

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.

TASS, J. On the leprosy in the Bible. *Actes du Septième Congrès International d'Histoire des Sciences, Jérusalem, Août 1953*, pp. 583-587.

The author, who has a thorough knowledge of Hebrew, studied the question of whether leprosy can be recognized with a reasonable degree of certainty from the biblical description of "Zaraath." One diagnostic criterion, according to the original text, is the presence of white hairs together with an apparent depression of the skin, signs which are not characteristic of leprosy. Other symptoms described include an eruption of "beharot," possibly meaning white or shining spots. The priest had to see the patient after a week, and after this period of observation he had to decide if the eruption was spreading. Leprosy, however, would rarely show any significant changes in a week's time. No mention is made in the Bible of the typical signs of the disease, such as the leonine face, loss of sensitivity, blindness, mutilations, etc. The word "Zaraath" was translated as "leprosy" in the Septuagint about 200 BC. From the Septuagint the translation passed into the Vulgate and then into other Bible translations. At the time of the Septuagint the Greek word "lepra" indicated a scaling skin disease of not much importance, such as perhaps psoriasis. Leprosy was not known in Greece at that time, and was only later described as elephantiasis by Celsus. It seems probable that it was not known in biblical times. Its symptoms are so characteristic, even for laymen, that it is remarkable that the striking features should not have been mentioned.

—F. SAGHER

SCHWEITZER, A. Medicine in the jungle. *J. American Med. Assoc.* **156** (1954) 1547-1549.

This is a brief account, by one of the most notable men of our time, of the establishment of the hospital at Lambaréné, French Equatorial Africa to provide for work for which he gave up a career in the ministry, became a physician, and went to Africa in 1913. The author is interested in leprosy, but if the impression has been gained that his work is primarily concerned with that disease that is incorrect; it is evidently a secondary feature of it. He was one of the first in Africa to employ the sulfones (diasone and promin), sent him by friends, and after he had applied them with favorable results (a "miracle") to a native evangelist with advanced leprosy, other patients began coming to his hospital in increasing numbers. He settled them in a village of bamboo huts which he built on a hill in the nearby jungle, where they were given daily treatments by a physician and a nurse. These huts were only temporary, and buildings of a more substantial nature are being constructed. Some details of the operation of this village are given, but how many patients there are is not said. [Dr. Schweitzer recently—January 14, 1955—celebrated his 80th birthday.]

—H. W. W.

GOMES, J. M. A lepra é um problema internacional. [Leprosy is an international problem.] *Rev. brasileira Leprol.* **21** (1953) 69-77.

A shaded map is given showing the prevalence of leprosy in the various countries of South America, each of which is considered in some detail. The stated rates per 1000 are: French Guiana, 25; Dutch Guiana, about 2; British Guiana, 2.27; Venezuela, 0.75; Colombia, about 2; Peru, 0.28; Bolivia, 0.42; Paraguay, 2; Argentina,

0.61; Uruguay, 0.35. In Amazonia there are thought to be more than 5 per thousand. The author believes that because these affected countries border on each other, the problem is an international one and should come under the purview of the World Health Organization or the Pan-American Sanitary Organization.—[From abstract in *Trop. Dis. Bull.* **50** (1953) 1051.]

- 8 SLOAN, N. R. Leprosy in Netherlands New Guinea. South Pacific Commission, Technical Paper No. 56; Noumea, New Caledonia, April 1954, mimeographed, 21 pp., 2/- sterling.

This report covers a six-months survey made by the author in 1952 at the invitation of the Netherlands New Guinea authorities as part of the South Pacific Commission's leprosy project. The work was done in close cooperation with Dr. Dirk L. Leiker of the health department of the local government. The latter subsequently spent a month at the Makogai hospital in Fiji, and has been a full-time government leprologist for the region, as recommended by the author. The substance of the present report, brought rather more up to date, appeared as an article by Leiker and Sloan in *THE JOURNAL* **22** (1954) 431-439.

—H. W. W.

- 8 SLOAN, N. R. Leprosy in the Trust Territory of the Pacific Islands. South Pacific Commission; Technical Paper No. 57; Noumea, New Caledonia, April 1954; mimeographed, 23 pp., 2/- sterling.

This report is of a three-months survey, ending early in 1953, made in continuation of the South Pacific Commission's leprosy project at the invitation of the Trust Territory administration. Guam, previously investigated [and not a part of the Trust Territory] was not included in the invitation. The work was done in collaboration with Dr. John Valentine, in charge of the territorial leprosarium on Tinian. The region, some 3 million square miles of ocean with 2,141 tropical islands which total only 687 square miles in area, with about 55,000 people, is divided into six districts: the Northern Marianas (Saipan district), the Carolines (Palau, Yap, Truk and Ponape districts), and the Marshalls (a district). The Japanese had established small leprosaria, long since abandoned, on Yap (Pekel Island, 1925), the Marshalls (Ele Island, 1927), and the Palaus (Ngurur Island, 1929); [*THE JOURNAL* **21** (1953) 380-383]. The survey began with the patients at the Tinian leprosarium and went elsewhere from there, one purpose being to locate a suitable site (or sites) for the leprosarium when it is moved from Tinian, as is to be done. The coverage was very sketchy, because of exigencies of time and transportation, but 4,924 people and 223 cases of leprosy, active or arrested, were seen; 20 other known arrested cases were not seen. These figures would give a known prevalence of 4.4 per thousand. Of the 223 cases, 48 were or had been lepromatous, 175 tuberculoid or indeterminate; 150 were old and 73 newly found in the survey (64 of them nonlepromatous); 137 were males and 86 were females. On the whole the disease appeared to be relatively mild, with strikingly low figures for the lepromatous form and for infected children. It is recommended among other things that leprosaria for open cases be established on Yap and Ponape—these being the main leprosy centers—near to the district hospitals and their facilities, and that the closed cases be treated as outpatients.

—H. W. W.

- 8 FLOCH, H. Sur la lèpre en Guyane Française. [Leprosy in French Guiana.] *Biol. méd.* **43** (1954) 597-690.

Two sections of this lengthy article have been supplied by the author in typescript. One, entitled "leprosy in children," describes in detail the establishment and development of l'Ecole Marchoux, in Cayenne, to provide for children with non-contagious forms of leprosy removed from the ordinary schools. A point given emphasis is that, whereas some children became lepromatous each year and had to be sent away while chaulmoogra was being used, not a single one has become lepro-

matous since the sulfones (mainly DDS) have been used. Here is a "prophylaxis" of such cases against becoming of the malign form. Discussion of the principles involved follows the statement of the following question: "If these children are contagious would it not be more logical to isolate them completely? If they are not contagious is it useful and proper to exclude them from the public schools? Why permit them to go out in the afternoon and during vacations, often to remain in contact with contagious cases? The justification cannot well be summarized briefly. The other section of this article has to do with the different elements of the antileprosy campaign. [A news item in this issue has to do with that subject.] —H. W. W.

[VIET-NAM] Rapport sur le fonctionnement technique en 1952, Institut Pasteur de Saigon; Dr. J. Fournier, directeur Saigon, 1953.

Apart from data from the antileprosy dispensary of the Institut Pasteur and from its chaulmoogra laboratory, the principal information about leprosy is a brief statement concerning observations of Lajudie and Destombes on the frequency of reactional tuberculoid leprosy among their patients, who had recently been reclassified according to the Havana nomenclature. About 10% of the 1,363 patients examined were of the reactional form: 132 (24%) of the 544 tuberculoid cases. In French Guiana these observers had seen only rare cases, and those only among Asiatics. —H. W. W.

[TANGANYIKA] Annual Report of the Medical Department for the year ended 31st December 1952. Dar es Salaam, Government Printer, 1953.

This report contains more information than usual about the leprosy institutions in the country. There are 14 leprosaria in all, plus 14 leprosy homes not recognized as leprosaria, and a number of dispensaries for outpatient treatment. All but three of the leprosaria are maintained by missions with government assistance; Belra aids with personnel at four places. The largest mission leprosaria are those of the Benedictine Mission at Ndanda and Peramiho in the Southern Province, the latter with over 1,000 patients. Of the three government leprosaria the largest is at Makete in the Southern Highlands Province, where at the end of the year (during which there was a clean-out and 647 were discharged) there were 347 infected persons and 61 uninfected. New construction was going on there. Of the other government leprosaria, mention is made of one at Chazi (location not indicated). The third one would seem to be Muheza hospital, the headquarters of a second medical officer for leprosy work who had been appointed, assigned to Tanga Province. —H. W. W.

[KENYA] Annual report for 1952 of the Medical Department of the Colony and Protectorate of Kenya. Nairobi, Government Printer, 1953.

Regarding leprosy, it is stated that the building of the new leprosarium at Itesio, in North Nyanza, was continued during the year. [This place is of special importance because it is here that there has been established the East African Leprosy Research Centre, under the charge of Dr. J. Ross Innes, interterritorial leprologist.] The demand for treatment was so great that by the end of the year 2,000 patients were being treated with DDS there as outpatients. In the absence of a leprosarium serving the country as a whole, treatment has been organized in most districts on an outpatient basis through special leprosy clinics. —H. W. W.

[EDITORIAL] Nuestro sanatorio "San Luis de Jagua." Rev. Sifilog. Leprol. y Dermat. 10 (1954) 5-15.

It is explained in an editorial note that this issue of the *Revista* is dedicated to the celebration of the tenth anniversary of the opening of the San Luis de Jagua leprosarium. The main feature is in the first section, 9 pages with 17 pictures of the place, outside and inside, and of various activities. There is also a 6-page article, by González Prendes, the director, and other staff physicians on the "general charac-

teristics" of the 363 patients there, and one on "our social atmosphere" by one Luis Armand, editor of "*Nuestra Antorcha*." —H. W. W.

- 8 BOENJAMIN, R. Penyakit kusta dan pemberantasannya. [Leprosy and the leprosy campaign.] *Madjalah Kedokteran Indonesia* (1954) 389-407 (Oct.-Dec.).

According to history, "leprosy" is a Greek word translated in 300 B. C. from the Hebrew "Zara'ath," which according to Leviticus (Jewish Code of Law) means: "Denounced as a result of Divine displeasure." The conditions defined in Leviticus have little in common with the disease we know as leprosy, but even nowadays there are here and there signs of cruelty towards people with that disease inasmuch as they are often segregated from society for being unclean and because they have been denounced by Divine Power. The Dutch word "melaats" is said to have been derived from the French "malade," which is a contraction of "Mal de Ladre," the disease of Lazarus. "Melaats," therefore, also has a religious meaning. As far as we know, according to Luke 16, verses 19-31, Lazarus was a poor man covered with wounds (parable of Christ) who after departing this life was accepted in Abraham's bosom, and we should therefore never denounce people suffering from leprosy, but behave on the contrary. It is therefore recommended that words such as lepra, melaats and the like should not be used in connection with ill associations. Factors influencing the spreading of leprosy are prolonged and intimate contact with persons suffering from leprosy whose lesions are bacillus positive, and the greater susceptibility of infants and young children up to the age of 14 years. To combat the disease the following is outlined: (a) organization; (b) the setting up of leprosaria, leprosy campons (villages) and outpatient clinics, and the registration of patients; (c) treatment with sulfones; (d) methods of segregation; and (e) preparations for performing BCG vaccinations as a preventative. —AUTHOR'S ABSTRACT

- 8 LOWE, J. Leprosy; some new concepts of epidemiology and control. *J. Roy. San. Inst.* 74 (1954) 723-729.

The author, saying that certain common misconceptions about leprosy should be laid aside, discusses briefly its forms, its infectiousness, its distribution, and its decline in Europe since the 16th century. Leprosy, he says, which by its nature should propagate itself very easily, has never done so; the human race as a whole is not highly susceptible, so that the disease rarely spreads widely and rapidly. There appears to be some factor operating to reduce this already low basic susceptibility and to produce relative or complete immunity. There are indications that such a factor has been more operative recently than in the Middle Ages, and more in towns than in scattered populations. The question of whether this factor may be due to cross-immunity between tuberculosis and leprosy is then discussed. A previous tuberculous infection, evidenced by a positive tuberculin reaction, "is a very frequent cause of sensitivity to the leprosy bacillus, as demonstrated by the positive lepromin test." In tuberculin- and lepromin-negative persons, BCG vaccination may make both reactions positive. Historically there has been a diminution of leprosy in many countries corresponding with the spread of tuberculosis, the inference being that tuberculosis which spreads more widely and rapidly, "drives leprosy out, because it renders the population sensitive to the tubercle bacillus and therefore to the leprosy bacillus." [In this Lowe agrees with Chaussinand's thesis, *THE JOURNAL* 16 (1948) 431-438]. About control, Lowe has little faith in isolation, particularly compulsory isolation. It is not impossible that modern treatment is good enough to bring the disease slowly under control. Although it takes a long time to clear up a case, the patient is rendered less infectious in a comparatively short time and thus the period of isolation necessary is reduced. There is also the possibility that BCG vaccination will prove of value in immunizing contacts, particularly children. The future is regarded as promising. Leprosy is not a disease which is spreading and increasing;

it already has a downward tendency, and it is only necessary to accelerate this downward trend. The author considers reporting of leprosy cases as necessary, and that contact between open cases and children and young people should be prevented, but that compulsory isolation is inadvisable in many countries where it will do more harm than good. He ends with a quotation from the report of the WHO Expert Committee on Leprosy: "Public health and not public fears and prejudices should determine the policy in respect to leprosy control."—[From abstract in *Trop. Dis. Bull.* 51 (1954) 1252.]

- 8 ROY, A. T. Criteria for discharge of a patient from a leprosy home. (With special reference for re-appointment by employer.) *Patna J. Med.* 28 (1954) 327-328.

As a patient whose smears are or become negative is unlikely to be infective, he is discharged from the leprosy home and told to continue on a maintenance dose of diaminodiphenyl sulfone 100 mg. daily. A three-monthly check is kept on these patients.—[Abstract from *Excerpta Med.* 9 (1955) 116.]

- 8 LAMA, A. Contributi alla epidemiologia ed alla profilassi della lebbra. [Contributions to the epidemiology and prevention of leprosy.] *Boll. Soc. Med.-Chirurg. Romagna* 6 (1954) 3-10; also, *Romagna Med.* 6 (1954) No. 2.

Based on geographic and epidemiologic speculations, the author believes that *Sarcopsilla penetrans* (an arthropod which penetrates under the skin of the feet) may be able to transmit leprosy. —M. TERNI

- 8 BECHELLI, L. M. Alguns dados epidemiológicos sobre a situação da campanha antileprosa no estado de São Paulo. [Epidemiological data bearing on the situation of the antileprosy campaign in the State of São Paulo.] *Rev. brasileira Leprol.* 21 (1953) 33-42.

Between 1926 and 1950, 33,476 patients have been registered. There were at the time 8,525 patients in leprosaria and 9,835 under treatment in dispensaries, approximately 2 cases per thousand of the population. There were 5 leprosy dispensaries in the capital and 23 elsewhere in the state. In the most-affected municipalities the numbers of cases have diminished, the author believes, since the intensification of vigilance on the part of doctors and regional dispensaries; the indices of incidence have diminished; there is still an upward curve in the total number of cases, but they have become more chronic. The course of events has been affected by the smaller numbers of deaths under present-day treatment, but the curve of prevalence will begin to descend when there is an appreciable fall in the numbers of new cases (incidence). There is already a slight decrease in the endemicity and the gravity of the disease. The use of sulfones and BCG, along with an increase in the number of dispensaries and of the control of lepromin-negative contacts, should, with the collaboration of health centers, lead to the extinction of the disease from the state.—[From abstract in *Trop. Dis. Bull.* 50 (1953) 1051.]

- 8 MURAZ. Note préliminaire sur une organisation rationnelle, en Afrique Equatoriale Française, de la lutte contre la lèpre. [Preliminary note on a rational organization for the antileprosy campaign in French Equatorial Africa.] *Bull. Acad. nat. Méd.* 138 (1954) 155-159.

In this report the author suggests a detailed program for the antileprosy campaign in French Equatorial Africa. This would require 3 treatment centers, 78 leprosy villages (the hospital being reserved for bed-patients only), and mobile medical teams. The treatment would be based on the use of deposit preparations (*sulfones-retard*) with weekly or twice-monthly injections. Chaulmoogra alone is not sufficiently effective, and oral treatment with sulfones is difficult to employ in primitive populations. —M. VIETTE

X COHN, E. Der Kampf gegen die Lepra in Mexiko. [The campaign against leprosy in Mexico.] München med. Wschr. **97** (1955) 573.

Leprosy was apparently unknown in Mexico before the entry of the colonial powers. According to the department of health the number of cases of leprosy in Mexico is at present 30,000 to 40,000. It is least prevalent in the Haate Puebla area and in the central highlands. It is most frequently met with in the coastal regions of both oceans. Emphasis is laid on the removal of leprosy cases from tropical to temperate or cold climates. The largest leprosarium is near Mexico City, and accommodates 500 patients. Tuberculoid cases are not accepted. The patients are, when possible, given leave to go home. Severe restrictions are not enforced. "Leprosaria have no further place today, either in Mexico or in the whole world." For treatment, sulfone preparations are used. —ERNST KEIL

γ MONTESTRUC, E. Quatre exemples de lèpres familiales (enfants atteints avant les parents). [Four examples of familial leprosy with children affected before the parents.] Rev. colon. Méd. et Chir. **26** (1954) 182-184.

In four instances leprosy was first observed in a child (2 lepromatous, 1 tuberculoid, and 1 indeterminate), and then from 2 to 6 years later it appeared in one of the parents (3 lepromatous and 1 indeterminate). The author considers three hypotheses: One, that the child was infected first and in turn infected his parent, but to the author this seems improbable because of the rarity of conjugal infection. Or, that the parent really had the disease and infected his child, which creates the problem of germ carriers and inapparent leprosy (*lèpres invisibles* of Gougerot). These cases are rare, and the author holds rather for the third hypothesis, that of infection from the same source, the disease developing in the children more rapidly because of their greater susceptibility. —M. VIETTE

γ LEVAN, N. E. Leprosy acquired in military service during World War II. Report of a case. J. American Med. Assoc. **156** (1954) 126-127.

The author states that this patient, a 47-year-old veteran, is the first reported case of a veteran who developed leprosy as a result of military service in endemic areas during World War II. He served 5 months in New Guinea, 3 months on Leyte, and 7 months on Luzon, and the first symptoms appeared while he was still in the Philippines, in 1945. The family and personal histories provide nothing to indicate that the disease could have been contracted outside of military service, it being pointed out that Kansas is a nonendemic region.

[Note: This report received much newspaper publicity as being about the first World War II veteran to acquire leprosy as a result of military service. However, records at Carville indicate that 75 veterans have developed the disease during or as a result of military service in World War II or the Korean conflict, although not all of them remain as patients. Epidemiologically, the disease in 7 of the 75 patients can be attributed to military service in endemic areas. The histories of 68 of the veterans indicate that they had lived in endemic areas or had symptoms of leprosy before entering military service.] —SR. HILARY ROSS

γ SLOAN, N. R. Leprosy. J. American Med. Assoc. **157** (1955) 170 (correspondence).

The report by Levan [see preceding abstract] is said to be an important one, but it has not been shown that the disease was actually acquired in service. Probably it was not. The diagnosis appears well established, but cases that develop within 18 months of first exposure are very rare. The patient's age—37 years when he went to New Guinea—is also against the thesis of recent infection. Leprosy infection of adult Europeans does occur, but it is unusual. Points to be considered are: 1. The patient's ethnic background (certain groups being especially susceptible). 2. Family history of leprosy (significant facts being often concealed). 3. Visits by the patient or his

parents to known endemic areas (there being such even in the continental United States). 4. The part of New Guinea in which he served, and his contacts with natives there. "The known distribution of leprosy in Dutch New Guinea is spotty, and presumably this is also true in the Australian end. His time in the Philippines before appearance of the first symptom was so brief that it is almost incredible that infection could have occurred there."

—H. W. W.

- 8 EPSTEIN, F. W. and BURNHEIMER, J. C. Leprosy in Ohio and report of a case. *Ohio Med. J.* **50** (1954) 229-231.

Fifteen cases of leprosy were reported in Ohio from 1925 to 1951, mostly in foreign-born immigrants from endemic areas. One of the patients served in the Philippines and Hawaii for six years, and it is presumed that his infection was connected with his military service. It is suggested that physicians be suspicious of patients who may have migrated from endemic areas and present suggestive dermatological and neural manifestations. One case is reported in detail; the patient was admitted to Carville in 1951. [This patient died in September 1953 of marked amyloidosis following repeated lepromatous reactions.]

—SR. HILARY ROSS

- 8 ROTBERG, A. Emprego dos termos "bipolar" e "infrapolar" para os aspectos intermediarios e indeterminados de lepra. [Use of the terms "bipolar" and "infrapolar" for the intermediate and indeterminate aspects of leprosy.] *Rev. brasileira Leprol.* **21** (1953) 13-15.

The author suggests the word "bipolar" for the intermediate cases, those that share characteristics of both "poles" of the Havana classification; in the Latin languages this would keep the symbol B of the English "borderline." Curiously, all other names in common use—*limitante*, intermediate, transitional—carry initials of the other types of the Havana classification. By analogy, and as a substitute for the often-criticized "negative" words—i. e., indeterminate, incharacteristic—the name "infrapolar" is suggested.—[From author's summary.]

- 8 ROTBERG, A. Fundamentação e proposta de modificação da classificação de tipos de lepra de Havana, apresentando guia para uso prático. [Fundamentation and proposition of modification of the classification of types of leprosy of Havana, presenting a guide for practical use.] *Rev. brasileira Leprol.* **21** (1953) 16-32.

This is a lengthy discussion of classification, with proposals. A footnote explains that its general outline was presented at a meeting of leprologists in October 1952, and with changes resulting from the discussion was prepared as a contribution on the subject for the meeting of the WHO Expert Committee that was held in Rio de Janeiro in November 1952. The modification of the Havana scheme included the proposals that the "indeterminate group" should be called the "infrapolar type," and the borderline group should be called "bipolar."

—H. W. W.

- 8 [CONFERENCE, BRAZILIAN] V Reunião Nacional de Leprologia. [Vth National Conference of Leprology.] *Arqu. paranaenses Leprol.* **2** (1953) 6-46.

This is a belated report of the fifth national leprosy conference in Brazil, held in Curitiba, Paraná, May 1-3, 1953. There were 7 sessions, devoted to the usual topics plus one on immunization (premunition), and a plenary session; the substance of each is recorded briefly. There follow the reports of four committees. That on classification uses the terms "infrapolar" and "bipolar," for indeterminate and borderline, as proposed by Rotberg [see elsewhere]. That on immunization recognizes the value of the positive lepromin reaction as an index of resistance to leprosy infection, and then treats of the use of BCG in that connection.

—H. W. W.

- 8 BECHELLI, L. M. Contribuição ao estudo da lepra hepática. (Estudo clínica.) [Contri-

bution to the study of leprosy of the liver; clinical study.] *Rev. brasileira Leprol.* **22** (1954) 1-94.

This monographic report of a study carried on in three of the leprosaria of São Paulo between 1934 and 1941, winner of a prize in 1942, is now published without essential change. It is divided into three chapters of which the first, on the pathologic anatomic changes, deals with 91 cases out of 150 that were autopsied and is illustrated with 8 demonstrative photomicrographs; the second, on the clinical features, has 7 pictures illustrating hepatic enlargement; the third, on functional tests, has tables and graphs. Precisely how many cases were involved is difficult to tell, but there is a table involving 1,013 cases of which 754 were lepromatous, 31 were residual lepromatous (secondary neural), and 228 were tuberculoid or indeterminate. The clinical examination revealed practically 35% palpable livers in each of the first of these two groups, and 17% in the third one. The autopsies revealed leprosy changes of the liver in almost all of the cases of the first two type groups (70 of 74), but in none of the 17 cases of the third type group. Clinically the enlarged livers were painless, and often associated with amyloidosis but rarely with splenomegaly; they were thickened and dull in a few cases but smooth in most of them; the consistency was increased. Hepatomegaly was marked in the course of lepra reactions, during which the liver became painful. A diagnosis of leprosy hepatomegaly was made because the enlargement developed without fever, ascites, or circulatory disorders. Jaundice may be present if the condition is complicated by other nonleprotic disease of the liver. Only one-third of the total number of patients with leprosy hepatomegaly complained of subjective symptoms, mainly gastric disorders and in rare cases dizziness, anorexia, somnolence, and physical and mental fatigability. The tests for liver functions give normal results. The occurrence of abnormal results indicates the presence of nonleprotic hepatic disease, and calls for discontinuance of anti-leprosy treatment and treatment for the nonleprotic disease. The histological changes of the liver consisted in periportal lepromatous infiltration, lepromatous induration, amyloidosis, and rarely leprosy cirrhosis (1 case only). Tuberculosis of the liver was a complication of hepatic leprosy in four cases.—[In part from an abstract in *J. American Med. Assoc.* **157** (1955) 1244.]

BRÉCHET, R. La lèpre et ses similitudes avec la tuberculose, principalement dans le domaine immunologique et thérapeutique. [Leprosy and its similarity to tuberculosis, especially as regards immunology and therapy.] *Rev. Méd. Suisse Romande* **74** (1954) 385-390.

The common points between leprosy and tuberculosis are discussed. The causative agent in each case is an acid-fast bacillus. There exist parallerism and paraimmunity between the two infections, hence the use of BCG for prophylaxis. The chemotherapeutic agents act more or less the same in both diseases. —M. VIETTE

FERRAND, B. La ponction biopsie du foie dans la lèpre. [Liver puncture biopsy in leprosy.] *Bull. Soc. Path. exot.* **47** (1954) 203-207.

Liver puncture biopsy was performed on 5 lepromatous patients. Specific histological lesions with bacilli were found in the 4 cases in which they were sought. After many months of treatment, further biopsies revealed slow regression of these lesions. —M. VIETTE

SPYRATOS, S. Ponction de la chambre antérieure sur un cas d'iritis lépreuse; observations cliniques et cytologiques. [Anterior chamber puncture in a case of leprosy iritis; clinical and cytological observations.] *Ann. d'Ocul. (Paris)* **187** (1954) 538-545.

Hemorrhage filling three-fourths of the anterior chamber occurred after diagnostic chamber puncture in a case of recurrent leprosy iritis. The bleeding was due to the

withdrawal of aqueous rather than to any direct trauma by the needle. Marked improvement in the iritis occurred, which the authors attribute to the induced auto-hemotherapy. Causative organisms could not be identified. Examination of the cellular content of the aqueous showed lymphocytes, monocytoids, histiocytes of the iris type, and unidentified cells with large nuclei. The authors feel that cytological studies of the aqueous humor make it possible to predict the nature and course of the ocular inflammation. However, in spite of this, and in spite of the favorable therapeutic effect obtained in their case, they feel that the advantages of anterior chamber puncture do not compensate for the risks involved.—[From abstract in *American J. Ophth.* 39 (1955) 142, supplied by Sr. Hilary Ross.]

ZIRILLI, L. and ABATE, A. Il test di Thorn nella lebbra. [The Thorn test in leprosy.] *Ann. italiani Derm. e Sif.* 8 (1953) 254-258.

The positive Thorn test consists in a decrease (not less than 45%) of the number of circulating eosinophil granulocytes after injection of ACTH. When an adrenocortical lesion occurs, especially of the fasciculate portion, the test will be negative. The authors performed the test in 20 leprosy patients with different types of the disease and found that 17 gave abnormal response to ACTH. One of the patients with a normal result died, and at autopsy his adrenals were found normal. The results confirm, according to the authors, the previous findings of adrenal lesions in leprosy.

—M. TERNI

MIRANDA, R. N. Leprofilia (ou Hansenofilia); desejo de ser doente de lepra. [Leprofilia (or hansenophilia); the desire to contract leprosy.] *Rev. brasileira Leprol.* 21 (1953) 67-68.

The author proposes, after discussion of authentic cases and with the justification of etymology, the term leprofilia for the cases of persons who want to be leprosy.—[From author's summary.]

WHEELER, C. E., CAWLEY, E. P., GRAY, H. T. and CURTIS, A. C. Occurrence of gynecomastia in conjunction with dermatologic disorders. *A. M. A. Arch. Dermat. & Syph.* 68 (1953) 685-692.

This is a very summary article calling attention to the occurrence of gynecomastia in conjunction with generalized dermatological disorders, as well as in numerous other conditions. Seven cases with the condition are reported briefly, 1 each of generalized atopic dermatitis, contact dermatitis with autosensitization, stasis dermatitis with autosensitization, generalized psoriasis, angiodermatomyositis, mycosis fungoides with hypertension, and unclassified collagen disease. Testicle biopsy in two of them showed some degree of tubule atrophy. [This article is valuable for anyone interested in the subject, especially because of the numerous references—in one of which, and nowhere else, appears the word leprosy.]

—H. W. W.

LOWE, J. Late results of sulphone treatment of leprosy in East Nigeria. *Leprosy Rev.* 25 (1954) 113-124.

The results reviewed in this paper are of patients treated in the research center in Uzuakoli, East Nigeria, people of the Ibo tribe who usually persist in their treatment until they can be given certificates of arrest of the disease. They had been selected from the Settlement and from the many outpatient clinics because of the severity and activity of their leprosy or because of complications arising out of treatment; they were selected as the most marked cases that could be found who could easily come for treatment at the center. In this report attempts are made to find answers to two questions: 1. What is the present condition of the patients who were being treated several years ago, and in how many has the disease been arrested? 2. How many have later shown relapse? Concerning the first question, an analysis is made of all the patients that had started sulfone treatment between March

1946 and May 1948. There were 131 of them, 9 bacteriologically negative (tuberculoid or other) and 122 bacteriologically positive (lepromatous). In 1954, 117 remained for analysis:

Disease inactive and smears negative; discharged.....	88 (75%)
Disease inactive and smears negative; awaiting discharge.....	17 (45%)
Disease inactive but smears still positive.....	12 (10%)

Of the last 12, 1 had had eight years treatment, 4 seven years, and 7 six years. Sulfone treatment has been found to be very sure, but sometimes very slow in its action. It appears to produce arrest of the disease in every case, but it may take a very long time to do so. Improvement up to a point followed by deterioration has not been seen, nor anything else indicating serious drug resistance. Different sulfones were tried, but no one form was found to be exclusively better than another. The second part is concerned with the relapse rate in discharged patients. In total, 252 patients had continued treatment until they could be discharged. Lepromatous cases had a minimum total period of 24 months treatment and were bacteriologically negative for 12 months. Nonlepromatous cases had to be clinically inactive for six months, with a minimum treatment period of 1 year (later increased to 18 months). Of the 252 discharged patients, 23 were not yet due to return, and of the remaining 229, 208 (92%) had returned at least once and some up to nine times in periods up to 5 years. Of 148 discharged lepromatous cases, 15 of the 139 reexamined had shown slight evidence of reactivation, but no serious case of relapse had been seen. Of 81 discharged tuberculoid cases, 8 of 69 reexamined showed signs of reactivation of the disease in the original form; in none had the lepromatous form developed, and in none had positive smears been found. Reactivation occurred early, usually within one year and almost always within two years of cessation of treatment. The relapses responded rapidly to treatment. Some cases that had turned positive became negative again without further treatment. Thus the relapses have been few, mild, and readily controlled.

—G. O. TEICHMANN

LOWE, J. The treatment of leprosy with TB1/698. A report based on 38 months' experience. *Leprosy Rev.* 25 (1954) 186-199.

The author holds that TB-1 undoubtedly has a beneficial effect in most active cases of leprosy, but there are questions regarding toxicity and efficacy. Compared with sulfone treatment, TB-1 has two advantages: In patients who have difficulty with sulfone treatment because of severe and repeated reactional conditions, TB-1 is almost always tolerated better, and is beneficial. In some patients, clinical improvement under TB-1 treatment seems—for a time, at any rate—more marked than in similar patients on sulfone treatment. On the other hand, TB-1 treatment has several disadvantages. While toxic effects of the two drugs are seen in about the same proportion of cases, TB-1 is the more dangerous because it has a toxic effect on bone marrow and the liver. The early results, clinical and bacteriological, of TB-1 treatment appear to equal those of sulfone treatment, but the late results are less satisfactory. A considerable proportion of patients, after 2 years or more with good progress, reach a stage where TB-1 seems to lose its effect and progress stops. In several such patients, moreover, definite deterioration occurred, which the author had not seen with sulfone treatment. In the long run, therefore, TB-1 is less effective than sulfone. While sulfone treatment can be given daily, it can also be given twice weekly, once weekly, or according to some workers once every two weeks. TB-1 has to be given daily, and preferably twice daily, to be effective, which renders the treatment less widely practicable. The cost of TB-1 treatment is several times as great as that of oral treatment with DDS. For these reasons it is considered that TB-1 treatment of leprosy should be confined to patients who become allergic to sulfones or who are intolerant of it for other reasons. In some cases, after a period on TB-1 it is possible to return to sulfone.

—G. O. TEICHMANN

- LOWE, J. The chemotherapy of leprosy. Late results of treatment with sulphone, and with thiosemicarbazone. *Lancet* **2** (1954) 1065-1068.

This paper, dealing with the late results of the treatment of leprosy with sulfone and TB-1, is in effect a summary restatement of the articles dealt with in the preceding two abstracts. The thiosemicarbazone used was TB-1/698 (*p*-acetaminobenzaldehyde thiosemicarbazone). The number of patients treated was 273, the treatment periods up to 38 months. The serious complications were agranulocytosis (5 cases), severe toxic anemia (6 cases), severe hepatitis (3 cases); there were 2 deaths. During the first two years there was satisfactory improvement in most instances, but in the third year improvement was not so good and many cases deteriorated, some rapidly. The late results were not as good as with sulfones, and in some cases there was evidence of drug resistance. Arrest of the disease was produced in a smaller proportion than with the sulfones, and some of the arrested cases relapsed. Thiosemicarbazone had therefore been abandoned for long-term treatment in patients who can tolerate sulfone, and was retained as an alternative remedy, useful temporarily, for those few patients who cannot tolerate sulfones.—[In part from abstract in *Trop. Dis. Bull.* **52** (1952) 163.]

- DAVEY, T. F. Leprosy treatment in East Nigeria. *Lep. Rev.* **26** (1955) 8-9 (correspondence).

Reporting to Lowe on cases previously treated by him, Davey says that a review of the TB-1 cases showed that deterioration in lepromatous cases is to be expected in a considerable proportion (30% of that group) by the third year, but that ordinarily they had done well when transferred to DDS. Thus there was no evidence of cross resistance. Because in the first few months on TB-1 the bacilli apparently undergo speedy reduction in numbers, it would perhaps be worth while to treat new cases with TB-1 for a year and then change to DDS. Of the tuberculoid cases discharged after TB-1 treatment, four (10%) had relapsed, but only two of the lepromatous cases [out of how many not stated]. No evidence of resistance to DDS had been found. "Some of the old chronic patients still continue to have positive smears, but almost without exception they do not seem to demonstrate the continuance of active looking bacilli, but rather the slow elimination of acid-fast debris." [This communication was a letter to Lowe personally, quoted at greater length than here indicated as an editorial note.] —H. W. W.

- AUSTIN, C. J. Modern leprosy treatment. *Leprosy Rev.* **25** (1954) 174-178.

This paper is really a report of progress in the Makogai Leprosy Settlement, Fiji, for 1952. The daily average of about 700 patients were 58% Fijian, the rest from Samoa, Tonga, Cook and Gilbert Islands. Discharges during the year totaled 58. There were only 13 deaths, the lowest number since 1920; none was from tuberculosis, which used to be one of the commonest causes of death. Of the 23 certified tuberculosis cases, the disease had become arrested in 17. The use of Pycazide (a form of isonicotinic hydrazide) had not only brought tuberculosis under control but had also greatly reduced the number of lepra reactions. Of the sulfones, the one first used was sulphetrone, but now the majority of patients were receiving DDS, which has proved equally effective and much less expensive. Thiacetazone was found effective in patients intolerant of DDS. A few patients had been given B283 with results much the same as with DDS, but the numbers were too small for true assessment of results. —G. O. TEICHMANN

- FLOCH, H. and GELARD, A. M. Une injection intramusculaire de 1gr80 de diamino-diphenyl-sulfone peut donner une sulfonemie satisfaisante pendant un mois. [An intramuscular injection of 1.8 gm. of diaminodiphenyl sulfone will maintain

a satisfactory sulfone level for one month.] Arch. Inst. Pasteur Guyane Française, Publ. No. 340, 1954.

The authors review the different possible methods for obtaining slow absorption (deposit effect) of various drugs. They have previously reported that by using DDS "grains" of large dimension—100 microns (sieve 150-180) in diameter—it is practicable to inject 1.5 gm. of the drug in saline with 0.2% agar only once in 3 weeks. They have now found, in 15 cases, that after the intramuscular injection of 1.8 gm. of DDS in grains of about 200 microns (sieve 80-150) there remained on the 31st day a sulfone level (in DDS) sufficient to permit the use of this preparation once a month, a method which would evidently be very practical especially in certain countries such as Africa. It is necessary to be careful in the increase of dosage with this monthly deposit method, especially with patients treated with sulfone for the first time. One can of course start with the usual doses, now classical, for at least 2 months before using the intramuscular repository route, but if one prefers to start with the latter one can use 0.5 gm. of repository DDS (crystals 200 to 300 microns) weekly for one month, then 1.0 gm. of the same suspension every 15 days for the next 2 months, until the 1.8 gm. monthly is attained, without forgetting to give protoxalate of iron during the first months of such treatment.

—AUTHORS' ABSTRACT

FLOCH, H. and GELARD, A. M. Etude de la diethyl-diamino-diphenyl-sulfone et de la succinyl-diamino-diphenyl-sulfone en administration retard par la voie intramusculaire. [A study of diethyldiaminodiphenyl sulfone and succinyl-diaminodiphenyl sulfone by intramuscular repository injection.] Arch. Inst. Pasteur Guyane Française, Publ. No. 343, 1954 (Oct.).

The authors used by the intramuscular route two kinds of soluble sulfones, the monosubstituted succinyldiaminodiphenyl sulfone, and the disubstituted diethyldiaminodiphenyl sulfone. In order to increase the retardation of absorption, the vehicle contained 0.2% agar and 8.25% polyvinyl-pyrrolidone. The sulfonemia (in DDS) after injection of 2.40 gm. of the diethyl sulfone or 5 gm. of the succinyl sulfone, studied for 7 days, revealed the practicability of giving such intramuscular injections only once weekly. The diethyl sulfone give a better repository effect than the succinyl sulfone.

—AUTHORS' ABSTRACT

POCH, G., CARDAMA, J. E. and BALIÑA, L. M. Psicosis por sulfonas. [Psychosis due to sulfones.] Rev. argentina Dermatosif. 38 (1954) 157-159.

The patient, a 21-year-old female, had had tuberculoid leprosy since 1950, positive to lepromin. In October 1951 she started taking DDS in gradually increasing doses up to a maximum of 200 mgm. daily, with two interruptions due to side-effects, and by November 1953 had taken a total of 479 tablets of 100 mgm. each. She then developed a confusional episode of symptomatic type with auditory hallucinations, without interpretative tendency, which were added to the schizothymic personality of the patient. These manifestations disappeared with the suspension of the drug. This is the first case to develop mental disturbance in about 300 patients treated with sulfones in the authors' experience. They conclude that psychiatric complications are infrequent in sulfone therapy. Symptomatic psychosis of the toxic type appears in the form of a confusional syndrome and in the hue of the psychopathic personality of the patient.

—G. BASOMBRIO

PREZIOSI, P. L'impiego dell'isoniazid nella lepra. [The use of isoniazid in leprosy.] Riforma Med. (Napoli) 67 (1953) 888-889.

After reviewing the bibliography on INH therapy of leprosy, the author concludes that although it is considered a very effective drug in rat leprosy, a longer period of observation is needed for decision regarding its value in human leprosy.—M. TERNI

MARKIANOS, J. Action thérapeutique de l'hydrazide de l'acide isonicotinique dans la

lèpre. [Therapeutic action of isonicotinic acid hydrazide in leprosy.] Bull. Soc. Path. exot. **47** (1954) 32-34.

Isonicotinic acid hydrazide was used in treating 44 patients, 13 with macular leprosy, 25 nodular, and 6 others (they being 2 macular and 4 nodular who also had pulmonary tuberculosis). They were given 150 mgm. daily for 2-3 days, then 300 mgm., which was tolerated satisfactorily. Ill-effects noted were jaundice (in 3 cases); aggravation of the lesions and appearance of new ones; lepra reactions; stomatitis; vertigo; and nephritis. These disturbances had necessitated suspension of the treatment. In cases with both leprosy and tuberculosis, there was no improvement of the tuberculosis, and that of the leprosy lesions was slight. In the macular cases the lesions subsided and bacilli were no longer to be found. In the nodular cases the old lesions retrogressed, while the recent ones seemed resistant. The bacilli disappeared from the nasal mucosa in some cases. The author believes that INH is less efficacious in leprosy than are the sulfones, and he suggests that it be used only in cases intolerant to them.

—M. VIETTE

PERCY, E. Klinische Erfahrungen mit Oxyprocain-Penicillin und Paratebin bei der Lepra. [Clinical trials with oxyprocaine penicillin and Paratebin in leprosy.] Beitr. Klin. Tuberk. **111** (1954) 377-384.

Five lepromatous and 7 tuberculoid cases of leprosy, mainly advanced, some of whom had previously been treated, received for three months a daily dose of 300,000 I. U. oxyprocaine penicillin (diethylaminoethanol-p-aminosalicylic acid salt of procaine penicillin). In most of them, in spite of the short period of treatment, repigmentation of macules and subsidence of infiltrates were seen. The bacillus picture, however, remained practically unchanged. No symptoms of intolerance to the drug or lepra reaction were seen. Five lepromatous and 8 tuberculoid patients received for three months one ampule daily of Paratebin. [Paratebin is 400,000 I. U. oxyprocaine penicillin + 1 gm. dihydrostreptomycin sulphate.] This preparation gave practically the same results as the other, and was equally well tolerated (Follow-up period, 6 months).

—ERNST KEIL

CHAUSSINAND, R. and VIETTE, M. Peut-on utiliser la vaccination par le "*Mycobacterium marianum*" dans la prophylaxie et la thérapeutique de la lèpre? [Can *Mycobacterium marianum* vaccination be used in the prevention and treatment of leprosy?] Bull. Acad. nation. Méd. **139** (1955) 165-169.

Three groups of guinea-pigs, totaling 36 animals, were given injections either intradermally or intraperitoneally of saline suspensions of BCG, *M. marianum*, and *M. phlei*. Three injections were given, at 3-week intervals. Eighteen of the animals received killed bacilli, each dose 1 mgm.; the other 18 received live bacilli, the doses 0.01 mgm. each. Six weeks after the last injection the guinea-pigs were tested with lepromin. In the animals injected with killed bacilli, those given *M. phlei* were all negative; of those given *M. marianum*, 4 were positive but 3 only weakly so; all 5 given BCG were positive, 4 very strongly so, with ulceration. Of the inoculations with live bacilli, the results obtained with *M. phlei* and *M. marianum* were almost identical; only 1 guinea-pig injected with the latter had a weakly positive Mitsuda reaction, while all the others were negative. In contrast, the 6 guinea-pigs vaccinated with BCG had strongly positive reactions. The reactivity to lepromin elicited by *M. marianum* is, therefore, clearly inferior to that produced by BCG. The authors recall that the morphological, tinctorial, and antigenic characteristics of *M. marianum* are not in accord with those of the Hansen bacillus, but permit classifying it in the group of paratuberculosis bacilli. They also recall that the vaccines prepared with the paratuberculosis bacilli and used in the treatment of leprosy have no appreciable effect on the progress of the infection. Finally, the results reported here show that

the action of *M. marianum* seems to be very inferior to that of BCG in the prophylaxis of leprosy. —M. VIETTE

MAUZÉ, J. La thérapie tissulaire dans le traitement de la lèpre. [Tissue therapy in the treatment of leprosy.] Bull. Soc. Path. exot. **47** (1954) 483-484.

The author treated 50 patients with amniotic extracts, using a 50% extract for local application in 30 of these, and injecting 4 ml. of a 10% extract intramuscularly in the other 20 twice a week. Treatment was continued for 3 years, in combination with sulfone therapy. The results were remarkable in healing up sores and perforating ulcers, and in improving the mobility of the fingers and strengthening the muscles in claw hand. If treatment is relinquished after 3 months the condition relapses.—[Abstract from *Trop. Dis. Bull.* **52** (1955) 165.]

DE SOUZA-ARAUJO, H. C. Eficácia do "Cortone" na reação leprótica causada pelas sulfonas. [Efficacy of cortisone in lepra reaction caused by sulfones.] Folha Méd. **33** (1952) 202-204; also, Brasil-méd. **67** (1953) 83-87.

In 12 cases of lepra reaction due to the indiscriminate use of sulfones, cortisone (Schering) was used, four 25-mgm. tablets per day. In this paper is summarized the clinical records of 6 of those cases, treated with good results which led to the conclusion that if the results obtained with cortisone in these cases is durable, that drug will be of great benefit to many patients who suffer with such leprotic reactions.

—AUTHOR'S SUMMARY

DE SOUZA LIMA, L., SOUZA CAMPOS, N., ROSEMBERG, J. and AUN, J. A. O emprêgo do BCG na dessensibilização da reação leprótica. [The use of BCG for desensitization in lepra reaction.] Rev. brasileira Leprol. **21** (1953) 59-66.

This report deals with 36 cases, all lepromatous, which had chronic lepra reaction for various periods of years and were subject to acute exacerbations, cutaneous or extracutaneous. Of this group, 19 were male and 17 female; they had been interned from 1 year (2 cases) to 14 years (1 case), the largest number (13) for 4 years [average 4.4 years]. The treatment was by the "concurrent" method of Arlindo de Assis, 0.2 gm. of BCG being given orally once a week for 15 weeks. After approximately a year of observation, 8 cases (22%) had complete clearing up of the condition; 9 cases (25%) had disappearance of the reactional elements, there remaining only cutaneous residuae; 14 cases (39%) showed marked improvement, with decreased intensity of the ENL elements; while in 5 cases (14%) there were no results.

—H. W. W.

LIPPELT, A. BCG e eritema nodoso em doente de lepra. [BCG and erythema nodosum in leprosy.] Rev. brasileira Leprol. **21** (1953) 221-224.

Erythema nodosum leprosum occurs in 65-70% of interned lepromatous patients. In the present sulfone era the frequency seems to be greater than before, but the intensity is less. Many patients whose specific lesions have healed remain in the hospital because they continue to have the eruptions; they are deprived of the privilege of dispensary treatment because the clinical condition is interpreted as a sign of activity. The author gave BCG, 0.2 gm. per week to a total of 3.0 gm., to 200 leprosy patients with ENL. Only 20% were able to leave the hospital for dispensary treatment, and another 20% showed distinct improvement, i.e., decrease in the frequency and intensity of the eruptions. The results are not very encouraging, but the treatment is harmless and, small as is the number of cases cleared up, no other available treatment is as good.

—H. W. W.

WILKINSON, F. and COLOMBO, V. La hialuronidasa en las neuritis de la enfermedad de Hansen. [Intraneural hyaluronidase in leprosy neuritis.] Orientación Méd. **4** (1955) 342-346.

The authors used the hyaluronidase diffusion factor, intraneural, for the treatment of leprosy neuritis (technique described). They injected 56 nerves (ulnar, radial, median, sciatic, external popliteal, and the auricular branch of the superficial cervical plexus) in 45 patients. They obtained 78% marked improvement, and conclude that the intraneural injection of hyaluronidase is practical and harmless and better than the prevailing methods of treating neuritis. They have treated lepromatous cases almost exclusively, and so cannot say anything about differences of results dependent on type. Neither can they make an appraisal with respect to specific therapy, since the treated patients were receiving sulfones. They saw no appreciable modification in lepra reaction, although the few patients with neural reaction that were treated responded rapidly.—[Authors summary, supplied by G. Basombrio.]

- ✓ FARINA, R. Nose tip collapse through loss of chondro-mucous substance. (Repair of nasal lining.) *Plast. & Reconst. Surg.* **13** (1954) 137-143.

Collapse of the tip of the nose of one or both alae is of common occurrence in leprosy; leishmaniasis and nasal abscesses are among other causes mentioned. The mechanism of the collapse, and the treatment and operative procedure, are thoroughly described. Satisfactory results are obtained with either frontal or nasolabial flaps, but the latter is preferable when the collapse is unilateral. The frontal flap has the advantage of uplifting the lobule of the nose more evenly. After the nasal lining is repaired, the dorsum has to be rectified and the nose tip raised by bone graft or a columello neoplasty. [This article in Portuguese, illustrated with 26 photographs of 5 patients, appeared in *Rev. brasileira Leprol.* **21** (1953) 1-6.] —SR. HILARY ROSS

- ✓ FARINA, R. Rinoneoplastia total na lepra. (Método Indiano.) [Complete rhinoplasty in leprosy; Indian method.] *Rev. brasileira Leprol.* **21** (1953) 7-12.

In a discussion of the complete reconstruction of the nose in leprosy patients, particular reference is made to the advantages of the Indian method with intersuperciliary pedicle, bone graft (not cartilaginous), and columella-plasty. The method proposed by the author has the advantage of a smaller number of operations, more adequate coloring of the repair, and less retraction of the transplant, but it leaves a frontal scar. The advantages and disadvantages of the Italian and Ollier's methods are also considered. Six photographs of each of 5 patients are reproduced.—[From abstract in *Excerpta Med.* **9** (1955) 21.]

- ✓ FARINA, R. Cirurgia plástica e reparadora da cabeça na lepra. [Plastic and reparative surgery of the head in leprosy.] *Rev. brasileira Leprol.* **21** (1953) 261-279.

The author, plastic surgeon of the Sanatorio Padre Bento in São Paulo discusses here briefly the things that can be done to repair disturbances of the nose, ears, eyebrows, eyelids, lips, and the skin of the face itself. A brief section is devoted to other deformities secondary to the existence of lepromas. There is interest in the 13 pages of illustrations, a total of 111 pictures of 24 patients, showing the condition treated and the results obtained with various deformities of the nose, ptosis of earlobes, loss of eyebrows, and a few other things. —H. W. W.

- ✓ RELVICH, A. L. The treatment of tuberculosis in leprosy patients. *Leprosy Rev.* **25** (1954) 179-186.

Until the introduction of thiosemicarbazone the death rate from tuberculosis was very high among leprosy patients in the Beni Delta leprosy control area in Nigeria, even after the introduction of sulfones. With thiosemicarbazone treatment there was a great improvement, but tuberculosis was not cured until streptomycin and isoniazid treatment was introduced in 1953. Since then a dramatic change has taken place in the tuberculosis, but these two drugs have had no effect on the leprosy. The author therefore recommends combining these drugs with sulfones or thiosemicarbazone. [The reviewer would like to draw attention to the article by W. S. Davidson, *Leprosy Rev.*

- 25 (1954) 69-73—see THE JOURNAL 23 (1955) 105—who found biological incompatibility in the combined use of sulphetrone and isoniazid.] —G. O. TEICHMANN

BONCINELLI, U. and PEROSA, L. Proteinuria di Bence-Jones nella malattia di Hansen. [Bence-Jones proteinuria in leprosy.] *Ann. italiani Derm. e Sif.* 8 (1953) 241-258.

Boncinelli had previously reported a substance similar to the Bence-Jones protein in the urine of leprosy patients with nephritis. In the present investigation the authors try to identify that substance, which they found associated with albumin in the urines in 16 of 50 nephritic leprosy patients. The similarities between it and the Bence-Jones protein are very close. The substance is unstable in concentrated NaCl solutions in acid medium, and to sulphosalicylic acid; it has an electrophoretic pattern similar to the Bence-Jones substance; it is precipitated by an anti-Bence-Jones serum at a higher titer than by an antihuman serum. It is excreted by patients with severe visceral lesions (amyloidosis). Since the Bence-Jones protein is considered to be a group of substances, the authors are not able to identify their substance with the Bence-Jones substances. —M. TERNI

TAKAHASHI, T. Studies on the blood sedimentation in leprosy patients. (Part 4.) Experiments of blood sedimentation ratio in rabbits. *La Lepro* 23 (1954) 251-256 (in Japanese; English abstract p. 251).

The effects of antileprosy agents such as promin, koha, chaulmoogra oil, and of inoculation with human, murine and pseudomurine leprosy bacilli, upon the blood sedimentation rate in rabbits were studied. Intravenous injection of promin for 111-178 days (30-32 cc.) accelerated the BSR. Intramuscular injection of chaulmoogra oil for 111-178 days (47-76 cc.) caused no change, nor did the injection of koha for 133-145 days. Of 10 rabbits which had received 20-119 cc. of a suspension of the human leprosy bacillus subcutaneously for 35-221 days, 3 showed no change, 3 slight change, and 3 moderate change; the remaining 1 had striking acceleration of the BSR. Every animal inoculated with murine bacilli showed acceleration. In those inoculated with 9 mgm. of pseudomurine bacilli in 45 days, 3 showed slight change and the other 2 moderate acceleration. A skin suspension, injected 28 cc. in 45 days into 5 control animals, produced almost no change of the BSR.—[From abstract.]

TAKAHASHI, T. Studies on the blood sedimentation in leprosy patients. (Part 5.) Relation of B. S. R. and serum proteins to B. S. R. of leprosy patients and rabbits. *La Lepro* 23 (1954) 256-259 (in Japanese; English abstract p. 256).

In this part of the work the correlation between the serum proteins and the BSR of leprosy patients and experimental rabbits was investigated. In the serum protein fractions of patients, there was decrease of albumin and increase of globulin, especially of γ -globulin, related in degree with the seriousness of the disease. This fact appears to have a relation to the BSR. In the experiments with rabbits, the injection of antileprosy agents did not provoke any increase of globulin, while the injection of human and other leprosy bacilli gave a rise to increase of γ -globulin in most animals. These results are in accordance with the BSR. The control group which had received injections of the skin suspension presented no marked change in the serum protein fractions.—[From abstract.]

DE OLIVEIRA LIMA, S. O índice leucocitemico de Véléz em tisiopreologia. [The leucocytic index of Véléz in tuberculosis and leprosy.] *O Hospital* (Rio de Janeiro) 44 (1953) 139-145.

The author carried out the Véléz test on the bloods of 201 leprosy patients (about 3 tests per patient, totalling 614) with the following results:

Cases	Positive	Doubtful	Negative
Lepromatous (155)	52 (33%)	59 (38%)	44 (28%)
Tuberculoid (46)	11 (24%)	7 (15%)	28 (61%)
Total (201)	63 (31%)	66 (33%)	72 (36%)

The difference between the lepromatous and tuberculoid cases is regarded as significant. A second table has to do with 125 patients found negative for tuberculosis by X-ray examination of the chest, classed with respect to lepromin reaction:

Cases	Positive	Doubtful	Negative
Lepra reaction	14	17	0
No reaction	0	34	41
Tuberculoid	0	7	12

In these cases the lepra reaction was regarded as responsible for the positivity. A third table shows the results in cases with tuberculosis, inactive or active:

Cases	Positive	Doubtful	Negative
L, inactive tuberculosis	0	4	3
L, active tuberculosis	38	4	0
T, inactive tuberculosis	0	0	16
T, active tuberculosis	11	0	0

Finally, 111 cases of tuberculosis without leprosy, 105 of them active and 6 inactive, were tested (as before, about three tests per patient), with the following results:

Cases	Positive	Doubtful	Negative
Inactive tuberculosis	0	2	4
Active tuberculosis	105	0	0
Normal controls	0	3	17

It is concluded that, in leprosy patients without lepra reaction, a positive test means active tuberculosis. This study is to be extended. —H. C. DE SOUZA-ARAUJO

HADLER, W. A. Estudo comparado das lesões provocadas pela injeção intradérmica de suspensões de *M. leprae* e *M. tuberculosis* em cobaias normais. [Comparative study of the lesions provoked in normal guinea-pigs by intradermal injections of *M. leprae* and *M. tuberculosis*.] Rev. brasileira Leprol. 21 (1953) 315-340.

In these experiments 92 guinea-pigs were used in total, divided into four lots of 20 or more each. Each animal in Lot 1 was injected intradermally with BCG tuberculosis, heated at 100°C for 2 hours, the dose of 0.1 cc. containing 0.33 mgm. Lot 2 received regular lepromin containing 0.74 mgm. of *M. leprae* per cc. (determined by the author's method; see following abstract). Lot 3 received the same lepromin concentrated by centrifuging to contain 3.4 mgm. per cc. The lot 4 guinea-pigs received two injections each, BCG on one side and lepromin of the same dilution on the other side; but relatively little is said of them. The BCG injections caused slightly larger lesions at 24 hours than the lepromins, but they retrogressed slightly more rapidly. At 21 days, however, all three were under 0.5 mm. on the average. There is no indication of anything different in the injection sites of the doubly-injected animals. Stress is laid on the histological findings with regard to the bacilli. They are taken up by macrophages and undergo lysis; the substances liberated by lysis cause transformation of the cells to the epithelioid type; and these cells, endowed with high metabolic activity, split the substances that were liberated by the lysis. This two-stage process occurs more rapidly with *M. tuberculosis* than with *M. leprae*, the macrophage phase being shorter and the epithelioid phase developing earlier. Consequently, tubercle bacilli disappear sooner than leprosy bacilli. The greater resistance of the latter to lysis can, it is stated, explain the two fundamental types of histologic structures which this bacillus produces in human tissues. In lepromatous leprosy the macrophages are unable to destroy the bacilli, and consequently they undergo transformation to the lepra cells. In the tuberculoid type the bacilli are lysed by the macrophages which then become epithelioid cells. On the other hand, the intra-

cutaneous injection of the tubercle bacillus in human beings, including lepromatous cases, always gives rise to the tuberculoid granuloma, with bacterial lysis. Thirteen photomicrographs are intended to demonstrate the tissue reactions to the two bacilli at various intervals from 24 hours to 40 days.

—H. W. W.

HADLER, W. A. and ZITTI, L. M. Estudo da sensibilidade tuberculínica em cobaios normais inoculados experimentalmente com *M. leprae*, *M. leprae murium* e *M. tuberculosis*. [The sensitivity to tuberculin in normal guinea-pigs inoculated experimentally with *M. leprae*, *M. leprae murium* and *M. tuberculosis*.] Rev. brasileira Leprol. **21** (1953) 341-364 (summary in English).

In contrast with the large number of studies of sensitivity to tuberculin in leprosy patients is the small number of experimental observations in animals, and they are contradictory. In the authors' study 173 tuberculin-tested guinea-pigs were used, inoculated (1) with *M. leprae* (four subgroups, intraperitoneal and intradermal, with various amounts of bacilli), (2) with *M. leprae murium* (two subgroups, both intraperitoneal), and (3) with BCG (also two subgroups, both intraperitoneal); the fourth lot was kept for controls. The tuberculin tests were made periodically with 0.05 cc. of 1:10 OT. The results are set forth in 20 tables and 2 graphs, and in the summary. *M. leprae* inoculated intraperitoneally gave rise in most of the animals to tuberculin hypersensitivity, usually weak, which took 30 days to develop and waned thereafter, disappearing by the 60th day. The intracutaneous injections were much less effective. Lepromin caused no hypersensitivity. *M. leprae murium* induced hypersensitivity more slowly, reactions increasing up to the 60th day, but it was well-established in 90% and it remained unchanged up to the 160th day, waning at the 200th day. The results with BCG were identical with those with the Stefansky bacillus.

The following is the procedure used to determine the weight of bacilli (human and rat) per cc. of suspension [see preceding abstract]: 10-20 cc. was evaporated by heat (90°-100°C) and ground in a mortar with 15-20 cc. of chloroform, which was then transferred to a separatory funnel; the trituration was repeated 3 or 4 more times, until the residue was free from bacilli. The collected chloroform in the funnel was decanted after 30 minutes and afterward centrifuged at 1,000 rpm for 5 minutes, then carefully separated. This chloroform contained the bacilli and lipids. After evaporating with heat (60°C) the residue, dried in the presence of sulfuric acid, was weighed. This method—that of Dharmendra, slightly modified—gives the approximate weight of bacilli per cc. of suspension. It is not a precise method, for it includes the tissue lipids extracted by the chloroform, and there is a slight loss of bacilli in the tissues. It is, however, held to be better than the method of separation by repeated centrifuging in solutions of different densities.

—H. W. W.

SAGHER, F., LIBAN, E. and KOCSARD, E. Specific tissue alteration in leprous skin.

VI. "Isopathic phenomenon" following BCG vaccination in leprous patients.

A. M. A. Arch. Dermat. & Syph. **70** (1954) 631-639.

The authors continue their study of the histologic lesions produced in lepromatous cases at the sites of injections of various specific and nonspecific materials [THE JOURNAL **20** (1952) 341-346; **21** (1953) 459-462; also, abstracts, **21** (1953) 612, **22** (1954) 112 and 113], studies which have indicated that the skins of such patients have a specific altered reactivity. They now report on the results with BCG, selected for one thing because in healthy persons it produces a lesion readily distinguished histologically from the lepromatous infiltration. Twenty-one patients, 13 with and 8 without active lesions, were injected intradermally. Clinically the effects were as in normal persons, the tuberculin-positives (9 of the 21) showing an accelerated or Koch-type reaction. Histologically, however, the lesions were the same regardless of tuberculin reactivity. Of 25 biopsy specimens taken from 16 patients at intervals of

4 days to 10 months after vaccination, 22 showed "isopathic" changes. Usually they were quite leproma-like (3+), and only in 8 instances were they prelepromatous (2+) or less. The question is discussed of whether or not such inoculations might reveal the presence of active leprosy and thus be useful in detecting early cases or even infection in contacts. [Presumably referring to those with or to develop the lepromatous type of the infection.] Also, whether the procedure might be of value in determining the effectiveness of treatment, suggestive indications having been seen. [The table, however, shows three 3+ findings and one 2+ in the five "inactive" cases biopsied.] Of the 12 patients tuberculin negative before the inoculation, 8 became positive afterward. All were negative to lepromin before the tests; of 20 tested afterward, 5 gave positive early and late reactions, while another 6 were positive to the early reaction only. No benefit seemed to result from this change of reactivity. One to 2 years later all were again negative. —SR. HILARY ROSS

8 BECHELLI, L. M. and QUAGLIATO, R. Teste de Mitsuda na lepre tuberculóide em reação. [The Mitsuda test in tuberculoid leprosy during reaction.] *Rev. brasileira Leprol.* **21** (1953) 51-58.

Of 119 cases of tuberculoid leprosy given the Mitsuda test during attacks of lepra reaction, 14 were negative, 1 was doubtful, 17 were 1+, 44 were 2+, and 43 were 3+. The degree of positivity varied directly with the duration of the reaction; the longer the time after its onset, the larger the percentage of positives. Of the patients in whom it had lasted 15 or more months, none was negative. It was noted, however, that when the test was repeated, at intervals of 6 or more months, the results first obtained tended to be repeated on subsequent occasions. In some cases, in which the clinical manifestations regressed very slowly, remaining active for 2, 3 or more years, the Mitsuda reaction remained negative or only weakly positive. Another factor was the number of lesions, cases in which they were few being most likely to be positive. The results showed that a positive reaction can occur in bacteriologically positive cases, but in general those with frankly positive reactions were negative for bacilli on routine examination.—[In part from abstract in *Trop. Dis. Bull.* **50** (1953) 1055.]

8 MARKIANOS, J. Action éventuelle de l'injection de lépromine sur l'apparition de la lèpre et sensibilité tardive à cet antigène provoquée par la vaccination au BCG. [Later effect of lepromin injection on the appearance of leprosy and the delayed sensitivity to this antigen provoked by BCG vaccination.] *Bull. Soc. Path. exot.* **47** (1954) 30-32.

An infant born to leprosy parents was separated from them at the age of 5 years, at which time he showed no symptoms of leprosy. Twenty-one months later he was given an injection of lepromin. The reaction was negative, but 3 weeks after the injection of the antigen there were noted two cutaneous lesions with impaired sensation. The patient was treated with diasone, 500 mgm. daily. After 3 weeks of treatment the spots had become larger, new ones appeared, and Hansen bacilli were found in skin specimens. The sulfone treatment was continued in a smaller dose, and after some months the spots subsided and the bacteriological examinations were negative. This patient, whose Mantoux reaction was negative, was given BCG intradermally, and 25 days after the vaccination a positive Mitsuda reaction appeared at the site where the lepromin had been injected 194 days before. —M. VIETTE

8 ISHIHARA, S. The supplementary results of Dharmendra's lepromin (refined and standardized) test. *La Lepro* **23** (1954) 297-300 (in Japanese, English abstract p. 297).

Intradermal tests with the lepromin reagent of Dharmendra were made in 229 leprosy cases (174 nodular, 54 neural, 10 tuberculoid), the Mitsuda test being applied

at the same time for comparison. The results were as follows:

Test	Lepromatous		Neural		Tuberculoid	
	— or ±	1+ or 2+	— or ±	1+ or 2+	— or ±	1+ or 2+
Mitsuda	164	10	4	41	0	10
Dharmendra ..	173	1	12	33	0	10

The Mitsuda and Dharmendra reactions coincided 100% in positivity in the tuberculoid cases, and 90% in negativity in the nodular cases. In the neural cases the Mitsuda reaction was positive in 91%, while the Dharmendra reaction was positive in 70%. —[From abstract, tabulation made up.]

APPEL, B., FERNANDEZ, J. M. M. and DOUGHERT, E. F. The influence of the local injection of hydrocortone (Compound F) on the reactions to tuberculin, lepromin, Frei and Ducrey antigens. *J. Invest. Dermat.* **23** (1954) 237-250.

The authors have investigated with the antigens listed in the title the inhibitory action of the corticosteroids on reactions of hypersensitivity, with special interest in the local action of hydrocortisone acetate on the reactions to lepromin. The study involved 15 adults with benign dermatoses who had not had contact with leprosy. They injected 0.2 cc. of the drug (25 mgm. per cc.) intradermally, and then in the same place injected one of the antigens studied. Of 46 control tests, 12 were with tuberculin (Mantoux), of which 6 were positive; 9 were with Ducrey vaccine, of which 8 were positive; 10 were with the Frei antigen (Lygranum), of which 5 were positive; and 15 were with lepromin, all of which were positive. The hydrocortisone partially or totally inhibited the reactions to tuberculin, Frei, Ducrey, and the early allergic (Fernandez) reaction to lepromin in the majority of the cases. This drug also inhibited the late (Mitsuda) immune reaction to lepromin, either partially or totally, preventing the formation of the nodule at three weeks and later. Histologic examinations confirmed the clinical observations by showing that the drug produces atrophy of the epidermis and suppresses the formation of the histologic infiltrate that characterizes these reactions. The authors conclude that the parallelism in the inhibitory action of hydrocortisone over the early and late responses to lepromin suggests an intimate relationship between the two phenomena. [Later, in their article in *THE JOURNAL* **22** (1954) 129-138, the authors speak of this present report as a preliminary one.]

—SR. HILARY ROSS

SUTER, E. and WHITE, R. G. The response of the reticulo-endothelial system to the injection of the "purified wax" and the lipopolysaccharide of tubercle bacilli. *American Rev. Tuberc.* **70** (1954) 793-805.

This study is based primarily upon the rôle which Raffel and associates have demonstrated that the wax fraction of the tubercle bacillus (or, more strictly, the lipopolysaccharide of Asselineau and Lederer) have in the experimental induction of the delayed type of hypersensitivity to tuberculin and also to other substances, a condition the mechanism of which is unknown. [See *THE JOURNAL* **20** (1952) 167-171, five abstracts.] Addition of the wax fraction to water-in-oil emulsions has been found to cause enormous proliferation of macrophages locally and in distant locations. The present study is mainly of the suitability, for intracellular multiplication of tubercle bacilli in tissue cultures, of peritoneal exudate mononuclears of guinea-pigs treated with the bacillary wax. [See *THE JOURNAL* **22** (1954) 1-11, original article; 118-119, two abstracts.] In three separate experiments it was found that such cells depressed or inhibited multiplication "to a considerable extent"—to the same degree, in fact, as do cells from guinea-pigs vaccinated with BCG. Secondly, the authors report further on the tissue effects of injection of emulsions containing either purified wax or lipopolysaccharides into the footpad of the guinea-pig. The foot swells to several times the normal size and ulcerates, and there is massing of large, coarse macrophages

of very different appearance from those in control lesions. There is also considerable proliferation of such cells in various distant organs. —H. W. W.

INZERILLO, R. La reazione di Middlebrook-Dubos nei lebbrosi. [The Middlebrook-Dubos reaction in leprosy patients.] Arch. E. Maragliano Pat. e Clin. **7** (1952) 1177-1183.

In 50 leprosy patients of different types, the Middlebrook-Dubos hemagglutination reaction (sheep cells sensitized with Koch's old tuberculin diluted 1:8) gave the following results: negative 1:4, 0%; positive 1:4, 12%; 1:8, 24%; 1:16, 22%; 1:32, 24%; 1:64, 14%; 1:128, 4%. There seemed to be no relation between the titers of the positive reactions and age or sex, type or severity of the disease, or bacteriological findings. —M. TERNI

DOULL, J. A. and STRACHAN, J. H. Group reactions to mycobacterial extracts. Leprosy Briefs **6** (1955) Nos. 1 & 2.

This being a very condensed review of the literature on the subject indicated, it is not susceptible to abstracting but should be examined in the original. There are 29 references, some to items which themselves are reviews. —H. W. W.

FERNANDEZ, J. M. M. Bacteriology of leprosy. Med. Panamericana **3** (1955) 345-358.

Methods other than culture *in vitro* and inoculation of *M. leprae* must be used to determine whether the germs are alive or dead. Three methods have been used for this purpose: (a) direct observation with the electronic microscope or the phase-contrast microscope; (b) observation of cell respiration; (c) staining. In the work reported in this paper the Ziehl-Neelsen method was used to determine whether the bacillus undergoes significant changes in morphology or staining affinity when submitted to procedures which might have influence on its vitality. Bacilli obtained under the following conditions were studied comparatively: (a) from patients treated with sulfones or chaulmoogra oil, and from patients who had received no previous treatment; (b) from recent, fresh lepromata, and from lepromata submitted to heat in different ways; (c) from recent, fresh material and from material which had been kept in different preserving fluids for days, months or years. It was found, taking into account morphologic characteristics, staining affinity, degree of positivity, and distribution of the bacilli, that the Ziehl-Neelsen method permits differentiation between lepromata from treated and untreated patients, and between fresh lepromata and macerated lepromata or a boiled suspension of bacilli. Taking into account only the individual bacilli, however, i.e., their morphologic and staining characteristics, it is not possible to establish the origin of the material under examination, because similar morphologic and staining characteristics are seen in bacilli from fresh lepromata or lepromata submitted to boiling, autoclaving, maceration, clinical treatment, or tissue reaction (in inoculation). Conclusion: the Ziehl-Neelsen method does not permit differentiation between living and dead bacilli.—[From author's summary, supplied by G. Basombrio.]

ITO, M. and OHIRA, K. Bacteriological investigations of suppuration in the lesions of erythema nodosum leprosum. La Lepro **23** (1954) 279-281 (in Japanese; English abstract p. 279).

The suppuration which takes place in the course of erythema nodosum leprosum has been studied to determine if this condition is caused by ordinary pyogenic germs, excluding the leprosy bacillus. Pus was collected aseptically from 42 ENL lesions of which the overlying epidermis was still intact, and was planted on goat-blood agar, aerobically in ordinary bouillon, anerobically in Tarozzi's bouillon, and on Kirchner's and Oka-Katakura's media for acid-fast bacilli. The results follow:

	Blood-agar	Bouillon	Tarozzi bouillon	Kirchener and Oka-Katakura
Number of cases examined.....	39	29	23	24
Negative results	38	26	21	24
Positive results	1	3	2	0

The cultures were entirely negative except in 3 cases. In 2 cases a *Corynebacterium* appeared, but it did not grow on blood-agar and is therefore regarded as a non-pathogenic saprophyte contaminating the cultures accidentally. In the third case *Staphylococcus albus* appeared in the bouillons, and it and *Staphylococcus aureus* upon blood-agar. In this case the pus itself contained these organisms, but the significance of the fact is a question. It is concluded that the suppuration of the lesions of erythema nodosum leprosum is independent of pyogenic or other organisms which can be recognized by the various media used, but must be attributed to some other mechanism.—[From abstract.]

HARADA, K. Cytochemistry in leprosy bacillus. *La Lepro* **23** (1954) 271-278 (in Japanese; English abstract p. 271).

Nucleic acid, gram substances and volutin of the leprosy bacillus have been stained with the Feulgen reaction, Newton's gentian violet (modified method), Brachet's methyl green-pyronin method, thionin method, gram staining and our diluted gentian violet method. The mechanisms of these staining methods are discussed. Leprosy bacilli are stainable with the Yoshida method for mitochondria, and with Baker's phospholipid method, to the same degree as with the Ziehl-Neelsen method. From these and other histochemical findings, the acid-fastness of leprosy bacillus is attributed to phospholipid or unsaturated lipid in the bacilli. And it is imaginable that the center of metabolism of the leprosy bacillus is in the nucleus.—[From abstract.]

NAKAGAWA, Y. and NAKAMURA, M. Animal experiments of *Mycobacterium leprae*. *La Lepro* **23** (1954) 293-296 (in Japanese; English abstract p. 293).

The effects of various experimental methods with leprosy and mice and developing chick embryos have been tested, as follows: subcutaneous or intraperitoneal injections of glandular mucin and Ota's solution containing trypan blue, diatom and potassium iodide into mice before or after the inoculation of *M. leprae*; intraperitoneal injection of cobra venom before the inoculation of bacilli; intracerebral inoculation of bacilli into suckling or slightly older mice; inoculation of *M. leprae* into the yolk sacs of developing chick embryos. No propagation of the lepra bacilli was obtained in any of the experiments.—[From abstract.]

NISHIMURA, S., KONO, M. and MASUDA, T. Effect of antibiotics on murine leprosy. *La Lepro* **23** (1954) 74-81 (in Japanese; English abstract p. 74).

The inhibitory effects of certain antibiotics—acidomycin (thiazolidone antibiotics of McLamort *et al.*), streptomycin, and aureomycin—on the development of murine leprosy were studied. Acidomycin and aureomycin had no inhibitory action, but streptomycin had a moderate inhibitory effect. From these results and those of previous studies of chemotherapeutic agents, it is believed that antibiotics which are ineffective in experimental tuberculosis are also ineffective in preventing development of murine leprosy.—[From abstract.]

NISHIMURA, S. and MASUDA, T. Studies on the chemotherapy of leprosy. Part 16.

On the resistance of the murine leprosy bacillus against streptomycin and prevention of INAH resistance by the combination of INAH and S.M. *La Lepro* **23** (1954) 345-348 (in Japanese; English abstract p. 345).

This paper reports the results of experiments to determine (1) if the murine bacillus can become resistant to SM, and (2) if the combination of SM with INH can prevent the murine bacillus from becoming resistant to INH. Relative to the first

question, white rats inoculated subcutaneously with the murine bacillus were injected with SM, 5 mgm. a day, six days a week. The lepromas which had developed after the total of 610 mgm. SM and that had developed after the total of 650 mgm. SM and then received no treatment for 150 days [sic] were selected for the inoculation of the next lot of animals. These two strains were inoculated into white rats and SM of the same dose was injected in the same manner for 150 days. The results show that the onset of the disease was inhibited to the same degree with both strains as in the case of SM-sensitive strains previously reported [see preceding abstract]. It is concluded that the multiplication of the murine leprosy bacillus cannot be strongly inhibited by SM, but it does not become resistant to it. Relative to the second question, a total of 50 mgm. INH and 200 mgm. SM were administered (INH 4 mgm./kgm. and SM 20 mgm./kgm. daily, 6 days a week for 60 days) to white rats with large lepromas. The lepromas that remained were extirpated, diluted, and inoculated to other rats, and those of this second generation were in turn transferred to a third lot. These animals were then administered INH from the next day for 150 days. The results show that there was an appreciable resistance compared with the sensitive strain, but development was clearly more delayed than with our resistant strain [THE JOURNAL 22 (1954) 494]. Therefore, INH resistance can be lessened by the combination of SM with INH.—[From abstract.]

NISHIMURA, S., KONO, M., TERA, S., MASUDA, T., SONODA, R. and HAYASHI, I. The inhibitory effects of isonicotinic acid hydrazine derivatives upon the murine leprosy. *La Lepro* 23 (1954) 287-291 (in Japanese; English abstract p. 287).

In a search for the effective radical of INH upon the murine leprosy bacillus, aromatic aldehyde derivatives of INH and hydrazines combined with thiazol or pyrimidin nuclei, which have strong inhibitory effects upon the tubercle bacillus *in vitro*, were examined. Two of the compounds have the most inhibitory effect, two of them appear to accelerate the development of murine lepromas, while other derivatives have no effect. From these results it follows that drugs which are effective with the tubercle bacillus cannot be expected always to be efficient with the murine bacillus. The effect of INH upon the murine bacilli cannot be attributed only to the hydrazine radical, because the derivatives consisting of H_2N-NH_2 cannot always have the inhibitory effect, while some of the compounds combined with $COOH \text{ } \bigcirc \text{ } N$ besides INH have this effect. Therefore, isonicotinic acid cannot be expected to provide the effective radical for research upon the murine leprosy.—[From abstract.]