

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.

- LAI, SHANG-HO. The History of Leprosy in China. Taipeh, Taiwan, China. First Edition, 1952, pp. 98 + 6.

This paper-covered booklet, from the Division of Leprosy, Institute of Public Health, Medical College, National Taiwan University, is in Chinese except for the last six pages. In that section there is a short preface telling the basis of the author's study of ancient and modern literature, and a table of contents, some of the sub-items of which are tantalizing. The titles of the chapters are: Ancient Ages; the System of Medical Care in Successive Generations; Medieval Ages (with items such as Tsao-Shi-Chea's case, Chang-Chung-Ching predicted Wang-Chung-Hsian, and Wu-Ti of Lian comforted Chou-Hsing-Su); Recent Ages (including authentication of the origin of using oleum hydnocarpi); Modern Ages; the Writings of Lepers (including the Grief of Lu-Chao-Lin); and a Brief History of Leprosy Control in Taiwan. —H. W. W.

- ROLIER, R., ROLLIER, M. and PETIT. Quelques données historiques sur la lèpre en milieu marocain. [Some historical data on leprosy in Morocco.] *Maroc Méd.* **30** (1951) 643-648.

The history of leprosy in Morocco dates at least as far back as 682 A.D. For the purpose of limiting contagion the affected were subjected to various restrictions in the territories of Morocco, such as segregation and the wearing of distinctive clothes. The native therapy, apart from organic products obtained from various animals or from man, includes sarsaparilla (*Smilax medica*, *S. officinalis*, *S. syphilitica*). Two active varieties have been identified, one native and the other from Arabia. The latter, the most efficacious, is the sarsaparilla of Jamaica. Lastly, immersion in certain springs was considered beneficial. —M. VIETTE

- COCHRANE, R. G. Memorandum setting out BELRA's research project in East Africa. *Lep. Rev.* **23** (1952) 138-145.

As the main function of BELRA is to advise governments and other bodies as to the most efficient way of bringing leprosy under control in the British Empire and Commonwealth, it is the Association's opinion that a first-class research station is required. The present research centers in Calcutta, Uzuakoli and Sungei Buloh are handicapped in various ways, and it is suggested that a central training institution be established in East Africa. This region is chosen because it is central and within 12 hours air travel of London where every facility is available. The various branches of research that should be dealt with and the proposed personnel are indicated, and also the financial requirement for starting and carrying on the institute. —G. O. TEICHMANN

- DE SOUZA-ARAÚJO, H. C. Progresso da profilaxia da lepra na Argentina. [Progress of the control of leprosy in Argentina.] *Brasil-Méd.* **65** (1951) 283-286.

Leprosy was introduced into Argentina by Europeans. The first cases recorded were in Santa Fé city in 1792 and in Buenos Aires in 1797. Up to 1897, 309 were recorded. At the Bergen conference in 1909, Baldomero Sommer presented the statistics of 730 cases from 5,410,000 inhabitants (0.13 p.m.). In 1926 a leprosy control law drafted by Aberastury was sanctioned. When the first leprosarium was inaugurated, in 1938, there were 3,905 recorded cases, this number increased to 7,201 in 1949. There has been much difficulty in the establishment of leprosy hospitals because of local opposition. The first one was the Sanatorio-Colonia "Maximiliano Aberastury," on the island of Cerrito, Chaco Territory, with 300 beds. Shortly afterward the second, the Sanatorio-Colonia "Posadas," Misiones Territory, with 320 beds, was established. The third, inaugurated in 1939, was the Sanatorio-Colonia "J. J. Puente," in San Francisco del Chañar, Province of Córdoba, with 160 beds. The fourth, the Sanatorio-Colonia (or Instituto) "Baldomero Sommer," Province of Buenos Aires, 85 km. distant from the capital—the National Institute of Leprology—was opened late in 1941; the original capacity of 645 beds has been increased to 1,100. The fifth, inaugurated in 1948, is the Sanatorio-Colonia "Dr. Enrique Fianza," in Diamante province of Entre Rios, with 350 beds. The sixth, Leprosarium Formosa, in the capital of Formosa Territory, with 70 beds, was acquired from the local government in 1949. The seventh, the Sanatorio-Colonia "Pueblo Esther," province of Santa Fé, capacity 350 beds, is to be opened soon. The total capacity of all colonies is 2,605 beds. Although the government has plans for 20 dispensaries, as yet there are only two, one in Buenos Aires and the other in Concordia, the latter in a building provided by the Patronato de Leprosos. There are two preventoria, one near Buenos Aires belonging to the national Patronato, the other in Rosario run by a local organization of similar nature. About one million pesos a year is appropriated for the purchase of antileprosy medicines. In 1951 the Department of Public Health was reorganized and six antileprosy directorships were created in the following cities: Buenos Aires (under Dr. Leonidas Llano, the general director), Córdoba, Resistencia, Mendoza, Bahia Blanca and Tucuman.

—AUTHOR'S ABSTRACT

DE SOUZA-ARAÚJO, H. C. Progreso da profilaxia da lepra na Argentina. II. O "Patronato de Leprosos da Republica Argentina." [Progress of leprosy prophylaxis in Argentina. II. The Patronato de Leprosos.] *Brasil-Méd.* 66 (1952) 6-13; 551-554.

This private organization was founded on November 26, 1930, by a group of Argentine ladies under the leadership of Sra. Hersilla Casares de Blaquier, since then its president. Its aims are to help poor leprosy patients and their families; to cooperate with the authorities in the prevention, control and cure of leprosy; and to facilitate and stimulate scientific investigation. Since 1932 there have been established 19 branches (*filiales*) in various cities and 70 sub-branches. The Patronato maintains 13 special skin clinics in the principal capitals. The first one, opened in 1935 in Buenos Aires, is in a building erected on the grounds of the Muniz Infectious Diseases Hospital, where Dr. V. P. Etcheverry and his assistants—paid by the Patronato—attend about 100 patients. In 1938 there was established a free home treatment service for patients unable to go to the clinic. Late in 1941 the Patronato inaugurated a preventorium, the "Colonia Infantil Mi Esperanza," 22 km. from Buenos Aires. Located on 37 hec-

tares of fertile soil, with 10 principal buildings and various annexes, it now maintains 241 children, although its total capacity is 800. There are 50 employees, including 2 doctors, a dentist, a pharmacist, 10 nurses, 7 Sisters, etc. In 1946 a "Hogar Central" was inaugurated in Buenos Aires for the complementary education of the older children. The reports of the president indicate the scope of activities, which include antileprosy medicines given, tickets given patients for transportation for treatment, and Mitsuda skin tests made. The federal government no longer aids the Patronato, which depends on money obtained from the public, including semi-annual street collections.

—AUTHOR'S ABSTRACT

COCHRANE, R. G. The influence of recent advances in leprosy on present day conceptions of the disease in relation to its diagnosis, treatment and prevention. *Edinburg Med. J.* **59** (1952) 509-516.

The writer states that by means of the Fite method of staining bacilli in sections and the Khanolkar method of concentrating bacilli from the tissues it is now possible to find *M. leprae* in every active case of leprosy. This raises again in acute form the question of the infectivity of the so-called noninfective form of the disease. However, he personally believes that this does not alter the generally accepted view that leprosy is only infective in those cases where bacilli can be discovered by the standard methods of examination. The writer then emphasizes the importance of tissue immunity in leprosy and its effect on prognosis, and gives a modification of the Pan-American classification in which he divides all cases into lepromin positive, lepromin variable, and lepromin negative, each with various subdivisions. After dealing with sulfone treatment, he discusses the 3 types of reaction that occur: (1) Violent local reactions seen in tuberculoid leprosy due to tissue response, which hasten recovery. (2) Erythema nodosum and acute lepra reactions, which are held to be allergic phenomena in which the antigen—bacillary products—is no longer confined to the tissues but is circulating and, as a result of rapid multiplication of *M. leprae* and its equally rapid destruction, a hypersensitization arises with high fever and erythema nodosum lesions. (3) Subacute or chronic lepra reactions in which there is rapid multiplication of bacilli without corresponding destruction.

—G. O. TEICHMANN

COCHRANE, R. G. Leprosy, with particular reference to conditions at present pertaining in the British Isles. *Publ. Hlth. (London)* **65** (1952) 197-198.

In this address to the medical officers of health of London the writer endeavored to remove the fears and prejudices which, unfortunately, still persist not only among lay people but also among doctors. Since leprosy was made notifiable in 1952 about 100 cases have been reported in England and Wales. The number of cases in the country may have doubled or trebled in the last 30 years, with perhaps a total of 150, but no case has been traced to infection from a patient in Britain. About one-half of them are Anglo-Indians and others who have immigrated. Measures involving compulsion are not advisable, and a new attitude towards leprosy needs to be encouraged by education and by the avoidance of the use of the words "leper" and "unclean" by doctors. Finally the writer spoke of the facilities for treating leprosy in England, with special reference to the new hospital at Redhill, Surrey, and he regretted the local opposition to it.

Leprosy has now been declared a notifiable disease by the Ministry of Health, but that does not imply that they consider leprosy to be a menace to public health. —G. O. TEICHMANN

- 6 COCHRANE, R. G. Recent advances in the pathology and treatment of leprosy, with special reference to their importance in the control of the disease. *Ceylon Med. J.* (n.s.) **1** (1952) 39-47.

The first part of this article deals with the histological work of Khanolkar. The second reviews recent advances in treatment, with special reference to the sulfones and thiosemicarbazone. The third concerns the work of Brand on the prevention and treatment of paralysis and deformities by use of special splints and exercises and, in suitable cases, by bringing the tendon of the flexor digitorum sublimis into the palm and attaching it to the lumbrical tendon. The fourth discusses the control of leprosy in Ceylon. The method of isolation in vogue is strongly criticized because it encourages a prison-like environment and results in dissatisfaction among the patients and avoidance. Regarding the application of treatment, segregation is still essential but a greater degree of laxity can be allowed in permitting infective cases to be treated in outpatient clinics provided reasonable precautions are taken to prevent close contact with children, especially night contacts. Sulfone treatment, used properly and intelligently, will increasingly become an essential aid to the prevention officer and along with adequate control measures should hasten the day when leprosy can be eliminated.—[From abstract in *Trop. Dis. Bull.* **49** (1952) 1129.]

- 6 FLOCH, H. and NOMDEDEU, G. Prophylaxie et sulfonothérapie de la lèpre. [Prophylaxis and sulfone therapy of leprosy.] *Inst. Pasteur Guyane et Terr. Inini*, Publ. No. 244, 1951, Oct.

In French Guiana, the application of sulfone treatment has completely changed the problem of leprosy prophylaxis, because the results obtained permit one to expect that in a few years the number of contagious lepromatous cases will be greatly decreased. For this reason the project of the Gallion sanitarium, designed for about 400 contagious patients, has been held in abeyance. The immediate needs can be met by the Sanatorium Départementel Antihansénien of Acarouany, which is being improved.

—AUTHOR'S ABSTRACT

- 6 WHEATE, H. W. Some principles and suggested methods of leprosy control in Eastern Uganda. *Lep. Review* **23** (1952) 122-127.

Two leprosy sanatoria at Kumi and Ongino at present serve one-half of Uganda, in an area where there are probably about 40,000 cases, but there are no proper hospital buildings, laboratory, or infant crèches. The writer discusses plans for the extension of the work into the preventive field after the provision of these essentials. There are numerous difficulties: the primitive nature of the community, the lack of organized village life and communal responsibility, and the fact that leprosy has no stigma. Years of patient work will be necessary to win the confidence of the people. The writer suggests that there should be established a mass-treatment and preventive service covering a radius of 20-30 miles from the sanatorium, rural preventive units, and a satellite settlement in the Nilotic tribal area 200 miles from Kumi. Full-time European supervision will be

necessary, with the acceptance by the African local authority of financial responsibility for the scheme.

—G. O. TEICHMANN

MIRANDA, R. N. Caso de lepra, em una criança, manifestada após injeção de sangue da progenitora lepromatosa. [Leprosy in a child manifested after an injection of blood from his leprous mother.] Paper presented at the III Pan-American Leprosy Conference, Buenos Aires, December 1951.

A 27-year old woman gave 5 cc. of her own venous blood to her 7-month old daughter who had measles, by injection into the buttock. Two months later the mother was seized by lepra reaction, her first clinical manifestation of lepromatosis. During four months an abscess developed at the place of injection in the child, that giving place to a lesion with the clinical aspect of tuberculoid leprosy but with simple inflammatory structure. This persisted until the age of 4½ years, then healed quickly under sulfone treatment. The circumstances suggest that this may be considered an example of direct transmission of leprosy by inoculation from one human being to another.—[From author's abstract supplied by H. C. de Souza-Araujo.]

HATA, O. Diurnal variation of leprosy patient's body temperature and histaminic drugs influence upon it. *La Lepro* 21 (1952) 51-54 (in Japanese; English abstract, p. 51).

The temperature of patients with leprosy of the nervous type is the lowest in the morning, after then gradually rising; its course is almost the same as in the healthy. In the case of the lepromatous type, its diurnal course is very irregular; rather large waves of elevation and lowering of the temperature often appear temporarily. At the time of these elevations and depressions, even in the summer season, the patient complains of a chill. When "restamin" is administered these irregular waves of body temperature and the chills usually disappear, and then the diurnal variations approach closely those of the healthy body.—[From abstract.]

HATA, O. The effect of antihistaminic drug on erythrocyte sedimentation rate of leprosy patient. *La Lepro* 21 (1952) 55-58 (in Japanese; English abstract, p. 55).

The effect of the oral use of "restamin," which is one of the antihistaminic drugs, on the erythrocyte sedimentation rate of leprosy patients has been observed. In the case of the lepromatous and macular [i.e., tuberculoid] types there was a delay of the sedimentation rate. In the macular type the histamin content of the blood is believed to be less than in the lepromatous type; the phenomenon appeared earlier in the latter type. The delay phenomenon, however, is temporary; the pretreatment condition is regained as soon as the administration of the drug is stopped. No delay phenomenon worthy of mention was observed in the case of the nervous type through the use of various doses of restamin.—[From abstract.]

GRAY, J. C. Some practical clinical aspects of leprosy. *U. S. Armed Forces Med. J.* 3 (1952) 1297-1311.

The author's experience in leprosy is based upon 21 cases observed in American Samoa. Six tables of data are given and discussed, the subjects including minimal physical examination and a nonimmunologic basis of classification. The most common physical findings were skin lesions, en-

larged peripheral nerve trunks and nasal congestion. Leprosy should be considered whenever these signs are seen, especially if they are of long standing, and in patients with apparent erythema multiforme, chronic ulcers or epistaxis.

—F. A. JOHANSEN

GARRETT, A. S. and CORCOS, H. G. Dapsone treatment of leprosy. *Lep. Review* **23** (1952) 106-108.

This is a very condensed account of the treatment of more than 10,000 patients with dapsone in Nigeria, about 1,000 at the central settlement [Oji River, Onitsha], and in surrounding outpatient clinics, which increased in number during the 22-month period from 27 to 39. As the medical staff was very small and the number of patients enormous the results given must be somewhat rough. Nearly all of the tuberculoid cases had improved considerably. Of the lepromatous cases, 10% had repeated lepra reactions and another 10% repeated nerve reactions, while the remainder improved without serious reactions. However, 2%-3% had dermatitis, and 50 patients developed psychoses. At first the maximum dose was 200 mgm. daily, but later 400 mgm. weekly. This latter dosage caused fewer reactions.

—G. O. TEICHMANN

PAUL, H. Result of analysis of sulphone negative cases over a period of 4-6 years. *Lep. Review* **23** (1952) 115-121.

This paper gives the results of treatment with various sulfones used at Chingleput, Madras, since 1946. Of 206 cases treated for 4 years or more, 79 (38%) had been rendered symptom-free and bacteriologically negative, and they have remained so for over 6 months. It had been learned at cost—although no patient had died—that massive dosage is no more useful than the minimal average dose, which eliminates as far as possible the provocation of toxic symptoms. The interesting fact emerges that it is not the quantity of drug that appears to be of importance, but the duration of regular treatment. It takes not less than 2½ to 4 years for moderately advanced lepromatous cases to become negative in any appreciable numbers. The different forms of sulfones have produced almost the same negative rate in about the same period of time.—G. O. TEICHMANN

FLOCH, H. and LECUILLER, A. Sur le mode d'action de la sulfone-mère, des sulfones monosubstituées, et des sulfones disubstituées dans la lèpre. [On the mode of action of the parent sulfone and monosubstituted and disubstituted sulfones in leprosy.] *Inst. Pasteur Guyane et Terr. Inini*, Publ. No. 240, 1951, September.

Since the parent sulfone and the monosubstituted sulfones act directly by their molecules, the authors believe that promin and disubstituted sulfones in general act through the intermediary of DDS. The fact that the monosubstituted sulfones have an activity of their own entirely apart from the liberation of DDS prompted them to try the combination of DDS and 1500F. This combination permits one to treat with entire satisfaction patients with leprotic reactions, with whom it is necessary to remain below the reaction threshold. This threshold may generally be raised by the use of this sulfone combination.

—AUTHOR'S ABSTRACT

FLOCH, H. and LECUILLER, A. Espacement des injections de 1500F en fonction des concentrations sanguines de sulfone en thérapeutique antilépreuse. [Spacing of 1500F injections in relation to blood con-

centrations of sulfone in antileprosy therapy.] Inst. Pasteur Guyane et Terr. Inini, Publ. No. 246, 1952, October.

It seems possible, in view of the results obtained, to space the injections of deposit-1500F by making 2 injections of 10 cc. each per week. One could also inject 20 cc. every 5 days, but aside from the fact that the injections would then not fall on a fixed day, which is not a negligible inconvenience, the dose of 20 cc. is sometimes not well tolerated locally.

—AUTHOR'S ABSTRACT

DREISBACK, J. A. Sulphone levels in breast milk in mothers on sulphone therapy. *Lep. Rev.* **23** (1952) 101-106.

All infants born in the Kano Leprosy Settlement, Nigeria, are separated at birth and reared in a separate crèche. This tends to make the mothers lose interest in their children, and to counteract that they were allowed to bring to the crèche their milk removed by breast-pump. After sterilization, this milk was fed to the infants. Sulfone determinations were made on the milk to ascertain if it might have prophylactic value. The average concentration was found to be 1.4 mgm./%, 4-6 hours after the mother had received a sulfone injection. The milk produced a sulfone level of 2.6 mgm./% in the infants' urine 4 hours after feeding. Although this encourages the idea that it may act prophylactically, further study will be necessary before the mothers can be allowed to feed their infants directly.

—G. O. TEICHMANN

COMBES, F. C. and SCOTT, M. J. Sulfoxone (diasone) sodium dermatitis; unusual distribution in a patient with leprosy. *A.M.A. Arch. Derm. & Syph.* **66** (1952) 748-749.

This is a report of a case of "dermatitis medicamentosa" in a male patient 52 years old who had been treated at the National Leprosarium at Carville with diasone, tibione, and promin without untoward reactions. When seen in the authors' office there were skin lesions from which the bacilli were obtained; the lepromin reaction was negative. After 3 months on sulfoxone therapy, 0.3 gm. three times daily, erythema nodosum-like and furunculoid lesions developed in the lateral third of the eyebrow regions and on the neck, with a few on the extensor aspects of the forearms and dorsa of the hands. The drug was discontinued. Penicillin, aureomycin and cortisone had no visible effect. The lesions gradually underwent involution, and after a lapse of 3 months sulfoxone was resumed, 0.3 gm. daily. A similar eruption occurred after 10 days, and the treatment was discontinued. The authors' comment only mentions briefly reactions resembling the Jarisch-Herxheimer phenomenon induced by other drugs. They feel that the distribution of the lesions was unusual. [This opinion is queried. This patient was bacteriologically positive when he left Carville, shortly before he was seen by the authors.]

—F. A. JOHANSEN

JOHANSEN, F. A. and ERICKSON, P. T. Antibiotics in the treatment of leprosy. *Ann. New York Acad. Sci.* **55** (1952) 1154-1160.

Experience with penicillin, streptomycin, dihydrostreptomycin, aureomycin hydrochloride, lupulon, terramycin, and chloromycetin in the treatment of leprosy is reviewed. Penicillin in large doses was ineffective. Streptomycin in large and continuous doses produced toxic manifestations excessively severe in comparison with the clinical results, but in combina-

tion with dihydrostreptomycin it appears to have a suppressive effect upon the lesions. Clinical improvement has been almost universal and well sustained, but in view of toxicity extended treatment beyond 6 to 9 months has not been possible. Unless the dosage can be reduced sufficiently to permit prolonged treatment, without impairing therapeutic activity, the use of streptomycin and dihydrostreptomycin must be limited to that of an adjuvant to sulfone therapy. Conclusions regarding aureomycin hydrochloride must await further clinical trial. Lupulon and terramycin, as used, have not been found of value. Chloromycetin, as employed by Cuban workers, likewise was not found to be beneficial. —AUTHOR'S ABSTRACT

GÜRÜN, H. Streptomycin and sulfone therapy in leprosy. *J. American Med. Assoc.* **148** (1952) 764 (Foreign Letters, Turkey).

Prof. Halil Gürün, a Turkish dermatologist at the Kabul (Afghanistan) Medical School, treated 4 leprosy patients with streptomycin and 10 with a sulfone (disulon). Of the streptomycin cases, three [apparently] were lepromatous, and one [perhaps] maculoanesthetic although with bacilli in skin ulcers. The results in all were remarkable, with clearing up of the bacilli in short periods of time. One man, "covered with lepromas," was given 0.5 gm. twice daily for 10 days when the lepromas enlarged, softened and ulcerated; hoarseness increased and so did the bacilli in the nasal secretion. Under continued treatment, however, most of the ulcers soon healed, and within a little more than two months from the beginning bacilli were not found even after KI; and the case was still negative after another 10 months. In the other cases clearing up occurred uneventfully in about the same length of time. In the case which had morphea alba patches, these "retrogressed" and atrophy of the muscles "subsided." The most notable thing about the sulfone-treated patients is that, apparently during the third week of treatment (the daily dose then 125 mgm., up from the original 75 mgm.), in several of them the lepromas increased in size, became darker in color in some, softened in others, and in still others showed inflammation and infiltration around them; the bacilli in the nasal secretion increased considerably. In two cases lepromas on the face and hands soon ulcerated. Improvement then followed (maximum daily dosage, 200 mgm.), and by the end of 5 months the cases had pretty well cleared up. The 3 maculoanesthetic cases, on the other hand, had not improved. —H. W. W.

KNORR, R. Die Behandlung der Lepra mit Conteben. [The treatment of leprosy with conteben.] *Ztschr. Tropenmed. u. Parasitol.* **4** (1952) 31-37.

A report of 10 cases treated with the thiosemicarbazone preparation "conteben" for 1¼ years. Beginning with 25 mgm. daily, the dose was gradually increased during 4 weeks to a standard dose of 200 mgm.; with higher doses reactions may be expected. In the presence of leprosy eye affections the dose must be chosen carefully. Leprous ulcers and mucosal infiltrations were rapidly healed, and infiltrations and lepromas disappeared within 2 to 3 months. Tuberculoid processes improved markedly, although more slowly than lepromatous. There was rapid normalization of trophic disturbances and alterations of sensibility, and thickened ulnar nerves were no longer palpable. Pale areas recovered normal color. Hair of the eyebrows and in the axillary and pubic regions grew again. Fresh

cases responded better than old chronic ones. Despite the rapid regression of the lesions of the skin and mucosa, bacilli were still present in tissue sections after the treatment period. Primitive patients soon gained confidence in the preparation, a fact of great importance in mass treatment. No side-effects were observed. —E. KEIL

DE MELLO, H. A. Contribuição a terapêutica das lesões tróficas na lepra. [Contribution to the treatment of trophic lesions of leprosy.] *Arq. mineiros Leprol.* **11** (1951) 148-151.

Previous use of vitamin E in the dystrophies of leprosy is ascribed to da Gloria Caldeira, who at the suggestion of Aleixo had injected it directly into affected muscles. The author has repeated the experiment in 8 cases, using a Wander Laboratories product called Vietal. In 6 of them injections were made into the atrophied muscles of the hands on alternate days, from 6 to 12 injections per case (100 mgm. of the vitamin per ampule); in the other 2 cases injections were also made into the ulnar nerve. Improvement was seen in all instances, and the author concludes that, although the results are not long-lasting, the procedure may be placed along with plastic surgery since it may be beneficial to patients who cannot be helped by surgery. —H. W. W.

[In the discussions of the meeting of leprologists held in Minas Gerais last Fall (see elsewhere), Diniz told of infiltration of vitamin E into atrophied muscles of the hands, reported by de Mello, with restoration of the esthetic appearance. This improvement, he said, was persistent, with entirely normal appearance after 2 or 3 years. Bogliolo said that he had examined the patients and believed that the effect was due to the vehicle rather than to the vitamin, but Freire affirmed his belief that the association of vitamin E and the sulfone treatment which had been used causes regression of the muscular atrophy. —EDITOR]

FLOCH, H. and HORTH, R. Intérêt du tocophérol dans le traitement des névrites et des troubles trophiques de la lèpre. [Tocopherol in the treatment of the neurites and trophic disorders of leprosy.] *Inst. Pasteur Guyane et Terr. Inini, Publ. No. 245*, 1951, October.

Despite the excellent results obtained on the whole in the treatment of leprosy by sulfones, chiefly in the tuberculoid and undifferentiated cases, there is an at least relative failure in the neurites and their trophic after-effects—ulcers, muscular atrophy, etc. It would be of interest to try vitamin E in minimum doses of 20 mgm. per day by mouth. This treatment should, as a rule, be continued for quite some time—2 months, for example—before one could judge the results. —AUTHOR'S ABSTRACT

KITAMI, Y. The pH measurement of saliva in leprosy patients. Part 2. *La Lepro* **21** (1952) 65-66 (in Japanese; English abstract, p. 65).

The nearer to 7.0 is the pH of saliva, the fewer carious teeth are found. They are seen most often when the pH is decreased to 6.0-5.0. It is an interesting fact that less tooth decay is found in the mandibular front teeth near the orifices of the sublingual and mandibular glands, the secretion of which is alkaline, than in the teeth near the parotid glands, which secrete acid saliva.—[From abstract.]

DOMAGK, G., OFFE, H. A. and SIEFKEN, W. Weiterentwicklung der Chemotherapie der Tuberkulose. [Further developments of the chemotherapy of tuberculosis.] *Beitr. Klin. Tuberk.* **107** (1952) 325-327.

Experiments have shown that the hydrazones of isonicotinic acid are more highly bacteriostatic than the hydrazide. Their inhibitory effect is of the order of 1:50 million or even 1:100 million. In animal experiments, tolerance is better than with "neoteben." Whereas neoteben in doses of 25-50 mgm./kgm. is all that can be tolerated, with the hydrazones 100-200 mgm./kgm. can be administered, subcutaneously or orally, daily for one week and longer, in guinea-pigs and rabbits. This dosage has a higher tuberculostatic effect than the lower dose of neoteben. —E. KEIL

6 BERTI, F. A., ZITTI, L. M., PEREGO, C., RZEPPA, H. W., RIECKMANN, B. H. G. and RAPP, O. P. Chemotherapy of leprosy. II. Compounds structurally related to 4,4'-diaminodiphenyl sulfone. Chemical studies. *Rev. brasileira Leprol.* **20** (1952) 104-115.

This is a report, in English, from the Instituto Butantan of São Paulo, of the synthesis of new sulfone derivatives. It deals with four products in which only the $-SO_2-$ group was modified: the sulfide (-S-), the sulfoxide (-SO-), the cetone or benzophenone (-CO-) and the amine (-NH-). The methods of preparation are described, and the results of toxicity tests of one of them in rats. —H. W. W.

6 DE SOUZA-ARAUJO, H. C. Caso de lepra aguda maligna, com infecção do cônjuge em três meses de vida matrimonial. Isolamento de um bacilo ácido-álcool resistente (cultura cromogênica), de lesão cutânea desse doente, patogênico para murídeos, "Macacus rhesus" e para o homem. [Case of acute malignant leprosy, with infection of the wife within three months of matrimonial life; isolation from a cutaneous lesion of the patient of an acid-alcohol fast bacillus (chromogenic culture) pathogenic for rats, mice, *Macacus rhesus* and man.] *Mem. Inst. Oswaldo Cruz* **48** (1950) 51-75; English version of text, pp. 76-99.

The patient, named Chaves, aged 30, was seen on June 24, 1949, 3 months after the existing macules, infiltrations and nodules had begun to appear and 3 years after he had first noticed an anesthetic area on the thigh. Some of the patches had depressed centers. Bacilli were numerous. Classified as L2-N1. Promin treatment started then was interrupted twice in the first 6 months because of severe reactional exacerbations, with great increase of bacilli, but later improvement was spectacular and the condition had almost cleared up by the end of 10 months. A lepromin test made in October was "weakly positive" after one week, diminishing thereafter. In the meantime Chavez' wife, aged 18 when she married him in April 1949, was found in July to have a suspicious red lesion on the right leg. By October this had become of tuberculoid appearance; a few bacilli were found; the lepromin reaction was 3+. A biopsy specimen taken in April 1952 was reported to be lepromatous, without acid-fast bacilli, by the Instituto Oswaldo Cruz. This infection is ascribed to the husband. From the beginning materials were taken repeatedly from Chavez for cultures and animal inoculations, and a chromogen was twice cultivated. With this culture prominent lesions were produced in monkeys inoculated in the face. Both Chavez and his wife were inoculated intradermally on the thighs in November with live suspensions of this "Chaves" strain and another one ("Hecke"). [See second abstract below.] Both individuals showed the Koch phenomenon—the woman equally to both strains, the man

only [or most strongly?] to his own—and the cultures were recovered from the reaction lesions. The author cannot say that the Chaves culture is the true Hansen bacillus, but he quotes Marchoux's opinion that there are probably several leprosy bacillus strains of varying pathogenicity, just as there are of the tubercle bacillus. Much emphasis is given to the histological reports from two different sources on the numerous biopsy specimens taken from the man: (1) The first one, taken on June 10 from the left thigh, before the author saw the patient, had been reported reactional tuberculoid, bacilli very numerous (Portugal). (2) June 24, nodule left ear; lepromatous, with many bacilli (I.O.C.). (3) July 13, left leg, divided and sent to the two laboratories: (a) tuberculoid granuloma, sarcoid type, without bacilli (Portugal); and (b) lepromatous (I.O.C.). (4) July 20, nodule left ear; diagnosed lepromatous, with many bacilli (Portugal). (5) August 9, from the same lesion as No. 1; lepromatous, with bacilli (I.O.C.). (6) September 5th, right thigh, also submitted to the two laboratories: (a) tuberculoid granuloma, sarcoid type, without bacilli (Portugal); and (b) leproma with bacilli (I.O.C.). (7) October 10, third specimen from left thigh: (a) tuberculoid granuloma, sarcoid type, no acid-fasts but a few cyanophil bacilli after Gram-Weigert (Portugal); (b) leproma, with many epithelioid cells in places, with bacilli (I.O.C.). (8) February 27—the patient's lesions much improved—from the same lesion as No. 3; lepromatous, with very rare acid-fasts (I.O.C.). (9) March 6th, right knee—the only lesion that still seemed to be lepromatous—reported precisely as the last (I.O.C.). (10) March 13—the patient then almost bacteriologically negative—a specimen from the ear, reported as "recalling the structure of a leproma," without acid-fasts (I.O.C.), this report being interpreted by the author as "leproma in marked regression." [Of 5 specimens, Portugal had reported all to be tuberculoid except—significantly—one of a nodule of the ear, while all 8 diagnoses from the Institute laboratory were of leproma.] Regarding these disagreements the author asks, "When this occurs in the two most specialized centers in the capital of the country, what cannot be expected to happen in the different states?" He adds that it "proves that it is impossible to recognize the clinical type of leprosy through the histopathological examination of a skin fragment," and he quotes Rabello as having said, in 1948, essentially the same thing. To accept this case as having both the lepromatous and tuberculoid forms, he asserts, would be to refute the classification adopted at Havana.

—H. W. W.

[The author has recently sent us a copy of a letter to the editor of *Tropical Diseases Bulletin* commenting on the abstract which appeared in that periodical [48 (1951) 647]. Among other things he objected to the abstractor's statement that apparently both tuberculoid and lepromatous features were present and that the case was probably an "intermediate" one, saying that ". . . the case was a lepromatous one, proved by many well studied biopsies." As for the culture, he had become convinced that it is "the etiological agent of leprosy in [that] patient." Regarding the comment that the strong local reactions produced by the intradermal injection of the culture "is evidence that [it] was not one of Hansen's bacillus" because injection of the latter would not have provoked such a reaction, the author replies, "In active tuberculosis patients the inoculation of the living Koch bacillus produces the same phenomenon . . . and nobody

denies that the inoculum was a Koch's bacillus." The fact that the inoculated culture produced a reaction different from that of lepromin is ascribed to the fact that the latter, prepared from human leprosy skin, is a complex product of acid-fast bacilli "mixed with all the antibodies of the Hansen infection" and not comparable with the antigen prepared with cultures.—EDITOR.]

PORTUGAL, H. Notas a margem de uma publicação: Caso de lepra aguda maligna, com infecção do conjuge em tres meses de vida matrimonial, pelo Dr. H. C. de Souza Araújo—Mem. Inst. Oswaldo Cruz **48** (1950) 51-75. [Notes on an article: "Case of acute malignant leprosy with conjugal infection after three months of married life," by Dr. H. C. de Souza Araújo.] An. brasileiros Dermat. & Sifil. **25** (1950) 235-242.

Histological examinations of biopsy specimens from this peculiar case were made by the writer on 3 occasions with seemingly contradictory results. It was first reported as reacting tuberculoid with innumerable bacilli; next as a tuberculoid granuloma (sarcoid type) with absence of bacilli; and on the third occasion as lepromatous leprosy with innumerable bacilli. The explanation of these seemingly contradictory reports is that the case was one of the kind described by Wade and Rodriguez as "borderline tuberculoid leprosy," in which appearances of tuberculoid and lepromatous leprosy are found simultaneously in the same case. The paper is illustrated by 9 photomicrographs.—[From abstract in *Trop. Dis. Bull.* **49** (1952) 873.]

[Actually, the report referred to quotes in full and summarizes in a table the reports by Dr. Portugal on five specimens from this patient. We suggest as significant the fact that the only one which he reported as lepromatous was from the ear, where the lepromatous condition is most likely to be found in borderline cases.—EDITOR.]

DE SOUZA-ARAÚJO, H. C. Caso de lepra maligna (L2-N1) que regrediu rapidamente sob a acção duma terapeutica mista (sulfona-fisioterapia). Isolamento de um bacilo ácido-álcool resistente (cultura não cromogenica) de lesão cutanea desse doente, patogenica para murídeos, "Macacus rhesus" e para o homem. [Case of malignant leprosy rapidly regressing after treatment by a sulfone associated with physiotherapy. Isolation from a cutaneous lesion of the patient of an acid-alcohol fast bacillus (nonchromogenic culture) pathogenic to man and to laboratory animals.] Mem. Inst. Oswaldo Cruz **48** (1950) 101-106; English version of text, pp. 107-112.

This is another of the author's chronological reports, relating his experience with a patient named Hecke, who had lepromatous skin lesions and peripheral anesthetics, classified as L2-N1 and confirmed histologically (3 biopsies; examinations made at the Instituto Oswaldo Cruz). Skin tests with both lepromin and the author's leprolin gave negative results. A culture was obtained, first spoken of as brownish-yellow, later as macroscopically similar to certain strains of *M. tuberculosis* (smooth). Although it was pathogenic for guinea-pigs, the lesions produced were not tuberculous. Those produced in monkeys, shown in photographs, were reported as histologically similar to human leproma. —H. W. W.

- 6 ISHIHARA, S. An example of lymphogranulomatosis combining with leprosy. *La Lepro* **21** (1952) 62-64 (in Japanese; English abstract, p. 62).

A very rare case was seen at autopsy in which lymphogranulomatosis was combined with lepra nervosa. This disease not only systematically injured many lymph-glands—e.g., cervical, axillary, mediastinal, abdominal, etc.—but also caused changes in the lungs, spleen, kidneys, pancreas, etc. In lepra nervosa it is generally found in [the serum] protein fractions that albumin and globulin are nearly in proportion. In this case, however, globulin, especially γ -globulin, was increased to an exceptional degree, and this is ascribed to the Hodgkin's disease. [Gross-specimen photographs and photomicrographs.]—[From abstract.]

- 7 ROSEMBERG, J., SOUZA CAMPOS, N. and AUN, J. N. Da relação imunobiológica entre tuberculose e lepra. VII. Influencia do BCG oral sôbre a reação de Mitsuda em individuos previamente positivos a lepromin. [The immunobiological relationship between tuberculosis and leprosy. VII. The influence of oral BCG vaccination upon the Mitsuda reaction in previously lepromin-positive individuals.] *Rev. brasileira Leprol.* **20** (1952) 75-83.

This study concerns 40 preventorium children of leprous parents, 3 to 14 years old, of whom 5 had had contact with their parents for from 7 months to 4 years, the others being isolated at birth. All had given positive Mitsuda reactions of uniform intensity in annual tests, over periods of from 2 to 7 years, on the last occasion \pm in 27, 1+ in 11 and 2+ in 2, but all were negative to tuberculin. The question of why these children living in isolated surroundings should be reactive to lepromin in spite of lack of sensitivity to tuberculin is discussed, the possibility of contagion from the nurses and other personnel being suggested. Oral BCG vaccination was performed (four 0.2 gm. doses at weekly intervals) and the lepromin test was made 3 days after finishing the vaccination. There was general intensification of the reactions except in the 2 cases originally 2+, that being the maximum intensity. (These 2 children were among the 5 contacts.) Among these 40 children, 25 (62.5%) showed the 48-hour Fernandez reaction after the vaccination, which is in contrast with its rarity in cases made Mitsuda positive for the first time by BCG vaccination. [There is no indication of observations of this reaction in the tests made before the vaccination.] The intensification of the Mitsuda reaction by oral BCG is of interest because of observations made in Brazil suggesting that calmettization can strengthen the specific resistance to tuberculosis in already infected individuals. By analogy, it may be that this procedure will strengthen resistance to leprosy infection in previously Mitsuda-sensitive individuals.—[From the English summary.]

- 7 ROSEMBERG, J., SOUZA CAMPOS, N. and AUN, J. N. Da relação imunobiológica entre tuberculose e lepra. VIII. Positivização remota do Mitsuda por efeito da vacinação BCG oral. [The immunological relationship between tuberculosis and leprosy. VIII. Remote positivization of the Mitsuda test resulting from oral BCG vaccination.] *Rev. brasileira Leprol.* **20** (1952) 84-96.

By "remote positivization" is meant the Mitsuda type of infiltrative reaction which, by effect of BCG vaccination, occurs much later than the

classical time interval of 21-30 days, at the site of a lepromin injection without any response having occurred until then. The classical 21-30 day reaction is referred to as "late positivization." Remote positivizations have been observed in 17 of 103 BCG-vaccinated children previously tested with lepromin at annual intervals. (1) In one group of 63 repeatedly negative children, the usual 4-dose BCG vaccination was performed one year after the last test. Three days after the last dose another lepromin test was made, and positive 30-day reactions resulted. Simultaneously with these reactions there appeared, in 10 cases, definite infiltrative nodules at the sites of previous lepromin inoculations—typical "remote positivizations." In 7 cases there was one such reaction, in 2 there were two, and in 1 there were three similar, simultaneous positivizations. In two instances these reactions underwent necrosis (i.e., 2+). Since the previous lepromin injections had been annual, the last one a year before the BCG vaccination, it follows that the procedure had induced the reaction phenomenon in loci of the dermis where the lepromin had been "stored" for 1, 2, and even 3 years. (2) Among 40 children which had given positive reactions to the annual lepromin tests performed before BCG vaccination, that procedure induced remote positivizations in 7 cases. The previous positive reactions had been of only medium or weak intensity, incapable therefore of consuming all the lepromin, which was left in the skin in a quantity sufficient to allow the remote reaction 1 year later. Here the condition was a "remote reactivation" rather than a "remote positivization." The time factor is an essential one in this phenomenon. In work previously reported the BCG vaccination had been performed 41 days after the lepromin inoculation, and remote positivizations occurred—after from 70 to 112 days—in 84.6% of the cases. In the present observation, in which the last lepromin injection had been made one year before the BCG vaccination, only 16.5% of the cases showed this remote reaction. Other possible factors are also discussed. There was no relation with age or sex, or with the intensity of the early or late responses to the new lepromin inoculations performed after the vaccination. Histologic studies confirmed the specific nature of these remote positivizations.—[From the English summary.]

ROSEMBERG, J., SOUZA CAMPOS, N. and AUN, J. N. Da relação imunobiológica entre tuberculose e lepra. IX. Reativação focal precoce da reação lepromínica, consequente a prove de Mantoux. (Nota previa.) [Immunobiological relation between tuberculosis and leprosy. IX. Early focal reactivation of the lepromin reaction, following the Mantoux test; preliminary report.] *Rev. brasileira Leprol.* **20** (1952) 97-103.

Here are reported observations on two children, living in closed surroundings since their birth, previously negative to lepromin and Mantoux (1/10) negative, aged 13 and 14 months when vaccinated with BCG by mouth. A new lepromin inoculation, made on the same day as the BCG vaccination, resulted in positive reactions with necrosis. Two Mantoux tests made after the vaccination gave negative results, but at the end of 2½ months a third test finally resulted in a positive reaction. Within 48 hours following this last test, at the places where the Mitsuda reactions were already receding, a new wine-colored infiltration appeared around the scabs, surrounded by a distinct erythema, then receded entirely during the next 2-3 days. This observation is suggestive of the existence, in cer-

tain circumstances, of a cross allergy by which tuberculin induces a brief reactivation of Mitsuda lesions which are in the regressive period.—[From the English summary.]

FLOCH, H. Reaction de Mitsuda et intradermo-réaction au BCG tué dans la lèpre. Conclusions théoriques et pratiques. [The Mitsuda reaction and the intradermal reaction to killed BCG in leprosy; theoretical and practical conclusions.] *Ann. Inst. Pasteur* **82** (1952) 517-527.

To study the immunological relationships between tuberculosis and leprosy, it is pointed out, a tuberculosis antigen as much like lepromin as possible should be employed. To permit making a usable tubercle-bacillus preparation of similar concentration, the lepromin was used in a 1:750 dilution rather than the usual 1:30 [sic] one. Reactions to this dilute lepromin, it is stated, can be correlated with those to the ordinary one by adding one plus to the readings. The tuberculosis antigen was a heat-killed, phenolized suspension made from dried living BCG, diluted to give about the same number of bacilli per field as the dilute lepromin. Whereas the early (48-hour) reaction to lepromin disappears within a week, that to the BCG suspension persists and progresses to the late reaction. That reaches its maximum about the 15th day, while that to lepromin is best read on the 30th day; but to simplify the matter the two can be read on the 22nd day. The cases tested were 46 tuberculoid and 50 indeterminate, mostly children 4-16 years of age, and 40 lepromatous. The gross figures for the late reactions are: (a) in the tuberculoid cases, practically identical, 41 (89%) to lepromin and 42 (91%) to the BCG suspension; (b) of the indeterminate cases, 34 (59%) to lepromin and 43 (79%) to BCG; and (c) of the lepromatous cases, only 2 (5%) to lepromin but 28 (70%) to BCG. These results are compared with those previously obtained with tuberculin as the tuberculosis antigen in 128 children of the same category as in the present work [see the *JOURNAL* **19** (1951) 387]. Of the 43 tuberculoids, 93% proved Mitsuda positive but only 39% positive to tuberculin (von Pirquet); and among the 85 indeterminates, 45% Mitsuda and 12% tuberculin. For an index for the whole lot: $\frac{25 \text{ tuberculin}}{79 \text{ lepromin}}=0.32$. In work reported by de Souza Campos *et al.* [see the *JOURNAL* **19** (1951) 385], of 185 children 70% were Mitsuda positive and 24% positive to tuberculin (Mantoux), which gives: $\frac{45 \text{ tuberculin}}{129 \text{ lepromin}}=0.35$. In the present work the index for the tuberculoid group is practically unity, and that for the indeterminate group is higher; for the two groups together:

$\frac{85 \text{ BCG}}{75 \text{ lepromin}}=1.13$. The very different results obtained with the BCG suspension and tuberculin are explained on the ground that the latter consists only of the soluble antigenic products of the tubercle bacillus whereas the former includes the endoproteins. The fact that the reaction to BCG lacks the recession between the early and late reactions that is seen between the Fernandez and Mitsuda responses to lepromin is because, the author believes, the injected tubercle bacilli are much more rapidly broken down than are the leprosy bacilli, and consequently the "endomicrobic" elements of their antigen mosaic are more rapidly released. The early reactions are ascribed to soluble antigens, the late ones to the endoproteins [which is

Fernandez' original explanation of the two phenomena]. All of these reactions are allergic; the view of de Souza Campos *et al.* that the early reaction represents allergy and the late one immunity is not accepted. Reactivity to BCG does not, *ipso facto*, involve reactivity to lepromin. Vaccination by BCG does lead to reactivity to both antigens, evidently due to common antigenic elements in the mosaic of the two microorganisms. The Hansen bacillus provokes a cross reaction to the Koch bacillus itself, but not to tuberculin. [For further information of the author's views, the original article should be consulted. The Koch reaction to the tubercle bacillus is not alluded to, nor the factor of sensitivity of the tissue cells involved in such reactions. No mention is made of the previous work of Fernandez with a tubercle-bacillus suspension, reported in the *JOURNAL* **6** (1940) 1-14 and mentioned in *Rev. argentina Dermatosis*. **23** (1939) 425-453.]
—H. W. W.

- 6 YOSHINAGA, T. The distribution of α - and β - types of lecithin and kephalin in animal viscera and their antigenicity against leprous and syphilitic serum. *La Lepro* **21** (1952) 59-61 (in Japanese; English abstract, p. 59).

The distribution of α - and β - types of lecithin and kephalin was investigated with the visceral organs of white rabbits, the complement-fixation reaction being made with antigens of each organ. The results revealed that the antigen against syphilitic serum is α -lecithin and that against leprous serum is β -kephalin.—[From abstract.]

- 7 GOHAR, M. A. A note on fluorescence microscopy in the diagnosis of leprosy. *J. Trop. Med. & Hyg.* **55** (1952) 156-157.

It is often possible to diagnose leprosy in its early stages by microscopical examination of scrapings from the nasal mucosa, where small lepromas are frequently found, sometimes long before any appear on the skin. In the anesthetic type these lepromas are often found only at this site. The organisms may be so few that they are missed after the routine Ziehl-Neelsen method. In a comparison of nasal smears so stained and examined by ordinary light, and others stained with auramine and examined by filtered ultraviolet rays, in 23 cases of early leprosy, a slightly higher percentage of positives was obtained by the latter method, provided that adequate care was taken to avoid decoloration. However, because of certain difficulties this method seems to have little advantage over the Ziehl-Neelsen method.—[From abstract in *American J. Med. Assoc.* **150** (1952) 1257.]

- 7 GRAY, C. T. The respiratory metabolism of murine leprosy bacilli. *J. Bacteriol.* **64** (1952) 305-313.

Murine and human leprosy bacilli are obligate parasites which have not been cultivated *in vitro*. Information which bears on the cultivation problem has been obtained by studying the metabolism of the former (Hawaiian strain) after separation from infected rat testicles—a favored site for their growth—by differential centrifugation. The bacilli show endogenous respiration with an optimum at pH 7.5. Like tubercle bacilli, their respiratory capacity is damaged by anaerobic storage. Fresh suspensions failed to oxidize any one of 50 test substrates used, including intermediates of glycolysis, amino acids, fatty acids, and complex sub-

stances frequently used in culture media such as peptone and digests of casein. Certain complex materials, notably rat serum, are toxic. Yeast and liver extracts stimulate respiration, as do also proteins with a strong binding capacity such as bovine serum albumin and protamine. It is thought that yeast and liver may function in part by supplying factors removed from the bacilli during the purification process, while the proteins act by removing inhibitors and/or replacing the function of structural proteins lost from the bacilli. The highest respiration rates were observed in the presence of combined albumin and yeast supplement. Even in the presence of this mixture with added vitamins and co-factors, respiration is not further increased by the addition of substrate. The failure of murine leprosy bacilli to oxidize substrates and make a net gain in energy, coupled with the unexpected toxicity of certain complex substrates, probably explains the failure of *in vitro* cultivation. It is suggested that the definition and solution of the metabolic difficulties which concern these bacilli offers more hope for the solution of the cultivation problem than does the practice of inoculating various empirically compounded media.—[From author's summary supplied by J. H. Hanks.]

HADLER, W. A., CARVALHO, C. M. and MAURI, A. C. Quimioterapia da lepra. III. Ação de compostos estruturalmente relacionados ao 4,4'-diaminodifenil sulfona na lepra murina (sulfoxido, sulfeto, benzofenona e amina). [Chemotherapy of leprosy. III. Action of compounds structurally related to 4,4'-diaminodiphenyl sulfone on the development of murine leprosy.] Rev. brasileira Leprol. **20** (1952) 116-131.

This report deals with four compounds not previously used in the treatment of murine leprosy, namely, the sulfoxide, sulfide, amine and benzofenone of 4,4'-diaminodiphenyl sulfone, in which the $-SO_2-$ group is substituted by $-SO-$, $-S-$, $-NH-$, and $-CO-$ respectively. The methods used were the same as in work previously reported, DDS being used in comparison, as well as untreated controls. The animals lost weight, compared with the controls. The curves of survival time are similar to that of the control group, the test drugs having no observed influence on survival, whereas there was a marked difference in the DDS group. The amount of lesion production was the same as in the controls, whereas the DDS group had less. It is concluded that the sulfoxide and amine compounds have very little activity, and the sulfide and benzofenone compounds have none at all, in agreement with findings of others with these classes of drugs in *in vitro* and *in vivo* tests against the tubercle bacillus and other agents.—[From the English summary.]

LEVADITI, C., GIRARD, A., VAISMAN, A., RAY, A. and CHAIGNEAU-ERHARD, H. Traitement de la lèpre murine par le G.469. [Treatment of murine leprosy by G469.] Compt. rend. hebdom. Acad. Sci. **233** (1951) 113-115.

After observing the effects of β -pyridine-aldehyde-thiosemicarbazone in tuberculosis of the mouse, this product was used in rats inoculated intramuscularly with a suspension of Stefansky bacilli. Five untreated rats showed, on the 171st day, lesions and a marked bacillosis of the chancre and of the regional lymph nodes, with metastases in the liver. Of 10 rats inoculated in the same manner and treated with 25 and then 50 mgm./kgm./day, or a total of 572-771 mgm., one died on the 147th day and

the survivors were sacrificed on the 171st day. These animals presented more limited histological changes in the chancre, very slight or even no lesions in the adjacent lymph nodes, and no metastases. It is concluded that G469 is active in murine leprosy. —M. VIETTE

- 6 NAKAMURA, M. and KANDA, Y. Studies on the period of the infection ability of the murine leprosy bacillus kept *in vitro*. *La Lepro* **21** (1952) 37-40 (in Japanese; English abstract, p. 37).

The vital period of the murine leprosy bacillus kept in Kirchner's medium was investigated. It was found that after more than 60 days the bacillus had no infection ability. Therefore, it may be concluded that when successive cultivation is possible for more than 60 days in Kirchner's medium and infection ability is demonstrated, the result of the cultivation should be positive.—[From abstract.]

- 6 TANIMURA, Y. Experimental studies on the immunity of the murine leprosy. Part I. On the bacilli doses for infection. *La Lepro* **21** (1952) 67-70 (in Japanese; English abstract, p. 67).

An experiment made to determine how many bacilli are required to produce infection showed that the minimum dose is 0.5 cc. of a 10,000 suspension of leproma. This dose contained 350,000 bacilli. Rats weighing 90-120 gm. were more susceptible than those weighing 30-50 gm. No difference by sex was seen.—[From abstract.]

- 6 YOSHINAGA, T. Experimental studies on the inducing factors of the onset of leprosy. Part 1. Influence of avitaminosis. *La Lepro* **21** (1952) 41-45 (in Japanese; English abstract, p. 41).

The influence of avitaminosis on the onset of murine leprosy was investigated. Deficiency of vitamin A, C and D did not accelerate the onset of the disease, while vitamin B₁ deficiency aggravated it.—[From abstract.]

- 6 YOSHINAGA, T. Experimental studies on the inducing factors of the onset of leprosy. Part 2. Influence of pregnancy, incised wound, fracture, famine and temperature. *La Lepro* **21** (1952) 46-50 (in Japanese; English abstract, p. 46).

These experiments were made with murine leprosy. The results were: Pregnancy aggravated the disease; incised wounds had no effect; fractures, when bilateral, aggravated it somewhat; burns had a marked influence upon the onset of the disease; famine had no effect; high and low temperatures had no influence on onset.—[From abstract.]

- 6 ENGBAEK, H. C., FRIIS, T. and TEILUM, G. Effect of cortisone on the tuberculous infection in mice and guinea-pigs. *Acta Path. Microbiol. Scandinavica* **31** (1952) 317-324.

The influence of cortisone on acute tuberculous infection in guinea-pigs (inhalation) and chronic infection in mice (intravenous) was ascertained both by histological study of lungs and spleen and by colony counts. During the first 10 days of cortisone treatment in guinea-pigs no differences were observed in the control and the treated animals. By the 19th day, however, the tissues of the cortisone-treated animals contained approximately 10 times more bacilli than did those of the control group. The cortisone effect was revealed histologically primarily by atrophy of the

splenic follicles. In mice, infected two months previously and fairly resistant to human tubercle bacilli, two weeks' treatment with cortisone again increased the bacterial count approximately 10 times. Histologically, there was pronounced atrophy of the lymphoid apparatus in the spleens and the lymphocytic infiltration around the tubercles in treated mice was reduced, and unphagocyted microcolonies of bacilli occurred.—J. H. HANKS

ROTH, L. J. and MANTHEI, R. W. The distribution of C^{14} labeled isonicotinic acid hydrazide in normal mice. Proc. Soc. Exper. Biol. & Med. **81** (1952) 566-569.

Isotopically labelled isonicotinic hydrazid, 10 mgm./kgm. was injected into mice and its distribution and fate in tissues and certain body fluids were ascertained by measuring residual radio-activity. From 75%-90% of the drug was excreted in the urine during the first 24 hours, and some was in the feces. During the first hour approximately 0.5% was concentrated in the lung, and 9% in the liver; by 8 hours only 0.04% remained in the lungs, while the liver retained more drug per gram than any other tissue. After 24 hours significant amounts (i.e., above 0.015 μ gm. per gm. or cc., which coincides with the bacteriostatic dose for the H37 strain of the tubercle bacillus *in vitro*) were found in the lung, liver and skin—0.19, 0.62 and 0.41 μ gm., respectively. After 7 days at most traces were found except in the liver (0.4 μ gm.) and the skin (trace-1.6 μ gm.). In view of the relative size of the skin as an organ, the results indicate that it may be a major reservoir. This fact should be of special interest to leprologists. —J. H. HANKS

TENTH BRAZILIAN CONGRESS OF HYGIENE

Papers pertaining to leprosy read at this meeting, held in Belo Horizonte, Minas Gerais, October 19-25, 1952. The papers read there are to be published in a volume of transactions. The following items have been prepared from detailed abstracts which were supplied by DR. ORESTES DINIZ.

AZULAY, R. D. BCG and leprosy.

The author reviews certain previous reports which indicate that tuberculosis affects the results of the lepromin test in nonleprosy areas: (1) 100% positive early and 87% positive late reactions in 9 tuberculin-positive cases of skin tuberculosis in New York, in contrast with no early reactions and only 1 late one in 7 cases of Boeck's sarcoid of which only 1 was tuberculin positive; (2) 45% positive late Mitsuda reactions in 42 tuberculous New York children 5 years or less in age, whereas ordinarily not more than 20% of children so young would react; and (3) 70% early reactions and 46% late ones in tuberculous patients in New York 20 years of age or less, all tuberculin positive. Also his own experience in the production of reactivity to lepromin by oral BCG in 15 tuberculin- and lepromin-negative children in which 80% subsequently gave the late reaction (failure in the 3 which did not become tuberculin positive), while only 66% gave the early reaction, this difference explained on the ground that BCG is avirulent and a less active allergizer than tuberculous infection. Recent results in 20 lepromatous cases ready for parole [see next abstract] are held to confirm his previous findings in the sense that the late reaction is an indicator of protection while the early one is allergic. The evidence

shows that *M. tuberculosis* may induce a positive lepromin reaction. In connection with the question of the value of BCG in the prophylaxis of leprosy, the author is attempting to immunize white rats with BCG to determine whether that will have any effect on subsequent infection with the Stefansky bacillus.

AZULAY, R. D., MOURA, A. and MOURÃO, G. Transformation of the lepromin reaction by BCG administered to lepromatous patients whose clinical, bacteriological and histopathological condition justifies transfer to the dispensary.

Twenty lepromin-negative lepromatous patients who, after sulfone therapy, had become clinically cured and bacteriologically negative (12 negative examinations) received two doses of BCG (100 mgm. per dose) by mouth. On retesting with lepromin 45 days after the administration of the first dose of BCG, 16 patients (80%) gave positive early reactions and only 7 (35%) showed the late reaction. The early reactions were 1+ in 5 cases, 2+ in 6, and 3+ in 5. The late reactions were all weak (1+). It is concluded that BCG is able to change the negative lepromin reaction in sulfone-treated lepromatous patients ready for transfer to the dispensary, but more with respect to the early reaction than the late one.

BUDIANSKY, E. and CAMPOS, E. C. The possible protective role of BCG against leprosy.

BCG treatment, a single dose of 0.2 gm., was given to a total of 38 children, aged 5 months to 13 years, who had been found negative to tuberculin and lepromin. (1) One group of 9 were born of leprosy parents; 5 had lived with their parents, and 4 had been born in leprosy but separated at birth. All gave positive Mitsuda reactions [when tested?] 50 days after the vaccination. The Mantoux reaction was positive in 6 of them 90 days after BCG. (2) The second group, 29 children, lived in supposedly healthy surroundings. In them the lepromin test was made simultaneously with the BCG vaccination. The results 25 and 30 days later were positive in 21 cases (72.4%), doubtful in 4, and negative in 4. The Mantoux reaction 30 days after BCG was positive in 11, doubtful in 4, and negative in 12. It is concluded that the production of reactivity can manifest itself as early as 25 days after BCG treatment; that positive lepromin allergy from BCG may be independent of tuberculin allergy, there being many lepromin-positive cases with negative or doubtful tuberculin reactions; that the antigen fraction of BCG which causes Mitsuda positivity may be identical with that present in Hansen's bacillus, hence its possible protective role in leprosy; and that the behavior of BCG-treated persons as regards leprosy infection when in contact with an infective focus should be observed.

GINEZ, A. R. BCG in the prophylaxis of tuberculosis and leprosy.

The author summarizes his experience in the use of BCG administered by the Rosenthal technique in the prophylaxis of tuberculosis, and discusses its possibilities in leprosy, for which the oral method is probably the more practicable. He does not regard as conclusive the findings which seem to demonstrate cross sensibility between tuberculosis and leprosy or vice versa. The tuberculin and lepromin allergy which BCG vaccination can produce obliges us to use this vaccine in the prophylaxis both of tuber-

culosis and of leprosy, but this does not imply acceptance of an antigenic—and much less of a microbic or pathobiological—similarity between the two diseases and the BCG vaccine. Although BCG possesses antigenic properties which can be profitably used in the prophylaxis of tuberculosis and leprosy, this does not justify us in deducing that Koch's bacillus possesses such properties for leprosy or that Hansen's bacillus possesses them for tuberculosis.

SILVA, C. BCG vaccination in leprosy.

In an area comprising four municipalities of the state of Rio de Janeiro there is being carried out a plan of oral BCG vaccination of contacts of lepromin-negative forms of leprosy. To all such, the same total dose of 1,200 mgm. (6 fortnightly doses of 200 mgm.) is given, regardless of age and independently of tuberculin or radiological control. For purposes of control these contacts were divided haphazardly into two groups, one of which received an inert substance instead of BCG. The author proposes another plan: mass BCG vaccination, without discrimination, of all individuals under 15 and all Mitsuda-negatives between the ages of 15 and 29, persons above 30 not to be vaccinated.

FLOCH, H. Discussions sur les résultats obtenus en prophylaxie anti-lépreuse par la vaccination BCG. [The results obtained in anti-leprosy prophylaxis through BCG vaccination.]

The author holds that the prophylactic value of BCG vaccine in leprosy is subject to immunological leprosy-tuberculosis relationships which have been interpreted in different ways. For example, Tisseuil states that tuberculosis does not immunize against leprosy, while Chaussinand believes that there is an antagonism and that tuberculosis caused leprosy practically to disappear from Europe. The author believes that the truth lies between these two extremes. In a previous report [see the JOURNAL 19 (1951) 387] he had expressed the opinion that the Koch bacillus can produce a state of para-allergy towards Hansen's bacillus, and inversely but less intensely. In 338 vaccinations of nursing mothers he had obtained the following results:

Von Pirquet reaction: 78% positive, 8% doubtful, 13% negative.

Intradermal BCG: 91% positive, 6% doubtful, 3% negative.

Fernandez reaction: 77% positive, 23% negative.

Mitsuda reaction: 73% positive, 27% negative.

The change of the Mitsuda reaction from negative to positive can undoubtedly be effected by various means, other than by BCG vaccination. In order to evaluate the results obtained it is essential to use leprosy and tuberculous antigens which are comparable, especially microbial antigens analogous to those used by him.

MOTTA DE AQUINO, U. Results obtained with a Mitsuda antigen made from tuberculoid lesions.

The antigen used was a preparation made by the Mitsuda-Hayashi technique with material taken from circinate, bacillus-negative lesions, histologically typical tuberculoid granulomata, the patients lepromin positive. Ordinary integral lepromin was used for comparison. Tests were made on 53 persons, diseased and healthy, of both sexes and of different ages and colors, at the Santa Tereza Hospital Colony, in Santa Catarina.

The observations were made after 24 and 48 hours. The tuberculoid antigen caused fewer reactions than did the lepromatous antigen. In no case in which the lepromatous antigen gave negative results did the tuberculoid one cause a positive reaction. On the other hand, the lepromatous antigen caused positive reactions in 8 of the 44 cases which were negative to the tuberculoid antigen. The author concludes by asking: "Which causes the lepromin reaction, bacillus or tissue?"

[This observation, concerned only with the 48-hour reaction, is very different from the original one with a tuberculoid-lesion antigen, made by Fernandez with respect to the late reaction [*Rev. argentina Dermatosisif.* 18 (1934) 108-128]. That a suspension of lesion-material so poor in bacilli that they were not found on ordinary bacteriological examination should not produce as many early reactions as ordinary lepromin cannot be regarded as surprising. The fact that such a suspension should produce some such reactions seems logically ascribable to the bacillary products (degeneration or other) with which the lesion cells are demonstrably impregnated, rather than to believe it may be due to some element normal to the tissue, which would seem to be implied in the question asked. A simple experiment with a normal-skin preparation, preferably of tissue from a nonleprous individual, would seem to be in order.—EDITOR.]

DE SOUZA ARAUJO, H. C. Leprosy, its probable transmission by arthropods.

Although the hypothesis of transmission of leprosy by arthropods is very old, few experiments have been made to confirm it despite the recommendation of the Bergen Conference that the question should be studied. The author has studied the matter experimentally in various regions of the country during the last 12 years, with *Culicidae*, *Ixodidae*, *Iriatomidae*, *Pediculidae*, *Cimexidae* and *Pulicidae*. He concludes that any hematophage can, in certain circumstances, transmit leprosy; that the National Leprosy Service should include such studies among its activities in order to settle the question once and for all; and that the National Malaria Service should extend their disinfection by DDT to recognized leprosy foci to hasten the extinction of the disease in Brazil.

RISI, J. C., FONTE, J. and ROSSAS, T. J. Readjustment of antileprosy work to present determining conditions.

The authors, of the National Leprosy Service, first discuss the development of the plan of leprosy prophylaxis in Brazil which was elaborated in 1935 on the three-point basis of asylum, dispensary and preventorium. In examining the results during the past 15 years they take into consideration the following elements: (1) Coefficient of prevalence, asking whether the statistical increase from 0.96% in 1946 to 1.17% in 1950 is due to an actual increase in the disease or to other factors such as better discovery of cases, attraction of patients by sulfone treatment, and longer survival resulting from modern treatment. (2) Prevalence of clinical forms, the lepromatous one continuing to predominate. (3) Control of contacts, the absence of such control having been one of the most significant lacunae in the work. (4) The unsatisfactory nature of the dispensary activity, it being stated, "the failure of this work has had unfavorable repercussions on all the other forms of antileprosy activity, whose efficacy is irremediably compromised." (5) Prophylactic trends consequent on recent scientific discoveries and economic realities, the authors saying that

because the expected results have not been obtained, it is necessary to adopt a different and more efficient course of action. The following conclusions are reached: (1) The prophylaxis organization in Brazil, based on the functioning of specific organs which may or may not be independent of the other sanitary entities, has not attained organic and functional maturity. (2) This maturity is unobtainable because of the precarious economic state of most of our political units, the lack of technical personnel, and other conditions. (3) In view of the proportions and spread of the disease it is necessary to adopt methods which will make use of all medico-sanitary and other organizations which can collaborate efficiently. (4) For a successful campaign the following measures are necessary: (a) early diagnosis, (b) extensive treatment, (c) education and propaganda, and (d) antiexposure treatment. (5) The work must be rationalized on the basis of modern knowledge of the disease. (6) To facilitate early diagnosis, a selection should be made of the groups to be observed as regards both contacts and population nuclei of epidemiological interest, the work of the leprologist to be closely articulated with that of periodical medical examinations. (7) The extensive treatment must be given by any medical body, official or private, the specialized services supplying the proper medicines and indispensable instructions. (8) Education and propaganda should be aimed chiefly at the social groups that are most receptive and most useful for cooperating with the leprosy service. (9) The antiexposure work can be done by prophylactic treatment, by domiciliary isolation and sanitary education of the patients, and in cases which require it by isolation in an asylum. (10) Because of the possibility of favorably modifying the immunological conditions, BCG vaccination should be used on a progressive scale among lepromin negative contacts.

X 6 WEAVER, E. The antileprosy preventorium, an indispensable weapon in the fight against leprosy.

The author holds that the healthy children of leprosy patients should be protected from the social stigma to which they are subject by means of the preventorium, which is an institution for social recuperation as well as a prophylactic weapon. It educates and raises the social level of children left destitute when their parents have to be isolated, and prepares them to face life.

6 PRATES, B. M. Organization of the São Tarcisio Preventorium, the Technical Professional Institute, and the Ernani Agricola Pupileira.

This paper deals with the assistance given to the healthy offspring of people with leprosy during the past 20 years by the Minas Gerais Society for the Protection of Lepers and Defense against Leprosy. In 1933-1934 this society built the São Tarcisio Preventorium which has had 1,095 children of both sexes and now houses 300. From it 97 have been transferred to the Technical Professional Institute in Belo Horizonte, another of the society's establishments, which contains four separate workshops for teaching purposes. Most recently it has built the Ernani Agricola Pupileira, a crèche for new-born children coming from leprosy asylums, located in a populous suburb of Belo Horizonte where human milk is easily obtained, and staffed by four specialized nurses and some female helpers trained at the São Tarcisio Preventorium who are being prepared for the profession of nutritionist.