

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.

NOTICE ABOUT RESTRICTIONS

At the time the material for this issue was prepared there were more abstracts on hand, obtained from one source or another, than could be normally used in three issues. Conditions at present are not normal, because of limitation of funds available for publishing the present volume, and there will be fewer pages than usual in the first three issues; the fourth is to be devoted entirely to the Tokyo Congress material. Consequently, despite our desire to make note of as many as possible of articles on leprosy that are published, and on subjects of collateral interest that come to our attention, more strict criteria for selection will have to be applied than usual. Consequently, to our regret some of the abstracts sent in by Contributing Editors may not be used, and those that are used may be sharply condensed.

[TANGANYIKA] Annual report of the Medical Department, 1956. In two parts, 38 and 44 pp., Dar es Salaam, 1957.

Although the number of cases under treatment increased during the year, to 5,246 in the 18 leprosaria and 18,427 at the 258 outpatient leprosy clinics, the increase was in the latter category. Referring to the feeling in at least one district that all treatment should be carried out in leprosaria it is said, "There is no doubt that the leprosarium continues and must continue for some considerable time to play an important part in the treatment and control of this infection. Existing leprosaria should be used only for infectious cases during such time as they are being rendered non-infectious by treatment, and that all non-infectious cases of the disease should be encouraged to remain within their normal communities, to which they present no menace whatsoever, and receive their treatment as for any other non-infectious condition." In Tanga Province, where the outpatient clinics have been in operation for some time, there has been a decline in the numbers of patients, perhaps attributable to the effects of the treatment. Tanganyika is well served with leprosaria, 5 operated by the government, 2 by native authorities, and the rest by missions. An attempt to get two missions to pool their resources and move their 2 leprosaria from unfavorable locations to a single institution in a better locality failed.

—H. W. W.

[BELGIAN CONGO] Rapport annuel de la Direction Générale des Services médicaux, 1956. Mimeographed, 114 pp.

This report—which incidentally contains evidence of a shift to use of the word "hanséniens" instead of lépreux—shows that the number of known cases had increased to 275,293 from 223,280 in the previous year, by far the largest numbers being in the Equateur and Orientale provinces. In the 133 leprosaria there were 30,825 patients, lepromatous or invalid. The mobile clinics (*équipes itinérantes*) are credited with having examined 5,769,346 persons and finding 25,692 new cases, bringing the total under their treatment to 235,532.

—H. W. W.

[QUEENSLAND] Annual report of the health and medical services of the State of Queensland for the year 1956-57. Brisbane, 1957, 108 pp.

There were only 18 patients in the Peel Island leprosarium who were required to be there, and only 1 patient had been admitted during the year. Judged by rates of discharge, the current drugs have been at least twice as effective as chaulmoogra oil in the

past. In the older period the average stay in the hospital was 8 years 5 months, but now it is only 3 years 3 months. The readmission rate, previously 35% of the discharges, is now only 5%. Regarding the Aborigines on Fantome Island, the total of whom was down to 24, it is said that whereas the disease progresses more rapidly among them than among whites, the treatment shows its effectiveness more rapidly. Most of these patients take treatment regularly, so that they may return home. —H. W. W.

DÖLCHER, W. Dermatologische Beobachtungen auf Bali; Beiträge zur Geographie der Hautkrankheiten. [Dermatological observations in Bali; contribution to the geography of skin diseases.] *Hautarzt* **8** (1957) 427-432.

In the Sunda Islands there are at present 11 primitively-equipped homes with about 700 beds. The intended construction of modern leprosaria, especially on Bali, is held up because of high costs. Bali has about 4,000 leprosy patients, but only a small part of them are in the 6 existing leprosaria, which have a total of only 300 beds. In the hospitals treatment of leprosy is usually only initiated for a short time. There is no law for compulsory isolation. In Bali, as everywhere in Indonesia, the few leprosy polyclinics are only provisional; at them the patients are advised and treated by male nurses. Treatment is with combinations of sulfones (promin, diasone, promizole, sulphetrone), thiosemicarbazone, and INH. This treatment regularly achieves improvement, or even "cure." —E. KEIL

BICA, A. N., ROMAN, J. and SAENZ, A. C. El problema de la lepra en las Américas. [The problem of leprosy in the Americas.] *Bol. Of. Sanit. Panamericana* **42** (1957) 548-555.

The activities of the Pan-American Sanitary Bureau have so far consisted of gathering information about the amount of leprosy in the various countries and about the resources that are available for dealing with it. A table gives the population; the known, segregated and calculated numbers of leprosy cases; the numbers of leprosaria and their capacities; and the numbers of dispensaries. The known cases add up to 116,129, and the calculated cases to about 200,000, of which 80,938 are in Brazil, 50,000 in Mexico, 16,000 in Argentina, 12,000 in Colombia, 10,000 in Paraguay (with a population of 1.5 million), 6,000 in Cuba, 3,400 in Peru, and 1,000 to 2,000 in the United States.—[From abstract in *Trop. Dis. Bull.* **54** (1957) 1192.]

VOGELSANG, T. M. Lepra in Norge; en kort oversikt over et langt kapittel i norsk medisinalhistorie. [Leprosy in Norway; a brief review of a long chapter in Norwegian medical history.] *Nordisk Medicin* **23** (1957) 743-748 (English summary).

The history of leprosy in Norway is reviewed briefly, with comments on the classic monograph of Danielssen and Boeck, published in 1847, and Hansen's discovery of *Mycobacterium leprae* in 1873. This discovery necessarily brought changes in the conception of the cause of the disease and also in the manner of its control. Under the law of 1877, amended in 1885, leprosy has been reduced from practically 3,000 cases in 1856 (more than 2 per thousand in a population of about 1,300,000) to only 7 known cases in 1957—none of them active. Beginning in 1854 there was a medical officer of leprosy for the whole country, a position held by Hansen from 1875 to 1912, but abolished in 1957 when Melsom resigned because the office was superfluous. With this change a long and important chapter in Norwegian medical history was brought to an end.—[From the author's English summary.]

QUAGLIATO, R. Lepra conjugal. Estudo epidemiológico dos casos observados no Dispensário do D.P.L. em Campinas, S. P. (1934-1954). [Conjugal leprosy; epidemiologic study of cases observed in the dispensary of the Department of

Leprosy Prophylaxis in Campinas, São Paulo, 1934-1954.] *Rev. brasileira Leprol.* **25** (1957) 59-68.

Out of 7,062 contacts of leprosy patients examined, 500 had contracted the disease. Of the 639 in contact with leprosy spouses, 7.8% (i.e., 50) had developed leprosy, compared with 9.9% in 2,064 children, 9.0% in 400 parents, 8.8% among 1,365 brothers and sisters, and 3.3% among 2,594 others. All the patients who had infected their spouses were lepromatous.—[From abstract in *Trop. Dis Bull.* **54** (1957) 1192.]

ANDRÉ, L.-J. and ANDRÉ-GADRAS, E. Étude des rapports entre la sicklémie et la lèpre. [Study on the relationships between sicklemlia and leprosy.] *Méd. Trop.* **17** (1957) 596-599.

Sicklemlia is said to give a certain degree of protection against malaria. An investigation along this line was carried out during a leprosy detection campaign. Sicklemlia was found in 13.5% of 600 healthy subjects and in 8.1% of 549 leprosy cases. Of the leprosy patients with sicklemlia, 4.4% were lepromatous and 95.6% were tuberculoid and indeterminate. Of the leprosy cases without sicklemlia, 17.1% were lepromatous and 82.9% were of the benign forms. —M. VIETTE

[SYMPOSIUM] Eritema nodosa na lepra. [Erythema nodosum in leprosy.] *Bol. Serv. Nac. Lepra (Brazil)* **15** (1956) Spec. No., 106 pp.

The introduction to this special number explains that, pursuant to an inquiry from the director of the National Leprosy Service as to how the "erythema nodosum" phenomenon should affect the granting of the so-called "transfer to dispensary" provided for in law No. 1,045, the Brazilian Association of Leprology had promoted a symposium on the subject of ENL. The following topics were adopted for the agenda on each of which one or more papers were read. (1) Clinical characters, dermatological affinities, frequency, differential diagnosis, by L. M. Bechelli. (2) Histological structure, other laboratory data, bacterioscopy; 3 contributions, by H. Portugal (10 photomicrographs), A. Porto Marquez, and P. Rath de Souza. (3) General pathology; 2 papers, by F. E. Rabello and N. Souza Campos. (4) Immunobiology; 2 papers, by R. D. Azulay and C. Silva. (5) Prognosis and treatment; 2 papers, by J. Baptista Risi and G. Mangeon. Two other articles were contributed, by A. M. Alonso and R. N. Miranda. The meeting began with a presidential address by Ramos e Silva, and there are several pages of discussion. Few of the articles have summaries, and no attempt can be made to abstract them; there is no editorial summing up, or evidence of an attempt formally to answer the question which led to the meeting. The reader must be referred to the original publication. —H. W. W.

WHEATE, H. W. (Caution regarding erythema nodosum leprosum.) *Leprosy Rev.* **29** (1958) 60-61 (correspondence).

Referring to the editorial implicitly in favor of the use of artificial lepra reaction in treatment of lepromatous cases [see preceding abstract], the writer of this note makes a plea for caution with respect to ENL. It may be that reaction would help in those minority cases that have stopped improving under sulfone [Floch's "threshold of improvement"], and some cases that have had ENL with neuritis and nerve stripping have improved, but he agrees with Davison that reactions do not favor recovery and discharge. The tendency is for the reaction state to become subacute or chronic, with consequent nerve damage. —H. W. W.

[ROSS INNES, J.] Induced leprotic reaction. *Leprosy Rev.* **28** (1957) 136-138 (editorial, unsigned).

Mentioning specifically Danielssen, Muir and Schujman in connection with the use of induced reactions in treatment, the writer of this note gives details of the practices of

the last-named, and remarks that, although most physicians today regard reactions as dangerous, it is salutary to consider "this thread of wisdom coming down to us from the past." The workers mentioned perhaps "have 'got something,'" and—for lepromatous cases, only—it may be advisable to induce reaction artificially. —H. W. W.

FLOCH, H. and MAILLOUX, M. Sur les réactions lépreuses et leur pronostic. [Reactions in leprosy and their prognosis.] *Bull. Soc. Path. exot.* **49** (1956) 867-874.

After noting the opinions of various leprologists as to the effect of lepromatous reactions, the authors compare 26 reactional lepromatous patients with 25 patients who did not have reactions. Of the reactors, the 17 who were either bacteriologically negative or nearly so all improved, while among the 9 patients with more bacilli the condition was aggravated in 7 and 2 died. Among the controls the course of the disease was practically the same, except that there was no death. ENL induced by sulfone treatment is usually accompanied by improvement, as is also apparently the case in the "reversal reaction" of Wade. Naturally-occurring lepra reaction, if it cannot be controlled, may be very dangerous. Reaction induced artificially may be useful if the reaction can be controlled.—(From abstract in *Trop. Dis. Bull.* **54** (1957) 700.)

GEHR, E. Relapse cases in leprosy. *Docum. Med. geograph. et trop.* **9** (1957) 58-68.

Between 1939 and 1949, in Surinam, an average of 31 patients per year were declared disease arrested. From 1950 to 1955 the numbers with arrested disease were, resp.: 31, 47, 46, 125, 240 and 221. From 1954 to early 1956 there were 23 relapses, most of the cases lepromatous. On the average, the disease had been arrested for 3 years. Also described are 3 relapsed cases which had become quiescent again, and 12 interrupted cases, with the occasional finding of bacilli which does not necessarily signify relapse. Many relapses are mild and of short duration. To prevent relapses, treatment of arrested cases should be prolonged; also, there should be periodic examinations at regular intervals.—[From abstract in *Trop. Dis. Bull.* **54** (1957) 828.]

COLLOMB, H. and SALLES, P. Névrite hansénienne. A propos de sept observations de névrite hansénienne isolée ou accompagnée de lésions cutanées minimales, non spécifiques. [Leprous neuritis; seven observations of leprosy neuritis, isolated or accompanied by minimal nonspecific skin lesions.] *Presse Méd.* **65** (1957) 2216-2219.

A report of 7 cases with neuritis of the peripheral trunks, 4 without skin lesions. The diagnosis was made difficult by the absence of skin lesions, or when present, by their uncharacteristic aspect. Electric examination (electromyography and chronaximetry) is of little value in diagnosis. On the other hand, surgical exploration confirmed the diagnosis of leprosy in most of the cases, either by the macroscopic appearance or the histologic findings. Furthermore, liberation of the nerve fascicles from the sclerotic perineurium usually gives good results where chemotherapy is often ineffective.

—M. VIETTE

BROWNE, S. G. Leprous nerve abscess; report of two cases. *Leprosy Rev.* **28** (1957) 20-24.

Two cases of tuberculoid nerve abscess of main nerve trunks are reported from the Belgian Congo. In one case, the tuberculoid lesion was long-standing and quiescent; in the other, cutaneous lesions had not made their appearance at the time the abscess was forming, but appeared later.—[From abstract in *Trop. Dis. Bull.* **54** (1957) 441.]

MELAMED, A. J. and ABULAFIA, J. Fenómenos vasculares en la reacción leprosa. [Vascular phenomena in lepra reaction.] *Med. Panamericana* **9** (1957) 455-466.

Previous papers dealt with the paradoxical action of phenylbutazone in the treatment of lepromatous lepra reaction, i.e., the capacity of the drug to improve or to

aggravate, depending on the case, the signs and symptoms of reactions. Similar effects were obtained by treatment with glucocorticoids and ACTH, and by suddenly interrupting their administration. In the present investigation patients with active lepra reaction, or who had had that condition previously, were submitted to successive or alternate treatments with phenylbutazone, ACTH, prednisone and cortisone, and to the sudden interruption of the latter three. Patients suffering from outbreaks of lepra reaction show alterations of the small vessels (capillaries and precapillaries) and occasionally of the arterioles, at lesion level. These alterations are visible even during quiescent periods. In manifest lepra reaction two different types of vascular symptoms were observed: (a) congestion and edema with quantitative variations, and (b) leucocytic exudates often accompanied by vascular fibrinoid necrosis and occasionally vascular thrombosis and hemorrhages. Symptoms of Type A were not accompanied by necrobiotic manifestations in the lepromatous granuloma or by modifications of the lipids, and significant changes of the number and appearance of microorganisms were not observed. On the other hand, the manifestations of Type B coincided with intense necrobiotic phenomena in the lepromatous granuloma, with obvious reduction of fat and with an evident decrease of the number of microorganisms. The manifestations of Type B were preferentially, and sometimes exclusively, observed inside the lepromatous granuloma; the vascular fibrinoid necrosis was seen only in the vessels of the granuloma. Lepra reaction is therefore a vascular response to changes undergone by the bacillus-granuloma complex. The functional correlation of vessels and dependent tissue indicates that the factors which may alter the function or the structure of the small blood vessels (permeability, capillary fragility) are potentially able to bring about the appearance and exacerbation of lepra reaction or to reduce it partially or completely. It is also understandable that every factor capable of modifying the chemical and metabolic activity of the lepromatous granuloma and of the microorganisms (permeability of the cell, necrobiosis of fat, etc.) may equally initiate the appearance of lepra reaction or aggravate its symptomatology.—[From authors' summary, supplied by G. Basombrio.]

FLOCH, H. Le phénomène de la sulfono-résistance en thérapeutique antilépreuse. [The phenomenon of sulfone resistance in antileprosy therapy.] *Arq. mineiros Leprol.* **17** (1957) 281-290.

The author had been asked about treatment of sulfone-resistant cases: Given patients who had more or less cleared up but who, while still receiving the same treatment, had relapsed and developed many progressive new lesions that were totally unresponsive to the drug, what treatment would he recommend? Beginning as early as the Havana congress he had repeatedly warned of the danger that the bacilli might develop sulfone resistance, but it does not appear that he has seen relapsed cases of the kind described. However, he has written of the many cases which reach a "threshold of improvement" beyond which they will not go on the sulfone alone, perhaps because of small dosage. For them thiosemicarbazone and isoniazid are of interest, especially in combination with a sulfone. There are very few cases of true resistance of the Hansen bacillus to sulfone, but usually only the relative resistance of the "threshold improvement" kind, and they should be given, in active dosage, combinations of drugs: DDS + TB-1, or DDS + INH, or even DDS + TB-1 + INH (or derivatives).

—H. W. W.

GEORGES, A. and LECHAT, M. Etude de la sulfonémie après administration d'une préparation de D.D.S. solubilisée à des lépreux. [Study of blood sulfone after administration of a soluble DDS preparation in leprosy.] *Ann. Soc. Belge Méd. Trop.* **36** (1956) 525-536.

The sulfonemia curves in leprosy patients treated by a new soluble DDS have been studied. Intramuscular injections of 1 gm. once a week has for consequence: (1) a basal

sulfonemia of 2 mgm./1. during the entire period of treatment; (2) considerable rise of sulfonemia during the three days following injection (5-8 mgm./1.). A strong bacteriostatic action without risk of toxicity is expected. —A. DUBOIS

MERKLEN, F. P. and RIOU, M. V. A propos du traitement des réactions lépreuses par la cortisone. Les risques d'une cortisonothérapie prolongée. [On the treatment of lepra reactions with cortisone; the hazards of prolonged cortisone therapy.] Bull. Soc. Française Derm. Syph. **63** (1956) 46-49.

Mentioning the qualifications which the Madrid congress wrote about corticosteroid therapy, the authors say that because their results with vitamin K derivatives have been so favorable that they had used the hormone therapy in only 3 especially difficult cases. The medications (with vitamin K, ACTH, and cortisone) varied, as did the results, but on the whole they were favorable. One of the patients had tuberculosis, and the stubborn (*subintrantes*) reactions which gradually subsided under the hormone treatment did so while the tuberculosis was advancing; and the drugs which affected the tuberculosis favorably had no beneficial effect on the leprosy. —H. W. W.

JONQUIERES, E. D. L. Control de las reaciones leprosas tuberculoide con prednisona. Comunicación previa. [Control of tuberculoid leprosy reaction with Prednisone; preliminary note.] Semana Méd. **111** (1957) 313-317 (English summary).

Exacerbation or reaction in tuberculoid leprosy has no beneficial result and is liable to leave scars and permanent nerve injury. To suppress it the author used prednisone in 5 cases, including 1 of dimorphous leprosy, giving 5 mgm. every 4 hours and continuing the sulfone treatment. In the 4 tuberculoid patients there was rapid subsidence of reaction within a few days, but there was not the same beneficial result in the dimorphous case.—[From abstract in *Trop. Dis. Bull.* **55** (1958) 53.]

VALETTE, A. Antihistaminiques et réactions lépreuse. [Antihistaminics and lepra reactions.] Bull. Soc. Path. exot. **50** (1957) 200-203.

Forty-six patients (39 lepromatous and 7 tuberculoid) presenting reaction conditions during sulfone treatment were given chlorhydrate of pyrrolidyl-ethyl-phenylbenzylamine (Domistan), a synthetic antihistamine, by mouth in 50 mgm. dose, morning and afternoon. In 43 cases the reactions subsided in 4 to 6 days. The drug was also given as a preventive in 50 mgm. daily dose to 18 patients at the beginning of sulfone treatment; 16 showed no reactions, and only 2 showed a cutaneous reaction without general symptoms on the 8th day, whereas usually 50% of the patients present reactions. —M. VIETTE

DE OLIVEIRA LIMA, S. Ensaio de tratamento das algias hansenóticas com um novo analgésico. [Treatment of the pains of leprosy with a new analgesic.] O Hospital **49** (1956) 397-402.

The cures obtained in 64% of cases with 3-hydroxy-N-methyl-morphinan show that it is an effective remedy. It is considered by far the best one tested so far. The most important advantage is that it does not cause habituation, and it is not soporific. When it is desired that the patient sleep, a suitable drug should be used. Its trial by others is recommended.—[From abstract in *Excerpta Medica* **11** (1957) 277.]

RELVICH, A. L. Experience with antigen *marianum* in the treatment of leprosy. Leprosy Rev. **28** (1957) 150-156.

Blanc claimed that he had converted lepromin negativity in 70% to 90% of lepromatous patients by injecting *M. marianum*, but he did not say how permanent this conversion was. The author obtained conversions in only 30%; he was not able to test their permanency. In a controlled experiment the marianum antigen was given to 55 patients under sulfone treatment, with 59 controls receiving the sulfone treatment only.

The antigen was injected 0.1 cc. once a month for 6 months, then after a rest of 2 months the injections were resumed, but the trial had to be cut short and only 5 to 8 injections were given. "No definite difference was observed in the rate of improvement of patients who received the antigen and sulfone compared with the patients on sulfones alone," although a final evaluation must await the results of further trials.—[From abstract in *Trop. Dis. Bull.* **55** (1958) 54.]

SEN, N. and MUKERJEE, N. Antigene marianum in the treatment of leprosy. *Bull. Calcutta Sch. Trop. Med.* **5** (1957) 32.

The supply of the antigen being limited only 10 cases were treated, 4 lepromatous and 6 nonlepromatous, all active. Intradermal injections were made monthly (how many, not stated; the observation was a "short time" one). There was always a local reaction, practically always ulcerating. Focal and general reactions were rare in the nonlepromatous cases, but frequent in the lepromatous ones. Improvement in the latter cases was slight, but the former cases "improved satisfactorily and the lesions . . . subsided considerably." In two of them the moderate hand deformities that had existed were almost completely corrected. It is concluded that "this antigen may be useful in the treatment of leprosy."
—H. W. W.

[LEPER'S TRUST BOARD] Reports at the third conference of the Lepers' Trust Board Inc., 30th November 1957. Mimeographed, 20 pp.

This is a report of a conference of the Lepers' Trust Board of New Zealand, which under the extraordinary drive of the secretary, Mr. P. J. Towmey, has long been making extraordinary contributions to the leprosy work in the South Pacific islands, including the institutions at Fiji. After two speeches by senior officials from Fiji, Dr. V. W. T. McGusty told of the building of the three vessels which the Board is to turn over to the Anglican, Methodist and Catholic missions in the British Solomons to facilitate their work with leprosy victims as well as other activities. Towmey reported on an extensive, five-month tour of the area, and his account of his three months traveling in the Solomons makes fascinating reading. The discussion of modern treatment, by Dr. D. W. Beckett, the present medical superintendent at the Central Leprosy Hospital, Makogai, goes at some length into physiotherapy, in which field he believes Makogai to be ahead of any other leprosy hospital, thanks to equipment provided by the Board. Among many other things he stated, "We have recently concluded a wide and prolonged experiment in Makogai on the value of [the] marianum vaccine . . . which . . . was evolved by the late Sister Marie Suzanne, S.M.S.M., who worked at Makogai for 25 years before returning to France to take up research work . . . I am still in the process of correlating the results of the trial but I think I may safely say that the evidence so far is not encouraging and I feel that this vaccine, in spite of reports to the contrary, will follow its predecessors into oblivion."
—H. W. W.

ROJO ECHEVARRIA, F. Tratamiento de la amiotrofia leprosa con vitamina E. (Reporte preliminar.) [Treatment of the amyotrophy of leprosy with vitamin E; preliminary report.] *Bol. Soc. cubana Dermat. y Sifilogr.* **13** (1956) 25-30.

With repeated injections of 60 mgm. of vitamin E into each small muscle of the hand affected by atrophy, the muscles regained their volume. Approximately 5 injections were made at each weekly session. The injections are painful. The results are encouraging.—[From abstract in *Excerpta Medica* **11** (1957) 276.]

DE SOUZA ARAUJO, H. C. Eficacia da vitamina "E" nas amiotrofias leprosas. [Efficacy of vitamin E in amyotrophy of leprosy.] *Arq. mineiros Leprol.* **17** (1957) 110-113.

Ten patients with amyotrophy of hands due to leprosy were given vitamin E treatment, as advised by Sigall, in weekly injections of 30-300 mgm., made deep into the

atrophied muscles, for 18 weeks. The intervals varied between 1 and 3 weeks, and the total dosage between 300 and 5,400 mgm. The injections were made into the muscles of the thenar and hypothenar eminences, and in some cases into the distal borders of the hands; one patient was given injections into his legs. Satisfactory results were obtained in all cases. The volume of the muscles increased progressively, as did muscle tone and muscular movements, partial or total functional recovery being obtained. The results were permanent, as shown by follow-up observations. It is concluded that this treatment produces great improvement in muscular atrophy and prevents aggravation of the condition. It is also advised for amyotrophy after poliomyelitis.—[From abstract in *J. American Med. Assoc.* **166** (1958) 537, supplied by Sr. Hilary Ross.]

DEGOS, R., LORTAT-JACOB, E. and BARRE, C. Ostéolyse chez un lépreux rapidement réparée à la suite d'infiltrations novocainiques. [Rapid repair of bone necrosis in a leprous patient following novocaine infiltrations.] *Bull. Soc. française Derm. et Syph.* **63** (1956) 158.

A DDS-treated tuberculoid patient with paralysis of the external popliteal nerve of the left foot had lesions of the 3rd, 4th and 5th metatarsals, with a fistula. Alternating lumbar and perifemoral infiltrations of 1% novocaine (20 cc.) were given 3 times weekly. In 3 months, after 27 infiltrations, the fistula was healed and x-ray examination showed bone repair. —M. VIETTE

BUSHBY, S. R. M. and WOIWOD, A. J. The identification of the major diazotizable metabolite of 4:4'-diaminodiphenyl sulphone in rabbit urine. *Biochem. J. (London)* **63** (1956) 406-412.

The antibacterial activity of sulfanilamide apparently depends on the fact that one of the two amino (NH₂) group is not attached to the benzene ring. In DDS both of the amino groups are attached, and it is believed that the activity of this drug depends on these groups becoming free *in vivo*. Substituted sulfones like promanide (Promin) and solapsone (Sulphetrone) should therefore be inactive unless the amino groups become free. Given orally, such derivatives are converted to the parent sulfone in the stomach. Studying the excretion products in the urine by paper chromatography and electrophoresis, the authors find that little unchanged DDS is present [cf *THE JOURNAL* **23** (1955) 479]. The substance in largest amount in rabbit urine is a monoacid compound of DDS and glucuronic acid, formed in the body to detoxicate the sulfone; in human urine it is somewhat different, appearing to be a glucuronide. Other evidence leads to the speculation that the antibacterial activity of DDS may be due to this monosubstituted (glucuronic acid) derivatives. It follows that it may not be reasonable to administer the drug in unsubstituted form, and that this particular derivative may not be the most effective one therapeutically. —H. W. W.

KINNEAR, A. A. The excretion of N'-methylnicotinamide and N'-methyl-2-pyridone-5-carboxylamide in leprosy and the response to DDS therapy. *South African J. Lab. & Clin. Med.* **3** (1957) 63-66.

This report deals with the excretion of the stated metabolic products of niacin (nicotinic acid) in the urine of 20 patients with lepromatous leprosy and 20 with tuberculoid leprosy before and after treatment with DDS, in comparison with normal controls. N'-methylnicotinamide is apparently converted to the pyridone derivative in the liver. In pilot experiments the amounts recovered amounted to as much as 80% of the nicotinamide administered. Leprous patients, especially lepromatous, excreted less of both substances than normal persons, with little change after 1 year's treatment with DDS. It has not been proved that the low excretion of these substances is due to increased demand in leprosy. An added interest of the niacin structure is that it occurs in co-enzymes I and II.—[From abstract in *Trop. Dis. Bull.* **54** (1957) 1198.]

CHATTERJEE, M. L., SEN, N. R., CHATTERJEE, K. R. and MUKERJEE, N. The nature of chemical substance present in tuberculoid lesions of leprosy. *Bull. Calcutta Sch. Trop. Med.* **4** (1956) 71-73.

The acetyl-choline and histamine content of 5 tuberculoid and 1 lepromatous lesions were compared with those of normal skin from the corresponding parts of the body, a total of 12 skin specimens being examined. Extracts were made according to Feldberg and Talesnik, and they were tested on the isolated guinea-pig ileum. The active lesions, especially tuberculoid lesions in reaction, showed higher concentrations of histamine than normal. The average histamine content of unaffected skin was 7.0 $\mu\text{gm/gm}$, significantly lower than the figures of 23-48 $\mu\text{gm/gm}$ for the affected skin (both the values being expressed in terms of the base).
—AUTHORS' ABSTRACT

CHATTERJEE, M. L. and SEN, N. The nature of chemical substances, present in maculoanaesthetic lesions of leprosy. *Bull. Calcutta Sch. Trop. Med.* **4** (1956) 126-127.

Referring to their study of tuberculoid lesions (preceding abstract) it is noted that a relationship of mast cells to histamine has been reported, and this led the authors to examine specimens of flat, bacteriologically negative, maculoanaesthetic lesions. Here no significant increase in the concentration of histamine was found, probably due to the relatively sparse cellularity of the lesions.
—H. W. W.

MAYAMA, A. Studies on the electrophoretic serum glycoproteins in human leprosy and experimental murine leprosy. *La Lepro* **26** (1957) 160-165 (in Japanese; English abstract p. 160).

The serum protein and glycoprotein fractions were studied by paper electrophoresis in 41 cases of leprosy (25 lepromatous and 16 tuberculoid), and in white rats inoculated with the Hawaiian strain of murine leprosy (3-10 months after inoculation). In the lepromatous type the albumin is reduced compared to the tuberculoid type or the normal subject. The γ -globulin is increased but there is no significant difference in the albumin-bound carbohydrate compared to the control. The γ -globulin-bound carbohydrate, on the other hand, is decreased. Furthermore, there is no rise in β -globulin even though the β -globulin-bound carbohydrate is increased. In the infected rat the serum protein fractions differed little from the normal except for a decrease in albumin, nor did the serum glycoprotein fractions.—[From abstract.]

CIACCIO, I. and POCHY-RIANO, R. Contributo allo studio della mucoproteinuria nella lepra. [Contribution to the study of mucoproteinuria in leprosy.] *Ann. italiani Derm. e Sifilogr.* **10** (1955) 151-156.

Mucoprotein determinations were made by the Albeaux-Fernet technique in 30 leprosy patients, and it was found that the rate of elimination of mucoprotein was increased. Only 10% had the normal 50 mgm. per 1000, whereas 20% had 375 mgm., 47% had 175 mgm., and 20% had 100 mgm.—[From abstract in *Ann. Derm. & Syphiligr.* **85** (1958) 219.]

WADE, H. W. Criteria of the histological diagnosis of the tuberculoid and lepromatous leprosy lesions. *Leprosy Briefs* **7** (1956) 17-19.

The essential feature of the tuberculoid lesions is "focalization of epithelioid cells," with or without Langhans giant cells. The foci are seen in the subpapillary zone, or in the deeper levels, or in the intermediate levels. The author declines to recognize the "macular" variety of the tuberculoid type, with such foci histologically but without clinical tuberculoid morphology. Nerves are involved in the lesions, and this is a point of differentiation from other tuberculoid granulomata. The lepromatous type the author divides into 2 histologic varieties: (1) The classical Virchow-cell variety, with globus formation and foamy cells, and (2) the histiocyte ("histioid") variety, made up of

spindle-shaped tissue histiocytes not becoming greatly differentiated, typically not showing globus formation although the cells of active lesions are crowded with bacilli, their cytoplasm after hematoxylin eosin staining being faintly greyish and finely granular. Some such lesions may show a dual character, basically "histioid" but with areas in which globus production may be seen. Nerves in the lepromatous type tend to be heavily invaded by bacilli.—[From abstract in *Leprosy in India* **29** (1957) 63.]

NARITA, M., TAKAHASHI, S. and HIRAGA, H. Histopathological studies on leprotic mal perforans pedis. *La Lepro* **26** (1957) 144-159 (in Japanese; English abstract p. 144).

The typical histopathological picture consists of hyperkeratosis, acanthosis, papillomatosis, parakeratosis, proliferation of connective-tissue cells in the corium, slight lymphocytic infiltration, collagenous- and elastic-fiber degeneration, and arteritis obliterans, besides a characteristic granular tissue. This granular tissue is made up of 3 layers: a necrotic layer due to deposition of fibrinoid masses, a necrobiotic layer, and a reaction layer. It is similar to ulcerative granulation, and there is marked proliferation of connective-tissue cells, a high degree of degeneration of vessels, and edema with little infiltration of vascular cells. Bacilli cannot be found, and the arteritis obliterans is a secondary change, so that neither is the essential cause of trophic ulcers in leprosy.—[From abstract.]

CHAUSSINAND, R. A propos de l'expérimentation de la vaccination par le BCG dans la prophylaxie de la lèpre. [On experimentation with BCG vaccination in the prophylaxis of leprosy.] *Bol. Serv. Saúde Publ. (Lisbon)* **3** (1956) 185-198.

The article deals with experiments in Brazil. Healthy young children from a leprosy environment usually show conversion from lepromin negativity after BCG vaccination, which encouraged the expectation that they might have developed immunity against leprosy. The author formulates the scientific demands to which such experiments should respond. The most adequate proof would be provided by comparison between a vaccinated and an unvaccinated group of young children, both living under similar circumstances. Less convincing evidence might be obtained by comparison of 2 groups of adults, negative to lepromin as well as to a heat-killed tubercle bacillus antigen, one of which groups should be submitted to BCG vaccination. In the latter experiment it could not of course be excluded that certain individuals might already have been infected with leprosy, in a latent stage.—[From abstract in *Excerpta Medica* **12** (1958) 71.]

PEREIRA, JR., A. ^c Premunção da lepra pelo B.C.G. [Protection against leprosy by BCG.] *Arq. mineiros Leprol.* **16** (1956) 177-199.

With the advent of the sulfones and of protection by BCG the dispensary takes a prominent position, and the preventorium can be dispensed with. Oral BCG given in 3 monthly doses (0.2 gm. each) converts the Mitsuda reaction in 100% of persons free from leprosy, and the positivity so obtained has persisted during 5 years of observation. BCG vaccination, especially by the "concurrent" method, seems to aid the therapeutic action of the sulfones in dispensary cases and in patients released from leprosia.—[From author's conclusions.]

SOUZA CAMPOS, N., ROSEMBERG, J. and AUN, J. N. Significação patogénica da correlação dos resultados das reações lepromínica e tuberculínica em comunicantes de lepra. Lepra infecção; lepra doença, lesão de inoculação. (Complexo primário?) [The pathogenic significance of the correlation of the results of lepromin and tuberculin reactions in leprosy contacts. Leprosy infection; leprosy disease; lesion of inoculation. (Primary complex?)] *Rev. brasileira Leprol.* **24** (1956) 107-121 (corrected page numbers).

Among children in leproseries, separated from lepromatous parents, 50% of those who develop the disease do so in the first year, and 90% within the first 3 years. The great majority are lepromin positive, whether without signs of leprosy or with small tuberculoid lesions—which lesions tended to clear up spontaneously. The lepromin-negative minority tended to develop indeterminate or lepromatous leprosy, their prognosis being particularly bad if the tuberculin reaction is positive. All these children, contacts of open cases, are in a state of "leprosy infection," the infection possibly being in the lymph nodes connected with the point of entry. During the early years of life there is a natural resistance which, however, is transitory. In the great majority, before this transitory resistance disappears, its place is taken by an acquired resistance induced by either leprosy or tuberculosis infection, or both.—[From abstract in *Trop. Dis. Bull.* **54** (1957) 698.]

DE SOUZA CAMPOS, N. O BCG na profilaxia da lepra. Positividade espontânea; positividade em seguida a reinoculação do antígeno de Mitsuda; resultados práticos até agora observados. [BCG in the prophylaxis of leprosy. Spontaneous positivity. Positivity following reinoculation with Mitsuda antigen. Results of practical observations up to date.] *Rev. brasileira Leprol.* **24** (1956) 173-187.

The author argues against those workers who believe that the lepromin reaction becomes positive only spontaneously and throws doubt on the influence of BCG in making it positive; and he discusses the induction of positivity by repeated injections of lepromin. Among the arguments supporting the value of BCG in raising resistance to leprosy, he records the data of the central clinic of the Department of Leprosy Prophylaxis in São Paulo. Since 1952, among more than 12,000 contacts vaccinated with BCG, there have occurred 91 cases of leprosy of which 3 were lepromatous, 13 indeterminate, and 75 tuberculoid—3.3%, 14.4% and 82.3%. The type percentages among the 590 cases arising among the unvaccinated contacts [number not stated] were 40.1 (237 cases), 36.7 (217), and 23.1 (136). The significant point is the difference of proportions of tuberculoid cases in the two groups, 82.3% vs only 23.1%, indicating considerably higher resistance in the vaccinated group.—[From abstract in *Trop. Dis. Bull.* **54** (1957) 704.]

CHAMBON, L., DESTOMBES, P. and NETTER, R. Etude de l'allergie à la lepromine chez des lépreux vaccinés par le B.C.G. [Study of allergy to lepromin in leprosy patients vaccinated with BCG.] *Bull. Soc. Path. exot.* **50** (1957) 631-633.

It has been reported previously that the intradermal administration of BCG to lepromin-negative patients (lepromatous, indeterminate and reactional tuberculoid) was followed by appearance of lepromin allergy in 17% of the cases. The lepromin test was repeated 2 years later in 27 of the patients who became clinically and bacteriologically negative due to sulfone treatment. Those who were lepromin positive 6 weeks after the vaccination remained so. In addition, 2 lepromatous out of 11, 1 indeterminate out of 5, and all of 5 reactional tuberculoid had become positive. Histological examination of 7 Mitsuda reaction nodules showed lymphohistiocytic and epithelioid nodules in the dermis. It seems that allergy to lepromin may appear in leprosy cases, following BCG vaccination, after so long a time. The authors recommend BCG vaccination before treatment for leprosy cases which are anergic to lepromin, and then another vaccination while the disease is in regression. —M. VIETTE

BECHELLI, L. M., RATH DE SOUZA, P. and QUAGLIATO, R. Correlação entre os resultados da leitura clínica e do exame histopatológico da reação de Mitsuda. [Correlation of the results of the clinical reading of the Mitsuda reaction and the histopathology.] *Rev. brasileira Leprol.* **25** (1957) 21-58 (summary in English).

This lengthy report, which includes diagnostic notes on 139 specimens examined (118 from patients and 21 from contacts), ends with a comprehensive 2-page summary.

Specimens called histologically positive had definite tuberculoid structure with few or no bacilli; negative ones showed only simple inflammatory or granulomatous (histiocytic) infiltration, with many bacilli; while there were some with histology "in favor of positive" but not typically so, which should also be considered positive (designated "intermediate" below). The findings in the specimens read according to the Madrid schemes are summarized below, omitting 2 cases with ulcers without nodules, found histologically negative.

Clinical reading	No. of cases	Histopathologic findings		
		Negative	Intermed.	Positive
Negative	30	27	3	0
Doubtful	17	11	6	0
1+	43	5	12	26
2+	34	6	8	20
3+	13	0	2	11

The clinical extremes (negative and 3+) are also histologically extreme, but there is considerable similarity between the 1+ and 2+ reactions—both of which may be negative histologically. Definitive parole should not be given to a 2+ reactor with negative histology, whereas it might be given to a 1+ reactor with positive histology. No tuberculoid case was negative histologically. Bacteriologically negative lepromatous cases are seldom lepromin positive, and when they are the histology is usually negative. From the histologic findings, clinically doubtful reactions signify a certain degree of resistance in about 1/3 of the cases (not including lepromatous). Because the 1+ and 2+ reactions would seem to have the same histologic values, the authors would read the lepromin reaction as negative, doubtful, 1+ (comprising the 1+ and 2+ of the Madrid scale) and 2+ (the present 3+). [According to this any reaction measuring 3 mm. or more without ulceration would be 1+, and ulcerated reaction nodules would be 2+.]

—H. W. W.

SCHUJMAN, S. Evolución ulterior de la Mitsuda en los lepromatosos clínica y bacteriológicamente negativizados. [Subsequent evolution of the Mitsuda reaction in clinically and bacteriologically negative lepromatous cases.] Arch. argentinos Dermat. **6** (1956) 114.

The author attempted to convert the negative reaction to positive in patients with active lepromatous leprosy or in clinically and bacteriologically negative "arrested" cases (how many not stated) by means of BCG or the Stefansky bacillus. He succeeded in only 50% of the cases, getting only mild late reactions, never the early one. He believes that the reactions thus produced are devoid of protective action, because many patients either continued to progress or had relapses. The results of such attempts at immunization of healthy persons may be different, but certain conditions are required to assess them.

—G. BASOMBRIO

KAMINSKY, A., FIOL, H., JONQUIERES, E. and MASANTI, J. Vacuna tuberculosa irradiada y modificaciones de la leprominorreacción en enfermos de lepra. [Irradiated tuberculosis vaccine and alteration of the lepromin reaction in leprosy patients.] Rev. Argentina Dermatosis. **40** (1956) 120.

Vaccination with irradiated tuberculosis vaccine (Parke Davis & Co.) was performed in 59 patients. Some changes were obtained in the hemagglutination test (Middlebrook-Dubos), and the Mantoux and lepromin reactions, which indicates some activity of the vaccine. Positivization of the Mitsuda reaction was observed, and confirmed histologically, in 8.5% of nonreactors. [See also Capurro, E. T. *et al.* Internat. J. Leprosy **25** (1957) 119-121.]-[From authors' summary, supplied by G. Basombrio.]

DINIZ, O. and ABRAHÃO NETO, H. Reação de Mitsuda com antígeno preparado com pele de lesões de lepra indeterminada. [Mitsuda reaction with antigen prepared with skin from lesions of indeterminate leprosy.] Arq. mineiros Leprol. **17** (1957) 3-6.

With this antigen both early and late reactions are less strong than with the Mitsuda antigen. When the reaction to the latter is negative, it is always negative to the former; but the reverse results are frequent.—[From author's conclusions.]

✓ CHATTERJEE, K. R., MUKERJEE, N., SEN, N. R. and BOSE, R. Further observations on the immunological skin test in leprosy with the antigen prepared from Kedrowsky's bacillus. *Bull. Calcutta Sch. Trop. Med.* **4** (1956) 163-164.

Comparison of the new Kedrowsky-bacillus extract (see following abstract), of which a preliminary report has previously been published [THE JOURNAL **24** (1956) 364], with the Dharmendra antigen for early reactions has been continued in 280 more persons, all but 9 of them leprosy patients. None of the 102 lepromatous cases gave a positive reaction with either of the antigens, although with both there were a very few doubtfuls. These results are held to be ample proof of the specific nature of the new antigen. —H. W. W.

✓ CHATTERJEE, K. R., RAY, H. N., MUKERJEE, N. and UZIR, P. K. Some cytochemical observations on Kedrowsky's bacillus. *Bull. Calcutta Sch. Trop. Med.* **4** (1956) 164.

In this brief report, too condensed to be further summarized, it is stated for the first time that the new Kedrowsky antigen with which the authors have been working (see preceding abstract) is "a chemical fraction" of the bacillus. The fact that it produced early skin reactions in leprosy similar to those produced by the Dharmendra antigen suggested that the two bacilli concerned had some sort of similar antigenic substance, and that led to the present cytochemical study. —H. W. W.

✓ CHATTERJEE, K. R., MUKERJEE, N. and BOSE, R. The study of lipids in *M. leprae* by cytochemical technique. *Bull. Calcutta Sch. Trop. Med.* **4** (1956) 164-165.

Continuing their histochemical study of the leprosy bacillus [THE JOURNAL **24** (1956) 367], the authors studied the lipids by first reacting their free carboxyl groups with benzedrine and then coupling the product with a chromogenic amine. Both the polar granules and the bacillary capsules took the stain, the former more deeply than the latter, suggesting that they contained proportionately more of the lipids. It was previously demonstrated that the bacillary membrane contains polysaccharides, and now it is shown to contain lipids, both being probably in bound form. A portion of the bound lipids may be in combination with calcium. —H. W. W.

BERGEL, M. Inoculación del *Mycobacterium leprae* a ratas alimentados con dietas prooxidantes. I. Resultados bacteriológicos hasta los siete meses de la inoculación. [Inoculation of *Mycobacterium leprae* to rats fed with prooxidant diets. I. Bacteriological results in seven months after the inoculation.] *Semana Médica* **111** (1957) 480-487.

In order to determine if a prooxidant state would be favorable for the growth of the leprosy bacillus, 30 rats were inoculated (intraperitoneally, intratesticularly and subcutaneously) with a saline suspension of lepromas, and 21 of them were fed a diet low in vitamin E with 15% linseed oil. Seven months after inoculation, impression smears of the inoculated testes showed in the rats with the prooxidant diet large numbers of acid-fast bacilli and globi, while the control rats at the 4th month had shown only a few acid-fast granules and remnants of bacilli.—[From the author's summary, supplied by G. Basombrio.]

BERGEL, M. Inoculación del *Mycobacterium leprae* a ratas alimentadas con dietas prooxidantes. II. Resultados bacteriológicos hasta los diez meses de la primera reinoculación. [Inoculation of *Mycobacterium leprae* to rats fed with prooxidant diets. II. Bacteriological results 10 months after the first reinoculation.] *Semana Méd.* **111** (1957) 1148-1151; also *Leprológica* **2** (1957) 13-17.

In continuation of the previous experiment, the author inoculated 8 more rats with a suspension of a part of a testis of one of the rats of the first lot which, 6-1/2 months after inoculation, had shown in smears large quantities of bacilli. These transfer ("reinoculated") rats had been fed the prooxidant diet from the 20th day of age, and were inoculated when 34 days old. In two females that had died 6 and 8 months after inoculation, nothing of interest was found. A male sacrificed after 2 months showed no acid-fast bacilli and one sacrificed after 7 months showed few of them, whereas smears of the testis of two sacrificed after 10 and 11 months showed large quantities of bacilli and globi with all the morphologic, tinctorial and grouping characteristics of *M. leprae*.—[In part from the author's summary, supplied by G. Basombrio.]

BERGEL, M. Inoculación del *Mycobacterium leprae* a ratas alimentadas con dietas prooxidantes. III. (a) Resultados bacteriológicos hasta cinco meses de la segunda reinoculación. (b) Especificidad biológica de los bacilos ácidosresistentes hallados a los siete meses de la segunda reinoculación. [Inoculation of *Mycobacterium leprae* to rats fed with prooxidant diets. III. (a) Bacteriological results five months after the second reinoculation. (b) Biological specificity of the acid-fast bacilli seen in seven months of the second reinoculation.] *Semana Medica* **111** (1957) 1313-1318.

The testis of the rat which, in the preceding experiment (first transfer, or "reinoculation") had been sacrificed and showed enormous numbers of acid-fast bacilli, was used for the inoculation of a third batch of rats (second "reinoculation"). The inoculated testis of 1 sacrificed after 60 days showed in impression smears very few bacilli and globi, and they were few in 1 sacrificed after 108 days, whereas there were many in the rat autopsied after 150 days. The morphological and grouping characteristics were characteristic of *M. leprae*. Histologic studies showed nonspecific infiltrations. Rats on ordinary diet showed only very few bacilli after 160 days. (b) the biologic study of the acid-fast bacilli found 7 months after the second inoculation showed that the leprosy bacillus can grow and reproduce in the testis of rats on a prooxidant diet. This, in the author's opinion, is the first time that it has been demonstrated that they can grow and reproduce in an organism other than the human one.—[In part from the author's summary supplied by G. Basombrio.]

NISHIMURA, S. and KODAMA, M. Immunological studies in human and murine leprosy. (1) Immunization of mice against murine leprosy by BCG and the effect of gamma globulin on the onset of murine leprosy. *La Lepro* **26** (1957) 266-269 (in Japanese; English abstract p. 266).

Studies were conducted on the possibility of utilizing the mouse as the experimental animal in immunological studies with BCG in murine leprosy, and the best site of BCG inoculation. The greater suppressive effect was obtained at 90 days by intraperitoneal inoculation of BCG, but subcutaneous and intramuscular inoculations also caused inhibition. Oral and intravenous inoculations were ineffective. After 120 days the difference between the treated animals and untreated controls becomes insignificant. The distribution of bacilli in the lymph nodes followed the order of suppression of the leprosy. It is concluded that the use of the mouse in immunological studies on murine leprosy is feasible, and that the intraperitoneal route is the most effective. In a second experiment γ -globulin from sera of leprous and healthy rats, leprosy patients, and healthy subjects was injected into the mouse, but no effect on the onset of murine leprosy was observed. It is not clear, however, whether this lack of effect was due to the absence of immune substances in the γ -globulin or impossibility of passive immunization in the mouse.—[From abstract.]

NISHIMURA, S. and KODAMA, M. Immunological studies in human and murine leprosy. (2) The effect of BCG immunization in reticuloendothelial system blocked mice

and immunization against murine leprosy by vaccine of various acid-fast bacilli. *La Lepro* **26** (1957) 270-272 (in Japanese; English abstract p. 270).

In order to clarify the role of the reticuloendothelial system in immunization in murine leprosy, that system was blocked with India ink and BCG was inoculated. At 90 days the lepromas in the ink-injected animals were somewhat larger than those in the normal controls. Inhibitory effect was less in the animals given BCG after injection of India ink than in those in which BCG alone was inoculated. The same result was observed in a similar experiment with an *M. avium* vaccine. These results indicate that the reticuloendothelial system is related to the strength of immunity. Vaccines prepared from acid-fast bacilli other than BCG which have some pathogenicity in mice, as H37Rv, INH-resistant strain, and the avian bacillus, have antigenic activity for murine leprosy.—[From abstract.]

YAMADA, N. Experimental studies on immunization with murine leprosy. (1) Prevention of infection in mice with killed murine leprosy bacilli vaccine. *La Lepro* **26** (1957) 135-140 (in Japanese; English abstract p. 135).

Experiments were carried out using the dd strain of mouse, the Hawaii strain of the murine bacillus, and a heat-killed vaccine with and without an adjuvant (liquid paraffin, olive oil, propylene glycol), prepared by the Couland and Saenz method. The animals were inoculated after a set time following injection of the vaccine and sacrificed after 5 months. The leproma at the site of inoculation and the distribution of bacilli in the lymph nodes and organs were examined. There was some degree of inhibition of the local lesion with the vaccine containing oil, but no preventive effect was noted in the organs. The olive-oil and liquid-paraffin vaccines had a moderately strong preventative effect; the former especially had an inhibitory effect on proliferation of bacilli in the lymph nodes and organs as well as an effect on the leproma. The propylene-glycol vaccine was without effect.—[From abstract.]

NOEL, R. and MARIE-SUZANNE (SOEUR). De l'influence de l'injection d'une suspension de *Mycobacterium marianum* autoclavée sur l'évolution de la lèpre murine. Étude histologique. [The influence of the injection of a suspension of autoclaved *M. marianum* on the evolution of rat leprosy; histological study.] *Bull. Soc. Path. exot.* **49** (1956) 1103-1108.

Subcutaneous inoculations with *M. marianum* antigen were given to 3-day-old rats, and this was repeated thrice at monthly intervals. After 5 months, 5 treated rats and 6 controls of a similar age were inoculated intratesticularly with Stefansky bacilli, the test animals being sacrificed 1, 3, 4 and 5 months after inoculation. The 4- and 5-month marianum animals had only small, pea-sized nodules, while the lesions in the controls were extensive. In both, the histological picture was of the same character, but the marianum injections had caused marked prolongation of survival of the rats, and distinct histological attenuation of the lesions.—[From abstract in *Trop. Dis. Bull.* **54** (1957) 835.]

MAKSIMOVA, A. A. [The effect of superinfection on the development and course of experimentally induced leprosy in rats.] *Sborn. Nauch. Leprol.* **7** (1956) 425-434 (in Russian).

Experiments on rats showed that superinfection, 2 months after infection, with a suspension of a rat leproma at the sites of the initial infection (under the abdominal skin and in the left testicle) led to death after 5 months, all the rats showing visceral lesions at autopsy. In denervated animals (section of the femoral and pudendal nerves) this procedure led to death more rapidly. Changes in the bone system noted in superinfected animals were identical with changes seen in patients with leprosy. The severe development of infection in superinfected rats depends, in the author's opinion, on pro-

found changes of specific reactivity and impairment of nervous trophic factors.—[From abstract in *Excerpta Medica* **12** (1958) 72.]

NISHIMURA, S. and MASUDA, T. Studies on the chemotherapy of leprosy. (Report 20) Further studies on the suppression of onset murine leprosy by non-chemical agents as chaulmoogra oil and triton and anti-biotics. *La Lepro* **26** (1957) 277-280 (in Japanese; English abstract p. 277).

Triton, Taifumin A, Minophagen AT, chaulmoogra oil and olive oil were administered for 150 days in experimentally-infected murine leprosy mice but proved ineffective. Although chaulmoogra oil was ineffective in mice, an effect was apparent in the rat. Similar results had been obtained in the rat in studies made in 1942. It is suggested that rats rather than mice should be used in experiments with nonchemical agents such as chaulmoogra oil. Of the antibiotics tested, Dextromycin clearly suppressed onset, but Acidomycin was without effect.—[From abstract.]

HIRANO, N. and SUSHIDA, K. Chemotherapy of murine leprosy. 2. The effect of isonicotinoyl-3, 4-methoxybenzal hydrazone. *La Lepro* **26** (1957) 273-276 (in Japanese; English abstract p. 273); also, *Yokohama Med. Bull.* **8** (1957) 87-92 (in English).

It was previously found that isonicotinoyl-3-methoxy-4-hydroxybenzal hydrazone (No. 254) caused marked suppression of the onset of murine leprosy, the effect being even greater than that of INH. It was also found that isonicotinoyl-4-hydroxybenzal hydrazone, which lacks the $-OCH_3$ radical, had less effect than No. 254. It was therefore assumed that the $-OCH_3$ radical may play an important role, so studies were conducted with isonicotinoyl-3,4-hydroxybenzal hydrazone (No. 282), which possesses two $-OCH_3$ radicals. Its onset-suppressing action was found to be greater than that of INH or No. 254. Most of the bacilli in the tissues of mice treated with No. 282 show degeneration, and typical globi are rare. The ulcer of murine leprosy is cured by treatment with INH, but in most cases the leproma remains and acid-fast bacilli are still present. No. 254, and especially No. 282, however, have a moderately strong therapeutic effect on the leproma. Oral administration of 5 mgm. daily of No. 282 results in apparent cure of the pathologic changes, and subcutaneous inoculation of healthy mice with a suspension of tissue taken from the site of inoculation does not give rise to infection. It is suggested that the $-OCH_3$ radical plays an important role in murine leprosy.—[From abstract.]

NARITA, M. and SUGAWARA, I. The effect of tissue therapy in murine leprosy with special reference to histopathological changes in the dermal node. *La Lepro* **26** (1957) 281-288 (in Japanese; English abstract p. 281).

Rats infected with murine leprosy were treated with daily subcutaneous injections of 0.2 cc. of frozen placental extract (containing 20 mgm. breakdown products of placental tissue) for a total of 4.2-7.0 cc., and histologic examinations were then made. The subcutaneous tissue surrounding the leproma showed a strong inflammatory reaction, and the necrosis and destruction of the leproma itself was greater than in the controls. The mechanism of this reaction is not known.—[From abstract.]

ITO, T. and SONODA, R. Biochemical investigations of murine leprosy bacilli. (1) Collection of murine leprosy bacilli from infected tissue. *La Lepro* **26** (1957) 141-143 (in Japanese; English abstract p. 141).

The following methods of collecting murine leprosy bacilli in pure form and in high concentration were tried and evaluated by comparative tests in rats: (a) centrifugation, (b) pretreatment with 0.1% trypsin for 1 hour at 37° and then centrifugation, and (c) pretreatment with trypsin followed by the Hanks concentration method. The

yields were: with (a) 13%, with (b) 21%, with (c) 11%. The (b) method was therefore best, and the activity of the bacilli was not affected by it.—[From abstract.]

ITO, T. and SONODA, R. Biochemical studies of the murine leprosy bacillus. (Part 2) On the respiratory metabolism of the murine leprosy bacillus. *La Lepro* **26** (1957) 255-260 (in Japanese; English abstract p. 255).

This paper deals with the influences of many substrates upon the respiration of the murine leprosy bacillus obtained by the trypsin and centrifuging method. Seventeen substrates, such as glycerin, succinate, and vitamin B₁₂, did not accelerate respiration in single addition. Untreated murine serum prevented respiration. Inactivated liver extract had no influence. Testis extract showed acceleration of which the intensity was stronger when untreated than when inactivated. However, when liver or testis extract inactivated at 60°C for 30 minutes was combined with succinate, respiration was accelerated. Extracts of various organs and of murine leproma accelerate respiration.—[From abstract.]

HADLER, W. A. Involução das lesões de lepra murina em ratos tratados com 4,4'-diaminodifenilsulfona e em animais inoculados com bacilos com vitalidade alterada. [Involution of murine leprosy lesions in rats treated with 4,4'-diaminodiphenyl sulfone and in animals inoculated with bacilli of attenuated vitality.] *Bol. Serv. Nac. Lepra* **16** (1957) 3-14 (English summary).

A study is reported of the histology of murine leprosy lesions in: (a) rats inoculated and treated with DDS; (b) rats inoculated with bacilli taken from previously DDS-treated animals, no further treatment being given; and (c) rats inoculated with heat-killed bacilli. All inoculations were intraperitoneal, with the same dose of bacilli; the DDS treatment (oral 0.3% in food) was begun 7 days afterward. The lesions in the first group were largest and began involuting latest; those in the second group were intermediate. The involution lesions in all three groups were identical: the leproma cells degenerate, the amount of lipids within their cytoplasm increases, and the number of bacilli decreases. Differences related only to the severity of the lesions and to the time when they became involutive. Apparently the DDS acts directly on the bacilli, producing nonreversible injuries to their vitality; bacteriostatic activity, if it exists, cannot be observed by this method. The lipids of the involutive lesions seem to arise from the lysed bacilli. The lysis, however, is very slow and even the heat-killed bacilli lie a long time in the tissues. Morphologic integrity of the bacilli does not mean functional integrity. The destruction of the bacilli seems to happen without active participation of the leproma cell, and the DDS has no action on the rate of lysis. However, previous injury of the bacilli (previous DDS treatment, or heat) seems to be essential for effective lysis.—[From author's summary.]