de la syphilis et du test d'immobilisation de Nelson (T.P.I.) chez les lépreux. [Comparative study of the results of the classical serological reactions for syphilis and the Nelson immobilization test (TPI) in leprosy patients.] *Bull. Soc. française Derm. et Syph.* **61** (1954) 499-502.

The Nelson test (TPI) and the classical serological reactions (Wassermann, Kolmer technique; MKR II, quantitative; Kahn standard; V.D.R.L. with cardiolipin antigen) were performed in 34 leprosy cases (16 lepromatous, 14 tuberculoid, and 4 indeterminate). All were negative in 28 patients who presented no history of syphilis, and positive in 4 patients with definite history of syphilis. In the remaining 2 patients, also with histories of syphilis, the serological reactions were negative and the TPI positive. The authors conclude that leprosy does not seem to provoke false positive serological reactions for syphilis. Such reactions are generally observed in persons who have been in the tropics, where there exist diseases besides leprosy liable to provoke such reactions. —M. VIETTE

- 8 LUCENTINI, L. and NAZZARO, P. La reazione di Middlebrook-Dubos nella lepra. [The Middlebrook-Dubos reaction in leprosy.] *Ann. italiani Dermat. e Sif.* **9** (1954) 97-100.

The Middlebrook-Dubos hemagglutination reaction was performed, with human red corpuscles sensitized with a tuberculin product from the Institut Pasteur, in 27 leprosy cases. High titers were obtained in active lepromatous leprosy; 15 of the

17 positive sera had a titer of 1/128. Neural cases gave lower titers; of the 3, one was positive at 1/32. Of the 27 sera, 24, or 89%, gave positive results. The authors suggest that the strongly positive reactions have a diagnostic value when active tuberculosis can be excluded.

—MAURIZIO TERNI

- 8 LOMUTO, G. Le false reazioni per la lue nella lebbra con particolare riguardo per gli antigeni alla cardiolipina. [The false syphilis reaction in leprosy, with special reference to cardiolipin antigens.] *Minerva Dermatol.* **29** (1954) 255-259.

Cardiolipin antigen gave the lowest rate of positive reactions with 61 sera from leprosy patients, 1.6%. The positive Wassermann reactions with the same sera were 9.8%.

—MAURIZIO TERNI

- 8 LOMUTO, G. Analisi quantitativa di 1,146 sieri con la reazione di Sachs-Witebsky. [Quantitative analysis of 1,146 sera by means of the Sachs-Witebsky reaction.] *Gior. italiano Dermat. e Sif.* **96** (1955) 43-70.

Among 1,146 sera tested quantitatively for the Sachs-Witebsky reaction, 34 were from nonsyphilitic leprosy patients. Some high titers were observed: in 2 cases the reaction was positive at 1:80 dilution, in 2 other cases at 1:160. Such high titers could explain why some concentrated sera can give strongly positive reactions.

—MAURIZIO TERNI

- 8 AMERICANO FREIRE, S. Some new bacteriological aspects of leprosy. I. Culture of the etiological agent of human leprosy (mycobacterium shape) by the glass slide culture method. *Arq. mineiros Leprol.* **14** (1954) 289-293.

- 8 ——— *Idem.* II. Culture of the etiological agent of human leprosy (yeastlike shape) by inoculation of liquid and solid media. *Ibid.* 294-316

- 8 ——— *Idem.* III. Results of inoculation of animals in the laboratory with: (a) culture of the etiological agent of human leprosy in the yeast stage; (b) leproma. *Ibid.* 317-335.

- 8 ——— and DINIZ, O. *Idem.* IV. Identification of the evolutionary forms of the etiological agent of leprosy in human lesions. *Ibid.* 336-352.

1. The author, professor of pharmacology at the University of Minas Gerais, presents the results of work done on the basis of experience gained in this field with tuberculosis, in the Laboratory of Chemotherapy organized with the help of the National Research Council. The glass slide culture method used was based in part on that of Pryce, with Kirchner's medium plus 1% agar and 20% of plasma or tyndalized human serum. Contrary to the results of Sato [see below], there was multiplication of the bacilli from leproma material, beginning on the 5th day and increasing until the 15th-20th day, after which the growth became stabilized. Four photomicrographs in color illustrate these growths. The new formation of globi in the absence of live cells is stressed as significant. Attempts with "exuberant" cultures to make subcultures were not successful. It is suggested that the leproma tissue from which the original culture preparations were made is a nutritive medium because it lacks specific antibodies, and when this tissue is exhausted further growth is impossible. At the same time, there frequently occurred whitish flocculent growths of a yeast-like germ ("pseudo-yeast") which originated in the material from which the cultures were made.

2. The author agrees with those who have thought that the leprosy bacillus is pleomorphic, taking on different aspects depending on the nutritive medium employed. In the work here reported suspensions of lepromas or positive nasal mucus were inoculated, with penicillin for control of contaminants, into tubes of the same medium as was used with the slide cultures. There was slight proliferation of the leprosy bacilli, with formation of globi, and frequently a growth of the gram-negative, non-acid-fast pseudo-yeast previously observed. Cultures from 15 lepromas and 4 samples

of nasal mucus were positive for that organism. This germ is readily subcultured, and becomes modified variously under different conditions. For example, it may produce globi [*sic*] of acid-fast granules, or coccoid and bacillary forms, or a fungoid form from a long, cyanophilic mycelium containing acid-fast spores. The pseudo-yeast and some of the culture forms occur in lepromas and the nasal mucus of leprosy patients. The various forms described are demonstrated in 7 photomicrographs and 8 drawings.

3. The inoculation work was with the rough-surfaced growth of the author's pseudo-yeast phase grown on Sabourand medium. Various animals were used, inoculated variously, but this report deals only with the preliminary results in 2 rabbits and 5 white mice. The rabbits were inoculated in the anterior chamber of the eye, and after they were killed smears of the viscera showed a yeast-like germ, and once very small forms of an acid-fast bacillus. The inoculated germ was recovered by culture. The mice were injected intravenously with different preparations; the results, given in detail, cannot readily be summarized. In conclusion the author says, "The possibility of cultivating the pathogenic agent of leprosy in the yeast stage and by its inoculation produce the disease in the animal enabled us to utilize these two techniques for chemotherapeutic tests . . ."

4. This joint report is of the findings in skin smears from various kinds of leprosy cases and in histological sections from a few, including an autopsy of a tuberculoid case with smears from the organs—22 cases in all. It is concluded that "whether Hansen's bacillus is present or not the agent of leprosy is always found in the lesions of human leprosy in its yeast-like phase or in some other phases of its evolutionary cycle." They are always present in the lesions of tuberculoid leprosy, even in the absence of acid-fast bacilli. "Therefore it can be concluded that the principal pathogenic agent of tuberculoid leprosy is the yeast-like structure."

—H. W. W.

- 8 SATO, S. and ARAKI, T. Study on the cultivation of the leprosy bacillus; on the multiplication of bacilli in slide cell culture. *La Lepro* 21 (1952) 175-178 (in Japanese; English abstract p. 175).

The cultivation of human and murine leprosy bacilli was attempted in test tubes, capillary tubes, and slide-cell cultures with media of Kirchner, Lockemann, Long and Seibert, and T.G.C. (a product of the Takecho Co.), with the addition of a small quantity of serum. No multiplication of the bacilli was observed. These results confirm the report of Hanks that the multiplication of the leprosy bacillus in artificial media has never been confirmed, even by microscopic examination.—[From abstract. Sato also reported briefly, in English, on the slide-culture method in *Rep. Res. Inst. Tuberc. & Lep.*, Tohoku Univ. 3 (1952) 269-273.]

- 6 DE SOUZA ARAUJO, H. C. Morfologia do *Mycobacterium leprae hominis* e do *M. leprae muris*. Estudo baseado na microscopia eletrônica e de contraste de fases. [Morphology of *Mycobacterium leprae hominis* and *M. leprae muris* based on electron and phase contrast microscopy. *Mem. VI Congr. Internac. Leprol.*, 1953; Madrid, 1954, pp. 843-847.]

Hansen bacillus: Electron microscopy reveals a membrane and halo, the latter being most prominent when surrounding the globi or bundles of bacilli. Also shown are free granules of various sizes, and external granules bound to the membrane and sometimes branching. By phase contrast microscopy at 400 $\times$  are seen many free granules with marked rotary movement; and granular bacilli with screw, skip or stroke motion, producing slow progressive motion. All such elements are surrounded by a halo corresponding to the classical gloea. It can be seen that the internal granules are motile and help the progression of the bacilli, giving the impression that the cytoplasm is liquid. The larger granules have been observed forming a prolapse, like a pseudopod, abandoning the bacilli and going in very rapid rotary movement. There are branched



bacilli, and pedunculated free granules like comets. The addition of a drop of formalin to the preparation stops all movements.

Stefansky bacillus: Electron microscopy confirms the close relationship between the agents of human and murine leprosy. The Stefansky bacillus also shows membranes and halos, internal and external granules, these being smaller than those of the Hansen bacillus. Shaded by chromium, they look thicker and shorter than those of Hansen. Due to electron bombardment, both bacilli suffer considerable alterations in their structure, showing black bars of chromatin condensation at their extremities as also in their centers. By phase contrast microscopy the Stefansky bacillus shows elements with one, two (bipolar), three or more small internal granules, developing movements identical to those of Hansen. The globi seem to be nonmotile, but the free bacilli appearing around the globi show intense movement. At 1000 $\times$  the examination is less satisfactory than at 400 $\times$ . The addition of formalin solution to the preparation suppresses all movements, even brownian, but the material becomes more suitable for a study of the static morphology of the bacilli.

We also examined material from carabao (lepra bubalorum) from Java, but due to its fixation the material was unsuitable for comparative studies.

—AUTHOR'S ABSTRACT

- 6 MORETTI, G. A-t-on découvert un bacille de Hansen cultivable et inoculable? [Has a cultivable, infectious Hansen bacillus been discovered?] *J. Méd. Bordeaux* **132** (1955) 431-434.

This is a critical examination of the so-called *Mycobacterium marianum* of Sr. Marie-Suzanne. The author concludes that it is an acid-fast bacillus, but that it does not arrange itself in globi like the leprosy bacillus, it is easily cultivable, and it is pathogenic for the rat but not for the guinea-pig. On inoculation into the rat it causes a cellular reaction similar to that produced by the leprosy bacillus itself and by several of the "paratuberculous" bacilli. It persists for a long time in the bodies of certain insects. When an extract [?] of it is made and injected into the skin of leprosy patients it causes a different reaction from that caused by the leprosy bacillus in the Mitsuda test. It is therefore concluded that it is not the leprosy bacillus, but a "paratuberculous" bacillus.—[From abstract in *Trop. Dis. Bull.* **52** (1955) 784.]

- 6 PALENCIA, L., MONTANO, R. and VARELA, G. Estudio bacterioscópico de la linfa de 100 enfermos leprosos tratados con sulfonas. [Bacteriological study of the lymph of 100 leprosy patients treated with sulfones.] *Rev. Inst. Salub. y Enferm. Trop. (Mexico)* **14** (1954) 133-147.

This investigation comprised 100 patients (73 lepromatous, 21 tuberculoid and 6 "incharacteristic"). Serum was obtained by puncturing a fold of skin rendered ischemic by pressure, and smears were stained by Ziehl-Neelsen. The greatest number of positive cases was found among those treated for 2 to 5 years, and the greatest number of negatives in those treated for 5 to 7 years.—[From abstract in *Trop. Dis. Bull.* **52** (1955) 653.]

- 6 NAKAGAWA, Y. and NAKAMURA, M. Preservation of *Mycobacterium leprae murium* by means of lyophilization. I. Report. *Kurume Med. J.* **1** (1954) 135-139.

Murine leprosy bacilli were lyophilized in saline solution, serum water, Kirchner's medium, and glycerine water, and stored in a refrigerator for about two years and five months; and then they were inoculated into normal white rats to determine their viability and infectiousness. It was found that the lyophilized bacilli had kept their infectiousness for rats, and that of the media used the serum solution was best and the glycerine water worst.—[From the author's summary, supplied by K. Kitamura.]

- 6 NISHIMURA, S. and KONO, M. Studies on serum protein components of murine leprosy. *Med. J. Osaka Univ.* **5** (1954) 645-651.

The serum protein components of normal white rats and of those infected with murine leprosy were examined by electrophoresis. The infected rats were divided into three grades of infection, inapparent, light and severe. There were found no significant differences in the albumin and globulin values between the normal controls and the infected groups. There was no relationship between the size of the leproma and the amount of gamma globulin. The small differences in values noted between the groups, studied statistically, were found not to be significant. Murine leprosy differs from human leprosy in that the serum gamma globulin does not increase. This fact, together with the fact that the inflammatory reaction is slight even though a large number of bacteria are present in the lesion, affords material of interest in discussing the mechanism of increase in gamma globulin in nodular leprosy.—[From the author's conclusions, supplied by K. Kitamura].

ICHIHARA, T., NONAKA, S. and FUJITA, Y. Studies on therapy of murine leprosy. Report II. Therapy and inhibition of the appearance and development of murine leprosy with isonicotinic acid hydrazid and its combination with streptomycin. *La Lepro* 24 (1955) 33-39 (in Japanese; English abstract, p. 33).

Report of an investigation of the treatment of murine leprosy, and of the inhibition of the appearance and development of that infection, by isonicotinic acid hydrazid alone or combined with streptomycin. It was found that INH inhibits the appearance and development of murine leprosy in some degree; that this inhibitory effect is increased by combination with streptomycin, and that the drug is more effective when administered from the day of inoculation than when the treatment is begun a month after inoculation.—[From the abstract.]

DE SOUZA ARAUJO, H. C. Novos estudos sobre a lepra murina. [New studies on rat leprosy.] *Men. Inst. Oswaldo Cruz* 52 (1954) 443-449; English pp. 449-454. Also, *Mem. VI Congr. Internac. Leprol.*, Madrid, 1953; Madrid, 1954, pp. 857-864.

The author reports infection of a macacus monkey with rat leprosy, the nodule removed for study, and the animal subsequently reinoculated, the reinfection occurring in a shorter time than at first. Rats were infected from this lesion, and culture media were inoculated. A second monkey was infected from one of the passage rats. New strains of acid-fast bacilli, S & R type, have been isolated from rats and mice. Illustrations appear only in the Madrid printing. —H. W. W.

KRANEVELD, F. C. and ROZA, M. Lepra bubalorum and lepra bovina in Indonesia. *Docum. Med. Geogr. et Trop. (Amsterdam)* 6 (1954) 303-314.

The authors describe a disease in bovine cattle that closely resembles lepra bubalorum. The first case was recognized in 1935 by P. H. Walandauw and was studied for years by Lobel. Almost all of the data concerning this case were lost during the war, but what survived have been examined and some of the original tissue sections and smears have been studied. This has led to the somewhat reserved conclusion that the course of the disease in cattle is very similar to that in the buffalo, and that neither the histological aspects nor the morphology of the acid-fast bacilli differ appreciably. The modes of distribution of the causative organisms in the body seem to differ in that the infection in bovine cattle may more closely resemble human leprosy. Data on a second case, however, suggest that care should be taken in drawing conclusions. It is proposed that the disease of cattle be provisionally named "lepra bovina." One of the questions that remain is whether the disease of the ox in question was a specific one of cattle, or whether it was caused by the same agent as buffalo leprosy; and there lies a question of terminology which the authors believe makes the name proposed the proper one.—[From authors' summary, supplied by P. H. J. Lampe.]

[This article, referred to as an abstract of a paper published elsewhere [*Hemera Zoa* 60 (1953) 290], dedicated to Lobel who died while a prisoner of war in Thailand,

has been examined in detail by J. A. Doull. The first part summarizes the information on lepra bubalorum available to the writers (a total of 146 cases known of), while in the second part are assembled the available data on the case of the ox found in 1935 and later studied by Lovel in Djakarta (Batavia), where it died late in 1942. No records of an examination at that time are to be found. Doull remarked that the photographs look like lepra bubalorum. About the second case mentioned, according to records found, it was a suspected one, and apparently only an inguinal gland, a testicle, and the mucosa of the nasal septum were positive for acid-fast bacilli. Why this condition of either the domestic water buffalo or the ox should be as it evidently is, confined to Indonesia remains a puzzle.—EDITOR.]