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.

SOSA CAMACHO, B. Cincuenta años de lepra en el Hospital General. [Fifty years of leprosy in the General Hospital.] Rev. Med. Hosp. Gral. **21** (1956) 579-586.

At the beginning of the century leprosy patients were put into a special ward of the Juarez Hospital of Mexico City, and in 1915 they were transferred to a ward of the General Hospital. Late in 1938 they were transferred to a sanatorium in Tlalpan, Federal District; and lastly, a few months thereafter, 29 male and 17 female patients were brought to the Dr. Pedro Lopez sanatorium in Zoquiapan, Mexico State. Leprosy patients are commonly found in dermatology clinics, 222 cases having been discovered in 14,101 dermatologic consultations at the General Hospital. Consequently, efforts have been made for the establishment of more dermatology centers in endemic areas, and at the same time to train young doctors to learn to make early diagnoses.—M. MALACARA

AVILÉS NUGUÉ, F. and GUTIÉRREZ, E. La lepra en el Ecuador; algunas observaciones sobre el problema. [Observations on leprosy in Ecuador.] Rev. ecuatoriana Hig. y Med. trop. **13** (1956) 95-103.

The authors have already recorded 60 new cases of leprosy in Ecuador [THE JOURNAL **24** (1956) 108] and now record 60 more. Of the 120, 80 were lepromatous, 36 tuberculoid and 4 indeterminate. Most of them were adults, 87 men and 33 women. The distribution by provinces is given.—[From abstract in *Trop. Dis. Bull.* **54** (1957) 298.]

DE ANDRADE LYRA, O., RAMOS E SILVA, T. and PAZ DE ALMEIDA, A. Considerações epidemiológicas sôbre o contato fortúito na disseminação da lepra. [Epidemiological data regarding fortuitous contact in the dissemination of leprosy.] Arq. mineiros Leprol. **16** (1956) 137-146.

Rio de Janeiro (the Federal District) is an active focus of leprosy, with a prevalence rate based on cases known to the leprosy service in 1955 of 1.12 per 1,000. In a population of 2,689,231 there were 3,022 cases, of which 1791 (59.7%) were open and 1,211 (40.3%) closed; and only 866 were interned. An examination of the records leads the authors to conclude that, in total, there is a strong tendency toward an increase of incidence with increase of age, most marked among males. On further analysis this tendency does not appear among people, of either sex, with a history of definite or probable contact, but only in those with negative histories regarding contact, who were most numerous. The authors regard fortuitous contact a very important factor in the dissemination of the disease. —A. SALOMÃO

ALEIXO, J. Modernas tendencias profiláticas e organização de serviço. [Modern tendencies in prophylaxis and organization of the service.] Arq. mineiros Leprol. **16** (1956) 129-136.

The author considers the trio, leprosy asylum, dispensary and preventorium, to be the basic elements in any antileprosy campaign. Additional is BCG vaccination of as many contacts as possible, which is being done in 14 municipalities of Minas Gerais. The asylums should be located near urban centers and should be staffed by specialists each with a maximum of 200 patients. Sanitaria are needed, in spite of the modern tendency towards tolerance as regards isolation. The role of the dispensaries is of great import-

ance, although it has been modified by the progress of sulfone therapy and the use of BCG; for one thing they should provide, indirectly, for the special training of physicians and health service workers. As a means of intensifying sulfone treatment it can be administered by the patient's own doctor without any direct interference of the leprologist.—[From author's summary, supplied by A. Salomão.]

ROTBERG, A. Perspectivas de progresso no campo da profilaxia da lepra. [Review of progress in the field of leprosy prophylaxis.] Arq. mineiros Leprol. **16** (1956) 147-152.

This article is a general discussion, of interest to those concerned with leprosy control compaigns, which apart from certain personal views does not constitute a new contribution and in any case is not susceptible to abstracting. —A. SALOMÃO

MARIANO, J. Considerações sôbre o hanseniano internado em leprocomio. (Aspectos do problema em Minas Gerais.) [Considerations regarding the segregated leprosy patient. (Aspects of the problem in Minas Gerais.)] Arq. mineiros Leprol. **16** (1956) 302-311.

The author holds that the leprosy colonies have failed of their purpose, not from the point of view of prophylaxis but because of the large numbers of patients who remain in them even after they are bacteriologically negative. He recommends small asylums instead of large establishments, and holds that they should not be agricultural colonies but centers for rapid treatment and social reintegration. This is possible under sulfone therapy, because the average period needed to attain bacteriological negativity is about 29 months of intensive treatment, after which the patients can be transferred to the dispensaries. He favors the modern tendency of transferring the antileprosy campaign to the dispensaries, in the interests of finding more early cases, most favorable for treatment. The importance of social work among the families of the interned patients is described. —A. SALOMÃO

SALOMÃO, A. O ensino da leprologia no *curriculum* universitário e nos cursos de especialização. [Teaching of leprology in the university curriculum and in specialized courses.] Arq. mineiros Leprol. **16** (1956) 235-241.

To extend the leprosy control work and give it greater mobility by recognizing and treating all patients wherever they may be, the author suggests stepping up the teaching of leprology to both medical students and doctors in general. In countries where the disease is endemic, ignorance of the fundamentals of early diagnosis on the part of doctors of whatever specialty is intolerable, and their collaboration—after the necessary training in diagnosis and treatment—is indispensable. Preferably this special training should be separate from the course in dermatology. The basic notions of leprology should form part of the specialized courses for sanitarians and hygienists. The accomplishing of a specialized course of leprology should be a *sine qua non* for admission of doctors into the official medical leprosy service. —AUTHOR'S ABSTRACT

SOSA CAMACHO, B. La lepra y los problemas de trabajo. [Leprosy and the problems of labor.] Sugestiones **21** (1956) 10-13.

The medico-social problems created by leprosy are discussed, especially in relation to the present situation where, thanks to the sulfone treatments, reintegration of the patient into society and labor is possible. The patients are classified as infectious and noninfectious, and the former—lepromatous—are subdivided into 3 groups: (1) those who are physically incapacitated but have families to look out for them, (2) invalids who lack economic resources and family help, and should therefore remain in some institution until they recover so they can return to society, and (3) those who are not incapacitated and no longer have infectious lesions but find themselves handicapped by prejudice. This last condition is illustrated by the case of a patient who had much difficulty in re-

gaining his old occupation chiefly because of prejudice on the part of the company physician. —M. MALACARA

SILVA, M. S. Modernos aspectos da profilaxia da lepra. [Modern trends in the prophylaxis of leprosy.] O Médico **7** (1956) 859-866.

The author points out the importance of BCG inoculation in prophylaxis, mainly among the children of patients. Vaccinated children 5-14 years old were 75.0% Mitsuda positive, against 31.9% in the uninoculated children of the same group.

—A. SALAZAR LEITE

BECHELLI, L. M. and ROTBERG, A. Contribuição para o estudo da herença de resistencia à infecção leprosa; a lepra no estado de São Paulo (Brasil) segundo a naturalidade. [Contribution to the study of heredity and resistance to leprous infection; leprosy in the state of São Paulo (Brazil) according to nationality.] Rev. brasileira Leprol. **24** (1956) 37-47.

Leprosy in São Paulo occurs mostly in immigrants, especially Italians. If prevalence were due to national heredity, then racial resistance should be stronger among the Italians than in the indigenous population, because leprosy appeared earlier in southern Europe than in America and the susceptible strains would have been eliminated earlier. Many factors connected with exposure to infection are to be taken into consideration. The type of leprosy which develops is more important in estimating resistance than the frequency of the disease in any community. The lepromatous form is more frequent in the indigenous population of São Paulo than among immigrants, but on the other hand the children of immigrants are more liable to develop the lepromatous form than the children of the indigenous people. The greater frequency of the disease among foreigners when they first arrive in the country is likely due to the strain of adaptation to new conditions of life, together with a greater tendency to seek medical attention and a greater liability to be exposed to infection because of ignorance of the disease.—[From abstract in *Trop. Dis. Bull.* **54** (1957) 438.]

COCHRANE, R. G. The relevance of leprosy to modern day concepts of medicine. St. Bartholemews Hosp. J. **60** (1956) 192-196.

The purpose of this article is to bring leprosy to the notice of medical students, and to emphasize that its study is relevant to our understanding of basic principles of medicine. Even after thirty years of more or less concentrated study in various parts of the world there is little awareness that leprosy can contribute to the understanding of the more basic aspects of medicine, and that it is a useful handmaiden for the pursuance of fundamental studies in (*a*) neural physiology in relation to peripheral nerve damage, (*b*) immunity and tissue hypersensitivity, (*c*) understanding of the mycobacteria, and (*d*) research in orthopedic surgery and physiotherapy. Leprosy is as relevant in modern medicine as tuberculosis and many other diseases which are accepted without the taint of sentimentalism and hysteria. *M. leprae* is of unusual interest to bacteriologists because of its low pathogenicity and the challenge it presents with respect to cultivation, and also in its affinity for nerve tissue. After mention of recent studies of the organism with the electron microscope, the paper takes up the subjects of the method of infection and the path of spread of the bacillus; immunity and susceptibility; modern concepts of therapy; and orthopedic surgery and physiotherapeutic principles.—AUTHOR'S ABSTRACT

COCHRANE, R. G. Leprosy; significant advances during the last decade. Med. Press & Circ. **236** (1956) 246-250.

The periodical in which this article appeared having a wide distribution among general practitioners and health officers, particular attention is paid to the importance of leprosy from the point of view of the general practitioner in diagnosis because, even in such countries as Britain, there has been a considerable introduction of the disease in

recent years and the physician should be aware that he may encounter cases. The main clinical signs are therefore mentioned, and also the official procedures laid down in respect to the notification of leprosy in the British Isles. Leprosy should no longer be thought of in mediaeval terms, but should be brought into line with other diseases as one of intense interest. —AUTHOR'S ABSTRACT

COCHRANE, R. G. Leprosy. St. Mary's Hosp. Gaz. (London) **63** (1957) (Nos. 2 & 3).

This comprises two lectures given to medical students and staff members at St. Mary's Hospital. It describes in detail the clinical and histopathologic aspects of leprosy, and there are illustrations of various forms of the disease and of the results of sulfone therapy. In view of the great advances of our understanding and the treatment of leprosy in the past decade—advances as great as have been made in any other disease—leprosy has entered into the domain of general medicine and research and can no longer be looked upon as a peculiar disease, attracting only the philanthropic and missionary-minded person; although, as in all chronic disease, those who can make a spiritual contribution to the individual's personality will be more successful in its treatment than others. —AUTHOR'S ABSTRACT

BOUZAS, A. Leprous iritis with hypopyon. American J. Ophthal. **44** (1957) 401-406.

Leprous iritis with hypopyon is seldom met, and only a few cases have been recorded. Recently, at the St. Barbara Leprosarium in the Athens area, the author was able to study the course of two cases from the day the trouble first appeared. The form of the hypopyon was quite different from other hypopyons, being fluid and white. In both cases aqueous humor was obtained through needle puncture of the anterior chamber for study. The Pandy reaction was intensely positive at first, but decreased progressively as the condition improved. At first the cell counts were 224 and 486, resp., but they disappeared in about two months. Morphologically the cells were characteristic of leprous iritis with hypopyon, always with a predominance of lymphocytes and lymphocytoides; the numbers of reticuloendothelial system cells, iris cells, and polymorphonuclear leukocytes were small. No Hansen bacilli were found in either case. Local hydrocortisone therapy, by subconjunctival injection, gave spectacular results.

—SR. HILARY ROSS

KITAGAWA, T., NAGATA, T. and IDE, J. Leprosy and amputation of lower legs. La Lepro **26** (1957) 24-29 (in Japanese; English abstract).

With the advance of chemotherapy of leprosy, the necessity of surgical treatment is increasing. In connection with the problem of supplying artificial legs to the amputees in Kikuchi-Keifuen, thorough examinations were made of 114 patients, of whom 33 had amputations of both legs. Type of case: neural, 71 (male 47 and female 24); and lepromatous, 43 (male 24 and female 19). Malum perforans pedis was the usual cause of amputation, which was usually done in the middle or lower third of the leg. One-half of the patients complained of neuralgia, pressure or other pains. In one-half, the amputated ends underwent ulceration. Development of the muscles due to prothesis was not observed, and atrophy was marked. Regular decrease of temperature of the amputated ends was not observed. In the lepromatous cases there was an average 3.7°C, decrease on the nonamputated side. By the Wada-Takagaki method, attention should be paid to perspiration in the amputated ends. By x-ray examination the changes are not simple, and they are variable.—[From abstract.]

CHATTERJEE, S. N. Breathing difficulty caused by tuberculoid lesions of leprosy inside the nose. Indian J. Dermat. **1** (1956) 139-140.

The author reports on 2 tuberculoid patients, each with a lesion on the face in the neighborhood of the nostrils, who developed breathing difficulty and hoarseness of voice during a reactive phase. Thickening and edema of the nasal mucous membrane and

edma of the vocal chords were found in the case in which the symptoms were the most severe and persistent. —N. MUKERJEE

MERKLEN, F. P. and RIOU, M. V. Survenue d'un pneumothorax tuberculeux dans une lèpre lépromateuse au début du traitement cortisonique d'une réaction lépreuse. [Occurrence of tuberculous pneumothorax in a lepromatous leprosy patient at the beginning of cortisone therapy of a lepra reaction.] Bull. Soc. Path. exot. **49** (1956) 789-792.

A patient with lepromatous leprosy had been treated with intramuscular injections of DDS and intravenous injections of vitamin K, to which latter the outbreaks of ENL responded favorably. After a 6-month interruption of treatment there appeared a resistant lepra reaction which finally responded to delta-1-dehydrocortisone of which the patient received a total of 135 mgm. However, 8 days after that treatment a tuberculous pneumothorax developed, with sputum positive for Koch bacilli. The author warns again against the dangers of cortisone treatment for reactions. —M. VIETTE

CONVIT, J., REYES, O. and KERDEL, F. Disseminated anergic American leishmaniasis. Report of three cases of a type clinically resembling lepromatous leprosy. A.M.A. Arch. Dermat. **76** (1957) 213-217.

The authors present, in a well-illustrated article, three cases of a clinical variety of American leishmaniasis in which the skin lesions closely resemble lepromatous leprosy. One of the patients had been mistakenly interned in a leprosarium. The differential diagnosis is discussed in detail. —SR. HILARY ROSS

DHARMENDRA and CHATTERJEE, K. R. Combined use of I.N.H. and D.D.S. in the treatment of leprosy. Leprosy in India **28** (1956) 3-6.

DHARMENDRA, CHATTERJEE, K. R. and SEN, N. R. Idem. Bull. Calcutta Sch. Trop. Med. **4** (1956) 28-29.

The authors, pointing out that the results with INH alone are not very satisfactory, there commonly being a setback after initial improvement perhaps because the leprosy bacilli become resistant, report on the result of combined therapy with INH and DDS in 22 cases of lepromatous leprosy. Of these, 6 had combined treatment from the start and the rest had been treated otherwise previously. The maximum dose for INH was 200 mgm. and that for DDS 100 mgm. per day, given for 6 days in the week. No other rest period was observed. The period of treatment varied from 20 to 103 weeks. Marked improvement, both clinically and bacteriologically, was found in 6, moderate in 9, and slight in 7. The improvement in all cases was progressive, although it slowed down later on but without any setback, and the degree of improvement was found to be proportional to the duration of treatment. —N. MUKERJEE

[When asked if this investigation had been pursued, the senior author stated (personal communication) that it had been discontinued when he assumed another post. "Addition of INH to DDS was found to produce better results than DDS alone, at least in the first few months of treatment. My impression was that development of drug resistance to INH is much delayed when it is used in combination with DDS."—EDITOR.]

DAVEY, T. F., KISSAUN, A. M. and MONETA, G. The treatment of leprosy with diaminodiphenyl sulphoxide; a progress report. Leprosy Rev. **28** (1957) 51-59.

Diaminodiphenylsulfoxide is similar to diaminodiphenylsulfone in molecular structure. In a short-term trial Buu-Hoi and co-workers found that the two were comparable in activity. The authors, in Nigeria, tried the sulfoxide in doses of 100 mgm. daily in a representative group of 24 untreated patients, who were matched individually against patients of a control group being treated with DDS. At the end of the 15-month trial, 18 of the patients had received the sulfoxide for a year or longer. In respect to its

activity against the bacilli it proved comparable to DDS, as Buu-Hoi had reported. Clinical progress was satisfactory in all patients and very gratifying in some. Adults showed more bacteriological progress than children. Toxicity was not of a high order at the dosage used, and complications were insignificant. The drug is considered worthy of wider trials.—[From abstract in *J. American Med. Assoc.* **164** (1957) 1720, supplied by Sr. Hilary Ross.]

LAVIRON, P., LAURET, L., KERBASTARD, P. and JARDIN, C. Le 4,4′-diaminodiphenylsulfoxyde (DDSO) dans le traitement de la lèpre. [4,4′-diaminodiphenyl sulfoxide (DDSO) in the treatment of leprosy.] Bull. Acad. nat. Med. **141** (1957) 195-204.

This drug was used in the treatment of 34 patients for from 7 to 24 months, in doses starting with 100 mgm. per day and increasing step-wise to 200 mgm. However, it was generally necessary to maintain the maximum dose around 150 mgm., or about 3 mgm./kgm., because of lepra reactions which appeared in 7 of the 16 lepromatous patients. There was clinical improvement in 16 lepromatous, 2 borderline, 2 indeterminate, and 6 tuberculoid cases, whereas there was aggravation in 2 tuberculoids. The authors believe that DDS has an activity comparable to that of the sulfones.

—M. VIETTE

BUU-HOÏ, N. P., BA-KHUYEN, N. and DAT-XUONG, N. Chimiothérapie antilépreuse au Sud-Vietnam avec les thiocarbanilides seuls or associés au 4,4′-diaminodiphénylsulfoxyde et avec une thiosemicarbazone. [Antileprosy chemotherapy in South Vietnam with the thiocarbanilides alone or associated with 4,4′-diaminodiphenylsulfoxide and with a thiosemicarbazone.] Bull. Acad. nat. Méd. **141** (1957) 204-210.

4,4′-diethoxycarbanilid (Dialid) was given, in daily doses of 100 mgm., to about 500 leprosy patients, of whom 75-80% showed significant clinical improvement. No toxic manifestations were noted, although there were some cases of erythema nodosum leprosum and lepra reactions. The same dose of 4,4′-diaminodiphenylsulfoxide (DDSO) given to the same number of patients also gave clinical improvement in 95% of the cases. 4,4′-diisoamyloxythiocarbanilid tried in 30 cases gave results comparable to Dialid, but its cost is very high. A new substance, the thiosemicarbazone of vanillacetone, given to 8 patients for 8 months in 100 mgm. daily doses, showed weak activity. —M. VIETTE

CONTRERAS, GUILLEN, TERENCIO and TARABINI. El timosulfón en el tratamiento de la lepra. [Timosulfone in the treatment of leprosy.] Rev. Leprol. Fontilles **4** (1956) 89-93; *also* Actas Dermo-Sif. **48** (1957) 24-30.

Timosulfone (sulfone J.51) was tried on 12 lepromatous patients who did not tolerate well the other sulfones and were in poor condition, with visceral complications. It was well tolerated, and the blood changes often produced by other sulfones were rare. The results were good, in spite of the poor condition of the patients, and 4 of them had become negative. The drug is regarded as the one of choice for patients with visceral complications, with frequent lepra reactions, or with intolerance of the other sulfones. The authors have had no experience with this drug in ordinary patients.

—AUTHORS' ABSTRACT

DHARMENDRA and CHATTERJEE, K. R. 2:2′-Dihydroxy 4:4′-diaminodiphenyl-sulfone in the treatment of leprosy. Bull. Calcutta Sch. Trop. Med. **4** (1956) 28.

After determining that the hydroxy-derivative of DDS is less toxic than plain DDS, and that its bacteriostatic activity against Kedrowsky's bacillus is of the same order, a therapeutic trial was undertaken with 6 lepromatous patients. The drug was given orally, starting with 25 mgm. and gradually increasing to 100-150 mgm. per day; the period of treatment varied from 13 to 54 weeks. In 3 cases in which the treatment was sufficiently long and maximum dosage could be reached, there was definite clinical and

bacteriological improvement during the first few months, but progress was not maintained and the results at the end were considered unsatisfactory. —N. MUKERJEE

FLOCH, H., FAURAN, P. and MAILLOUX, M. Mode d'action des sulfones dans la lèpre. (XI) Comment agit la sulfone monoéthylée administrée par la voie intramusculaire. [The mode of action of the sulfones in leprosy. XI. How monoethylated sulfone acts when given intramuscularly.] Arch. Inst. Pasteur Guyane Française et Inini **18** (1957) Publ. No. 423 (May).

Sulfone 3459 CT, or monoethylated sulfone, is a stable substance which, like the other monosubstituted sulfones, acts both by its own molecule and by the intermediary of the DDS molecule that it liberates. Ten patients, accustomed to sulfones, were given intramuscular injections of 1.8 gm. once a month. The sulfone levels in the blood and urine were low, the elimination of the drug being slow and regular. The findings, at 10-day intervals, were: (1) without hydrolysis: 1st, 0.137; 2nd, 0.093; 3rd, 0.097; (2) after hydrolysis: 1st, 0.220; 2nd, 0.132; 3rd, 0.121. The maximum amount in the blood was found on the 16th day, and in the urine (in a different patient) on the 11th day. This sulfone is, therefore, suitable principally for intramuscular depot injection. Unfortunately, the levels recorded are too low to justify undertaking a clinical trial of any extent, at least for the present. —AUTHORS' ABSTRACT

MIYAGAWA, Y. Studies on the preparation of cod-liver and chaulmoogra oil, caprinic and 1-rhodinic acid for the use of the intravenous instillation and clinical findings of tbc. and leprosy patient treated with these preparations. Japanese J. Exper. Med. **26** (1956) 149-151.

For intravenous treatment the author used a 10% colloidal watery solution of a mixture of cod-liver and chaulmoogra oils, with caprinic or 1-rhodinic acid to 5% and glucose to 95%. This mixture, which has a certain antituberculosis action, seems to have a good effect on leprosy patients. —K. KITAMURA

HAYASHI, Y. and TACHIKAWA, N. Effect of *"Taifumin,"* a powdered colloid preparation of chaulmoogra oil used intravenously as its aqua solution in the treatment of leprosy. Yokohama Med. Bull. **7** (1956) 74-79.

The authors have found this preparation of chaulmoogra oil to be useful in leprosy patients unresponsive to promin. Of 13 such patients (10 of them lepromatous) 4 became bacteriologically negative, 2 moderately and 2 slightly improved, while in 2 the condition became aggravated. The preparation is made from chaulmoogra oil in the same way as fat-colloid-glucose is made from cod-liver oil. Of this preparation 2.0 gm., containing 0.1 gm. of chaulmoogra, is dissolved in 10 cc. of distilled water and heated at 60°C to make a perfect colloid solution. This is injected intravenously 3-6 times a week. —[From abstract in *Trop. Dis. Bull.* **54** (1957) 442.]

MONTESTRUC, E. L'hormone somatotrope hypophysaire dans le traitement des réactions lépreuses. [Hypophysial somatotropic hormone in the treatment of lepra reactions.] Bull. Soc. Path. exot. **49** (1956) 589-590.

Six patients with lepra reactions were injected daily with 100 rat units of hypophysial somatotropic hormone. In 4 of them, with mild reactions, favorable results were obtained in 48-72 hours, while in the other 2, with severe reactions, the same results were obtained in 5 and 7 days respectively. This treatment is less effective than with cortisone or ACTH, although this hormone may be beneficial because it protects the suprerenals against the atrophy caused by cortisone treatment. —M. VIETTE

SAMUEL, P. S. Colchicoside in the treatment of lepra reaction. Leprosy in India **28** (1956) 80-82.

The author tried colchicoside in 12 lepromatous cases in reaction. It was given

intravenously in doses of 2 cc. (10 mgm.) daily for 10 days. Severe joint pain was a common complaint. The majority of the patients did not appear to improve with this treatment. —N. MUKERJEE

LAURET, L. and KERBASTARD, P. Traitement des rhagades et ulcères perforants par l'association d'acide trichloracétique et d'acide salicylique. [Treatment of leprous ulcerated and perforating fissures (rhagades) by the association of trichloracetic acid and salicylic acid.] Méd. Trop. (Marseille) **16** (1956) 83-92.

At the Marchoux Institute, where 20% of the patients have trophic lesions of the extremities, 129 of them were given morning and afternoon soaks with glycerin solution containing trichloracetic acid and salicylic acid, or applications of an ointment containing those ingredients. In some cases this external treatment was combined with daily intravenous injections of 5 cc. of 20% sodium dehydrocholate. The results were good except with perforating ulcers, the unsatisfactory results in those cases being attributed to the presence of bone lesions that called for surgical treatment. —M. VIETTE

GOKHALE, B. B. Treatment of trophic ulcers of the soles of the feet in leprosy with certain hydrogenated ergot alkaloids. Dermatologica (Basel) **113** (1956) 142-155.

Nineteen leprosy patients with plantar ulcers were treated with intra-arterial injections of Hydergine, a mixture of certain hydrogenated alkaloids of ergot. All of the ulcers healed in the first instance. Of the lot, 5 patients could not be followed up, but of the remaining 14, the majority, 9, have had no recurrence of the ulcers. Of the other 5, relapse occurred in 4 and in 1 a fresh ulcer developed on the same foot at a different site.—[From abstract in *Excerpta Med.* **11** (1957) 276.]

ROBERTSON, W. S. Protective footwear for leprosy patients. Leprosy in India **28** (1956) 73-76.

The author advocates the use of especially prepared shoes to prevent the development of plantar ulcers, or to facilitate the healing of such ulcers. Such shoes are provided with a moulded leather in-sole fitting into the contours and hollows of the foot and distributing the weight bearing on all normal parts of the foot, hollows being provided over which the ulcerated areas can "float." The technique of preparing such shoes is described, and should be read in the original. —N. MUKERJEE

CHATTERJEE, K. R. A spring device for rectification of drop foot. Leprosy in India **28** (1956) 83-84 (clinical notes).

A light, cheap and easy-to-wear splint with a spring device for the rectification of foot-drop is described. Interested readers are referred to the original article.
—N. MUKERJEE

TERENCIO, J. El laboratorio en las leprorreacciones. [The laboratory and lepra reactions.] Rev. Leprol. Fontilles **4** (1956) 85-87.

A series of colloidal lability reactions and electrophoresis tests, as well as the variations in the hemogram and the appearance of abnormal elements in the urine, were studied in 21 patients with genuine lepra reaction in an attempt to recognize the involvement of the reticuloendothelial system and the disproteinemic state. All of the colloidal lability protein reactions were positive, with distinct increase of $alpha_2$ and gamma globulin fractions, slight increase of $alpha_1$, normal beta, and decrease of albumin. Liver insufficiency, hypochromic anemia, leucocytosis and eosinophilia were observed. —F. CONTRERAS

RICHTER, R. Bemerkungen zur Histotopographie unspezifischer Esterasen in der Haut bei Lepra lepromatosa. [Remarks on the histotopography of nonspecific esterases in the skin in lepromatous leprosy.] Arch. klin. exp. Dermat. **204** (1957) 554-565.

To determine the histotopography of esterase activity, in particular the behavior of the nonspecific ali-esterases and lipases, studies were carried out with Gomori's Tween method comparing lepromatous granulomas and healed, apparently normal, skin of another patient. Parts of the skin containing great numbers of leprosy bacilli, rich in lipids (usually phospholipids), always showed a strong esterase activity. In retrogressed granulomas with few bacilli the esterase activity was mainly bound to fibroblasts and histiocytes. In the latter it appeared to be specifically bound to the plasma of the epithelioid cells and was particularly dense around the nucleus. In healed, atrophic lepromas the location of the esterase-reactive deposits corresponded to normal conditions. It was not possible to prove a lipase activity in either normal skin or the lepromatous granulomas. —E. KEIL

RATH DE SOUZA, P. and MICHALANY, J. Sôbre a presença de corpos asteróides na lepra. [On the presence of asteroid bodies in leprosy.] Rev. paulista Med. **48** (1956) 179-180 (society meeting; summary only).

Asteroid bodies were found in 77 specimens out of the 9,013 from patients with regressive lepromatous leprosy, always in giant cells, which were found in 234 cases of that group. Asteroid bodies were not present in any of the 1,042 nonregressive lepromatous lesions, since no giant cells were found in them and these bodies are not found without giant cells. Nor were they found in any of the 719 tuberculoid specimens, in which the giant cells are of the Langhans type, or in any of the 4,000 specimens from indeterminate cases, in which no giant cells occur. It is concluded that in leprosy asteroid bodies are found only in lepromatous cases in regression, and only in foreign body giant cells.—[From authors' summary, supplied by N. Souza Campos.]

CAMAIN, R., KERBASTARD, P. and DEVAUX, J. Ponctions-biopsies hépatiques chez des lépreux non traites et des "contacts de lépreux." [Puncture biopsies of the liver of untreated leprosy cases, and of contacts.] Bull. Soc. Path. exot. **50** (1957) 351-355.

At the Institut Marchoux, at Bamako, the authors made liver-puncture biopsies of 81 leprosy cases (37 lepromatous, 41 tuberculoid, and 3 indeterminate), and of 20 healthy children living with their leprous parents. Of the liver specimens from the 37 lepromatous cases, 35 showed histological changes of lepromatous nature, and were bacteriologically positive. (It is stated incidentally that staining for lipids gave a picture similar to that of the lipidic reticulopathy of Niemann-Pick.) Of the 41 specimens from tuberculoid cases, only 13 showed that condition in the liver sections, and only 4 showed bacilli. One of the 3 indeterminates showed pathology and bacilli (according to the tables). Of the 20 specimens from the healthy contacts, only 1—the child 2 years old—showed abnormality, a follicle like the young ones seen after BCG vaccination. Reexamination of the child revealed a 7 mm. indeterminate macule between the eyebrows. —H. W. W.

QUAGLIATO, R. BCG e lepra; comunicantes-calmetizados da I.R. de Campinas e que vieram apresentar sinais da moléstia. [BCG and leprosy; vaccined contacts in Campinas who later presented signs of the disease.] Arq. mineiros Leprol. **16** (1956) 212-215.

Previously [THE JOURNAL **21** (1953) 586] Bechelli and the author had reported that of 1,658 contacts given BCG at the central dispensary of the São Paulo leprosy service in the course of a year, 12 had developed lesions, the great majority being of the tuberculoid type. Proper control data of unvaccinated contacts was difficult to get, but the records of 2 of the districts indicated that the average occurrence of lesions in reexamined contacts was about 10 per thousand. [Roughly the same rate as among the vaccinated contacts reported on, although no such comment was made in the abstract

published.] Indeterminate and tuberculoid cases predominated, but it was pointed out that the period between the beginning of the disease and "lepromatization" of cases is usually long. In Campinas the present author, up to 1956, had 1,147 vaccinated contacts, and of them 12 (±1%) had developed lesions. Eight were tuberculoid (3 reactional), the other 4 indeterminate; no case beginning as lepromatous had been seen, in accord with finding of Bechelli and de Souza Campos. In 4, the Mitsuda reaction was negative but it was strongly positive in the others. The times of appearance of the lesions were as follows: at the time of the last dose of BCG, 3 cases; after one month, 2; and after 3 to 4 months, 3 (thus 7 within 4 months); in the other 5 the lesions appeared at varied times after 6 months. The evolution was favorable in all cases, all of which received sulfone treatment. A control examination of unvaccinated contacts could not be made because the various public health services of the region had BCG-vaccinated the entire population indiscriminately.—[In part from an abstract supplied by A. Salomão.]

QUAGLIATO, R. Reação de Mitsuda e BCG. Censo lepromínico entre comunicantes da I. R. de Campinas, antes e após uso do BCG. [Mitsuda reaction and BCG. Lepromin census among contacts in the I. R. of Campinas before and after the use of BCG.] Arq. mineiros Leprol. **16** (1956) 216-220.

The results of the lepromin test (Mitsuda reaction) were studied in Campinas, São Paulo, with special respect to the effects of BCG in 511 contacts. The lepromin testing was somewhat restricted because of limitations of antigen available. One group of 258 contacts who did not receive BCG vaccination before the lepromin testing gave 204 (79%) positives and 54 (21%) negatives. A second group of 226 who were given BCG without lepromin testing (and who presumably would have given approximately the above results without vaccination), were later tested with lepromin; 175 (77%) were positive and 51 (23%) were negative. Of a third group of 27 individuals who had been previously tested and found negative, then given BCG, only 15 (56%) converted to positive while 12 (44%) remained negative. [This statement is based on the text and table, not on the author's summary in which the second and third groups are dealt with as one. Although there is no difference between the percentages of the first and second groups, the table shows that there was a material difference in the age composition; the second group had more children under 11 years (21% vs 4.3%) and fewer adults (51% vs 75%), and consequently under natural conditions fewer positives would be expected.]

—H. W. W.

TEIXERA COELHO, J. Considerações sôbre a positivação da reação de Mitsuda após a administração de B.C.G. (Dados sôbre a sua revisão depois de três anos.) [Considerations regarding the positivization of the Mitsuda reaction after BCG treatment of a healthy group. Data on revision after three years.] Arq. mineiros Leprol. **16** (1956) 427-431.

In 1953 the author had observed positivization by BCG vaccination of the Mitsuda reaction in almost all of 66 negative reactors among healthy persons, and on retesting in 1954 as many as were available (34) he found the positivity to persist. Again, three years after the BCG vaccination, further tests (30 persons) gave the same positivity rate as previously. The importance of this fact with respect to the prophylaxis of leprosy is emphasized.

—A. SALOMÃO

BLUM GUTIERREZ, E. Estudio del estado inmunoalérgico de la lepra en nuestro medio. [A study of immunoallergy of leprosy in Ecuador.] Rev. ecuatoriana Hig. y Med. trop. (Guayaquil) **13** (1956) 241-264.

The lepromin tests applied in four towns of Ecuador where leprosy is prevalent gave lower positive rates than in the city of Guayaquil and other areas where leprosy is

not common. This is because tuberculosis and BCG vaccination are more common in the latter populations, whereas in the former areas these reactions reflect the incidence of leprosy only. The positivity rate is very low in the first year of life, rising rapidly in the 1-5 year group, less rapidly but steadily after that to 50, then dropping again. Mass BCG vaccination is recommended, as well as dispensaries for treatment of all closed cases and sanatoria for isolation of all open cases.—[From abstract in *Trop. Dis. Bull.* **54** (1957) 699.]

BECHELLI, L. M., DE PAULA SOUZA, R., QUAGLIATO, R. and DE TOLEDO FERRAZ, N. BCG por vía oral e positivação remota do teste lepromínico em escolares saõs. [Oral BCG vaccination and remote positivization of the lepromin reaction in healthy schoolchildren.] Rev. paulista Tisiol. e Tórax **16** (1955) 63-72; *reprinted*, Rev. brasileira Leprol **24** (1956) 1-8.

Previously, observations with groups of orphanage children had led the authors to question the effectiveness of BCG in converting lepromin negatives to positive, and to regard that change mainly as a "spontaneous" conversion [THE JOURNAL **21** (1953) 585, 590; **23** (1955) 350]. The study was then extended to 650 schoolchildren (5-14 years of age), in 3 interior cities of São Paulo. The present report deals with the "remote" changes seen at the lepromin-injection sites following oral vaccination with BCG treated variously, some of the children being left unvaccinated as controls. The results of the test were first read after 4 weeks, graded as negative (−), weakly positive (1+) and strongly positive (2+). Each of the first two groups was then divided into 4 subgroups and given (1) fresh BCG; or (2) over-age BCG, 15 days old, not refrigerated; or (3) heat-killed BCG; or (4) a similar-looking placebo [nature not stated] for the controls. The vaccination was oral, 3 weekly doses. The final readings of the lepromin sites were made 30 days after the last vaccine dose, about 10 weeks after the test injections. The changes ("remote positivization," or intensification) that occurred during the final 6 weeks were as follows:

Vaccination	Original negatives turned positive	Original 1+ positives intensified
BCG, fresh	73% (of 37)	22% (of 60)
BCG, over-age	39% (of 31)	19% (of 52)
BCG, killed	35% (of 31)	20% (of 46)
Controls (placebo)	36% (of 39)	20% (of 81)

Of the original negatives who had received fresh BCG, 73% had become positive, whereas of the other 3 subgroups only 35-39% had done so, the controls no less than those receiving altered BCG. The fresh BCG evidently had a positivizing effect, but the change in the controls must have been "spontaneous." [Note that no second lepromin test was made.] In the original weakly positive group, however, the fresh BCG had no such effect; in all 4 subgroups the percentages of intensification were virtually identical. The authors lay stress on the "spontaneous" changes that had occurred. They ask why, if the apparent effect of fresh BCG among the negatives was real, it was not also seen among the weakly positives as a strengthening of the reaction. It is suggested that BCG does not have a constant action with respect to the delayed lepromin test.

[It has been known from the outset that the reaction to lepromin is not necessarily at its maximum even after 4 weeks, but the reported proportions of long-delayed changes seen in these schoolchildren are extraordinarily high. Of the 101 negatives not given the fresh BCG, 37% had become positive at some time before the end of the 10th week; and of the 239 weak reactors, 20% had shown increase by that time. The fact that living BCG had no apparent effect in the weak reactors is especially interesting, doubtless of biological significance. Notable in this study is the fact that, for the first time known to us, there was introduced an important—and, apparently, devastating—innovation, the control group. Without that group the conversion of the negatives given

altered BCG would surely have been ascribed to that intervention.] —H. W. W.

DE PAULA SOUZA, R., BECHELLI, L. M., DE TOLEDO FERRAZ, N. and QUAGLIATO, R. BCG vivo, de 15 dias e morto em escolares saõs e viragem ou intensificação da lepromino-reação. [BCG living, 15 days old, and killed, in healthy schoolchildren, and conversion or intensification of the lepromin reaction.] Rev. paulista Tisiol. e Tórax **16** (1955) 77-90; *reprinted*, Rev. brasileira Leprol. **24** (1956) 9-22.

This further report of the study made on 650 schoolchildren (see preceding abstract), concerns the results of a second lepromin test made at the time of the post-vaccination readings of the "remote" reactions. The first test had been made about 75 days before the second one, and the vaccination treatments had been completed 30 days before; the second-test readings (done blind) were made after another 30 days. The differences in the second results from the original findings—conversion from negative to positive or increase of the reaction above the 1+ level—were as follows:

Vaccination	Original negatives second-test positive	Original 1+ positives second reaction stronger
BCG, fresh	86% (of 37)	58% (of 62)
BCG, over-age	78% (of 27)	53% (of 51)
BCG, killed	69% (of 29)	41% (of 51)
Controls (placebo)	80% (of 35)	49% (of 67)

With respect to the negative group, the *frequency* of change did not differ significantly in the 4 subgroups, including the controls; but the *intensity* of the positive reactions was highest in the fresh BCG lot, the other three not differing significantly (5% level with the 2 test). In the original weakly positive lot there were no significant differences among the 4 subgroups, fresh BCG failing to have an intensifying effect. Emphasis is laid on the "spontaneous" changes evidenced (i.e., "changes occurring without the interference of any measure deliberately administered to that end"). Other workers getting similar results with BCG but not using controls have ascribed such changes exclusively to the vaccination. The fresh BCG did not cause more numerous transformations than the over-age BCG or than occurred in the controls, from which it follows that vaccination is almost worthless in such children. Indeed, the fact that some of the original 1+ individuals in the fresh BCG subgroup now gave lesser reactions is held to be a point against the value of BCG vaccination as a means of protection against leprosy. A tabulation lists 29 reports on the effects of BCG vaccination by other workers, in only 2 of which studies—on very young children—there had been controls (8 and 15, resp.), with no change to positive on the second test.

[Here again the importance of controls is indicated; but it may also be that another control is needed, namely, BCG vaccination by the intradermal method for comparison with oral vaccination. Regarding the "spontaneity" of the changes, seen in 80% of the controls, it is to be considered that they had occurred within some 10-15 weeks, whereas all the negatives involved had resisted the natural "positivizing" influences of their environment for years. The only unusual thing that had happened to the controls was the double lepromin testing. Since lepromin is an allergen and not an antigenically inert test reagent like tuberculin, that factor is to be considered as a possible explanation of the "spontaneous" changes observed. Bechelli and associates have recognized this fact in a subsequent publication (see following abstract).] —H. W. W.

BECHELLI, L. M., QUAGLIATO, R. and NASSIF, S. J. Lepromino-reação em Holandeses radicados há 2-3 anos no Brasil e sem contacto conhecido com doentes de lepra. [The lepromin reaction in persons from Holland who had been 2-3 years in Brazil without known contact with leprosy patients.] Rev. brasileira Leprol. **25** (1957) 107-125.

The persons concerned in this study were 240 members, of all ages, of families who

had come from Holland to work on a plantation (*fazenda*) in São Paulo, without known leprosy contact [THE JOURNAL **21** (1953) 582.] The frequencies of positive Mitsuda reactions in the different age groups are shown summarily in the following tabulation, which for two of the lower age groups includes comparative figures for 89 Brazilian children on the same plantation, who gave much larger percentages of reactions.

Age group (and number)	1+ to 3+ Dutch	Brazilian
0- 4 (12)	2 (16.7%)	—
5- 9 (63/49)	12 (19.0%)	23 (46.9%)
10-14 (48/40)	20 (41.7%)	28 (70.0%)
15-19 (26)	13 (50.0%)	—
20 plus (41)	64 (70.3%)	—

Of the Dutch, around 80% were negative in the first two age groups, and there were somewhat over 50% negatives in the next two groups, but of the total above 20 years 70% gave positive reactions. This is the figure for the Brazilian children of the 10-14 age group. The Fernandez reaction was relatively infrequent (5.85%). Of 230 of the Dutch tested with tuberculin 1/1000, only 2 gave positive reactions, and it is remarked that the lepromin reaction can be positive in large percentages of Mantoux negatives living under rural conditions. The authors explain the positive lepromin reactions in the Dutch subjects on the ground of "sensitization" by the lepromin antigen used (Wade, Bechelli), in persons with the capacity for defence against leprosy (Rotberg's N factor).
—H. W. W.

RABELO NETO, A. V. and SILVA, C. O teste lepromínico em comunicantes de casos de lepra. [The lepromin test in contacts of leprosy patients.] Bol. Serv. Nac. Lepra **14** (1955) 107-117.

A preliminary selection of healthy contacts in the area of the dispensary of Nova Iguaçú (State of Rio de Janeiro), some of whom were to be given BCG experimentally, gave the authors an opportunity to study a significant sample of them as to their reactivity to the first injection of the classical Hayashi-Mitsuda lepromin. The reactions were read 30-40 days after injection, the results being classified as negative (no sign at the site of the injection), doubtful (any induration up to 4 mm. diameter), or positive (induration of 5 mm. or more). The following data were obtained:

Age group (years)	No. of cases	Negative	Doubtful	Positive
0-2	139	87 (62.6%)	14 (10.1%)	37 (27.3%)
3-6	199	80 (40.2%)	51 (25.6%)	68 (34.1%)
7-14	279	98 (35.1%)	41 (14.7%)	140 (50.2%)
15-21	139	41 (29.7%)	14 (10.2%)	83 (60.1%)
22 plus	448	109 (24.7%)	56 (12.5%)	283 (63.2%)
Total	1,203	415 (34.5%)	176 (14.6%)	612 (50.9%)

Statistically this is a significant sample, as the case distribution through the age groups is closely similar to the age distribution of the total population of the state. A comparison of these figures with those found by leprologists in other regions shows sometimes significant differences, presumably due to variable standards of either the antigen or the methods of reading the reactions. An analysis of the results with the youngest children gives 12.9% positives in the 31 babies of the 0-5-month group, and 23.5% of the 17 aged 6-11 months. The percentages of the groups aged 1, 2, up to 6 years (38-57 children per group) were all in the lower 30's, except for 23.6 in the 5-year group and a compensating 44.9 in the 6-year group, the average being 33.8. The progression with age, therefore, was: under 1 year, 16.7%; 1-6 years, 33.8%; 7-21 years, 53.4%; 22 and over, 63.1%. [The percentages of positives would have been higher if 3 mm, or even 4 mm, had been used as the lower limit of positivity, but the increases could not have been great because the proportions read as doubtful were not high.] Aging seems to be the only really impor-

tant condition that concerns lepromin reactivity, there being no evident influence of several factors, including the type of the contact case, and residence in urban or rural areas. Similar lepromin censuses should be made in pilot areas throughout Brazil, to permit better knowledge of the resistance of the population.—[In part from authors' summary, supplied by H. C. de Souza-Araujo.]

SILVA, C. O., RABELO NETO, A. and DE CASTRO, I. Ação do BCG sôbre a lepromino-reação em comunicantes de casos de lepra. [Effect of BCG upon the lepromin reaction among contacts of leprosy patients.] Bol. Serv. Nac. Lepra **14** (1955) 123-135.

This study was made with the lepromin-negative contacts detected in the testing reported in a previous article (see preceding abstract). The negatives were divided in two groups: (1) BCG group, which was given oral BCG, 1,200 mgm. in doses of 200 mgm. at two-week intervals; and (2) the control group, not given BCG. Three to 6 months after the vaccination they were again tested with lepromin. The enhancing effects on the lepromin reaction are best appreciated by the figures on the individuals who were found *negative* on the second testing, as follows:

Age group (years)	BCG group		Control group	
	Cases	Neg.	Cases	Neg.
0-2	21	4.8%	16	18.7%
3-6	53	13.2%	25	36.0%
7-14	34	5.9%	35	22.8%
15-21	12	16.7%	16	6.3%
22 plus	44	11.9%	43	11.6%
Total	162	10.5%	135	19.3%

In percentages, there was a greater positivization of the lepromin reaction in the BCG groups, particularly among those younger than 15 years. However, statistical analysis of the data shows that there is no significant difference between the two samples. On the possible influence of oral BCG vaccination alone, without the influence of lepromin, there are no available data for statistical analysis. [In the article it is said, about the control group, "This conversion of the Mitsuda reaction obviously could not have occurred in so short a time if some factor had not intervened," but there is no speculation as to what that factor was—the original lepromin testing or something else.]—[Largely from authors' summary, supplied by H. C. de Souza-Araujo.]

FLOCH, H. Sur la positivation de la réaction de Mitsuda apres vaccination au BCG et son intéret en prophylaxie antilépreuse. [Positivization of the Mitsuda reaction after BCG vaccination and its significance in the prevention of leprosy.] Arch. Inst. Pasteur Guyane Française et Inini (1957) Publ. No. 422, April.

The author discusses critically two articles by de Paula Souza, Bechelli and associates (of which abstracts appear above this item). In the first of them they had concluded that BCG vaccination caused little positivization in children aged 5 years or older, but admitted lack of experience in younger children—mentioning indecisively a report by the present author. In actuality those children were 467 2-month-old babies, and in them BCG produced 73% positive reactors. The fact that in the second article the Brazilian authors lumped together the wholly negative and the doubtful reactors is criticized, it being held that they should have been dealt with separately. The present author arrives at conclusions different from those of the original authors, and goes on to point out that if BCG vaccination has no value, then among new cases there should be as many infectious cases among vaccinated people as among the unvaccinated.

—AUTHOR'S ABSTRACT

RABELO NETO, A. V., AZULAY, R. D., SILVA, C. O. and CESAR DE ANDRADE, L. M. Verificação da ação do BCG em doentes de lepra em tratamento; comprovação histo-

patológica das lepromina-reações. [Verification of the action of BCG in leprosy patients under treatment; histological confirmation of the lepromin reactions.] Rev. brasileira Leprol. **24** (1956) 48-55; *also*, Bol. Serv. Nac. Lepra **15** (1956) 115-121.

Further attempts were made with oral BCG to convert negative lepromin reactors among lepromatous cases that had become bacteriologically negative, and also in indeterminate-class cases. The 18 lepromatous patients treated were given 200 mgm. doses of BCG every two weeks up to 400-1,200 mgm. The lepromin test was then made, and in all cases the inoculation sites were biopsied regardless of the macroscopic results. The reactions were positive in 2 cases, with tuberculoid histology. In 12 the reactions were doubtful; 3 showed tuberculoid structure, in 2 instances Virchow's cells also. The other 4 cases were negative, including the histology. The indeterminate cases behaved in practically the same manner. Of the 4 unvaccinated controls, none showed tuberculoid structure, even with gross positive results. Macroscopic reading of the lepromin reaction should be supplemented by the histological examination.—[From abstract in *Trop. Dis. Bull.* **54** (1956) 445.]

YANAGISAWA, K., ASAMI, N. and ISHIWARA, S. Prophylaxis of leprosy by means of dried BCG vaccine. (The first report.) La Lepro **26** (1957) 70-76 (in Japanese; English abstract).

Lepromin allergy was studied after BCG vaccination, regarding it as an indirect expression of leprosy immunity. The results obtained in two separate populations of school children showed clearly that BCG vaccination could convert more than one-half of the subjects to lepromin positivity within 8 to 11 weeks. In one case the vaccinations were by scarification, and the positive conversion rate was 56.5% in 11 weeks; while in the second case, with intracutaneous vaccination, it was 77.4% in 8 weeks. There was a high correlation between the lepromin and tuberculin reactions. As far as the present study is concerned, the authors consider that BCG vaccination is effective for the prophylaxis of leprosy.—[From abstract.]

TARABINI CASTELLANI, G. Alergometría; primeras pruebas mediante concentraciónes múltiples y simultáneas de lepromina. [Allergometry; first tests by means of multiple, simultaneous concentrations of lepromin.] Rev. Leprol. Fontilles **4** (1956) 73-84.

This test was made by injections of 1:4, 1:2, and 1:0 integral lepromin in 29 lepromatous, 16 indeterminate, and 5 tuberculoid cases, in doses of 0.2 cc. for the tuberculoid and indeterminate cases, and 0.4 cc. for lepromatous ones. The early and late readings are plotted in such a way as to show what can be attributed to sensitivity and what to reactivity, which is not revealed by a single injection. The results obtained indicate differences which serve to reveal the tendency to progression or regression in each case. —F. CONTRERAS

HADLER, W. A. Influencia da inoculação prévia de BCG sôbre os resultados da reação da lepromina em cobayos. [Influence of previous inoculation of BCG upon the results of lepromin test in guinea-pigs.]—Bol. Serv. Nac. Lepra **15** (1956) 6-62 (English summary p. 55).

In this study the author used 134 guinea-pigs: (1) 87 vaccinated with BCG 50 days before testing with lepromin, (2) 23 injected with lepromin and given BCG 50 days later, and (3) 24 unvaccinated controls injected with lepromin only. The reactions to lepromin in the vaccinated animals were larger and disappeared more slowly than in the controls. The evolution was accelerated, indicating more rapid lysis of the bacilli. In spite of the evidence of hypersensitivity, however, histologically there was no cytological difference, except in degree, in the lesions of the vaccinated animals and the controls. The results

of the lepromin reaction must be based on histological grounds, the presence and size of macroscopic nodule having little significance; it is the development of epithelioid cells which signifies positivity. In principle, skin reactions to lepromin and to BCG are not comparable.—[From the author's summary, supplied by Dr. H. C. de Souza-Araujo.]

MINAMI, K. On serum reaction of leprosy. Supplementary experiments on Ogata's slide agglutination method and complement binding reaction. La Lepro **26** (1957) 82-91 (in Japanese; English abstract).

Ogata reported that the agglutination titer with an antigen with cardiolipin : lecithin ratio of 1:1 was higher than that with an antigen of cardiolipin : lecithin ratio of 1:10. In my supplementary experiments 64% were positive, tuberous leprosy cases being 75% positive. Of syphilitic sera 9%, and of other sera 12% were positive, but the titers were always low. Positivity of this reaction, combined with the clinical symptoms, leads to the diagnosis of leprosy. The slide method with the antigen of cardiolipin : lecithin : cholesterol = 1:34:30 and = 1:1:18 presented strong reactions, but not superior to the agglutination test. Complement-fixation reaction with a cardiolipin : lecithin : cholesterol = 1:1:20 antigen reacted intensely in syphilis, but inferior to the agglutination. This reaction presented no specific result with murine leprosy.—[From abstract.]

COLLIER, W. A. and GEHR, E. Uber eine brauchbare Lepra Komplementbindung. [On a useful complement-fixation reaction in leprosy.] Laboratoriumsblätter **7** (1957) 54-55.

——— ——— A quantitative leprosy complement fixation test. Docum. Med. Geograph. et Trop. **9** (1957) 165-168.

The antigenic relationship between the causative organisms of leprosy and tuberculosis led the authors, in the State Leprosy Hospital in Paramaribo, to employ the complement-fixation reaction for tuberculosis in the diagnosis of leprosy, using the "Tuberkulose-Antigen-Essen" supplied by Messrs. Behringwerke. Examination of the sera of 146 leprosy patients gave the following positive results. Lepromatous (82 sera): 34% positives of dilutions under 1/5, 31% of dilutions 1/5-1/20, 35% of dilutions 1/40 and higher. Tuberculoid (38 sera): 60%, 37%, 3%, resp. Mitsuda-positive patients (36 sera): 64% positives under 1/5, 25% of 1/5-1/20, 11% of 1/40 and higher. Mitsuda-negative patients (50 sera): 36%, 28%, 36%, resp. Patients positive for bacilli, (*a*) with globi (53 sera): 28% under 1/5, 23% of 1/5-1/20, 49% of 1/40 and higher; (*b*) without globi (37 sera): 46% under 1/5, 38% of 1/5-1/20, 16% of 1/40 and higher. Patients negative for bacilli (42 sera): 62% under 1/5, 33% of 1/5-1/20, 5% of 1/40 and higher. The bacterial findings paralleled the reaction titer in the individual patient. A co-existing syphilis did not essentially affect the leprosy reaction. The tests showed that on the whole the Essen tuberculosis antigen of Behringwerke is useful in the diagnosis of leprosy.
—E. KEIL

[The basis of the last statement is not evident, since the test was applied only to diagnosed cases, at least 90 of which were bacteriologically positive (53 "with globi"), and not at all to newly-found cases being diagnosed, or cases presenting diagnostic problems. Even among those under study the tuberculoids and the bacteriologically negative ones generally gave very few strong reactions. What dilution-reaction was considered the limit of positivity is not stated in this abstract, but in one seen elsewhere [*Trop. Dis. Bull.* **54** (1957) 1087] it is said that low dilutions to 1:10 "served as controls." In that abstract note is made, in a quotation from the original article dealt with, of the apparent anomaly that Mitsuda-negative and supposedly less resistant cases gave many more strong reactions than the Mitsuda-positive and supposedly more resistant cases. This may not be as anomalous as it perhaps seems, for in lepromatous cases there is much serological disturbance which is ineffective in the absence of tissue reactivity,

whereas in tuberculoid cases there is much less serological disturbance (because there are so much fewer bacilli?) but positive tissue reactivity.—EDITOR.]

MASON, K. E. and BERGEL, M. Maintenance of *Mycobacterium leprae* in rats and hamsters fed diets low in vitamin E and high in unsaturated fats. Federation Proceedings (Baltimore) **14** (1955) 442 (summary).

The chemotherapeutic use of antioxidants in leprosy, together with evidence of a prooxidant state in lepromatous lesions which resembles that induced in tissues of the rat by vitamin E-deficient diets high in unsaturated fats, suggested that the inability to establish *M. leprae* in experimental animals might be overcome if a sufficiently prooxidant state existed. To test this hypothesis, 12 rats and 6 hamsters were fed diets low in vitamin E and containing 20, 10 or 6% cod liver oil for variable periods up to 75 days. They were then inoculated (intraperitoneally, intratesticularly, or subcutaneously) with a saline suspension of a leproma from an untreated patient, frozen with dry ice for 4-1/2 days during transport and storage. Six hamsters and 8 rats killed at intervals over a 5-month period after inoculation showed small intraperitoneal or larger subcutaneous lepromas. Impression smears of lepromas, inoculated testes and spleens showed numerous enlarged, foamy reticuloendothelial cells containing large numbers of strongly acid-fast bacilli and globi, a typical feature of lesions of human leprosy and indicative of active intracellular reproduction of the bacillus. This evidence that *M. leprae* can survive and produce typical lesions in laboratory animals, properly prepared dietetically, offers new experimental approaches to the metabolic and pathogenic aspects of human leprosy.—[From the summary supplied by J. A. Doull, who commented on the absence of controls. Nor is it indicated that the lesions were shown by histological examination to be typical lepromas.] Ver Internat 1959; 27 (1) 76-77

BERGEL, M. Cuadros lepromatiformes en animales provocados por alimentación prooxidante. [Lepromatous-like conditions induced in animals by prooxidizing diet.] Leprología **1** (1956) 46-50.

The author discusses two syndromes which, from the pharmacotherapeutic, histologic, and histochemical points of view, are very similar to lepromatous leprosy. These are the "yellow fat" in the rat subjected to vitamin E deficiency and the nonsuppurative panniculitis (yellow fat) in the mink. The most striking feature of these two syndromes is the deposition of an acid-fast pigment in the subcutaneous fat and the reticuloendothelial system (liver, spleen, lymph nodes, etc.). Certain antileprosy compounds, such as DDS, isoniazid, and TB-1, prevent the formation of this acid-fast material in the rat.
—AUTHOR'S ABSTRACT

BERGEL, M. La isoniacida como un antioxígeno biológico. [Isoniazid as a biological antioxygen.] Rev. Méd. Rosario **47** (1956) 3-18.

The author points out the similarity of activity of vitamin E and isoniazid in rats fed on prooxidant diets. With a low content of vitamin E and a high content of unsaturated fatty acids in the diet, isoniazid protects against the formation of "yellow-fat," degeneration of the testicles, and pigmentation of the uterus. Because of this, and of the *in vitro* antioxidant activity of isoniazid, he thinks that isoniazid acts *in vivo* as a biological antioxidant, and he ascribes the antileprosy activity of this compound to its antioxidant action. —AUTHOR'S ABSTRACT

[Dr. G. Basombrio, who procured the preceding two abstracts and translated them, also asked the author for an explanation of what is meant by the "prooxidant state." Dr. Bergel replied: "Prooxidant state: The redox" (i.e., mutual reduction and oxidation) "potential of the lepromatous tissues is higher than others in the body, and for that reason we speak of a 'prooxidant state' in leprosy. The behavior of lepromatous tissues in relation to the redox dye methylene blue proves this statement."]

NAGUIB, M. and ROBSON, J. M. The effect of cortisone alone and in combination with isoniazid on experimental murine leprosy in mice. British J. Pharm. & Chemother. **11** (1956) 326-329.

Four groups of mice, after intracorneal inoculation with *M. leprae murium*, were treated with (1) cortisone, (2) isoniazid, (3) cortisone plus isoniazid and (4) as control. The drugs were started on the day of inoculation. Isoniazid alone did not prevent early corneal lesions but these progressed slowly, then decreased steadily, and sacrificed animals showed no or only microscopic evidences of infection. Cortisone alone caused a marked prolongation of the latent period, but corneal lesions eventually did develop in most of the animals; the lesions were smaller and fewer than in the controls, but many lepra cells were found in the liver and spleen, with very large numbers of bacilli. The results of the combination treatment were similar to those of isoniazid alone in most animals except that when cortisone was stopped 2 (of 5) mice developed gross systemic leprosy never seen on isoniazid alone. The results of these experiments are similar to those dealing with corneal tuberculosis in rabbits, in which cortisone has a beneficial effect, but they differ from experience with corneal tuberculosis in mice, in which cortisone overcomes the beneficial effects of isoniazid.—[From abstract in *American Rev. Tuberc. & Pulmon. Dis.* **75** (1957) 143, supplied by Sr. Hilary Ross.]

NAGUIB, M. and ROBSON, J. M. Correlation between rate of development of corneal lesion and size of inoculum of Mycobacterium lepraemurium. J. Path. & Bact. **72** (1956) 657-661.

A suspension of *Mycobacterium lepraemurium* was diluted 10, 100, 1,000, and 10,000 times, and the various dilutions were inoculated intracorneally into groups of mice. With increasing dilutions the latent period preceding the appearance of macroscopic lesions gradually increased, but there were no qualitative differences between the lesions produced by the various dilutions.—[From abstract in *American Rev. Tuberc. & Pulmon. Dis.* **76** (1957) 24, supplied by Sr. Hilary Ross.]

TAKAYAMA, Y. Inhibitory and treatment effects of intramuscularly DDS and promin used upon murine leprosy. La Lepro **26** (1957) 15-18 (in Japanese; English abstract).

Twenty-five female white rats were divided into 5 groups. Group 1 was the DDS inhibitory group, Group 2 DDS treatment, Group 3 promin inhibitory, Group 4 promin treatment, and Group 5 was the control. In the inhibitory experiments, from the day after the inoculation, DDS was injected 0.1 mgm. 6 days a week to the 7th, and 0.2 mgm. to the 13th week, and 0.4 mgm. to the 2nd week. For the promin inhibitory experiments 45 mgm. was injected through the tail vein twice a week to the 22nd week. With the treatment experiments, 4 weeks elapsed after inoculation and then the animals received the DDS or promin in the same manner. Intramuscular DDS seems to be inferior to promin both in the administration method and doses used in these experiments.—[From abstract.]

TAKAYAMA, Y. The influences of X-ray and administrations of cortisone and other drugs upon the onset of murine leprosy. La Lepro **26** (1957) 8-14 (in Japanese; English abstract).

Some animals were given 500 γ or 150 γ (3 times) of x-rays before inoculation, and then 0.25 mgm. of cortisone intramuscularly on alternate days, while others were given only the cortisone treatment after inoculation. With still others there was added to the inoculum toluidine blue (1 mgm./cc.), or toluidine blue alum, or egg-yellow solution (25%); or a mixture of ox-serum albumin and ferment extract (2%) was inoculated. Toluidine blue, without or with alum, did not accelerate the infection. Cortisone, under both conditions, depressed the development of the granuloma to some extent. Egg-yellow or the mixture of ox-serum albumin and ferment extract added to the murine bacillus had some accelerating effect on the granuloma.—[From abstract.]

USHIO, K., TAKAYAMA, Y. and IKEDA, K. The effects of isonicotinyl-3-methoxy-4-hydroxybenzal hydrazone, 4:4′-diamino diphenyl sulphoxide and Neo-minophagen AT upon murine leprosy. La Lepro **26** (1957) 19-23 (in Japanese; English abstract).

The three drugs named were used in both inhibitory and treatment experiments. The isonicotinyl-3-methoxy-4-hydroxybenzal hydrazone was found to have striking effects in both inhibition and treatment, while the other two drugs had small inhibitory effects, which could not be expected therapeutically by the doses used in this experiment.—[From abstract.]

NISHIMURA, S. and MASUDA, T. Studies on the chemotherapy of leprosy. Effects of the chemotherapeutic and nonchemotherapeutic agents upon murine leprosy applying Nishimura-Iwasa's screening method. La Lepro **26** (1957) 77-81 (in Japanese; English abstract).

By the method used, which permits judging of results in 3 months, isonicotinyl-3-methoxy-4-hydroxybenzal hydrazone and isonicotinyl-glucuronolactone-hydrazone in large doses proved slightly superior to INH. N-isonicotinyl-N′-carbethoxy-hydrazine hydrochloride and 2-(γ-pydidyl)-1.3.4. oxydiazolone-(5) had less inhibitory effect than INH. Proethyl, Tibione and Viomycin had no effect. Among nonchemotherapeutic agents, Triton (WR-1339) and Neominophagen AT showed weak inhibitory effects, whereas Taifumin, vitamin D_2, cepharanthin and Chiyugen had no effect.—[From abstract.]

KIMMIG, J. and MEYER-ROHN, J. Chemotherapie der Stefansky-Lepra mit N-Acetyl-D-glucosaminyl-INH und (β-Methyl-mercaptopropionaldehyd-) isonicotinsäure-hydrazon. [Chemotherapy of rat (Stefansky) leprosy with N-acetyl-D-glucosaminyl-INH and (β-methyl-mercaptopropionaldehyde) isonicotinic acid hydrazone.] Hautarzt **8** (1957) 320-322.

In Stefansky-infected rats the authors achieved complete clinical cure, or at least significant retrogression of the lesions, with INH preparations while sulfone compounds were ineffective. Most effective were the two new INH derivatives mentioned, the first called for short NAG-INH and the other BT-103. When treatment was started in the tumor stage, 2½ to 3 months after infection, both of these preparations caused disappearance of the lepromas and rendered the rats negative for bacilli within 4 months, and no signs of relapse were found on autopsy 3 months later. Both preparations, but particularly NAG-INH, were very well tolerated in a dosage of 1 gm./kgm. daily for 4 months. —E. KEIL

NAKAMURA, M. Studies on the chemical composition of the murine leprosy bacillus. (Part 3) A separation method of the murine leprosy bacilli from infected subcutaneous tissues using trypsin digestion, and its chemical properties. La Lepro **26** (1957) 1-7 (in Japanese; English abstract).

Intact murine leprosy bacilli are obtained from the lesions by trypsin digestion followed by the application of Hanks' method, which is a modification of one for mitochondria concentration. The results of chemical analyses of bacilli so obtained show that, compared with findings in cultivable acid-fast bacilli, total nitrogen, carbohydrate and nucleic acid are somewhat less, and alcohol-ether extractable substances and phospholipid are more. The values of chemical compositions of the bacilli previously described are somewhat corrected. The separation method employed may contribute toward the preparation of lepromin.—[From abstract.]