CURRENT LITERATURE

It is intended that the current literature 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.

GRAMBERG, K. P. C. A. Leprosy and the Bible. Trop & Geogr. Med. **11** (1959) 127-139.

Saying at the outset that for more than twenty years he had been obsessed by the thought that the Bible is largely responsible for the sad fate of "leprotics" in large parts of the world, the author reviews extensively the history of the nomenclature of leprosy and views of various authorities about it. He ends with two suggestions: (1) that the word *zara'ath* in the Bible should remain untranslated, or at least be translated otherwise than as leprosy, and (2) that the name Hansen's disease be changed from lepra to "leontiasis" or "leontide." [How appropriate these terms would be, considering their etymology, for other than advanced lepromatous cases may be open to argument.]—H. W. W.

YBARRA PEREZ, R. and GONZALEZ PRENDES, M. A. Estudio comparativo de la supervivencia de los enfermos de lepra, antes y despues de emplearse los medicamentos sulfonados. [Comparative study of the survival of leprosy patients before and since the introduction of the sulfone medicaments.] Rev. Sifilog. Leprol. y Dermat. **14** (1958) 13-16.

———— and FOJO, F. Resumen estadistico de los enfermos fallecidos en el Hospital "San Lazaro" de la Habana (1937-1957). [Statistical summary of deaths in the San Lazaro Hospital of Havana (1937-1957).] *Ibid.* pp. 17-22.

1. The sulfones came into general use in the San Lazaro Hospital in 1947. The number of deaths in the 1937-1946 decade was 350, and in the 1948-1957 decade 118. The average duration of the disease in these cases had increased from 15 to 21 years. [Nothing is said of the members of inmates, but it is probable that the population was fairly constant.]

2. Data on 495 patients who had died are given in 10 tabulations. One shows that 63 (13%) had been classified as "lepra incaracteristica"; 419 (85%) were lepromatous, and 13 (2.6%) tuberculoid. Regarding certain of the causes of death in the two decades [based on the totals in the preceding paragraph] "cachexia leprosa" decreased from 27% to 20%, laryngeal stenosis from 7.7% to nil, enterocolitis from 7.1% to nil, and septicemia from 3.1% to 0.9%. On the other hand, pulmonary tuberculosis increased from 3.7% to 9.3%, nephritis from 11% to 20%, and hepatic insufficiency from 3.1% to 9.5%.—H. W. W.

GONZALEZ PRENDES, M. A. and MACHADO ROVIRA, R. Distribución geográfica y epidemiológica de la lepra en Cuba. [Geographic and epidemiologic distribution of leprosy in Cuba.] Rev. Sifilog. Leprol. y Dermatol. **15** (1959) 7-14.

The data of this report, presented at the Tokyo congress and so presumably brought up to 1958, contain no comparisons with previous reports. In a population of some 6,200,000, the estimated number of cases is 6,000. Of the 4,242 known cases, 724 (17%) are hospitalized (356 in the San Lazaro Hospital in Havana Province, and 368 in the San Luis de Jagua Hospital in Oriente Province); for the 3,518 (83%) under ambulatory treatment there are 10 dispensaries in the 6 provinces. The proportion of lepromatous cases is high (55%), that of tuberculoid cases low (only 19%). Most of the cases (63%) are in the 21-50 age groups. The sex ratio (males vs females) is 1.4:1.0.

The proportion of cases among whites is less than their proportion in the population (61 vs 73); those of other ethnic groups are somewhat higher.—H. W. W.

MERCADANTE, F., RINALDI, D. and CAPURRO, E. T. Informe epidemiológico sobre la provincia del Chaco. [Epidemiologic report on Chaco Province.] Leprología **3** (1958) 147-152.

The Chaco epidemiologic study reveals that the endemic is of importance, and that lepromatous cases predominate over tuberculoid cases. Unfortunately, as yet the sources of information are limited to the sanatoria, which explains the lepromatous prevalence. The data reveal the urgent need of dynamic installations of a dispensary organization. —[From authors' summary, supplied by G. Basombrio.]

PONS, S. Lepra en Mendoza. [Leprosy in Mendoza.] Leprología **3** (1958) 153-159.

The author, a dermatologist in the province of Mendoza, Argentina, included in a zone of low leprosy prevalence, has observed and classified 21 leprosy patients—11 lepromatous and 10 tuberculoid—in 32 months (March 1952-October 1955). The lepromatous cases were sent for internment; the others continue under the author's supervision. Three lepromatous and 6 tuberculoid cases acquired their disease in Mendoza (autochthonous cases); the 12 other patients came from other provinces or from foreign country.—G. BASOMBRIO

JAMISON, D. G. An assessment of the effects of outpatient DDS administration in Katsina Province, Northern Nigeria. Leprosy Rev. **30** (1959) 159-167.

The author, who for some time was deputy director of the leprosy service of Northern Nigeria, describes the outpatient work in that region and reports on surveys of 7 representative clinics in Katsina Province which he made in 1957 and 1958 to ascertain the developments during the interval. The total number of registrants had increased from 2,447 to 2,796. The type diagnoses, made by the trained African assistants in charge, were simply lepromatous and nonlepromatous. The latter type, in 1958, comprised 64% of the total, while 36% were lepromatous; of the 413 new cases that had been registered during the year, 24% were lepromatous. Of the 64 cases removed from the register during the year, only 8 had been discharged as cured, but it is suggested that many of the "absentees" (twice as many, proportionately, among the nonlepromatous as among the lepromatous) may have stopped coming because their lesions had cleared up. The advanced lepromatous cases had improved markedly under treatment (DDS), but around 17% of the nonlepromatous cases (and many in two leprosaria) had in spite of the sulfone treatment developed generalized diffuse lepromatous infiltrations. [Further information about this extraordinary development is awaited.]—H. W. W.

PRICE, E. W. Studies on plantar ulcers in leprosy. Leprosy Rev. **30** (1959) 98-105.

In 2,395 leprosy patients the author studied the distribution of the 561 plantar ulcers present in relation to the stresses of standing and walking. There were more ulcers in men than in women, but there was no difference between the right and left feet. Ulcers overlie bony prominences; 71% were under the forefoot, 13% on the heel, and 17% on the outer border of the foot. A single ulcer on one foot is the commonest occurrence (sometimes 2 on one foot), but 1 in 6 ulcer patients have one on each foot. The positions of ulcers in order of frequency is: second metatarsal head, first metatarsal head, lateral metatarsal heads, tubercle on the base of fifth metatarsal, heel. The second part of the paper describes the mechanics of the foot in relation to plantar ulcers (based on previous work of Morton and of Lake). The walking cycle is described under 7 headings. (1) The walking roll and sole pressures. In walking, pressure passes rapidly from heel to fifth metatarsal, across to the first metatarsal, and along the big toe to its tip. Each of these pressures may measure as much as one-half the body weight. Compared with this, in standing the body weight is distributed over the whole pressure-

bearing area of the soles. (2) The "angle of gait" (degree of pointing outwards of the toes) alters the pressures. The wider the angle the more medial the pressures and consequently the ulcers. In women who carry heavy weights the angle tends to be diminished, and the ulcers are formed more laterally. (3) A study of the sole-dorsiflexion during the walking roll shows the stress on the head of the first metatarsal, where the flexion is of about 40°, and the considerable friction engendered is absorbed by the cartilage buffer. (4) The function of the big toe in walking is the thrust forward, which increases with speed and in walking uphill or in sandy soil. (5) The intrinsic muscles of the foot are very important in the stability of the toes and in protecting the sole from damage. The flexion of the proximal interphalangeal joints of the lateral toes depends on these intrinsic muscles, whereas in the hand it is a forearm muscle that causes flexion. (6) The role of plantar sensation is important in judging the weight that must be transferred to the sole to prevent a fall, according to the nature of the ground surface. In the absence of this sensation excessive weight has to be placed on the foot to be sure that friction is adequate to prevent slipping. (7) Types of gait are described. The rigid gait is advised in treatment and prevention of sole ulcers, as being least likely to cause damage.—[From abstract in *Trop. Dis. Bull.* **56** (1959) 729-730.]

MASANTI, J. G. Amiloidosis secundaria en la lepra; reacción leprosa y amiloidosis. [Secondary amyloidosis in leprosy; amyloidosis and lepra reaction.] Medicina (Buenos Aires) **19** (1959) 1-10.

The incidence and causal factors of amyloidosis were investigated in 306 leprosy patients in the Baldomero Sommer Sanitarium (Buenos Aires), of which 263 were lepromatous and 43 benign. Amyloidosis was diagnosed by the clinical symptoms and by the results of (either or both) the Cohen and Benhold tests. Amyloidosis was detected in 4 of 160 quiescent lepromatous cases, in 15 of 100 cases with the reactional type of lepromatous leprosy, and in 2 out of 43 cases of benign clinical forms. In all the reactional lepromatous cases the reactional bouts started within the first year from the appearance of leprosy. They were severe, febrile, and recurrent. They were followed by the appearance of albuminuria (showing amyloidotic involvement of the kidney) from 7 months to 3 years after the beginning of the reactions. It is concluded that nonreactional lepromatous leprosy and benign leprosy are rarely complicated by amyloidosis (2.5% and 4.5% respectively), whereas amyloidosis is frequent in the reactional type of lepromatous leprosy (15%). The main causal factor of amyloidosis is the acute reaction itself. The condition rapidly damages the kidney, causing renal insufficiency and final uremia in a period of 1 to 5 years.—SR. HILARY ROSS

DERBES, V. J., SAMUELS, M., WILLIAMS, O. P. and WALSH, J. J. Diffuse leprosy; case in a Louisiana Negro. A.M.A. Arch. Dermat. **81** (1960) 210-224.

This is a well-illustrated report of a case of Lucio leprosy in a Negro sawmill worker, 52 years old, a life-long resident of Alexandria, Louisiana, living with aged parents who were well, who was admitted to the Charity Hospital, New Orleans, in November 1956. In 1951 he was struck on both lower legs by a saw. The injured sites became infected, the infection extended, and he became unable to walk. Over the next few years he developed peculiar skin lesions, not only of the legs and feet but also of the arms and hands. A lesion would start as a small, purple, hyperpigmented macule which became vesiculated, then encrusted and ulcerated. After being treated by a number of physicians he was admitted to a regional Veterans Hospital on two occasions in 1955 and 1956, with little or no improvement in the skin lesions. He has had frequent episodes of epistaxis for several years, and has lost 47 lb. in weight. Biopsies revealed numerous acid-fast bacilli in the skin, liver and bone marrow, but none—and no amyloid material—in the kidney. The authors sent materials to a number of leprologists, seeking their opinions of the diagnosis of diffuse lepromatous leprosy (Lucio leprosy), and all agreed that the case was one of that kind. [This patient was admitted to the

Carville leprosarium in December 1956 and is here at the time of writing, March 1960. He is still bacteriologically positive in spite of 3 years of treatment with a variety of sulfones and TB-1.]—Sr. Hilary Ross

Duperrat, B. and Berger, J. Atrophie cutanée lépreuse. [Leprous atrophy of the skin.] Bull. Soc. française Dermatol. Syphilig. **66** (1959) 36-38.

Report of an unusual case marked by extensive areas of cutaneous atrophy, with scattered small ulcers. Smears from the nose, skin and lymph nodes contained innumerable leprosy bacilli, but not those from the ulcers. Sections of the atrophic skin showed marked lepromatous infiltration.—H. W. W.

Takano, K. Anatomo-pathological study on completion of tuberculosis seen in human leprosy. (Report I.) La Lepro **28** (1959) 233-241 (in Japanese; English summary).

———— *Idem.* (Report II.) *Ibid.* pp. 242-257 (English summary).

1. At the National Institute for Leprosy Research (at the Tama Zensho-en leprosarium) the tuberculous foci in the organs of 66 autopsied cases—45 lepromatous and 21 tuberculoid—were examined with respect to the primary pulmonary focus and secondary lesions. The total incidence of tuberculosis was 71%, with no type difference in frequency. In all of the 32 affected cases of the lepromatous group, the infection had progressed to secondary tuberculosis, severe in several of them; but in the 15 affected cases in the tuberculoid group that progression had occurred in only 3 cases, none of them severe; all of the others had healed in the primary stage. The fact that, although there was no difference in the infection rate in the two types, there was a marked difference in the severity of the infection, with many cures in the tuberculoid cases, indicates that individuals who are more resistant to the leprosy infection also possess a stronger tendency to inhibit tuberculosis, and suggests that BCG vaccination may be effective in the prevention of leprosy.

2. To further this study, all the material of 450 leprosy cases (313 lepromatous and 137 tuberculoid) autopsied at the Oshima Seisho-en leprosarium from 1924 to 1959 was examined. The total incidence of tuberculosis was 77%, 81% in the lepromatous and 70% in the tuberculoid cases. The data are examined with respect to three periods: (1) 1924-1942 (before the war, hydnocarpus therapy), (2) 1943-1950 (during and immediately after the war, after the introduction of chemotherapy), and (3) 1951-1959 (post-war, chemotherapy). Severe cases of tuberculosis in the lepromatous groups varied in the three periods (77%, 82% and 56%, resp.) less than in the tuberculoid groups (64%, 31% and 13%, resp.), the decrease in them being marked. The type tendency seen in the first study is also seen in this one.—[From summaries.]

Watanabe, Y. Clinical studies on the pulmonary tuberculosis complicated with leprosy. (Report I.) La Lepro **28** (1959) 258-267 (in Japanese; English abstract).

Clinical studies on the course of pulmonary tuberculosis in leprosy patients has been conducted on admissions to the Tama Zensho-en from 1948 to 1957. In the pre-chemotherapeutics period the prognosis of pulmonary tuberculosis was, in general, very serious. All forms of tuberculosis, except the indurative type, showed a tendency to deteriorate—as was also observed in tuberculosis patients without leprosy. Chemotherapy has influenced markedly the course of pulmonary tuberculosis. All forms, except the indurative type, have showed good response to chemotherapy. Comparing the effect of antituberculosis chemotherapy on tuberculosis with and without leprosy on the same background, no remarkable difference was observed between these two groups. Hardly any influence of Promin on the course of pulmonary tuberculosis was observed. Activation of the leprosy lesions, if it was simple, showed no notable influence on the course of pulmonary tuberculosis, but if it was succeeded by erythema nodosum or neuralgia, exacerbations of the tuberculous disease were frequently observed. No significant

difference was found between the lepromatous and tuberculoid types in the occurrence of tuberculosis, or in the type and extent of the pulmonary lesions.—[From abstract.]

MIZUOKA, J. and OYAMA, I. Results of investigation for the physically handicapped in leprosy. La Lepro **28** (1959) 183-191 (in Japanese: English abstract).

A total of 1,209 cases [evidently in the Kikuchi Keifu-en National Leprosarium in Kumamoto] were examined, 755 lepromatous and 454 tuberculoid. Among them 940 (78%) were regarded as crippled, 591 in both extremities, 295 in the upper extremity only, and 54 in the lower extremity only. [Other data are given, but not readily followed. No distinction is made between the two type groups in the summary, although that is done consistently in the tables, from the first of which it would seem that the disability rate among the lepromatous cases was 79% and that among the tuberculoid cases was 76%.]—H. W. W.

CONVIT, J. Leishmaniasis tegumentaria difusa. Nueva entidad clinico patologica y parasitaria. [Diffuse leishmaniasis of the skin; a new clinical, pathologic and parasitic entity.] Rev. San. Asist. Soc. **23** (1958) 1-28.

This article (seen as a repaginated reprint) is of direct interest because the pictures might readily be mistaken for leprosy, they ranging from a girl with a single lesion on the cheek which resembles a tuberculoid nodule to men with a marked, widely dispersed nodular condition which "resembles very strikingly lepromatous leprosy." It is based on a study of 6 of the 11 known cases [one of which, with pictures, was reported in the *A.M.A. Arch. Dermatol.* **76** (1957) 213-217]. The condition is believed to be different from the ordinary American leishmaniasis because the Montenegro test gives negative results (specific anergy), and the patient can be infected with a culture of the parasite of the latter variety. Only in the early stage does it respond to treatment; the disease is progressive over many years, but the viscera are not invaded and the patient's general condition remains good. There are 24 plates with 30 case photographs, 11 photomicrographs, 6 pictures of experimental lesions in animals and 2 in man, and 4 folded inserts of electron micrographs of ultra-thin sections, one of which demonstrates submicroscopic bodies believed to be related to the vegetative form of the Leishmania organism.—H. W. W.

BRUN, R., GAY-PRIETO, J. and JADASSOHN, W. Appareil d'ionophorèse et technique du test de transpiration pour le diagnostic de la lèpre. [Ionophoresis apparatus and technique of the transpiration test for the diagnosis of leprosy.] Schweizerische Med. Wchnschr. **89** (1959) 179-181.

The apparatus is a battery-operated generator with a milliampere meter in a pocket-sized aluminum case. The passive electrode, wet with saline, is held in the patient's hand while the active one, containing cotton wet with a pilocarpine (or acetylcholine) solution, is applied to the lesion to be tested. A current (2 milliamp.) is passed for 2 minutes, and after 10-15 minutes (1 minute with acetylcholine) an impregnated test paper is applied to the area for ½ minute under a piece of plexiglass. Prussian-blue spots due to moisture from transpiration are seen through the plexiglass. Another color method employed is bromphenol blue formation from constituent powder adhering to scotch tape. (A different, smaller, apparatus can be used where electricity is available.) [This apparatus was demonstrated, by J.G.P., at the Tokyo congress.] —H. W. W.

TAMEMASA, O. and TSUTSUMI, S. Studies on antimycobacterial substances. I. Selection of antileprous substances worthy for clinical trial. La Lepro **28** (1959) 272-275 (in Japanese; English abstract).

——— and ——— *Idem.* II. On polyethylene glycol ethane sulfonates of *p*-monoacylamino-*p'*-amino-diphenylsulfone. *Ibid.* pp. 276-278.

———— and ———— and WATANABE, T. *Idem.* III. On *p,p'*-diaryl-thiourea derivatives. *Ibid.* pp. 279-283.

1. The authors have investigated Buu Hoi's postulation that substances effective against human leprosy exhibit both antituberculosis and antifungus activities, and are also soluble in fat solvents. After testing some 20 appropriate substances they concluded that it is difficult to determine whether Buu Hoi's postulation has any practical value in screening substances worthy of clinical trial in leprosy.

2. None of the several substances of the type indicated which were synthesized to determine their *in vitro* effects were found to have antimicrobial activities greater than DDS itself.

3. Recently, two different diphenylthiourea derivatives (Dianilide and Ciba 1906) have been reported to be effective in leprosy treatment. In order to throw light on the relation between chemical constitution and antileprosy effect of thiourea derivatives, about 20 symmetrically substituted thiourea derivatives were synthesized and tested for *in vitro* activity, and then some were put on clinical trials. On account of undesirable effects, the administration of *p,p'*-dihydroxy- and *p,p'*-dichloro-derivatives was stopped within a month, while the *p,p'*-dimethylamino- derivative, which is less strong in antituberculosis action, was found to be effective without serious side effects. This fact seems to suggest that high antituberculosis activity is not important for the exhibition of antileprosy effect, as may also be concluded from the antituberculosis activity of DDS. It seems interesting that the introduction of several radicals into a benzene ring without destruction of the structure of the NH-CS-NH group, probable active center of the antibacterial action, might give rise to a number of derivatives which are different in chemical, physicochemical and biological properties.—[From abstracts.]

FLOCH, H. and MAILLOUX, M. Traitement de la lèpre par la D-cyclosérine. [Treatment of leprosy by D-cycloserine.] Bull. Soc. Path. exot. **51** (1958) 290-294.

The authors placed 4 newly-detected lepromatous cases under treatment with cycloserine in gradually increasing doses up to 3-4 250-mgm. tablets daily, with the addition of 0.05 gm. of phenobarbital every afternoon. The results after 10 to 13 months were encouraging, with clinical, bacteriologic, and histologic improvement, despite the occurrence of violent reactions. It is concluded that cycloserine has real activity in leprosy.—N. BOURCART

LAVIRON, P., BEYTOUT, D., RIST, N., GRUMBACH, F., LIBERMANN, D. and COTTET, J. Essai de traitement de la lèpre par le thioamide de l'acide isonicotinique (3,264 TH). [Treatment of leprosy by the thioamide of isonicotinic acid (3,264 TH).] Bull. Soc. Path. exot. **51** (1958) 60-66.

This product, which is two times more active than streptomycin in experimental tuberculosis in the mouse, was given to 4 lepromatous patients for 6 months. Improvement was evident in all the cases, in spite of 2 lepra reactions. Six tuberculoid cases showed spectacular improvement, apparently more rapid than that produced by sulfones. A dosage of 1 gm, daily was well tolerated and seemingly sufficient; 2 gm. daily provoked anorexia and loss of weight. There would be interest in trying out the α-ethyl derivative of T.I., which is much more active on the Koch bacillus.—[From authors' summary, supplied by N. Bourcart.]

SÉRIÉ, C. and SCHALLER, J. K. Essai de traitement de la lèpre par le "para-aminosalicylate d'isonicotyl hydrazide." [Treatment of leprosy by *p*-aminosalicylate of isonicotyl hydrazide.] Bull. Soc. Path. exot. **51** (1958) 563-570.

The authors have experimented with this drug in 13 previously untreated cases, 8 lepromatous and 5 tuberculoid, 9 for 15 months and 4 for 6 months. The follow-up included clinical, bacteriologic, immunologic, electrophoretic, serologic and histologic

observations. It is concluded that the drug has certain activity, clear in the tuberculoid form, less clear in the lepromatous. It is well tolerated, and can be used as a complementary treatment. For adults they used a dosage of 600 mgm. (6 tablets) per day in 3 divided doses, with one day of rest per week. The course was 6 months, with 3 months of rest, although it is believed that the rest period can be reduced to 1 or 2 weeks.—N. BOURCART

BERGEL, M. Influence of various pro-oxidant nutritional conditions on the growth *in vivo* of *M. leprae*. Leprosy Rev. **30** (1959) 153-158.

A comparative study has been made of the growth of *M. leprae* inoculated intratesticularly in white rats submitted to various pro-oxidant nutritional conditions. With the pro-oxidant diet employed (vitamin E deficient diet with linseed oil, with rancid linseed oil, with cod liver oil, with or without the addition of silver nitrate in the drinking water and injection of hemolysates) there was a notable growth of *M. leprae* in relation to their growth in control animals fed on ordinary diets. The great development of *M. leprae* in the group of animals which received the diet containing the rancid linseed oil may be connected with the pathogenic mechanism of human leprosy. It is indicated that the search for new nutritional and pharmacological pro-oxidant factors may lead to the finding of optimal conditions for growth *in vivo* of *M. leprae*.—[Author's summary.]

BERGEL, M. Empleo de la vitamina E en el tratamiento de la lepra. [Use of vitamin E in the treatment of leprosy.] Leprología **3** (1958) 133-141.

The clinical and bacteriologic improvement of 3 lepromatous and 1 tuberculoid case of leprosy treated with vitamin E (800 mgm.), plus isoniazid (160 mgm.) and ascorbic acid (400 mgm.) daily, per os is described. It is held that vitamin E has value in the treatment of leprosy, and that it should be used in combination with sulfone. —[From author's summary, supplied by G. Basombrio.]

MOORE, T. and SHARMAN, I. M. Nutritional studies of isoniazid in rats deficient in vitamin E. American Rev. Resp. Dis. **80** (1959) 223-231.

These studies were based on the thesis of Bergel that the autoxidation of fats may be an essential feature of mycobacterial infections, and that isoniazid among other drugs may act as antioxidants, as vitamin E does. The findings confirm, but only in part, the claim of Bergel that isoniazid can act as a substitute for vitamin E.—H. W. W.

SCHNEIDER, J., LANGUILLON, J. and CLARY, J. Traitement de la lèpre par un nouveau sulfamide: la sulfaméthopyrazine; premiers résultats. [Treatment of leprosy by a new sulfonamide, sulfamethopyrazine; first results.] Bull. Soc. Path. exot. **52** (1959) 47-52.

Recalling how the sulfonamides have been forgotten with respect to leprosy since the advent of the sulfones and certain newer drugs, the authors report on an 11-months trial in 10 cases of Bamako of sulfamethopyrazine—also called sulfamethoxypyridazine (Kynex, Lederle; Sultrene, Specia). Emphasized are: its excellent activity, particularly clear in tuberculoid cases; the remarkable tolerance; and the lack of lepra reactions. Photographs show marked clearing of large minor tuberculoid patches in 2 cases after only 4 months treatment, and obvious improvement in 3 lepromatous cases.—H. W. W.

CONSIGLI, C., BIAGINI, R. and VAZQUEZ, A. El empleo de la emulsión de tejido placentario humano en los enfermos de Hansen y sus resultados en los casos de lepra-reacción. (Comunicación previa.) [Use of a suspension of human placenta tissue in leprosy, and its results in cases of lepra reaction; preliminary note.] Leprología **3** (1958) 142-146.

Although only a relatively small number of cases has been observed, we believe that

use of "tisuline" in leprosy is frequently promising. Promising results have been seen not only in lepra reaction, but also in patients who have become stationary despite continued treatment. We are therefore inclined to believe that we have come across a valuable method of auxiliary therapy, with which further experimentation is required.—[From authors' summary, supplied by G. Basombrio.]

GARRETT, A. S. Vadrine "131" in the treatment of leprosy. Leprosy Rev. **30** (1959) 118 (correspondence).

Commenting on reports by Jopling and Ridley and Brodhage [see THE JOURNAL **27** (1959) 401], the writer reports entirely unsatisfactory results in 6 cases (4 lepromatous and 2 borderline), concluding that this drug is of no value. (In a comment on this statement, Jopling and Ridley said that further observations of the patients who had shown early improvement had been disappointing, and they agreed that, used alone, it has no place in leprosy treatment. However, they were continuing their trial of it in conjunction with sulfone.)—H. W. W.

MACOTELA, E. Reacción leprosa; su tratamiento con cloroquinas. [Lepra reaction; treatment with chloroquines.] Dermatología (Mexico) **3** (1959) 238-241.

A brief review of the results obtained with the chloroquines, especially Nivaquine, in the treatment of the reactional processes of leprosy patients is reported. Almost all authors who have studied the matter, and the experience gained in the Pavillion de Malta of the Hôpital St. Louis of Paris, are in accord in affirming that the medicament may be useful in selected cases. Furthermore, it may be combined with the sulfones in the treatment of these patients.—[From author's summary.]

MELAMED, A. J. and JONQUIERES, E. D. L. Factores que modifican la actividad de los capilares en la reacción leprosa; sugestiones para la terapéutica dermatológica. [Factors which modify capillary action during lepra reaction; suggestions for dermatologic treatment.] Semana Méd. **114** (1959) 370-376.

The authors have found that when certain hormones (corticotropin and glucocorticoids) and certain derivatives of pyrazol (phenylbutazone and Irgapyrin) are given for a long time in lepromatous leprosy to suppress lepra reaction, and are then stopped suddenly, the result may be to cause an acute inflammation of the capillaries in the lepromatous lesions with resulting necrosis followed by healing with scarring.—[From abstract in *Trop. Dis. Bull.* **56** (1959) 843.]

MELAMED, J. A., SIMONOVICH, I. and GANOPOL, J. (with the technical assistance of Messrs. Fuhrer and M. Melamed). La dexametosona en la lepra reaccional. Clínica proteinogramas y permeabilidad capilar. [Dexametosone in reactional leprosy; clinicol proteinograms and capillary permeability.] Rev. Assoc. Méd. Argentina **73** (1959) 458-466.

In the present study proteinograms and the Landis test were made serially in lepromatous cases which were in reactional states and were being treated with the corticosteroid dexametasone. It was ascertained that in these patients there existed marked alterations in the permeability to the fluid and the proteins of the blood, and equally marked disproteinemias. All of these alterations showed marked changes (favorable or unfavorable) according to the time of evolution of the reactional episode. Although the individual study of each test can reveal data of importance, the present study suggests that most useful would be the appreciation of the variations which occur successively in a given patient, by means of tests practiced repeatedly and under different clinical and therapeutic conditions. From this point of view it is possible to classify the patients studied in this investigation into two groups: (1) *taxicos*, or coordinated (of good prognosis), and (2) *ataxicos*, or uncoordinated (of bad prognosis). The confirmation of these findings may demonstrate that the functional capacity of the vessels (arterioles,

capillaries, and venules) in leprosy and in lepra reaction may account for the different evolutive modalities of the disease and the variable results of corticosteroid medication. Dexametasone showed, in lepromatous lepra reaction, the same effects as did the similar drugs formerly used, although it had much greater activity and less undesirable secondary effects.—[From authors' summary, supplied by G. Basombrio.]

JARDIN, C. Chromatographie sur papier de deux substances léprostatiques: la DDS et le DDSO. [Paper chromatography of two leprostatic substances, DDS and DDSO.] Sem. Hôp. Paris (Thérapeutique) **34** (1958) 611-616.

DDS and DDSO can be separated by paper chromatography by the use of benzene saturated with water, or by normal butyl, isoamyl or benzyl alcohols. With benzyl alcohol diluted with water it is possible to make a particularly good separation of the metabolites of these two substances. With this method it is possible to detect in normal urines 3 Ehrlich-positive substances. Urines of leprosy patients treated with DDS show 4 supplementary spots, 1 of which is due to DDS and the other 3 to its metabolites Urines of patients treated with DDSO also show 4 supplementary spots, 1 due to DDSO, 1 to DDS, and the remaining 2 to the metabolites of DDSO.—[From author's summary, supplied by N. Bourcart.]

ENSELME, J. and TIGAUD, J. Étude chimique des protéines du sérum de lépreux. [Chemical study of the serum proteins in leprosy.] Rev. Lyon. Méd. **7** (1958) 659-664.

The authors' study has shown that there is a decrease of the albumin and an increase in the α-globulins, especially of the group of gamma globulins of electrophoretic mobility 0,9 10^5 cm^2 V^{-1} s^{-1}. The sera of murine leprosies (Stefansky or Marianum) [*sic*] showed no alteration, except in the case of a special preparation of the Stefansky bacillus.—[From the authors' summary, supplied by N. Bourcart.]

YUKAWA, T. Histopathological studies on the influence of salivary gland hormones upon the formation of the murine leproma (I). Short period (7 wks.) experimental observation on the large dose of subcutaneous inoculation of live muri-lepra bacilli. La Lepro **28** (1959) 201-213 (in Japanese; English abstract).

———— Idem. (II). Moderate period (15 wks.) experimental observation on the large dose of subcutaneous inoculation of live muri-lepra bacilli. Ibid. pp. 214-219.

———— Idem. (III). Long period (25 wks.) experimental observation on the moderate and small doses of subcutaneous inoculation of live muri-lepra bacilli. Ibid. pp. 220-232.

1. A lot of rats whose salivary glands had been removed, and which had each been inoculated subcutaneously with murine leprosy bacilli (0.4 cc. of 50× dilution), were divided into two groups. (1) Nothing further was done to the first group (asialadenism group), while (2) the other group (asialadenism-plus group) was injected daily with parotin (1 mgm./100 gm. body weight). Within the short period of 7 weeks the skin and visceral lesions of the 2 groups showed marked differences. The asialadenism group showed hypofunction of the reticuloendothelial system, and aggravation of the leprotic changes; on the other hand, the hypersialadenism group given the salivary gland hormone showed hyperfunction of the reticuloendothelial system and inhibition of the leprotic change. Thus was brought about a transition from the symbiotic phase (a histologic condition found in human and murine leprosy, in which the histiocyte phagocytizes and mycobacterium, and the bacilli not only continues to exist but also multiplies within the cytoplasm) to the granulomatous phase (an epithelioid granuloma accompanied by lymphocytic infiltration containing Langhans' giant cells, the finding of productive tubercules and of the tuberculoid type of human leprosy).

2. There were three groups of rats in this experiment, (1) one with salivary glands removed (asialadenism), (2) one normal, untreated (control), and (3) one normal but

given parotin injections daily (hypersialadenism), all were injected with the same dose of murine-leprosy inoculum as before. The animals were observed over a short period (7 weeks) and a moderately long period (15 weeks). As in Report 1, the lesions of the skin and viscera were strongly inhibited in the hypersialadenism group as compared with the normal untreated group, while there was a tendency toward aggravation in the asialadenism group, with hypofunction of the reticuloendothelial system cells. The order as regards size of lesions is: asialadenism group < untreated normal group < hypersialadenism group. In this experiment, the differences were not so marked between the skin lesions of the various groups as in the visceral phase.

3. In this experiment two smaller doses of leproma suspension were used, 100× dilution for one lot of rats, and 10,000× for the other. Each lot was further subdivided into three groups, as in the preceding experiment. Observations were made on six occasions up to 25 weeks [apparently with sacrifice of animals each time, for examination of the viscera and the reticuloendothelial system]. The dose being small and the time long, the results were marked. The lesions of the hypersialadenism group had almost all changed to granulomas. It is concluded that the salivary gland hormone activates the reticuloendothelial system and increases the resistance of the body, inhibiting the murine leprosy infection and transforming it from the symbiotic to the granulomatous phase. This permits the assumption that the mechanism involved in the transition from the lepromatous to the tuberculoid type in human leprosy is the increase of resistance of the body, caused by hyperfunction of the reticuloendothelial system.—[From abstracts]

[For explanatory notes on this study see the letter from Professor Kitamura in the *Correspondence* section of this issue. In the article by Ogata to which he refers are several instructive photomicrographs. One of a leproma from an asialadenism animal shows supposed histiocytes densely massed with bacilli, while one from a hypersialadenism animal appears to be a mass of epithelioid cells, said to contain very few bacilli.—EDITOR.]

AKAZAKI, K., KOJIMA, M., MIYAKAWA, K., WATANUKI, T. HAYASHI, T. and NAKAMURA, K. Experimental studies on the functional condition of reticuloendothelial system, especially with reference to the various manifestation types of the leprous and tuberculous foci. Tohoku J. Exper. Med. **70** (1959) 325-334.

In this experiment with murine leprosy in mice (and mouse tuberculosis) typhoid vaccine was injected to enhance the functional condition of the reticuloendothelial system (RES), and injections of Evans blue and of cardiolipin were used to lower or inhibit that system. The results are summarized by the authors in the conclusions as follows: (1) Enhancement of the functional condition of the RES resulted mainly in the formation of tuberculoid foci. (2) Disturbance of the RES (Evans blue) resulted in the formation of diffuse necrotic foci in the early weeks. (3) Inhibition of the RES (cardiolipin) resulted in the early formation of typical leprous foci. [Photomicrographs show: (1) a clear-cut tuberculoid focus in the subcutaneous tissue of a mouse which had had the typhoid vaccine treatment 11 weeks previously; (2) diffuse inflammatory cellular infiltration, with necrotic foci, in the subcutis of an animal treated with Evans blue 10 weeks previously; and (3) typical murine-leprosy leproma in an animal which had had the cardiolipin pretreatment 13 weeks before.]—H. W. W.

MONTESTRUC, E., GARCIN, D., BERDONNEAU, R. and BENOIST, J. Renseignements obtenus par la pratique simultanée de la tuberculino et de la lépromino-réaction chez les enfants contacts de lépreux apparemment indemnes de lèpre. [Results obtained by simultaneous tuberculin and lepromin testing of child contacts of leprosy who were apparently free from the infection.] Bull. Soc. Path. exot. **51** (1958) 154-156.

Simultaneous tuberculin and lepromin testing of 132 child contacts of leprosy, apparently free from the infection, gave the following results. 1. A large majority

(65%) are susceptible to both tuberculosis and leprosy infection, and hence they should be given BCG vaccination which, in Martinique, has converted in 2 months' time 78% of Mitsuda negatives to positives. 2. Nearly one-fourth of these children (23%) are infected with the Koch bacillus (Mantoux positive), but not with the Hansen bacillus (Mitsuda negative). It is believed that these children, after clinical and x-ray examination, would benefit from BCG vaccination. 3. A not negligible proportion of these subjects (9%) were Mantoux negative and Mitsuda positive, which indicates a primary leprosy infection, and that adequate control measures should be taken. 4. Only 3% of these contacts possess a specific or crossed resistance to both leprosy and tuberculosis infections. 5. Specific leprosy infection may occur in a child in contact with a bacteriologically negative leprosy patient.—[From authors' summary, supplied by N. Bourcart.]

[Japan Leprosy Research Committee] The effect of BCG vaccination in leprosy patients. La Lepro **28** (1959) 105-108 (in Japanese; English abstract).

The lepromin and tuberculin tests have been applied 1, 3, 6 and 12 months after the vaccination of leprosy patients who previously had been negative to both tests. The results were as follows: The positive conversion rate was higher for the tuberculin reaction, in both a group of 111 cases tested with the Mitsuda antigen, and a group of 141 cases tested with Fernandez's antigen. Therefore, the results in leprosy patients were different from those in healthy persons.—[From abstract.]

Yanagisawa, K., Asami, N. and Ishihara, S. Comparison of intradermal reaction of leprosy patients and non-leprous individuals by the use of Dharmendra's antigen of human leprosy bacilli and the same of murine leprosy bacilli. La Lepro **28** (1959) 74-79 (in Japanese; English abstract).

Correlations of intradermal reactions to the Dharmendra antigen (H-D, human Dharmendra), to a similar preparation of murine leprosy bacilli (M-D), and to tuberculin were made with leprosy patients (138 lepromatous and 61 nonlepromatous) and nonleprous school children (878, including those who had received BCG inoculation). Results obtained were as follows: 1. No correlation among the three reactions in the leprosy patients. 2. Reactions to tuberculin and the H-D antigen were found to correlate in nonleprous school children, but the correlation between tuberculin and the M-D antigen were poor. It is concluded, therefore, that the H-D and M-D antigens are of different antigenicity in the intradermal reaction. [Referring, obviously, to the 48-hour reaction.]—[From abstract.]

Yanagisawa, K., Asami, N. and Ishihara, S. Studies on the lepromin reaction. X. Intracutaneous reaction with the water-soluble antigen. La Lepro **28** (1959) 67-73 (in Japanese; English abstract).

Water-soluble antigen was prepared from the trypsin-digested antigen and from the Dharmendra antigen by grinding the bacilli in an agate mortar, extracting with a buffer solution, and removing the cellular material by centrifuging. The potency of the water-soluble antigen was tested in animals sensitized with tubercle bacilli and in leprosy patients, and the following results were obtained. (1) Leprosy bacilli are readily broken up by grinding in an agate mortar. (2) The water-soluble antigen contains nitrogen and is protein-reaction positive. (3) Using tubercle-sensitized animals, the potency of the (*a*) supernatent of the trypsin-digested antigen is about one-half that of the original, while that of the Dharmendra antigen is about the same as the original, whereas with the (*b*) filtrate, the potency is somewhat lower than the original with both antigens. (4) Testing in nonlepromatous leprosy patients for the early reaction, the potency of both antigens was about the same as the original material with (*a*) the supernatant, but weak with (*b*) the filtrate. For the late reaction, on the other hand, the potency of both antigens was markedly weaker than the original. From these findings, it is suggested that the water-soluble antigen can be used for the early lepromin reaction.—[From abstract.]

SATO, S., FUKUDA, M. and TAKEDA, M. Skin reaction in leprosy with antigens prepared from "Kedrowsky" and "Takeuchi" strains, acid fast bacilli isolated from human leproma, by Chatterjee-Bose's method. Sci. Rep. Res. Inst. Tohoku Univ. **8** (1959) 379-387 (English summary).

Skin tests with the Chatterjee-Bose new antigen prepared from the Kedrowsky bacillus were made on 155 patients, comparatively with the Mitsuda and Dharmendra antigens and with the authors so-called "T" antigen, prepared from an acid-fast bacillus by Chatterjee's method. The Chatterjee-Bose antigen is promising for serviceability in place of the Dharmendra antigen for the early reaction in leprosy. The "T" antigen [apparently, from the title made from the Takeuchi strain of acid-fast bacillus isolated from a human leproma] is of no use in leprosy for eliciting either the early or the late skin reaction.—[From authors' summary.]

KOOIJ, R., PEPLER, W. J. and WAINWRIGHT, J. Histopathology of the reaction papules evoked by intradermal injection of normal tissue suspensions and Kveim antigen. Dermatologica (Basel) **119** (1959) 105-114.

It is shown that suspensions of normal skin and liver can evoke histologically sarcoid structures in the skin of patients with tuberculoid leprosy and in controls, similar to those obtained with Kveim antigen. The sarcoid structure was most often found 4-6 weeks after the injection. There is evidence of the existence of different stages of development of the sarcoid granuloma. It is concluded that the Kveim antigen does not contain a specific substance for sarcoidosis, and that the Kveim test is not specific. Probably patients with the sarcoidosis syndrome react more strongly to the Kveim antigen.—[From the authors' summary.]

LEVY, D., RUSSELL, W. F., JR., HOLLIFIELD, W. C., MOTAMEDI, G. and MIDDLEBROOK, G. The effect of topical hydrocortisone acetate ointment on the tuberculin skin reaction. American Rev. Resp. Dis. **80** (1959) 587-589 (notes).

Application of the ointment on one of two injection sites of PPD, 5 TU, after 24 and 48 hours, suppressed no weak reactions but lessened the degree of reaction in progressively increasing proportions of cases with stronger reactions, so that more than one-half of those with severe (necrotic) reactions on the control side had no necrosis on the treated side. [Students of the lepromin reaction might find interest in an extension of this experiment.]—H. W. W.

LESTER, W., COLTON, R., PARLETT, R. C. and YOUMANS, G. P. An evaluation of the agar double-diffusion test in 600 consecutive patients. American Rev. Resp. Dis. **81** (1960) 954 (abstract).

Sera from 600 tuberculosis patients admitted consecutively to the Suburban Cook County Sanitarium were studied for the presence of mycobacterial antibodies by means of the agar double-diffusion precipitation test. Of 369 patients with bacteriologically-confirmed tuberculosis, 364 (98%) were found to be antibody-positive. Positives in other case groups: of 58 cases of photochromogenic infection, 53 (91%); of 15 cases of the Battey type infection, all (100%); of 31 patients from whom only scotochromogenic cultures had been isolated, 25 (80%); of 107 patients from whom no positive cultures were obtained, 86 (80%). [Nothing said of normal controls.] The concentration of antibody detectable by the gel-diffusion test seems in most cases to tend to increase with the passage of time and the institution of chemotherapy. Thus, a single negative test may not be significant unless confirmed on repetition. However, the data reported indicate that a positive test demonstrating detectable antibody is of significance and does not vary appreciably on repetition.—[From abstract.]

PLANCHET, L. Les résultats faussement positifs des réactions sérologiques aux antigenes cardiolipidiques dans la lèpre. Etude biologique et pathogenique. [False positive results of serologic reactions with cardiolipin antigens in leprosy. Biologic and pathogenic study.] Maroc méd. **37** (1958) 1113-1129.

This report is essentially statistical, giving the results of various tests in 515 treated leprosy cases in Casablanca, where such cases have been found to give 43% positive or dissociated serologic reactions of syphilis, against 20% in nonleprous Moroccans. False postives are practically confined to lepromatous cases, especially the more advanced ones. The albumin-globulin ratio is almost always low in leprosy, but relatively little modified in the indeterminate and tuberculoid forms; the manner of positive and dissociated serologic reactions is inversely proportional to the change in the albumin-globulin ratio. With the Nelson test it is possible to differentiate between the syphilis reactions and the false reactions. This test was positive in 21% of the leprosy cases, regardless of type or advancement; the serologic index of syphilis infestation in Morocco is 20%. Antileprosy treatment was found often to result in disappearance of false serologic reactions. Gamma globulin determinations by electrophoresis (68 cases) or the Kunkel technique (100 cases) showed increase of that element, but without a correlation with the false positive reactions to the cardiolipid antigens.—N. Bourcart

De Souza, P. R., De Azevedo, M. P. and De Castro, M. P. Mycobacterium leprae em cultura de tecido. [Mycobacterium leprae in tissue culture.] Rev. Assoc. méd. Brasileira **5** (1959) 408-412.

This report was presented to the São Paulo Leprosy Society on November 10, 1959, with a summary of which the following is a somewhat abbreviated translation. The basic considerations involved are: (*a*) *M. leprae* is a strict parasite of the human histiocyte; (*b*) only histiocytes of Mitsuda-negative individuals are suitable for the intracellular development of *M. leprae*; and (*c*) neoplasmic cells are the most easy to cultivate. The authors encountered a case of lepromatous leprosy (Mitsuda-negative) with a complicating mycosis fungoides (malignant lymphoma of histiocytic lineage), and got the idea that cultured neoplasmic cells from that patient should be particularly suitable for the growth of *M. leprae*. On biopsy it was found that the tumor, just under the epidermis, contained no bacilli, but there was a little lepromatous infiltration deeper in the specimen. Tissue cultures of tumor tissue were set up with the intention of first getting cell growths and later infecting them with bacilli. No bacilli were seen in preparations of the first two transfers of the tumor cells, but some were seen in neoplasmic cells in smears of the third transfer, 40 days from the start of the experiment. The bacilli were in the cytoplasm of the cells—isolated, or in palisade arrangement; or in globus formations—this all resembling *M. leprae*. Smears up to the 6th transfer, the culture then 120 days old, still showed the presence of infected cells, although in decreasing proportions—the decrease explained on the ground of faster multiplication of the cells in comparison with that of the bacilli. (The work was being extended at the time of the report. Two cell cultures from nonleprous patients, one of mycosis fungoides and the other of reticulosarcoma, had been started and would be inoculated in due time.)—[From authors' summary, supplied by N. de Souza Campos.]

Bapat, C. V., Ranadive, K. J. and Khanolkar, V. R. In vitro cultivation of an acid-fast mycobacterium isolated from human lepromatous leprosy. Indian J. Path. & Bact. **1** (1958) 156-159.

These authors tried to cultivate *M. leprae* from seven untreated lepromatous cases in tissue culture bottles containing Eagle's synthetic medium supplemented with 20% human serum and enriched with cystine, in the presence of dorsal root ganglion cells of the human fetus. In all cases a strain of acid-fast bacilli grew which could not be identified as *M. tuberculosis, M. ulcerans, M. fortuitum, M. balnei* or any saprophytic mycobacterium. [The abstract of another article from the same source, which abstract appeared in The Journal **27** (1959) 297, spoke of "fibrocytes containing acid-fast material in some form," which is vague. Actually, the article says that when leprous nodule material was incubated in association with fetal spinal ganglia, 78% of those cultures showed fibrocytes full of acid-fast rods, granular material, and diffuse foaminess

or faint pinkish coloration of the cytoplasm. However, with fibrocytes of skeletal muscle cultivated under the same conditions, such findings were rare.]—N. MUKERJEE

McMILLEN, S. and KUSHNER, D. S. Atypical acid-fast bacilli. III. An expanded schema. American Rev. Resp. Dis. **80** (1959) 434-437 (notes).

The scheme presented, designed for the identification and classification of acid-fast bacilli not typical of *M. tuberculosis* frequently isolated in general hospital laboratories, was applied to 19 species. Included among those regarded as etiologic agents of disease in human beings was *M. marianum*. That culture was placed in Group 2, composed of those which grow slowly at 37°C on the Löewenstein-Jensen medium, and in subdivision C, those which produce pigment in the dark (scotochromogenic), along with *M. scrofulaceum* (a pathogen) and *M. paraffinicum* (not a pathogen).—H. W. W.

ROBSON, J. M. and SMITH, J. T. Studies on the multiplication of *Mycobacterium lepraemurium* in the mouse cornea. British J. Exper. Path. **40** (1959) 33-39.

Mice were injected intracorneally with 0.001 cc. of a suspension of *M. leprae murium* and killed at intervals. The bacilli present in the cornea were counted after the cornea had been digested with collagenase and hyaluronidase. The results show that many of the bacilli disappear from the cornea during the first few days; they apparently escape, either extracellularly or inside of phagocytes, and become widely disseminated. After about a week, when the epithelium has regenerated, no further loss occurs and then, for about 6 weeks, the number of bacilli increases rapidly; thereafter there was a progressive decrease in the rate of increase, which continued until the end of the experiment (maximum 160 days). The reason for the change in the rate of increase is unknown, but the changes in the number of bacilli parallel the development of the macroscopic lesions. Speculating, the change in rate may be due to the development of immunity or, perhaps, to a loss of bacilli through the sclera. The parallelism between the number of bacilli present in the cornea and the size of the macroscopic lesion, is regarded as supporting the validity of assessing the value of drugs under test by their effects on the development of the macroscopic lesions.—[From abstract in *Trop. Dis. Bull.* **56** (1959) 734-735.]

CHAPMAN, G. B., HANKS, J. H. and WALLACE, J. H. An electron microscope study of the disposition and fine structure of *Mycobacterium lepraemurium* in mouse spleen. J. Bact. **77** (1959) 205-211.

The spleen specimens studied were treated as usual for ultra-thin sectioning, except that they were fixed for 6 days in the osmium tetroxide solution. A capsule-enclosing membrane separating the cytoplasm of the spleen cells from the bacterial cell was sometimes clearly visible; and although the origin of this membrane is doubtful, it appeared to be a product of the tissue cell, especially as occasionally 2 or more bacilli were enclosed by the same membrane. The capsular space was occupied by a material which was more finely granular than that of the cytoplasm of the host's cells. The bacterial cell wall appeared either as a solid ring 120-150 Å in thickness, or as 2 concentric rings 40-50 Å thick separated by a low-density space of similar thickness. When this wall was closely appressed to the protoplast the cytoplasmic membrane was not distinguished, but it became clearly visible when there was slight shrinkage. Low density areas, considered to represent nuclear material, were present in many cells; in these areas there were sometimes thick threads of dense material 40-60 Å in diameter, thought to correspond to mitochondria equivalents of other workers. Another inclusion body, which was only occasionally seen and is of unknown significance, was of low density and agranular. The bacilli were never seen within the nuclei of the tissue cells, although occasionally they were present within an invagination of the nuclear membrane thus giving a false appearance of being intranuclear. No evidence was seen that the host cells had a deleterious effect on the bacilli.—[From abstract in *Trop. Dis. Bull.* **56** (1959) 734.]

EUROHASHI, T., TAKAHASHI, T., OSHIMA, S. and UEMURA, M. Evaluation of the therapeutic effect of kanamycin (KM) and streptomycin (SM) in the treatment of murine leprosy in rats. La Lepro **28** (1959) 80-84 (in Japanese; English abstract).

Lepromas in the treated and control groups of rats, after 3.5-4.5 months of treatment, were weighed and ground up, and the bacilli in decimal dilutions of the suspensions were counted, stained comparatively by the victoria blue and malachite green methods, and tested for virulence by subinoculations. Both drugs were very effective in the treatment, the nodules being much lighter and the numbers of bacilli smaller than in the controls. Most of the bacilli from the controls stained with malachite green and were typically rod-shaped, whereas those from the treated group did not take that stain and were granular or beaded, and it is suggested that this stain may be used to demonstrate a qualitative change under treatment. After subinoculations with suspensions from the treated animals, nodules appeared much later than with material from the control animals.—[From the summary.]

OSHIMA, S., TAKAHASHI, T., UEMURA, M., NOJIMA, T., YANAGISAWA, K. and NISHIMURA, S. Immunological studies on murine leprosy (IV). Effect of BCG and an attenuated tubercle bacilli (Imamura strain) on murine leprosy in rats. La Lepro **27** (1959) 85-95 (in Japanese; English abstract).

The studies reported were made in an attempt to clarify the important problem of what effect BCG vaccination would have on individuals already infected with leprosy but without any apparent signs of the infection. As a model experiment, 100 rats were first infected by subcutaneous inoculation with murine leprosy bacilli and then, after 1 day, 2 weeks, 4 weeks or 8 weeks, they were injected intraperitoneally with BCG or an attenuated tubercle-bacillus (Imamura) vaccine. The following results were observed. (1) The growth and weight gain of the leproma was slower in the group in which BCG was injected 1 day after infection, compared with the unvaccinated control. The lepromas in the 2- and 4-weeks BCG groups were also somewhat smaller, but there was almost no effect in the 8-weeks BCG group. (2) All of the groups injected with the Imamura strain vaccine showed smaller lepromas compared to the untreated control. (3) Examination of the bacillus distribution in lymph nodes revealed little difference between any of the groups, but there were differences with respect to the visceral organs. In the group injected with the Imamura vaccine, bacilli were totally absent, showing that a definite inhibition had taken place. The results suggest the injection of the vaccines used is effective in inhibiting the onset of murine leprosy, and that the shorter the interval between the infection and vaccination the greater is the inhibitory effect.—[From abstract.]

NISHIMURA, S., NAKAO, M. and KOSAKA, K. Sensitivity of wild mice to murine leprosy. La Lepro **28** (1959) 192-200 (in Japanese; English abstract).

Four species of wild mice (*Apodemus speciosus speciosus, Apodemus geisha geisha, Meriones unguiculatus, Microtus montebelli montebelli*) were tested for susceptibility to murine leprosy, and the results shown in Tables 1-4 (English language) were obtained. To Meriones animals, which proved the least susceptible, cortisone and hyaluronidase were administered with the object of heightening infectivity, with negative results. The following is suggested: (1) The morphologic classification of wild mice and susceptibility to murine leprosy appear to coincide closely, and *Apod. s. s.* is most susceptible. (2) In *Mer. ung.*, growth of murine bacilli takes place only in the testes, and inoculation of a small amount of bacilli gives better results than a large amount. (3) Another finding of interest was the production of lesions at joints: diligent, long-term observation is required for the determination of susceptibility. (4) It is difficult to alter natural susceptibility or resistance, so that for inoculation experiments with human leprosy bacilli, animals which are naturally susceptible should first be found. [Fifteen photographs, including 8 photomicrographs.]—[From abstract.]