

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 needed.

SAGHER, F. Leprosy. (A review of the literature of late 1950, 1951 and part of 1952.) *Dermatologica* (Basel) **107** (1953) No. 3, 183-224.

This is one of the compilations that the author has made, much of the nature of the supplements to his book that Klingmüller used to make, about which it is impossible to do much more than indicate its thoroughly comprehensive scope. There is one passage however, that tells of an apparently unpublished observation of his own. Speaking of the conversion by BCG vaccination of lepromin nonreactors to positive reactors, it is said that an observation in the leprosy hospital in Jerusalem has shown that this "tissue immunity" may be temporary. BCG inoculations in 22 patients induced weakly positive reactions to lepromin in 10 of them, but 1 or 2 years later all of them were again negative. —H. W. W.

[C. I. O. M. S.] Council for International Organizations of Medical Sciences, Annual report for 1954.

The introduction of this detailed mimeographed report summarizes its activities and accomplishments. It is noted among other things that the Council was invited to represent medical sciences on a UNESCO committee, and that it organized a new and successful type of international symposium on the subject of Support of Medical Research. Another symposium organized by the Council was on Glaucoma on the North-American Continent. During the year 19 congresses and conferences were coordinated into 8 groups, and a total of U.S. \$20,533 was allocated to 18 international meetings. (The address of the Council is 19, Avenue Kléber, Paris 16e.) —H. W. W.

[TANGANYIKA] Annual Report of the Medical Department, 1954. Dar es Salaam, Government Printer, 3/-.

Much progress was made, it is stated, in accordance with the new policy of extending outpatient treatment of leprosy. In the Eastern Province two rural medical aides and two tribal dressers received a month's intensive course in the diagnosis and treatment of leprosy and returned to their dispensaries, where they would be visited monthly by the district medical officer. Cases will be screened and lepromatous ones will be sent to the Chazi leprosarium; the tuberculoid cases will be treated in the native administration dispensaries. A similar scheme for the Lake Province, drawn up with the Interterritorial leprologists, envisions the use of 57 centers to treat an estimated total of 3,000 cases. An outpatient scheme centered on Muheza, established in 1953, has continued to be very popular and successful. Treatment teams tour a large area on 11 regular routes, and a total of 2,630 patients received treatment during the year. The large numbers of patients who leave the Chazi leprosarium before completing treatment is a matter of anxiety. The situation is ascribed in part to some of the patients having been coerced by relatives to enter the center, and in part to the fact that some of the patients thought they should be fed and clothed free and were unwilling to do any work in return. —H. W. W.

[EL SALVADOR] Contribución al estudio de la lepra en El Salvador, C.A. [Contribution to the study of leprosy in El Salvador, Central America.] Pamphlet, typewritten with 11 photostated maps and printed cover.

It is stated that this report was presented to the Madrid congress by the department of dermatology of the Hospital Rosales, San Salvador, but no record of it is found in the official transactions. The history of the disease goes back only to 1885, when a patient presented himself at the hospital. The next actual record is of a lepromatous case diagnosed in 1937, and cases have been seen sporadically since then. Tables show 62 known cases, for a rate of 3.2 per 100,000 of the population of an estimated 1,900,000 inhabitants. Nearly one-half (29) are from a single political subdivision, Chalatenango. All are in mestizos; no case has been seen among the pure Pipil Indians, although they live the same kind of life as the mestizos and whites. Clinical and histological descriptions of the different types are given, but there is no statement about the numbers of the several kinds; the results of various examinations are given; treatment is mainly by sulfones. —H. W. W.

[VIET-NAM] Rapport sur le fonctionnement technique en 1953, Institut Pasteur de Saigon, Drs. J. Fournier and de Lajudie, directeurs. [Technical report for 1953.] Saigon, 1954.

At the antileprosy dispensary of the Institut Pasteur there were 344 new cases—145 T, 48 I, 151 L, of which 16%, 17% and 98% resp., were bacteriologically positive. These were added to the 2,620 old ones on record, of which 1,087 had not been seen for more than 3 years; the total number treated was 954. Hydnocarpus (*krabao*) oil, soap and esters were being used, and much diasone (Diamidin) from American aid. Under "research" are detailed the results of work with BCG (intra-dermal injections) by Destombes and Choumara among the mountain people, involving more than 1,000 children, and by Lajudie and Chambon in the dispensary. Analysis of 219 cases showed agreement between the Mantoux and Mitsuda reactions before BCG (33% positive and 15% negative). In the figures given (see below) are seen certain features not mentioned in the report.

Type	Mantoux positive		Mantoux negative	
	Mitsuda +	Mitsuda -	Mitsuda +	Mitsuda -
Lepromatous	0	63	0	29
Indeterminate	19	17	4	29
Tuberculoid	54	16	13	0

Among the indeterminate cases (i.e., neither lepromatous nor reactive enough to be tuberculoid) the tuberculin reactivity made no difference with respect to reactivity to lepromin. Among the tuberculoid cases, 23% of the Mantoux positives were Mitsuda negative, but none among the tuberculin negatives failed to react to lepromin. Another table shows, among other things, that of 25 lepromatous cases tested with lepromin before and after BCG, all negative at first, 1 gave a positive Mitsuda reaction afterward while 4 gave positive Fernandez reactions. —H. W. W.

[GUADALOUPE] Rapport technique; année 1953, J. Mauzé, directeur. [Technical report for 1953.] Arch. Inst. Pasteur Guadeloupe 4 (1954) 1-25.

This thin publication is accompanied by a loose insert of the article on electrophoresis of serum of leprosy patients which appeared in THE JOURNAL [22 (1954) 55-60], without credit line. In the report itself it is stated that the new building for the Institute, began early in 1950, was not yet finished; there was no progress in 1953; the place where work is now being done is not shown to visitors. The village for people with leprosy is still a project. Detailed data are given of the 21 new cases found during the year. Sulfones are used mainly in treatment, but chaulmoogra products (usually combined with DDS) are also used. As the author had said before, hopes of the sulfones are too high. At Madrid, he relates, there was a tendency in the amphitheater to present them as the sole medication for leprosy, but in the corridors numerous leprologists recognized that they had been deceived—not that these drugs are not the best we have, but that with them serious relapses have been seen in cases

that were apparently cured and always under precautionary treatment; the author himself had seen such cases.

"Nous ne pouvons que regretter que la grande et la petite presse, s'acharne là, comme pour la tuberculose, à clamer, à grand bruit, que la lèpre est vaincue,—dernièrement on écrivait d'énormes betises sur le "vaccin" de soeur Marie-Suzanne. Cette dernière, que nous connaissons, n'a jamais dit que son "vaccin" guérissait ou guérirait."
—H. W. W.

[FRENCH GUIANA] Rapport sur le fonctionnement technique de l'Institut Pasteur de la Guyane Française et du Territoire de l'Inini pendant l'Année 1953. (Archives, Publication No. 326). Méd. Lt-Col. Floch, directeur. Cahors, 1954.

This report, of 260 closely-printed pages, is most unusual for one coming from such an institution; the amount of writing involved represents a major task, but the writer is known to be extraordinarily prolific. Much space is devoted to leprosy. First is a 19-page individualistic account of the Madrid congress, followed by some other related material. In the chapter on research and publications the first of 36 numbered subjects is leprosy, that having 17 topics treated in 38 pages. In a recapitulation of publications the first section is a list of 36 items (Nos. 277-312, incl.) of the *Archives* of the Institut, 13 of them on leprosy; 23 are by Floch alone and in the others except one (by Gougerot, in Paris) he was the senior author. Of the 40 titles listed as published elsewhere, 20 of which were on leprosy, 24 were by Floch alone and he appears as senior author in the others. There is of course much duplication among these 76 items in the two lists, although because of altered titles it is sometimes difficult to tell which are identical.
—H. W. W.

SLOAN, N. R. Leprosy in American Samoa. South Pacific Commission, Technical Paper No. 62; Noumea, New Caledonia, July 1954; mimeographed, 12 pp., 2/- sterling.

This three-week survey, made at the invitation of the local government as a further part of the South Pacific Commission leprosy project, is of a small group of islands totalling 76 sq. mi., of land area, of which only three are found on ordinary atlases: Tutuila (the main one, 40 sq. mi., high volcanic), Manu'a (here called the Manu'a group, also volcanic), and Rose (one of two coral atolls); the population is 19,000, most of them on Tutuila. The survey was conducted with the cooperation of Saipale Matagi, a Samoan medical practitioner trained in the famous school in Fiji and for leprosy in Hawaii, who conducts the leprosy program. The inquiry was evidently confined to the main island and mostly to schools that could be visited by road. Just 4,000 people were seen, including almost all known cases and a few contacts. The tabulated data are on 46 cases (2.4 per thousand), of which 25 were at Makogai, Fiji; all but 3 were from Tutuila itself; 31 were male and 51 female; 19 were lepromatous and 27 nonlepromatous; only 6 were newly found, all schoolboys either T or I. It is believed that the disease is diminishing. One of the recommendations is that a leprosarium be established locally, the Samoans at Makogai to be brought home. [It is said in the introduction (Dr. E. Massal) that the leprosarium had been prepared and housed 23 patients, most of them formerly at Makogai.] —H. W. W.

SLOAN, N. R. Leprosy in Western Samoa and the Cook Islands. South Pacific Commission, Technical Paper No. 69; Noumea, New Caledonia, October 1954; mimeographed, 28 pp., 2/- sterling.

The survey here reported, made in 1953, was the fourth and last carried out by the author in territories within the scope of the South Pacific Commission. A schedule of his travels during the five-weeks period illustrates the great transportation difficulties that affect such work; one trip was by rowboat. (1) Western Samoa (a trust territory under New Zealand), population 84,909 in 1951. There are two main islands: Upolu (430 sq. mi., including small islets, pop. 61,348), with the central town of Apia, and Savai'i (700 sq. mi., including two small islands nearby, pop. 23,561); both are

volcanic, fairly recently active. Most of the open cases found are sent to Makogai, for it would not be feasible to take care of them all in Samoa, although there are a few in a place connected with the hospital at Apia; nowadays the closed cases are not segregated but are treated as outpatients. In total 3,688 persons were examined, few of them adult males and practically none adolescents; 2 new cases were found. The total tabulated is 96, of which 60 were males and 36 females; 61 were lepromatous and only 35 nonlepromatous. The high lepromatous rate, it is suggested, may be due to lack of a thorough search for other kinds. As in American Samoa, only a few children were affected. (2) In the Cook Islands, a group of 15 of which 3 are uninhabited, the author spent some days on Aitutoki, and also visited Raratonga, where there were no known cases at the time. At Aitutoki one-half of the entire population was examined, only 1 new case being found; the rest of the 42 "newly diagnosed" cases had been found by John Numa, a Fiji-trained assistant medical practitioner who studied leprosy at Makogai. Of the 179 total, males were 108, females 71; the lepromatous cases were only 29 and the nonlepromatous 150. Striking were the high proportion of children and the low proportion of lepromatous, and it was remarked that it is hard to understand how there could be so many tuberculoid cases with so little evident source of contagion. [For a comprehensive report on the Cook Islands, by John Numa, see *THE JOURNAL* 21 (1953) 151-160.] —H. W. W.

[LOWE, J.] Leprosy as a communicable disease. *Lep. Rev.* 26 (1955) 51-55 (editorial).

In this editorial note, doubtless one of the last things written by Lowe for publication (his sudden death was announced in the last issue) he reviews this much discussed subject in his usual balanced, common-sense fashion. "While accepting the general view that in most circumstances the infectiousness of leprosy is of a low order (or perhaps its pathogenicity, for many must get infected without developing the disease)," he "does not subscribe to the view that close contact for long periods is always necessary for transmission; nor does he accept the view advanced by some workers that serious infection is nearly always acquired early in life." He ends, however, by reiterating the view that leprosy is not a disease apart but should be viewed in the light of modern concepts of communicable diseases and public health in general. —H. W. W.

LATAPI, F. La lepra en retirada? Estado actual del problema. [Is leprosy in retreat? Present state of the problem.] *Sinopsis* 1 (year?) No. 4.

Scanning of this 10-page article, an excellent educational one, has revealed nothing new except perhaps the statement that the number of cases in the country has been estimated to be at least 50,000, the officially known ones about 10,000. The latter part deals with the desiderata of an antileprosy campaign, ending with a summary statement about the Asociación Mexicana de Acción contra la Lepra, A. C. In addition to that institution there are Patronatos Regionales in Guadalajara, Culiacán and Mérida. [Certain of the facts given about the Association have been included in the story of that organization in the news section of this issue.] —H. W. W.

PICARELLI, J. O sigilo e a notificação na lepra. [Segregation and notification of leprosy.] *Rev. brasileira Leprol.* 21 (1953) 227-244.

This is a plea for a reversal of the present system of compulsory segregation employed in Brazil. Among the arguments used is the change in the patient's personality caused by the stigma and by separation from society, and also the tendency for patients to hide their disease as long as possible and thus be a danger to contacts. Instead of this, isolation should be encouraged on a domiciliary basis, as far as possible with adequate inspection to see that patients carry out the rules. This should be easier to make effective with the new forms of treatment now available.—[From abstract in *Trop. Dis. Bull.* 51 (1954) 700.]

MUÑOZ-RIVAS, G. Transmisión indirecta de la lepra murina por las pulgas. [Indirect

transmission of murine leprosy by fleas.] *An. Soc. Biol. Bogotá* **6** (1954) 181-198; also Bogotá, Colombia, 1954, 25 pp. (Privately printed.)

First publishing on the subject in 1942, the author has persistently worked on the thesis that fleas have a part in the transmission of leprosy, at least under conditions favorable to their propagation, and that measures to eradicate fleas should be a part of the antileprosy campaign [see *THE JOURNAL* **16** (1948) 116 and 403]. The present paper, apparently communicated to the Sociedad de Biología in Colombia and the Academia de Medicina at Rio de Janeiro, deals with experiments on the indirect transmission of the Stefansky bacillus by fleas. It was first ascertained that a suspension of rat leproma injected into rats and mice 4 days after it was made (kept at room temperature in the interim) killed them all, but was not infectious when 57 days old or more. Earth taken from the floors of habitations was inoculated with the suspension, and the bacilli were found to become noninfectious equally rapidly, in the absence of flea larvae. If, however, dried blood infected with Stefansky bacilli is placed where fleas are breeding, the larvae become infected and, the bacilli surviving the pupal stage, a small proportion of the emerging fleas are infected; triturated and inoculated subcutaneously into rats before biting for the first time, rat leprosy is produced. In one case such infection was obtained six months after the infected material had been placed in the experimental breeding place of the fleas. Indirect, experimental transmission of rat leprosy occurs under these conditions. Animals free in nature might probably be infected by eating food containing fleas from infected places, and also when infected fleas are crushed and rubbed against the skin during scratching. Because of the similarity between *M. leprae* and *M. leprae murium*, the author believes that the possibility that human leprosy may be transmitted by fleas cannot be ignored.—[Partly from the *J. American Med. Assoc.* **157** (1955) 262 (Foreign Letters).]

CHAUSSINAND, R. Condensé de léprologie à l'usage du médecin praticien. [Condensed leprology for the medical practitioner.] *Sem. Hôp. Paris* **30** (1954) 4405-4412.

This article is designed to give the nonspecialist practitioner an idea of the clinical, morphological and bacteriological features of leprosy and to aid them in diagnosis, classification, and treatment of cases. It is pointed out that leprosy should be sought systematically among all subjects who have lived in endemic countries and who present cutaneous or neuritic lesions. The evolution of the disease is briefly described: incubation generally 2-3 years; infection beginning at the place of penetration of the bacilli, showing visible cutaneous changes or a limited area of anesthesia without change of appearance of the skin; extension of the primary lesion, peripheral for the visible ones and centripetal for the neuritic ones; dissemination by neural and lymphatic channels, then through the blood. The evolution of leprosy is conditioned by the resistance of the subject, which is evidenced by the lepromin test (Mitsuda reaction). The preparation of lepromin is described in detail, and the reading of the reactions. The clinical lesions are described: In allergic subjects (tuberculoid and indeterminate) cutaneous lesions that are generally macular, well-defined, asymmetrical, with a tendency to peripheral extension, to coalescence, and to central resolution; presence of superficial impairment of sensitivity to touch. In anergic subjects, cutaneous lesions which are poorly delimited, with no tendency to peripheral extension of central resolution; inconstant superficial disturbances of sensitivity to touch; frequently symmetrical arrangement of lesions. Diagnostic procedures are described, and a treatment schedule is given. —M. VIETTE

BASSET. Hansen's disease. *Postgrad. Med.* **17** (1955) A 38-39 (Medicine from Abroad; Paris).

This is an over-all summary of leprosy as it exists in France. It no longer exists as an autochthonous disease. It is still rampant in the French colonial possessions, and many persons with it show up in Paris to escape ostracism and to

obtain treatment. There are others with the disease who came from the Mediterranean countries. Cases are found among the French armed forces who saw service in Indochina. Diagnosis does not result in isolation, but each case must be reported. The patient may enter a hospital treatment center, of which three are named. A striking increase has occurred in the number of ill-defined manifestations of the disease which come to light in the dermatological or neurologic services, and knowledge of this fact should increase the vigilance of dermatologists in Paris. —SR. HILARY ROSS

SARROLA, A. Les aspects de la lèpre en O.R.L. [Features of leprosy in the ear, nose and throat.] Thèse, Faculté mixte de Médecine Générale et Coloniale et de Pharmacie de Marseille, 1954; mimeographed, 66 (plus) pp.

The subtitle of this thesis for the doctorate of medicine is, "Clinical, anatomopathological and therapeutic considerations with respect to 136 cases examined in French Morocco." In the section on history it is said that the disease was perhaps introduced from Central Africa by the Arab invasion—There is no equivalent in the Berber dialect for *tajoura* or *djedam*—but it may have come in earlier, possibly even with the Phoenicians. The disease is ubiquitous in the country, with concentrations around Fez and Magazan (extending to Marrakech), but how many cases there are is not known. An official inquiry turned up 1,100. At the Jeanselme Dispensary at the Civil Hospital in Casablanca are listed 400 patients from that region. Detection of cases among the tribesmen is a "very delicate" business, and patients come for treatment on their own initiative only very late. Thus, of the 136 cases examined on the Jeanselme service and at the Hopital d'El Hank, inpatients and outpatients, most had been under observation for many years and 74% were lepromatous. Among the drugs employed in the Jeanselme service, there has been tried out in recent years red sarsaparilla (*Smilax ornata*), recommended by the Moroccan medicine men (*sorciers*). It is not believed to be an important advance in therapy, but a useful adjunct. —H. W. W.

TAJIRI, I. On Mitsuda's reaction in cases of acute infiltration of lepromatous leprosy. *La Lepro* 23 (1954) 119-121 (in Japanese; English abstract p. 119).

In severe cases of acute fever and erythema which appear in the progress of leprosy, an acute, erysipelas-like, infiltration eruption may take place. When these symptoms of infiltration develop in the lepromatous type it is called "acute infiltration." *Akuter Schub* ("acute rash") has been used in the past as a general term for this infiltration and a kind which suddenly appears in neural—or tuberculoid-type cases. Their causes and symptoms show apparent slight differences, however, and "acute infiltration" is different from *akuter Schub* in relation to the type of the disease in which it occurs, and is distinctive with respect to the results of the Mitsuda test. Since 1932, 28 cases of acute infiltration have been studied, and 24 have been tested for that reaction during the course of the outbreak. Of these cases, 17 were also tested before it developed; 13 were then negative, while 4 were positive. Of the group of 13 negatives, 11 became positive after the outbreak of acute infiltration; one of the 2 that remained negative at that time turned positive two years later. One case that was only doubtfully positive (\pm) before the occurrence of the acute infiltration reacted more strongly afterward. In all but one case the Mitsuda reaction was positive after the acute infiltration subsided; 3 have turned negative again, but it was two or three years before that happened. It seems probable that according to the Madrid classification these cases of acute infiltration are to be included in the intermediate (borderline) group, but they represent a process of a special kind. The cases which have turned Mitsuda positive after the acute infiltration generally remain positive for a long time, even for twenty or more years.—[From abstract.]

TAJIRI, I. On acute infiltration of the lepromatous type of leprosy. *La Lepro* 23 (1954) 261-269 (in Japanese; English abstract p. 261).

In the course of leprosy there develop acute manifestations among which there may frequently be swelling of the face as seen in erysipelas. Such acute symptoms (not including erythema nodosum leprosum, which occurs only in lepromatous leprosy) appear in all types of leprosy, and they have been called "*akuter Schub*," "lepra reaction," or "lepra fever" by different leprologists. The reaction which appears in a case of the neural-tuberculoid class bears a close resemblance in its origin and symptoms to one which occurs in the lepromatous type, but which nevertheless should be distinguished. The *akuter Schub* occurs only in the neural-tuberculoid class, and is very different in serology, pathology and clinical features from the "acute infiltration" of the lepromatous type. When the latter condition in a lepromatous case subsides, the disease returns to its previous state or, in some cases clears up to leave only the secondary neural condition. The eruptive lesion of the "acute infiltration" contains more lepra bacilli than there are in the lesions of the *akuter Schub* of the neural-tuberculoid class, but they are less numerous than in the ordinary lepromatous infiltration. The Mitsuda reaction, although negative before the appearance of an acute infiltration reaction, becomes positive afterward. The lesions of this reaction are not ordinary lepromatous nodules or infiltrations that have undergone abrupt augmentation and aggravation. The ordinary lepromatous lesion called "infiltration" is unequivocally a collection of lepra cells. The "acute infiltration" reaction, however, despite its occurrence in cases of the lepromatous type, does not show the lepromatous histological structure or anything near it. It seems that the acute infiltration may belong to the "borderline" group under the classification adopted by the Madrid congress in 1953, but it is different from the acute manifestations of the neural-tuberculoid class because of the histological structure and the negative Mitsuda reaction before the attack. It is also different from ordinary acute changes of lepromatous nature because the Mitsuda reaction changes to positive, and with that the prognosis becomes good. The acute infiltration syndrome usually occurs in the resorption stage of lepromatous type cases of long duration, sometimes in an early stage of transition to the lepromatous type from the neural or tuberculoid type. Briefly described, the term acute infiltration is applied to an abruptly developing condition with an acute but temporary eruptive infiltration of the skin, as seen in erysipelas. At an early stage there is fever of 37°-39°C, and it is often accompanied by joint pains. Histologically the lesions show a structure like the tuberculoid type, but there are more bacilli than are found in the *akuter Schub* reaction of the neural-tuberculoid class; and it is certain that the cases in which the condition appears belong to the lepromatous type. With this occurrence as the turning point, the Mitsuda reaction becomes positive and remains so for fairly long periods—about two years, at least. In one observed case it remained positive as long as 20 years. Once the acute infiltration reaction has occurred the condition of the disease may be remarkably improved, some cases eventually clearing up to leave only the secondary neural manifestation. The author wants to establish a distinction between the "acute infiltration," and the acute lepromatous infiltration, and the ENL of the lepromatous type on the one hand, and the *akuter Schub* of the neural-tuberculoid class on the other hand.—[From abstract.]

[This article on "acute infiltration" in lepromatous leprosy, the original abstract of which is somewhat difficult to follow, deals with a concept of Japanese leprologists which caused much discussion at the Leonard Wood Memorial Conference held in Japan in 1952, as noted in an editorial in this issue. Special efforts have been made to clarify this abstract, with the aid of the author and our Contributing Editor for Japan. A point to be mentioned is that the designations "maculo-anesthetic type" and "neural-macular type" originally used have been changed with the author's approval to "neural-tuberculoid class" to conform with more generally used terms. It will be recalled that for many years the Japanese leprologists have applied the term "macular" to the tuberculoid form of leprosy, and "neural" to other nonlepromatous varieties.

The author wishes it to be emphasized (cf Correspondence) that the cases are originally lepromatous although the reaction lesions are of tuberculoid appearance histologically, and that the condition is becoming increasingly frequent with the spread of chemotherapy. This abstract should be considered together with the one that precedes it.—EDITOR.]

DE MOURA, A. M. and ROCHINE, S. Vinte casos de recaída entre doentes transferidos para tratamento ambulatorio ou com alta provisória. [Twenty cases of relapse among patients transferred to dispensary treatment or paroled.] *Arq. paranaenses Leprol.* **2** (1953) 47-50.

The authors have the impression that sulfone treatment is very promising in the indeterminate and tuberculoid forms, and in early lepromatous cases. In advanced lepromatous cases, however, the effects are not permanent, for if treatment is interrupted the disease continues to progress with the appearance of new lesions and positive bacteriology. Practically, for the segregated patient, the sulfones may bring about relief and improvement, but not expectation of cure, because with the suspension of treatment the disease which seems to be extinct may reappear, as embers smoldering under ashes.—[From author's summation.]

MIRANDA, R. N. Recaída em caso de lepra lepromatosa. [Relapse in a case with lepromatous leprosy.] *Arq. paranaenses Leprol.* **2** (1953) 51-54.

This is a report of a lepromatous case in which the infection continued concealed for several years despite constant sulfone treatment which had been continued in small dosage long after the symptoms had disappeared. When that treatment was suspended there developed a severe lepromatous eruption. Lepromatous leprosy is deceiving, and in the present state of antileprosy therapy we should continue intensive and prolonged treatment after symptoms are cleared up. This leads to consideration of the need of a more exacting clinical and laboratory examination of cases for discharge. Such relapses must depend upon a reservoir of the germs, whether that be in the lymph nodes, or in the nerve trunks, or in some internal organ. —H. W. W.

GODOY, S. Lepra tuberculóide figurada com muco nasal esporadicamente positivo. [Circinate tuberculoid leprosy with nasal mucus sporadically positive.] *Rev. brasileira Leprol.* **21** (1953) 203-206.

This is a report of a case of tuberculoid leprosy, strongly reactive to lepromin, that was originally bacteriologically negative as such cases usually are. After the patient was put under sulfone treatment there was a period of two months when the nasal mucosa was sporadically positive. In that period no new skin lesions appeared, but those previously present were more infiltrated. It is concluded that while under treatment the patient had suffered an exacerbation of the disease, with more activity of the skin lesions but without loss of lepromin positivity. Later the disease retrogressed. —H. W. W.

JOULIA, LASSIÉ, TENIER, FRUCHARD and LEURET, J.-P. Maladie de Hansen forme "L". [Hansen's disease, L form.] *Bull. Soc. française Derm. & Syph.* **61** (1954) 277 (case report).

This case, it is said, like others presents problems of diagnosis with tuberculosis. The patient aged 31 years, while in Indochina in 1945, had pulmonary trouble diagnosed tuberculosis despite the absence of Koch bacilli in the sputum. Pneumothorax was done and the patient was repatriated. Skin lesions appeared in 1952, with arthralgias and sensory abnormalities; Hansen bacilli were demonstrated. X-rays showed probable sequelae of pulmonary tuberculosis. Mitsuda negative, sections lepromatous. [The reader is left uncertain whether or not the authors regarded the pulmonary trouble in 1945 as due to leprosy.] —H. W. W.

JOULIA, TENIER, FRUCHARD and BOUFFARD. Maladie de Hansen forme "L" (2e présentation). Abscès du poumon et ostéite vertébrale. [Hansen's disease, L form (2nd presentation). Abscess of the lung and vertebral osteitis.]

presentation); abscess of lung and vertebral osteitis.] Bull. Soc. française Derm. & Syph. **61** (1954) 277 (case report).

The trouble with this patient, aged 60 years, began in 1950 in Senegal as anesthesia on the upper extremities, skin lesions appearing later. In 1952 he returned to France, a lepromatous case with trophic ulcers. Under treatment with chaulmoogra and sulfones combined he improved materially, but quit in 1953. Six months later he returned with a lung abscess and vertebral trouble that had nothing to do with the primary disease, and improved under treatment with terramycin. —H. W. W.

FASAL, P. Lepromatous leprosy in a man born in Minnesota. A.M.A. Arch. Dermat. **71** (1955) 280-281 (San Francisco Derm. Soc.).

A 42-year-old white man born in Minnesota and resident there for 30 years, first noticed coldness and numbness of the elbow and middle finger 15 years ago. A diagnosis of syringomyelia was made 8 years ago. In April 1954 advanced lepromatous leprosy was diagnosed. The patient was treated with sulphetrone and has made remarkable improvement. His father was born in Finland and came to the United States at the age of 13; the mother was born in Illinois. The father shows no evidence of leprosy, but he lived on a farm where there were farmhands from Finland and Norway with whom he [the patient?] may well have been in close contact during his childhood. The patient has several grown children, one of whom shows some depigmented areas now being observed. —SR. HILARY ROSS

CHAUSSINAND, R. Thérapeutique de la lèpre. [Therapy of leprosy.] Rev. Praticien **4** (1954) 1955-1964.

This article is designed to enable the nonspecialist practitioner to treat leprosy patients. The most efficacious of the various antileprosy drugs are the sulfones. In the beginning only derivatives of the parent sulfone (DDS) were used, for that substance itself was erroneously believed to be too toxic. However, the derivatives are expensive and their only action is to liberate the parent sulfone in various proportions, so most leprologists are now using DDS. The author recommends oral treatment, 6 days a week with one day of rest after 3 weeks treatment. The doses should be increased gradually from 25 mgm. to a maximum of 100-150 mgm. in 5 months in adult tuberculoid and indeterminate cases, and in 10 months in lepromatous cases. For children the doses should be less, according to the body weight. Too rapid increase provokes cutaneous, neuritic and ocular reactions. In some cases with ill effects on this dosage the author has used only 75 mgm. as the maximum, with the rest period reduced to one day per week. For patients not under supervision, it is possible to give the drug only once a week (maximum 300-600 mgm.), or twice weekly (200-400 mgm.); or it may be given twice monthly by intramuscular injection in a deposit vehicle (maximum 1,500 mgm.). However, this discontinuous sort of treatment is less efficacious and more frequently provokes ill-effects (anemia and reactions). The drug apparently acts by bacteriostasis. The effects are most striking in heavily positive patients, but it takes from 4-5 years of treatment to clear up advanced cases. Thiosemicarbazone (TB1/698) also gives quite good results, although inferior to those of the sulfones, and it seems more toxic. It is given in the same dosage as the parent sulfone. Isoniazid is effective only above about 7 mgm./kgm., but impairment of digestion is seen with this dose. It is less active against the lesions than the sulfones and cannot be used as a basic treatment, but it has an excellent effect on the general condition, and in some cases that facilitates the administration of DDS. Chaulmoogra has been practically abandoned. It should not be used alone, because of its low efficacy, and its combination with sulfone seems of little value except for local intradermal injection to accelerate the clearing up of anesthetic tuberculoid lesions. Streptomycin is much less efficacious than DDS, and PAS is without value in leprosy. Vaccines prepared with paratuberculosis bacilli have no appreciable action on the evolution of the disease. —M. VIETTE

HARADA, N. D.D.S. in the treatment of leprosy. *La Lepro* **23** (1954) 335-340 (in Japanese; English abstract p. 335).

This paper summarizes the history of antileprosy treatment with DDS and reports the author's results in treating 38 patients (22 lepromatous, 6 tuberculoid and 10 neural) with DDS for periods of 1-18 months. The dose by mouth began with 15 mgm. per day and was slowly increased to 100 mgm., which dosage was maintained. (A saline suspension of DDS also used by intramuscular injection. The results will be reported later.) On the 22 lepromatous cases treated by mouth, 4 improved strikingly, 8 moderately and 7 slightly; 3 remained unchanged, but none was aggravated. Toxic manifestations were observed, such as slight anemia in 3, neuralgia in 2, and paralysis of the sural nerve in 1 patient. Erythema nodosum leprosum appeared in 4 cases. DDS has an excellent therapeutic effect upon leprosy and can be administered without fear.—[From abstract.]

IMAEDA, T. Fundamental experiments on D.D.S. *La Lepro* **23** (1954) 331-334 (in Japanese; English abstract p. 331).

Pharmacologic experiments on DDS gave the following results: DDS inhibits the growth of staphylococcus *in vitro* in 0.1-0.5 mgm.%, but is effective with the tubercle or the smegma bacillus only in higher concentration. Below the concentration of 1 mgm.% it has no influence on the development of chick embryo heart tissue cultured in the test tube. Given by mouth to rabbits, the DDS concentration in the various organs becomes highest after 3 hours. The concentration in the liver and kidney is as much as 2 to 3 times that in the blood. In the skin and nerve it reaches to 0.2 mgm.%, and is of therapeutic significance. The blood concentration in patients given DDS by mouth three times a day shows no marked fluctuations throughout the 24 hours. Of the dose administered by mouth, 70%-90% is excreted in the urine, and 90% of that is excreted as DDS. Between DDS and blood proteins, absorption takes place in an acid medium, and both absorption and chemical combinations occur in an alkaline medium.—[From abstract.]

PAUL, H. Advances in the treatment of leprosy. *Antiseptic* **51** (1954) 664-670.

The efficacy of DDS in the lepromatous type of case is emphasized. Signs of appreciable results take 6 months to appear, and it takes 2-3 years on the whole to produce marked all-round improvement. Sulfones may provoke lepra reaction. Toxic reactions are easily controllable. The drug is believed to have a direct lethal effect on the bacilli. The question of rehabilitation of patients is discussed.—[From abstract in *Excerpta Med.* **9** (1955) 117.]

[LOWE, J.] The action of sulphones on various infections. *Lep. Rev.* **26** (1955) 3-4; *Ibid.* 56 (editorials).

Note is made of other diseases than leprosy and tuberculosis in which the sulfones have effect. First mentioned is a report by Ida Mann of the absence of trachoma in a leprosarium in Australia although prevalent in the general population of the area, a difference which she ascribes to the sulfone treatment. It is remarked that the severe secondary infections of the hands and feet, with ascending cellulitis and gangrene, previously common in leprosaria are now relatively rare, as are pneumococcal and meningococcal infections. The sulfones have been found active in toxoplasmosis. Only for leprosy, however, are they the best drugs available.

In the next issue attention is called to a note in the *British Medical Journal* [**1** (1955) 542] in which is mentioned the widespread use in recent years of DDS for the control of dermatitis herpetiformis.
—H. W. W.

ALEIXO, J. Aspecto paradoxal da sulfonoterapia na profilaxia do mal de Hansen. [Paradoxical aspect of sulfone therapy in the prophylaxis of leprosy.] *Arq. mineiros Leprol.* **14** (1954) 353-359.

The author reviews reports on sulfone therapy presented at recent meetings, finding all of them to agree about the rapid regression of clinical symptoms and the slow change of bacteriological status. If such clinically improved but bacteriologically positive patients leave the leprosaria they will be a serious source of contagion, for they will not be recognized for what they are by the people with whom they come in contact. Improvement in the network of leprosaria is recommended.—[From author's summary.]

SHIONUMA, E., ARAI, M. and ITO, N. The effects of cortisone and ACTH upon the eye symptoms in leprosy. *La Lepro* **23** (1954) 341-344 (in Japanese; English abstract p. 341).

As a result of experience with 65 patients with leprosy eye disturbances (74 eyes) the authors conclude that local treatment with cortisone produces the most remarkable effects on acute iridocyclitis, upper scleritis due to erythema nodosum leprosum, and scleritis. It has no effect on leprosy keratitis. ACTH was also used, and it gave favorable results in 3 cases (5 eyes) of iridocyclitis and scleritis caused by ENL in which cortisone had produced no effect. The excellent efficacy of ACTH and cortisone on ENL and the accompanying acute iridocyclitis supports Mitsuda's assumption that erythema nodosum leprosum should be considered an allergic inflammation.—[From abstract.]

SIMONARD, R. O "lumetrox" nas nevrites lepróticas. [Lumetrox in leprosy neuritis.] *Rev. brasileira Leprol.* **21** (1953) 225-226.

This is a preliminary report of the use in neuritis of a drug the commercial name of which is Lumetrox, relatively new but used in general surgery, principally in surgery of the thorax, to combat postoperative pain. The duration of its anesthetic action is said to be 6-18 days. It is used in association with 1% or 2% novocaine. In leprosy patients 3-4 cc. of novocaine is injected into and around the nerve, and—leaving the needle in place—the syringe is exchanged for one containing the Lumetrox, of which about 2 cc. is injected. Promising results were obtained in the 10 cases so treated.
—H. W. W.

[SOUTH PACIFIC COMMISSION.] Physiotherapy of leprosy. Technical Information Circular No. 8, July 1954. (Information collected by G. Loison.) Mimeographed, 10 pp.

This circular is predicated on the view that chemotherapy of leprosy patients, with "mere bacteriological sterilization," is not enough, that physiotherapy is needed to mitigate the handicapping neurotrophic after-effects, and that physiotherapy has proved its worth in that respect and in economies for the leprosy hospitals. Mostly it is a description of the work being done at the Ducos Sanitarium at Noumea, in an annex provided and endowed by the New Zealand Lepers' Trust Board for the housing of the electrotherapeutic and radiodiagnostic apparatus. This work was started in 1951 by Barnay [*THE JOURNAL* **22** (1954) 484], who was replaced in 1952 by Jouen [*Méd. trop.* **14** (1954) 72-77]. Their reports are summarized, with respect first to the conditions treated and results obtained, then to the equipment used. It is said that with trophic ulcers (infra-red rays first, then other things if necessary) about 70% cures obtained; other ulcerations, 60% cures with diathermy (other things if needed; U-V rays ineffectual); leprosy infiltrations, material benefit from diathermy; neuritic pains (various modes), 67% cures; anesthesia, etc., diathermy of value; claw hands improvements around 80%, distinction in treatment being made between reducible cases with paralysis and irreducible cases. The section dealing with equipment is intended as a guide for its use.
—H. W. W.

HUNDLEY, J. M. Nutritional needs of institutionalized patients. *American J. Publ. Hlth.* **45** (1955) 328-335.

The National Institutes of Health have recommended a set of nutrition standards to be used in feeding patients in Public Health Service hospitals of different kinds (general, neuropsychiatric, tuberculosis, leprosy, etc.). A table of the recommended daily dietary allowances gives 3,600 total calories for tuberculosis and leprosy hospitals, against 3,000 for other hospitals; protein 125 as against 100; and increases in calcium, iron, thiamin, niacin, ascorbic acid and vitamin A. It was considered important to provide a high calorie, high protein, high vitamin and high mineral diet in order to rehabilitate the patients, who are usually undernourished when admitted, and to aid in promoting recovery. Another table shows the actual food consumption in the selected hospitals, with a maximum of 3,920 calories for the leprosy hospital and a minimum of 2,600 for general hospitals of the service. This article is worth reading for anyone interested in the nutritional phase of leprosy and tuberculosis. —SR. HILARY ROSS

RICHTER, R. Histologische Studien über die Veränderung der spezifisch leprosen Gewebes und das Verhalten der Leprabazillen unter Isonikotinsäurehydrazidbehandlung bei *Lepra lepromatosa*. [Histological study of the changes in specific leprotic tissues and the content of leprosy bacilli occurring during isoniazid treatment.] *Ztschr. Haut. u. Geschlkr.* **13** (1955) 137-145.

A 48-year-old patient with advanced lepromatous leprosy, previously untreated, received for eight months 8 mgm./kgm. of isoniazid orally, the total dose being 85.65 gm. Pronounced improvement in the clinical condition commenced in the 4th to 5th month, and after eight months the infiltrations, the nodules and macules on the body and extremities were practically resolved. The hyperpigmentation and atrophy had regressed, or had transformed into a sarcoid-like structure. The face returned to normal, and a nodule on the back of the tongue completely resolved. The hair of the head and eyebrows commenced to grow again. The enlarged nerves were in part still palpable, but were not as prominent on the skin as before. Paresthesia had completely disappeared. The bacteriological picture, however, changed very slowly; the nasal mucosa remained positive, as did skin sections. Many of the bacilli, however, were present as acid-fast debris and granules. The infiltration had grown more compact due to the increase of epithelioid cells, and especially from increase of connective-tissue elements. —ERNEST KEIL

GUIMARÃES, A. S. Do valor do quadro hematológico na lepra. [On the value of the hematologic chart in leprosy.] *Arq. mineiros Leprol.* **14** (1954) 147-282.

The entire issue of the *Arquivos* is taken up by this immensely detailed report of a study of the blood in leprosy. In her introduction of the 7-page English-language abstract the author says that the study comprised the hemograms of 600 cases, including 500 in which parasitism was not excluded and 100 cases of "pure leprosy." The examinations included determinations of the various formed elements, besides hemoglobin, color index, etc., and of the red-cell sedimentation and proteins. Myelograms were also made on 10 occasions. Neither hemogram nor myelogram is of diagnostic value; they have no characteristics which can be used to identify leprosy. The hemogram is, however, useful in the control of treatment. —H. W. W.

LIBAN, E., ZUCKERMAN, A. and SAGHER, F. Specific tissue alteration in leprosy skin. VII. Inoculation of *Leishmania tropica* into leprosy patients. *A.M.A. Arch. Dermat.* **71** (1955) 441-450.

In leprosy patients an altered tissue reactivity to living flagellates of *Leishmania tropica* was observed on histological examination of the inoculation sites (isopathic reaction). Lepromatous and prelepromatous reactions were seen in 20 of the 27 patients, in 25 of the 44 biopsies performed between 16 days and 20 months after inoculation, although clinically the lesions were characteristic of leishmaniasis. This response to *L. tropica*, a protozoan totally unrelated to *M. leprae*, bears out the results previously obtained in leprosy patients following the inoculation of the closely related *M. tuberculosis* (BCG).—[From author's summary.]

MOORE, D. C., HAIN, R. F., WARD, A. and BRIDENBAUGH, L. D., JR. Importance of the perineural spaces in nerve blocking. *J. American Med. Assoc.* **156** (1954) 1050-1053.

Accidents that sometimes occur during nerve blocking have led the authors to consider the relationships of the perineural spaces of the peripheral nerves to the structures of the spinal cord. Since the nature of the channels by which substances may ascend nerves is a matter of some interest in connection with the pathogenesis of leprosy lesions, this article is worth examination. The authors' own experiments were with injections made into the nerves in the paravertebral location, but some of the studies of which references are given were of injections into more distant locations, and these should be consulted. Here, as is not rare in writings dealing with this matter, there is evidence of confusion of terminology: The connective tissue filling the interstices between the nerve bundles (fasciculi) is spoken of as perineurium, whereas it is actually the inner part of the epineurium. The relationships between the connective tissue structures of the nerve and those of the spinal cord as ascribed to Gray's Anatomy differ materially from the relationships stated in the edition of Cunningham's Anatomy that is available to this reviewer. —H. W. W.

DE PAULA SOUZA, R., DE TOLEDO FERRAZ, N. and BECHELLI, L. M. Influencia do BCG vivo e morto sobre a reação de Mitsuda. (Observações preliminares.) [Influence of BCG, alive or dead, on the Mitsuda reaction; preliminary observations.] *Rev. brasileira Leprol.* **21** (1953) 43-50.

In connection with lepromin conversion by BCG and the belief that the protective effect of that vaccine is closely related to the absorption of living germs, the authors undertook to compare the effects of oral administration of fresh BCG, of 15-day BCG (5 days past the limiting 10th day, on which day only 14% of the bacilli are expected to be alive), and of heat-killed BCG. This was done at the Anjo Gabriel orphanage with children almost all under 15 years of age. After the preliminary examinations there were only 63 children available for the test, 22 lepromin negative and 41 weakly positive, and these were divided into 4 groups. There were no significant differences between the results in the three BCG groups, or between them and the "spontaneous" conversions in the control group with no such treatment. Of the 15 controls, 12 (80%) became positive or more strongly reactive, in the period of 70 days before the final reading. Originally, 152 children had been tested with tuberculin and lepromin, and 11 months later 76 of them had been Mitsuda-tested again; 60% of them had changed similarly in the interval. The small numbers of observations [apparently referring especially to the BCG work] did not permit drawing definite conclusions, but indicated the need of more extensive work.

[The present status of this work and views of the authors are not known. This paper was presented at the 10th Brazilian Congress of Hygiene, in October 1952, and also at the 3rd Brazilian Leprosy Conference. Three abstracts dealing with this work were sent to the Madrid congress (Resumenes, pp. 75, 76 and 80), two of which appeared in the Congress number of *THE JOURNAL* **21** (1953) 585 & 590. Nothing on the subject appeared in the Memoria of the Congress. In these abstracts considerable emphasis is given, as also in the original article, to the factor of spontaneous change of lepromin reactivity.

[In one of the abstracts it is said that there was an absence of relation between the Mitsuda and tuberculin reactions. That statement must apply to some particular condition, for it is not in agreement with one of the tables in the published article. There it is shown that the Mitsuda reaction was more than weakly positive (2+ or 3+) in only 16% of the 119 tuberculin-negative children, but in 47% of the 30 that reacted to 1:1000 tuberculin. Interestingly, the corresponding lepromin reactivity rate was almost as high, 42%, in the 48 children who gave the nonspecific, high-dose (1:10) tuberculin reaction.] —H. W. W.

DE SOUZA, CAMPOS, N. O B. C. G. na profilaxia da lepra. (Revisão bibliográfica.) [BCG in the prophylaxis of leprosy; a bibliographic review.] *Rev. brasileira Leprol* **21** (1953) 292-314.

The major part of this extensively-documented review (81 references) represents an effort to bring together all of the pertinent material that had appeared about the effect of BCG vaccination on lepromin reactivity and the probable influence of that procedure on leprosy prophylaxis. One section is devoted to a justification of Rotberg's "N factor" of natural resistance; and the author also brings in a "P factor," one of predisposition. A graph shows increase of the N factor with age, from nil at birth to about 80% at the age of 30 years. The zone between that level and the 100% level is labeled the "anergic margin," apparently meaning the proportion of adult individuals who do not react to lepromin. A large folder insert is a tabulation of 34 reports concerned with inversion of the Mitsuda reaction by BCG vaccination, beginning with Fernandez (Argentina) in 1939, followed by Ginez and Poletti (Uruguay) in 1945, and by Azulay (Brazil) and Chaussinand (Indochina) in 1948; the others appeared in 1950 and subsequently. One section on "spontaneous" change of lepromin reactivity concerns the reports of de Paula Souza and associates [see preceding abstract] of "positivization" or augmentation on retesting, supposedly without tuberculosis infection or any such influence. The author points out the anomaly of how unlikely it would be for persons to escape that effect for years and then, in the short interval between two tests, large proportions of them encountering some unknown factor that caused them to change. The observations reported would lead to the conclusion that BCG does not intervene to produce lepromin positivity. They can only be due to an effect of the first lepromin test, which [although giving negative results nevertheless] caused sensitization to the second one in the cases that changed. This is the author's explanation, although he seems dubious about it, saying that long experience with children has shown that there are many who will remain nonreactive after repeated tests, even as many as 6 or 8. Out of 34 children (average age 8.8 years) in the Goiás preventorium, 23 remained negative after from 2 to 9 tests (average 4.4), but with only 3 exceptions they become positive after BCG vaccination. [In his explanation of the reports of de Paula Souza and associates, however, the author finds himself in the position of admitting that high percentages of individuals may be made reactive solely by single injections of lepromin. If this be so, this factor must affect consideration of the results of BCG vaccination, where usually the positive change is ascribed to the vaccine alone.] —H. W. W.

ROSEMBERG, J., DE SOUZA CAMPOS, N., AUN, J. N. and BRANDINI, R. Vitalidade da vacina BCG e capacidade de induzir a reação de Mitsuda. [Vitality of BCG and its capacity to induce the Mitsuda reaction.] *Mem. VI Congr. Internac. Leprol.*, Madrid, 1953, pp. 588-603.

This interesting article, which escaped notice in the Congress number of *THE JOURNAL* for lack of a record of it, has to do with tetrazolium testing of the metabolic activity of BCG suspensions, with the recovery of BCG in cultures from suspensions of various ages, and with making positive of the Mitsuda reaction by BCG of various ages and conditions. It is first shown that the ingestion of a single 0.1 gm. dose of BCG less than 10 days old is practically as effective as the larger doses usually used, or as the Rosenthal multipuncture method, whereas BCG kept 45 days in the refrigerator does not allergize to tuberculin and makes the Mitsuda positive only infrequently and then but weakly. Heat-killed BCG was without any effect, and the control group (30 cases) showed no change on the second test. The tetrazolium test gave, with variations, an index of 60-65% when the vaccine was received in São Paulo, 2 days old; on the 6th day it was 20-30%, with or without refrigeration; with refrigeration, this level was maintained to the 25th day, but at room temperature it fell to 10% by the 10th day and to zero by the 17th-25th day. Yet cultures still gave abundant

colonies, showing that there is a period of failure of relationship between viability and metabolic activity. Fresh BCG heated at 80°C for 30 minutes gave zero tetrazolium tests and no growth on subculture. Regarding effects on the lepromin and tuberculin reactions: Of BCG kept 25 days at room temperature, tetrazolium zero since the 17th day but recovery in culture still abundant, a single oral dose of 0.2 gm. caused 12 Mitsuda and 11 Mantoux positives in 17 cases. With BCG refrigerated for 25 days, tetrazolium 20-30% and recovery abundant, same dose, all of 17 cases were made positive to both reactions. The "paradoxical" findings of de Paula Souza and associates are commented on briefly.

—H. W. W.

HADLER, W. A. Comportamento do cabaio e do rato, normais, injetados com "lepromina" por via intradérmica. [Behavior of guinea-pigs and rats when injected intradermally with lepromin.] Rev. brasileira Leprol. **21** (1953) 165-194.

Intradermal injections of lepromin were given to 174 guinea-pigs and 95 rats, and the sites of the injections of 44 guinea-pigs and 35 rats were studied histologically. In none of the animals was there any macroscopic reaction, early or late. A graph shows that the injection sites averaged only 2 mm. (rats) or 3 mm. (guinea-pigs) in diameter after 24 hours and decreased rapidly after that. Microscopically there were seen in both animals, but less marked in the rat, an initial acute (polymorphonuclear) phase followed by a chronic phase which differed markedly in the two species. In both animals certain cells of the fixed connective-tissue (i. e., adventitial, perivascular, etc., and interstitial) are "activated" and develop into fixed macrophages. In the guinea-pigs these cells phagocytose and destroy the bacilli, after which they transform into epithelioid cells. The whole lesion forms a granulomatous structure, not typically tuberculoid, which resolves about the 40th day. In the rat the activated cells also phagocytose the bacilli, but they store them without destroying them. As the number of stored bacilli increases the macrophage undergoes transformation into a "rat lepra cell." These cells, containing numerous bacilli, accumulate as nodular lesions which remain until the 90th day, undergoing slow involution after that. The histologic picture of the negative lepromin reaction in man is like this condition in the rat, while that of the positive lepromin reaction in man is like the condition seen in the guinea-pig. By analogy it can be supposed that in man the result of the test depends on (a) the ability or lack of it of the macrophages to destroy the bacilli, and (b) the consequent transformation of the macrophages into cells of different degrees of metabolic (enzyme) activity, epithelioid cells or lepra cells. The difference in these animals is not significant of resistance to infection or lack of it, for both are highly resistant, but in man the processes are significant.

—H. W. W.

HADLER, W. A. Estudo comparado das lesões provocadas por suspensões de "*M. leprae*" e de "*M. tuberculosis*," injetadas por via intradérmica, em cobaias préviamente vacinados pelo BCG. [Comparative study of the lesions caused by suspensions of *M. leprae* and *M. tuberculosis* injected intradermally in guinea-pigs previously vaccinated with BCG.] Rev. brasileira Leprol. **22** (1954) 109-123.

It has been found previously [THE JOURNAL **23** (1955) No. 2] that the leprosy and tubercle bacilli gave rise to identical inflammatory reactions as regards the cytology, but there are differences in the bacteriological findings, the intensity of the reaction, and its evolution; and the leprosy bacillus is the more resistant to lysis. The study has now been extended to the effects of vaccination, involving 98 guinea-pigs of which one lot was injected with the tubercle bacillus (BCG), another with lepromin, and a third with both bacilli. With both inocula the maximum average size of the skin reactions were reached on the 6th day, that to BCG being 12.2 mm. (maximum 26+ mm.), that to lepromin 4.66 mm. (maximum 10+ mm.). The former subsided a little more rapidly than the latter—by the 30th day, vs the 40th day. Cytologically the lesions were alike, with a central abscess surrounded by tuberculoid inflammatory tissue; in normal guinea-pigs only those receiving the tubercle bacillus

developed the abscess element. The differences in the lesions produced by the bacilli were in keeping with the clinical differences mentioned—stronger reactions of shorter duration with the tubercle bacillus than with the leprosy bacillus. The rate of evolution depended on the transformation of macrophages to epithelioid cells, and that probably depends on the ease of lysis of the bacilli. That of the leprosy bacillus is the more difficult in vaccinated as well as in normal guinea-pigs. [A feature of the earlier changes, after 1-2 days, more marked with the tubercle bacillus than with the other, with excitation (*solicitação*) of the fixed connective-tissue cells, interstitial and perivascular.] —H. W. W.

HADLER, W. A. and ZITTI, L. M. Efeito da vacinação pelo BCG sobre a evolução da lepra murina; observação em ratos inoculados por via peritoneal, com pequena dose de "*M. leprae murium*." [Effect of BCG vaccination on the evolution of murine leprosy; observation in rats inoculated intraperitoneally with a small dose of *M. leprae murium*.] Rev. brasileira Leprol. **22** (1954) 124-134.

Intraperitoneal inoculation of rats with *M. leprae murium* in a sufficiently small dose (about 0.03 mgm.) provokes only histological lesions which progress very slowly, thus permitting observation of the influence of BCG vaccination. In an experiment involving a total of 50 young rats divided into four lots, it was found that the evolution of the infection was exactly the same in the previously vaccinated rats as in the unvaccinated controls. Histological study showed that the macrophages of the rat, whether normal or vaccinated, are unable to destroy the bacilli of murine leprosy, human leprosy, or tuberculosis. In contrast, the macrophages of the normal guinea-pig have that capacity, and BCG vaccination enhances it. Thus the effect of vaccination differs widely in these two animals. —H. W. W.

RIDLEY, D. S. The significance of antibody in the pathogenesis of leprosy. Trans. Roy. Soc. Trop. Med. & Hyg. **48** (1954) 400-405.

LOWE, J. Ibid. **49** (1955) 195-196 (correspondence).

RIDLEY, D. S. Ibid. 196 (correspondence).

1. This work was based primarily on acceptance of Khanolkar's belief that before invading other tissues the leprosy bacillus gets established by multiplication in nerves—in which location, the author holds, it is protected against a humoral defense mechanism. An attempt was made to correlate the presence of circulating complement-fixing antibodies and the reactivity to lepromin. The work was done with sera from 24 patients at the Jordan Hospital at Redhill, Surrey (type not stated except that 2 are called tuberculoid). Using a suspension of a lepromin powder from India, it was found that there was complement fixation in many cases where the skin reaction to lepromin was negative. No antibody against tuberculin was detected, although 8 of the 14 cases tested gave positive tuberculin skin reactions. On the basis of the views of Pickert and Löwenstein (1908), the two positive (48-hour) reactors to lepromin were tested with two mixtures, made 24 hours previously, of lepromin and serum from lepromatous cases. In one of the cases so tested the reactions were smaller than to the controls, and in the other case they were negative. It is concluded that the sera of the lepromatous cases destroyed the capacity of lepromin to evoke a positive skin reaction in tuberculoid leprosy.

2. Lowe refers to Ridley's idea that the negative lepromin reaction in lepromatous leprosy may be explained by the presence of circulating antibody inactivating the lepromin and rendering it incapable of reacting with fixed antibody, and says that if the *in vitro* inactivation experiment is confirmed it will be important. In connection with the positive complement-fixation tests, however, he points out that it has long been known that various acid-fast bacilli will give such results, and also that the negative results with tuberculin do not signify that there were no circulating antibodies that would react with the tubercle bacillus itself.

3. In his response Ridley passes lightly over Lowe's criticism, mentions certain further observations, and states his hypothesis that some skin tests are subject to blocking by the presence in the circulation of a corresponding antibody.

[The abstractor would point out that the existence of the "anticutins" of Jadasohn's school is moot. Those believing in their existence—they a small minority at most—agreed that their demonstration was difficult and uncertain. The advocates used to explain the habitual anergy of sarcoid on the ground of anticutins, but nothing is heard of that nowadays. That, of course, refers to tuberculosis, not leprosy; but Sulzberger defined "anticutin" as: "Any substance capable of specifically inhibiting or reducing the capacity of an excitant to produce reaction in the sensitive skin (or of specifically inhibiting or reducing the capacity of the skin to react to an excitant)." When the action of anticutin is invoked the substance concerned is a soluble one, the binding of which would involve no particular mystery. But for a neutralizing or blocking antibody to render a suspension of intact, entire leprosy bacilli incapable of producing the usual effects of lepromin would be quite another matter. Ridley does not indicate whether the bacilli in the lepromin he used were intact, as in the Mitsuda-Hayashi antigen, or were extracted and nonacid-fast, as in the Dharmendra antigen. Nor does he say that the Mitsuda reaction was suppressed; the only data shown are of the 48-hour Fernandez reaction. Finally, it may be recalled that nearly a score of years ago Rodriguez (*THE JOURNAL* 6 [1938] 22) attempted to demonstrate anticutins in lepromatous leprosy to explain the anergy to lepromin of that form of the disease, but met with no success. He was, of course, working with the true lepromin reaction, the Mitsuda phenomenon, although he was aware of the early reaction; he was one of the first, before Fernandez, to describe the acute inflammatory response seen in some cases.]

—H. W. W.

DAVEY, T. F. The effect of treating lepromin with lepromatous serum. *Lep. Rev.* 26 (1955) 65-71.

Referring to the recent report of Ridley that serum from two lepromatous cases caused inhibition of the (early) reaction to lepromin [*THE JOURNAL* 23 (1955) 353-354], Davey reports experiments with Lowe's so-called modification of the Dharmendra lepromin and the sera of 12 typical lepromatous patients. Using suitable controls, 60 leprosy patients (55 of them tuberculoid) were each given 5 injections, the tests so set up that each of the 12 lepromatous sera, mixed 50:50 with lepromin, was tested in 10 persons (120 such tests in all). The early (Fernandez) and late (Mitsuda) reactions to the first control (lepromin and saline, 50:50) were taken as normal in and for each individual, other reactions in that individual being compared with it. On this basis, only 11 of the 120 early reactions to the test mixtures were weaker than the normal control, while 43 were stronger. This "enhancement" was seen in 50 of 120 other control tests (lepromin mixed with sera of normal persons), and only 5 reactions less than the normals. With the late reaction there was much less deviation from the normal, only 3 diminished and 6 enhanced; there was considerably more enhancement (22 reactions) to the normal-serum controls, and only 2 instances of diminution. The deviations in both reactions were scattered, no single serum showing any special effects. There were no relations with duration of treatment or reaction to tuberculin on the part of the serum donors, nor were there any relationships between variants in the two reactions. Thus, no evidence was seen of a specific inactivating action on either phase of the lepromin reaction on the part of the sera from 12 lepromatous patients that were used.

—H. W. W.

NAGAI, Y. and SHIONUMA, E. Supplement on the eye reaction with leprosy bacillus suspension. *La Lepro* 23 (1954) 327-330 (in Japanese; English abstract p. 327).

The results of the eye reaction (subconjunctival injection) done in parallel with the Mitsuda reaction agree with those of the latter, namely, negative in lepromatous and positive in tuberculoid and neural leprosy. In the case of lepromatous leprosy

in which the lepromatous infiltrations have been absorbed and the Mitsuda reaction has become positive, the eye reaction is also positive. The leprosy pannus in the cornea does not always disappear when the eye and Mitsuda reactions have become positive after antileprosy treatment, because of the vacuolization of bacilli and the presence of vacuolated lepra cells. One case is reported in which the eye reaction was useful as a means of differentiating the leprosy or nonleprosy nature of the swelling in the eye of a lepromatous patient whose diagnosis was under doubt of neural type and the Mitsuda reaction positive.—[From abstract.]

OLIVEIRA DE ALMEIDA, J., SOUZA LIMA, L. and CARVALHO, R. P. S. The value of the quantitative complement-fixation test for syphilis in leprosy. *American J. Trop. Med. & Hyg.* **4** (1955) 41-46.

The authors applied the complement-fixation test of Wadsworth, Maltaner and Maltaner to 467 treated and untreated cases of lepromatous leprosy, using both cardiolipin and tubercle-bacillus extracts as antigens. Of the 467 sera, 413 (88.4%) gave titers higher than 6 with the tubercle antigen and 28 (6%) reacted with cardiolipin. Sera from 133 of the negative cases were retested with the complement-fixation test for syphilis after 3 months or repeatedly, some as many as 24 times, and on all occasions gave negative results. The 28 sera that reacted positively were from patients who gave histories of venereal disease in the past, and in them penicillin treatment for syphilis was instituted. The titers with cardiolipin decreased after treatment in the same manner as is to be expected in nonleprosy syphilitic patients. The authors feel that the diagnosis of syphilis among individuals suffering from leprosy, by the laboratory method used, is feasible.

—SR. HILARY ROSS

TANIMURA, T., NISHIMURA, S., HONDA, H. and KODAMA, M. Studies on culture of the leprosy bacillus. (Part 3.) *La Leprosy* **23** (1954) 319-326 (in Japanese; English abstract p. 319).

A new basic medium consisted of Kirchner's medium plus serum and extract of murine leprosy. Various amino acids, vitamins, phthiocol, and 6-aminocaproic acid (ACA) were added to this basic medium. Besides the ordinary method, the double-tubes method was employed, and also intraperitoneal cultures in white rats. Fresh or X-ray-treated murine bacilli gave no multiplication in the cultures. The human bacillus was inoculated upon the double-fluid medium with added sphingomyelin, and the result was negative. These results lead the authors to doubt possibility of *in vitro* culture of the human and murine bacilli claimed by some workers.—[From abstract.]

BEAMER, P. R. and FIRMINER, H. I. Improved methods for demonstrating acid-fast and spirochetal organisms in histologic sections. *Lab. Invest.* **4** (1955) 9-17.

The acid-fast method is a modification of Fite's original formalin one (1939), avowedly closely similar to modifications by Tilden and Tanaka (1945) and by Armstrong and Price (1947). After staining in the new-fuchsin solution (new fuchsin, or magenta III, 0.3-0.7 gm.; phenol crystals, 5.0 gm.; ethyl alcohol, 95%, 10 cc.; distilled water to 100 cc.) up to "a few hours" if at room temperature and decolorizing, the sections may be processed in any of several ways. It is said that proved leprosy tissues were used in the study; the one picture is of tuberculosis. In a comparison with the Ziehl-Neelsen method [technique not stated], of 37 specimens negative by that method 26 were positive with the modified Fite. Of these 37 cases, 31 were regarded as histologically characteristic [sic] of tuberculosis (21 found positive) and 6 as leprosy (5 positive).

—H. W. W.

MONTESTRUC, E. and MARTIN DE MIRANDOL, P. Sur la fixation de bacilles de Hansen au point d'inoculation d'une injection d'anatoxine antitétanique. [Fixation of Hansen bacilli at the site of an antitetanic toxoid injection.] *Bull. Soc. Path. exot.* **47** (1954) 196-198.

An individual, 25 years old, was given an antitetanus anatoxin injection because of a wound. Some days later there was observed a local reaction which persisted, and then after several weeks there appeared a macule centered at the point of injection. After two years this lesion was very extensive and infiltrated. Finally, five years after the injection of the anatoxin, the diagnosis of leprosy was made. The authors recall the hypotheses concerning the subject of tuberculosis infections following vaccination, i. e., endogenous origin of the bacilli fixed at the site of the injection, or exogenous origin due to insufficient sterilization of the syringe. They believe that these two hypotheses can equally be considered in a case such as this one.—M. VIETTE

TIMPE, A. and RUNYON, E. F. The relationship of "atypical" acid-fast bacteria to human disease. *J. Lab. & Clin. Med.* **44** (1954) 202-209.

Acid-fast bacteria other than the human and bovine tubercle bacilli are not infrequently isolated from patients with pulmonary disease. These organisms, being commonly chromogenic and nonpathogenic to guinea-pigs, are usually considered to be saprophytes, but there are indications that some of them may be etiologic agents of human disease. The authors have examined such atypical acid-fasts from 120 patients with pulmonary disease, with detailed culture studies of 88 strains (51 from the Kansas City area, 31 from Georgia, the rest from other states) and tests for animal virulence of 41. None was virulent for guinea-pigs in 1 mgm. dose. Colony characteristics permitted dividing these strains into three groups, two of which were found to be virulent for mice. Certain of the strains show some resemblance to avian or vole bacilli. Mouse-virulent strains were obtained repeatedly, over long periods of time, from the sputa of patients who had no concurrent tuberculosis infection. The authors feel that "discard of an acid-fast organism isolated from a patient with pulmonary disease because it fails to fit the cultural or virulence pattern of *M. tuberculosis* does not appear to be justified." [With the discussion of findings of others and 33 references, this article would be a good point of departure for anyone undertaking to look into the matter of nontuberculosis acid fasts found in human disease.]

—SR. HILARY ROSS

HOBBY, G. L., AUERBACH, O., LENERT, T. F., SMALL, M. J. and COMER, J. V. The late emergence of *M. tuberculosis* in liquid cultures of pulmonary lesions resected from humans. *American Rev. Tuberc.* **70** (1954) 191-218.

This is a contribution to the problem of apparent nonviability and noninfectiousness of tubercle bacilli found in lesions that have improved to a certain point under chemotherapy. The technique employed, described in detail, was somewhat elaborate. Of 31 resected lesions from 19 patients, bacilli were recovered from 25— from 15 of the 19 patients. In several instances growth was slow, none being detected until after 9 to 12 weeks. Although only 10 of the 25 lesions that showed growth in cultures were capable of producing tuberculosis on direct inoculation into guinea-pigs, all strains of bacilli recovered by culture proved to be highly virulent to that animal. It is concluded "that tubercle bacilli can survive in healed or semi-healed necrotic pulmonary lesions, even after prolonged chemotherapy, and that, in many instances, their viability can be demonstrated by appropriate cultural techniques."

—H. W. W.

CHAUSSINAND, R., VIETTE, M. and KRUG, O. Nouvelles observations sur l'action de l'hydrazide de l'acide isonicotinique (INH) dans l'infection murine à bacille de Stefansky. [Further observations on the action of isonicotinic acid hydrazide (INH) in rats infected with the Stefansky bacilli.] *Ann. Inst. Pasteur* **88** (1955) 378-381.

It has been demonstrated in two earlier articles that INH definitely retards the progress of the Stefansky-bacillus infection in rats. The appearance of lesions after a latency period of many months indicated the development of resistance of the

Stefansky bacillus to the drug. To determine if this was so, 30 rats were divided into three lots and inoculated with bacilli obtained from lesions that had developed in spite of treatment. Twenty of them were treated with 10 mgm./kgm. INH. The infection developed as severely in the treated animals as in the controls, although in the latter it was a little more rapid. The infection was more rapid in the animals treated from the time of the inoculation than in those not treated until the 17th day. In another experiment the effect of discontinuous treatment was investigated, in 30 rats inoculated with bacilli that had never been in contact with INH. Ten of the animals were given continuous treatment. The 20 others were treated for 3 months and then given a rest of either 1 month or 2 months, and then treated again. The lesions were less marked in the animals with the one-month interval. Three other lots of 10 rats each, inoculated with bacilli not previously under the action of INH, were treated by mouth with 10 mgm./kgm. beginning either at the time of the inoculation, or on the 17th day or the 30th day afterward. The average survival was 266.4, 312.7 and 329.3 days, respectively, in the treated animals, and 212 days in the controls. The treatment was, therefore, most efficacious when it was not begun until the 17th day after the inoculation. Forty rats inoculated intramuscularly were treated either orally with 10 mgm./kgm. or subcutaneously with 25 or 50 mgm./kgm. The subcutaneous route permits the administration of much higher doses than the oral route and it is more efficacious, but it does not suppress the infection. —M. VIETTE